Preview - Information

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Workbook Preview

Grade 4 – Science Unit

Organizing Idea: Matter: Understandings of the physical world are deepened by investigating matter and energy

Guiding Question: How can materials be managed safely?

	Learning Outcome – Students investigate the management of waste and dangerous materials and describe environmental impacts.	Pages
M.1	Methods of waste management that can negatively impact the environment include using landfills and burning.	8 – 20, 34 – 43
M.2		
M.3	Waste materials may be solids, liquids, or gases.	5 – 7
M.4	Dangerous materials include natural and processed materials that can be harmful to the health of individuals. Symbols are used to identify dangerous materials. Hazard symbols are used to identify dangerous materials, including those that are explosive flammable corrosive poisonous	61 – 71, 75 – 76
Computer Science:		
CS.1	Students examine and apply design processes to meet needs.	21 – 23, 44 – 46, 72 – 74

NAME: _____

WASTE

Name: _____ 6

What is Waste?

What is Waste?

Waste is anything that we don't need or want anymore. We call it trash, rubbish, or garbage. But did you know waste isn't just old food or crumpled paper? Waste can also be a liquid or even a gas. Let's learn more!

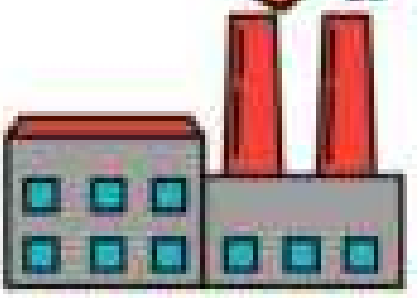
Solid Waste

When we think about waste, we often picture solid waste. Solid waste is stuff we can touch and see. Examples include old toys, food scraps, or a broken pencil. This is the kind of waste we put in the garbage bin at home. Sometimes, if we recycle, solid waste like plastic bottles can be turned into something new!

Liquid Waste

Next, there's liquid waste. This is waste in the form of a liquid. Spilled soda or used cooking oil are examples of liquid waste. Even some of our liquid waste is actually from our bathrooms. When we flush the toilet or wash our hands, the water is waste too. It needs to be cleaned at a water treatment plant before it goes back into the environment.

Gas Waste



Lastly, there's gas waste. This one's tricky because we can't see or touch it. But it's very real! When we burn fuels like gas, oil, or coal, it creates waste gases. These gases can pollute our air and harm our environment. Even burping cows create a gas waste called methane!

Name: _____ 7

What is Waste?

Type Which type of waste is it – solid, liquid or gas?

1) Soapy water	
2) Smoke from cars	
3) Used tires	
4) Old clothes	
5) Paper	
6) Sewage	
7) Paint	

8) Smoke from a factory	
9) Burp from a cow	
10) Oil spill	
11) Old table	
12) Food scraps	
13) Old coffee	
14) Fumes from gas	

Draw Draw examples of waste

Solid Waste	**Liquid Waste**	**Gaseous Waste**

Questions Answer the questions below using evidence from

1) What is waste?

2) What things have you thrown out as waste in the last day or two?

Name: ______________________ 8

Plant and Animal Waste

Plant and Animal Waste

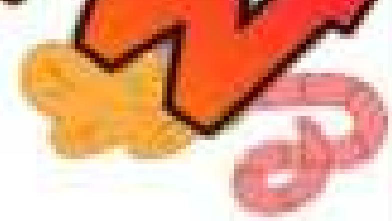
In our natural environment, plants and animals will produce waste as well. The difference is that the waste they produce is useful and can be reused again. Some common examples of plant and animal waste is when they die, or when a bird leaves its [illegible] The waste is reused for another important purpose.

Reusi[illegible] Waste

When a [illegible] leave[illegible]he twigs, mud, leaves and feathers are all left as waste. This isn[illegible] be[illegible]f these organic materials will be reused. The sticks and leave[illegible]s. The mud goes back into the soil, where it helps plants gro[illegible]

The feathers are **biodegra[illegible]le**, [illegible] will break down and return to nature. Biodegradable mate[illegible] are br[illegible] fungi, molds, worms, bacteria and other little soil creature[illegible]e cr[illegible] called **decomposers** and their job is very important as th[illegible] down all organic material so it can be reused.

When a plant or animal dies, the decomposers will break them down so they can be useful for the soil. We all need soil so that food can be grown.



Organic Material

Organic material is any material that was alive but is now dead. That piece of fruit you ate for breakfast was once alive but is now organic material. Organic material will be decomposed by worms, fungi, bacteria and molds. That is why old fruits and vegetables start to mold after awhile.

Name: _____ 9

Plant and Animal Waste

Yes/No Is the example an organic material?

1. Banana Peel	Yes	No
2. Plastic Bag	Yes	No
3. Wooden Chair	Yes	No
4. Aluminum Foil	Yes	No
5. Leather Shoe	Yes	No
6. Glass Bottle	Yes	No
7. Cotton T-Shirt	Yes	No
8. Gold Ring	Yes	No
9. Leaf	Yes	No
10. Steel Spoon	Yes	No
11. Grass clippings	Yes	No
12. Ceramic Plate	Yes	No
13. Dead Insect	Yes	No
14. Rubber Tire	Yes	No

Questioning What questions do you have about the reading?

1)	
2)	

Questions Answer the questions below using evidence from the reading.

1) What is an organic material?

2) What organic materials have you thrown out as waste lately?

Name: _____ 10

Composting

What is Compost?

Compost is decomposed organic material. This means that compost is broken down dead stuff! When something dies, like a plant, it will break down slowly into soil. The soil is actually compost, which is nutrient rich soil.

Decomposers

Decomposers are bacteria, fungi, and other living organisms that eat dead plants and animals. They break down decaying matter so that it turns into soil to be used by plants.

When they break down dead plants and animals, they release nutrients and mineral salts that go into the soil. This makes the soil rich in nutrients for plants to grow. Examples of decomposers include molds, fungi, and worms that reuse and recycle materials that were formerly living.

Decomposers are alive. They get their energy from the nutrients in dead matter. Worms take in food through their mouths and pass a 'cast' through their rear end. The cast is very valuable fertilizer for the soil.

What to Compost

As a general rule, you can compost things that were once growing but are now dead. Some examples include fruits, vegetables, paper, coffee, tea, and eggshells. You shouldn't compost cheese, medicines, or glass.

When you compost the right things, decomposers will begin to break down the dead matter, so it turns into good soil!

Name: _____ 11

Composting

Questions Answer the questions below using evidence from the text

1) What are decomposers? How do they help create compost?

2) Wha[illegible]nd what shouldn't you compost?

Making Connections W[illegible]ing remind you of?

Word Scramble Unscramble the words below using the word bank

Compost	Soil	Worms	Bacteria	Fungi	Decay	Break	Down

IETCARAB		SWMRO	
DACEY		EKARB	
LOIS		CDTPSMO	
WNDO		NIFGU	

Name: _____ 12

Composting

Not all organic material can be composted. Check out the infographic below to learn more about the organic material that can be composted.

Making Connections

Share your exp[illegible]s w[illegible]ing below

1) Have you ever used a composter? If so, what do you c[illegible]

2) What kinds of things can you not compost? Why do you think you can't compost those things?

Name: _____ 1A

Pop Bottle Composter

Background — What is this experiment all about?

How is compost made? How long does it take for organic material to turn into compost? These are the questions we will answer after our experiment is complete!

Materials — What will you need for this experiment?

- Em[illegible]
- Soil
- Leaves, gra[illegible]ews[illegible]an fruits or vegetables
- Anything else you[illegible]ted

Method — How you wi[illegible]am[illegible]nt

1. Cut the top off the 2-litre soda bottle.
2. Remove the label so you can see inside the bo[illegible]
3. Start with a layer of soil on the bottom
4. Add a layer of compostable material
5. Continue this process by alternating soil and organic material until the bottle is nearly full
6. Add water to the bottle to start the composting. The water will help rot the organic material
7. Put the composter in a place where it won't tip over and where it will get enough sun. The sunlight will also help rot the organic material
8. Monitor the progress of the composter by checking it once a week. As an option, you could take a picture each week to record what is happening

Name: _____ 15

Pop Bottle Composter

Diagram Draw a diagram of your bottle with each layer. Label the diagram

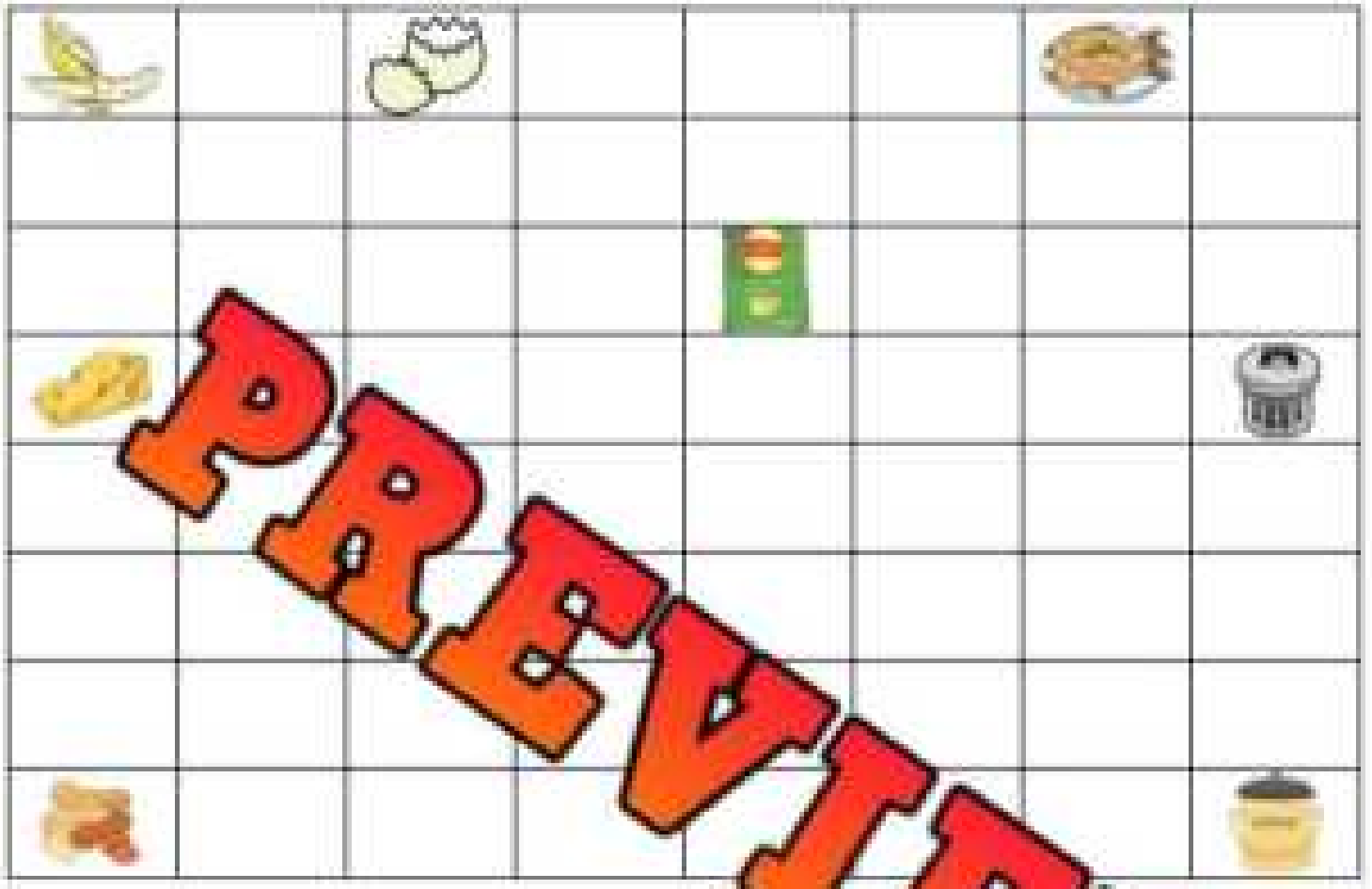
Questions Answer the quest[illegible]low

1) Why won't the composter work if you don't add w[illegible] it in[illegible]?

2) What did you notice happened to the organic material you put in the composter? What happened to it over time? How long did it take for anything to decay?

Name: _____ 16

Writing Code - Composting



Direction	Write code to move the waste to the [illegible] the [illegible]e can. Example: move down 3, move right 6

Banana	Cheese	[illegible]
run program	run program	run progra[illegible]

Fish	Chip Bag	Nuts
run program	run program	run program

Name: _____ 17

Recyclable Waste

What is Recyclable Waste?
Recyclable waste is stuff that we throw away that can be turned into something new again. It's like magic, but it's actually science!

Examples of recyclable waste:
- ☑ Paper and cardboard
- ☑ Glass bottles and jars
- ☑ Some plastic containers
- ☑ Metal cans like soda cans and soup cans

Types of Recyclable Waste

- Paper and Cardboard: Things like newspapers, magazines, and boxes can be recycled into new paper products.
- Plastics: Plastic bottles and containers with certain numbers on them can be recycled into new plastic items.
- Glass: Glass bottles and jars can be melted down and turned into new glass items.
- Metal: Things like aluminum soda cans and steel food cans can be recycled into new metal items.

Why Recycle?
Recycling is important for several reasons:

1) Saves resources: Instead of using new resources, recycling uses what we already have. For example, recycling one glass bottle saves enough energy to power a computer for 25 minutes!

2) Reduces landfill waste: The more we recycle, the less waste ends up in landfills.

3) Reduces pollution: Making new items from recycled materials usually creates less pollution than making things from new materials.

Name: _____ 18

Recyclable Waste

Yes/No Is the example recyclable waste or not?

1. Glass bottle	Yes	No
2. Banana peel	Yes	No
3. Aluminum soda can	Yes	No
4. Tissues	Yes	No
5. Plastic	Yes	No
6. Styr	Yes	No
7. Used di	Yes	No

8. Plastic milk jug	Yes	No
9. Disposable diapers	Yes	No
10. Newspapers	Yes	No
11. Chip bag	Yes	No
12. Metal food can	Yes	No
13. Ceramics	Yes	No
14. Used batteries	Yes	No

Questioning What questions do you have about the reading?

1)	
2)	

Questions Answer the questions below using evidence from

1) What is recyclable waste?

2) What things do you commonly recycle?

Types of Packaging

Different Types of Packaging Materials
Almost everything we buy comes in a package. Food, toys, electronics and more are usually wrapped in some form of package that protects the product inside. The problem is that all packaging is waste. This is because we don't buy the product for the packaging. The packaging is extra and unwanted. Some types of packaging are better for the environment than others. Check out the list below.

Plastic	
Advantages	[illegible]stic has a low cost, is durable, lasts a long time, is light-weight, and [illegible] used in many different ways (shrink wrap, hard plastic covering, [illegible])
Disadvantages	Pla[illegible]degradable, which means it won't break down naturally [illegible] t[illegible]uch plastic pollution. Some plastics can leak [illegible]to [illegible]

[illegible]	
Advantages	Cardboard [illegible] low[illegible]tweight for people to carry. Businesses can [illegible]ard. Cardboard can be easily recycled. Cardboard is a[illegible]grad[illegible]
Disadvantages	Cardboard isn't as durabl[illegible] plasti[illegible] be damaged by water (rain). Cardboard does not prote[illegible]odu[illegible] well because it can be damaged (deformed) eas[illegible]

Aluminum	
Advantages	Aluminum is 100 percent recyclable. It can be [illegible]p[illegible] back in a store in as little as two months. Aluminum [illegible]ycle rate at 68 percent. It is also inexpensive.
Disadvantages	Aluminum is a non-renewable resource, which means when we run out of aluminum, it is gone forever. To make aluminum, a lot of energy is burned. Some research suggests that aluminum could be bad for our health.

Glass	
Advantages	Glass keeps the contents fresh. No chemicals will leech into the food or drinks. Glass can store contents for a long time. Glass is 100 percent recyclable. They can be washed and reused as well.
Disadvantages	Glass costs a lot, which means the product costs more. It can be broken easily when being moved around. If glass is not recycled, it can take up to 1 million years to fully decompose.

Name: _____ 20 _____

Types of Packaging - Questions

Questions

Use information from the text to support your answer

1. What is packaging? What are the four main types of packaging?

2. Why is ch[illegible]ckaging materials an important choice? Explain some of the advantag[illegible]ages in your answer.

Reflection

Which packagi[illegible]nk is the best?

True or False

Circle whether the statement is true or false

1. Plastic is biodegradable and will break down naturally	True	False
2. Some plastics can be harmful to eat and drink out of	True	False
3. Cardboard is biodegradable and will break down naturally	True	False
4. Glass is biodegradable and better for the environment	True	False
5. All packaging needs to be recycled, especially glass, plastic, aluminum	True	False

Name: _____ 21

Free Assignment - Product Packing Machine

Today, companies are trying to make everything as automated as possible. This means they want robots to do as much of the work as they can.

Your task is to create a robot that can measure the size and weight of a product and then package it accordingly.

For example
IF the product has a volume less than 100 cm^3
THEN pack the product in a bag

IF the pr... volume between 100 cm^3 and 200 cm^3
THEN ... in a small box

IF/THEN	Write ... your invention

If the product has a volu... than 1...

THEN

If the product has a volume between 100 cm^3 ... 0 cm^3

THEN

If the product has a volume between 200 cm^3 and 400 cm^3

THEN

If the product has a volume between 400 cm^3 and 800 cm^3

THEN

If the product has a volume greater than 800 cm^3

THEN

Name: _____ 22

STEM Assignment - Product Packing Machine

Draw your packaging machine. Make sure you have:

- ✔ A place to put the product
- ✔ Where the packaging types will be stored (box, bag, etc.)
- ✔ A screen to tell you what is happening
- ✔ A start button
- ✔ A place for the package to go

Name: _____ 23

Unit Assignment - Product Packing Machine

Questions	Answer the questions about your machine below

1) How does your packaging machine work?

2) How does your machine work? Write one example line of code for the machine to pack your product

3) How much does it cost to make your machine?

4) Who will you sell your machine to?

5) How much will you sell it for?

6) If you sell 5 machines today, how much money will you make? Remember to subtract how much the machine costs to make!

Name: _____ 24

Decreasing Waste - The Three R's

Decreasing Waste

We all know that waste is not good for our environment. When waste ends up in our environment, it is pollution that affects our air quality as well as our ecosystems. Plants and animals suffer when we produce too much waste. That is why we all need to work together to decrease the amount of waste we produce.

The Three R's

To keep this [illegible]e, Canadians and people around the world have been learning about the [illegible]educe, reuse, recycle. By following the three R's, we can decrea[illegible]te we produce.

Reduce

We can reduce [illegible] co[illegible] less. The less we buy, the less waste we will have. When we do [illegible]gs, [illegible]ake sure we use them and try to choose packages that are biod[illegible]. For example, buying plastic water bottles and then throwing [illegible] g[illegible]rrible for the environment.

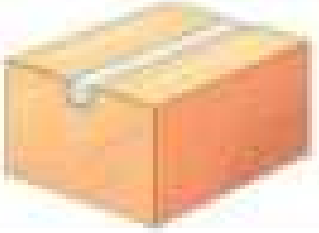
We should reduce the a[illegible] of [illegible] purchase by buying a reusable water bottle. We can also try [illegible] how many things we are buying. Sometimes we buy things we [illegible]ally [illegible] we don't use them. Most of the time, these things end up as waste.

Reuse

Reusing items instead of throwing them away is another way to reduce waste. When we buy new items, we throw out our older stuff, which adds to the landfills and causes pollution. You should consider reusing [illegible]g items before buying new. For example, you can reuse paper by writing [illegible]e back of a page or using scrap paper for less important things.

Recycle

Recycling is making new products out of already used materials that would have been otherwise thrown away. When we recycle materials, they are sent to factories to be sorted and eventually reused for new products. The recycled materials like plastic, cardboard, and metal are made into new products. This means those plastics, carboards, and metals never end up as waste, since they are always being used.



Name: _____ 25

The Three R's - Questions

Questions Use information from the text to support your answer

1. What can we do to decrease the amount of waste we make?

2. Which [illegible] to work on the most?

Summarize What is the reading all a[illegible]g the important details

True or False Circle whether the statement is true or false

1. We need to decrease our waste to keep our environment healthy	True	False
2. Doing the three R's will decrease the amount of waste we make	True	False
3. We should recycle everything we are getting rid of	True	False
4. We can reduce the amount of things we buy	True	False
5. We don't need to worry about which type of package a product comes in	True	False

Name: _____ 26

Activity - Build a Recycled Bird Feeder

Objective What are we learning more about?

To learn about recycling, repurposing, and helping animals.

Materials What do we need for our activity?

1) An empty plastic bottle
2) Two [illegible] spoons
3) S[illegible]
4) B[illegible]
5) Craft paint [illegible] (optional)

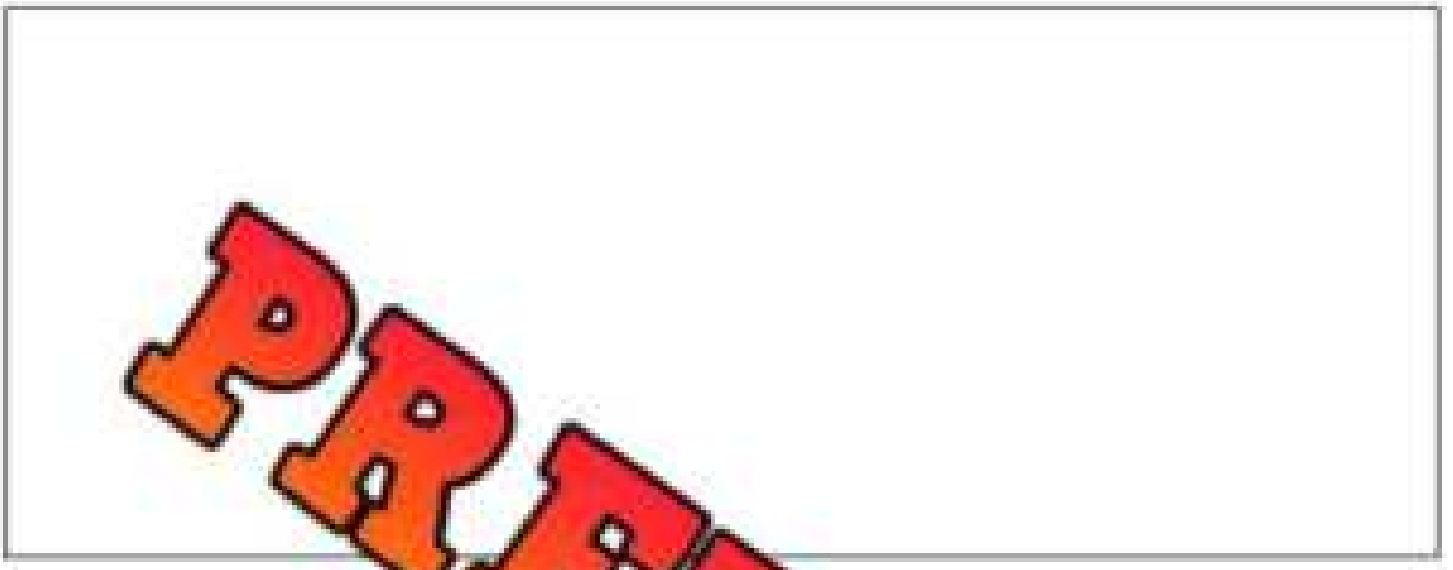
Method How to [illegible] experiment?

1) Clean the plastic bottle and remove the label.
2) Ask an adult to help make two pairs of holes on opposite sides of the bottle, one pair near the bottom and the other halfway up the bottle. Large enough for the spoons to fit through.
3) Push the spoons through the holes so that the bowls are inside the bottle. The spoon handles will act as perches for the birds and the bowls will hold the birdseed.
4) Make two small holes near the top of the bottle and thread the string through them. This will be used to hang the bird feeder.
5) Fill the bottle with birdseed until the seeds are level with the spoons.
6) Screw the cap back onto the bottle.
7) If you want, you can paint and decorate the outside of the bottle with craft paint.
8) Find a tree in your backyard or a park and hang the bird feeder on a branch.
9) Watch and see what kinds of birds come to visit your bird feeder!

Name: _____ 27

Activity - Build a Recycled Bird Feeder

Plan | Draw your bird feeder below



Questions | Answer the questions

1) What materials did you reuse?

2) How did you help the environment with your bird feeder?

Name: _____ 28

Beyond the Three R's

Beyond the Three R's

Waste is a big problem and the three R's are a great start to solving it. But there is more we can do to stop how much we are wasting. We should consider the new 7 R's! Calgary is the world's cleanest city, and they do it by having their residents follow the 7 R's. Beyond the three r's, we can add 4 more – Refuse, Repair, Regift, and Recover.

Refuse

The term r[illegible] all things left over after use. It is similar to waste, but waste means [illegible] that cannot be recycled. When we buy things, we should consid[illegible] that will be leftover after we use the item. We should ask questions like:

- Is this produ[illegible] sold [illegible] with less packaging?
- Do I need this p[illegible]?
- Is this product recyc[illegible]

Repair

We quite often buy new things because [illegible] have stopped working. To cut down on [illegible], we should consider repairing what we already ha[illegible] example, our old shoes can have new soles pu[illegible] them to allow them to last longer. We could also g[illegible] machines fixed before buying new ones.

Regift

If we have items that we don't like anymore, we shouldn't just th[illegible] trash. Instead, we can regift them to someone who will appreciate the[illegible] you post these items for free, you will quite often find someone who will love them. This means the item did not end up in the trash and it is helping someone else.

Recover or Rot (Compost)

We need to remember that organic waste is helpful for our environment. We should never throw away food scraps, glass clippings and other organic waste because we can compost it. Composting organic waste means the waste becomes nutrient rich soil. Allowing organic waste to rot in composters is good for our environment.

Name: _____ 29

Beyond the Three R's - Questions

Questions Use information from the text to support your answer

1) What can we do beyond the 3 R's?

2) Does [illegible] have thrift shops? Can you easily regift or sell some of your [illegible]?

Making Connections What does [illegible] reading [illegible] your life?

True or False Circle whether the statement is true or false

1. Letting organic material rot is good for our environment	True	False
2. Throwing out old food is okay because it is old	True	False
3. We can reduce waste by regifting or reselling our old stuff	True	False
4. Refuse is only the leftover waste that can't be recycled	True	False
5. You can repair your old things so you don't have to throw them away	True	False

Name: _____ 32

Reselling - Online Marketplace Assignment

Objective | What are we learning more about?

Have you ever heard the saying, "one person's trash is another person's treasure?" Well, it is true! We shouldn't throw our old things away. Instead, we can post these things for free or even for sale by using an online marketplace.

Instructions | How do we complete the activity?

1) Ask students to think of one item they have at home that is no longer needed or want. It should be something that is in good condition and could be useful to someone else.
2) Discuss with students the concept of reselling. Emphasize how this helps the environment and also help other people.
3) Once they have chosen their item, have them create an online marketplace post. They should include:
   - A title for their listing (e.g., "Gently Used Bicycle for Sale")
   - A description of the item, including its condition, color, size, and any other important details.
   - A reason why someone else might want or need this item.
   - A 'pretend' price or, if they choose to give it away, they can list it as 'Free'.
   - They can also draw a picture of their item to go with their listing.
4) Once they've created their listings, have the students present their items and explain why someone else might want or need them.
5) Discuss how the activity can be applied in real life and the benefits of reusing, recycling, and regifting.

Name: _____ 33

Reselling - Online Marketplace Assignment

Plan | Plan your sale item posting

1) What will the title of your listing be? Example: "Gently Used Bicycle for Sale"
2) A descrip[illegible] of the item, including its condition, colour, size, and any other important [illegible]
3) Why might someone want this or ne[illegible]

4) What is the price for it?	5) Which city are you in?	6) Draw the object below.

Name: _____ 3A

Reselling - Online Marketplace Assignment

Listing	Create your listing below

Title	
Price	
Location	
Picture	
Seller's Description	
Condition	New / Used – Like New / Gently Used / Used / Damaged
Message / Share / Save / Report Listing	

Name: _____ 35

How Long Does Garbage Take To Decompose?

Questions Answer the questions below

1) What surprised you about how long garbage takes to decompose?

2) How does this graphic show the importance of recycling? What happens when we don't?

Name: _____ 36

The Journey of Recycled Plastic

The Journey of Recycled Plastic
Have you ever wondered what happens to the plastic bottle after you toss it into the recycling bin? It goes on a fantastic journey to become something new!

Step 1: Collection
Our recycling journey begins at your house! When you put your plastic bottle into the recycling bin, a recycling truck comes to collect it. These trucks go around your neighborhood picking up all the recyclables.

Step 2: Sorting
Next, the collected waste goes to a recycling center. Here, workers and machines sort out different materials. They separate plastic, glass, and metals. Our plastic bottle is grouped with other plastic items.

Step 3: Cleaning
Now, it's bath time for the plastic! The plastic waste must be cleaned to get rid of any food, dirt, or other stuff that might be on it. It's important to make sure the plastic is clean for the next step!

Step 4: Shredding
Once the plastic is clean and dry, it goes into a big machine that shreds it into tiny pieces. These pieces, or flakes, are easier to handle and process.

Step 5: Melting and Reshaping
The flakes are melted in a big oven. The melted plastic is then shaped into small pellets. These pellets can be used to make all sorts of new things!

Step 6: Making New Products
Finally, the pellets are sent to factories. There, they can be used to make new products like clothing, toys, and even new plastic bottles!

Name: _____ 37

The Journey of Recycled Waste

Poster Draw a poster below that outlines the steps plastic takes to be recycled

Name: _____ 38

The Journey of Recycled Glass

The Amazing Adventure of Recycled Glass
Did you know that a glass bottle can go on an exciting journey to become something new when it is recycled? Let's see how that happens.

Step 1: Collection
Our adventure begins at your house! When you put your glass bottle into the recycling bin, a big truck comes to pick it up. The truck travels around your neighborhood, collecting all the glass bottles and jars people have recycled.

Step 2: Sorting
Next, all the collected glass goes to a recycling center. Workers at the center sort the glass by color. Green glass, clear glass, and brown glass each have their own piles.

Step 3: Crushing
Now the real fun begins! The glass is crushed into tiny pieces called "cullet." This makes it easier to melt and reshape.

Step 4: Melting
The cullet goes into a big furnace where it gets really hot and melts. Imagine a giant oven full of liquid glass!

Step 5: Shaping
Now, the melted glass can be shaped into new products. It's poured into molds to make new bottles, jars, or even items like drinking glasses and vases.

Step 6: Cooling and Checking
Once the glass is shaped, it has to cool down. Then, workers check each item to make sure it's safe and ready to use.

Name: _____ 39

The Journey of Recycled Glass

Poster Draw a poster below that outlines the steps glass takes to be recycled

Name: _____ 40

The Journey of Recycled Paper

The Exciting Expedition of Recycled Paper
Have you ever wondered what happens to a piece of paper once it's put into the recycling bin? Let's follow its adventure and find out!

Step 1: Collection
The journey starts in your house. When you put a piece of paper in the recycling bin, a recycling truck collects it. This truck travels all around houses in your neighborhood, picking up paper for recycling.

Step 2: Sorting
The truck takes all the paper to a recycling plant. There, workers and machines sort the paper from other items and sort it by type: newspaper, cardboard, office paper, and more.

Step 3: Shredding and Soaking
Next, the paper is shredded into tiny pieces. The pieces are mixed with warm water and turned into something called pulp. This pulp looks like thick soup!

Step 4: Cleaning
The pulp is then cleaned and screened. It's kind of like washing dishes - it removes all the inks, glues, and other unwanted stuff. This leaves only clean, recycled pulp.

Step 5: Drying and Rolling
The clean pulp is then spread out on large screens to dry. As it dries, it turns back into thin sheets of paper. Then, the sheets of paper are rolled up into big rolls.

Step 6: Making New Things
Finally, the rolls of recycled paper can be cut and shaped into new things! This might be notebooks, newspapers, or even the very paper in your schoolbooks!

Name: _____ 47

Consumerism and Waste

What is Consumerism?

Consumerism is a word we use to talk about the habit of people buying lots of goods and services. It's like when we want the newest toy, the latest gadget, or the most fashionable clothes. When we keep wanting more and more, that's consumerism.

How Does Consumerism Lead to More Waste?

Every time we buy something new, it usually comes with packaging. This packaging can be plastic wrappers, cardboard boxes, or even metal cans. Once we get home, we often throw the packaging away. This is waste.

Not only that, when we buy new stuff, we often throw away our old stuff. If our old stuff still works, throwing it away creates even more waste.

Waste Management Problems

When we create more waste, it becomes harder to manage. "Waste management" is a fancy term for how we deal with the stuff we throw away.

We can put waste in landfills, which are big holes in the ground. But landfills can fill up if we create too much waste. When landfills are full, we need to find other places for our waste, which can be difficult.

Recycling is another way to manage waste. But recycling takes energy, and not all things can be recycled. Also, when we recycle, we still need to deal with the waste that can't be recycled.

Conclusion

So, consumerism, or wanting and buying more things, can lead to more waste. And more waste can lead to problems with waste management. It's important to think about what we buy, and whether we really need it, to help reduce waste.

Name: _____ 48

Consumerism and Waste

Questions Answer the questions below using evidence from the text

1) What is consumerism?

2) Why [illegible] to more waste?

Making Connections Do you take part i[illegible] you need the latest things?

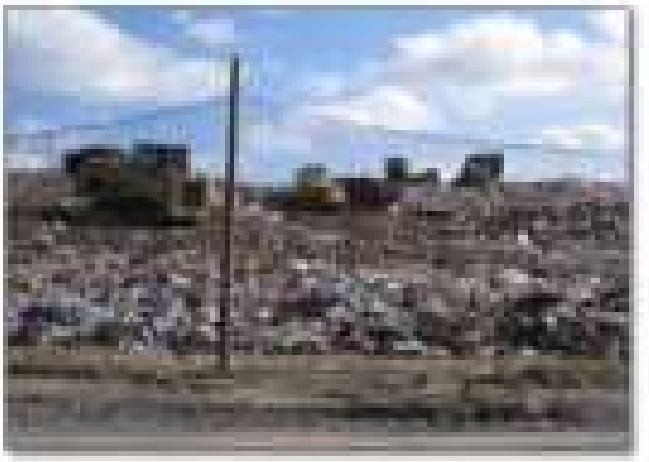
True or False Is the statement true or false?

1) Consumerism means we want more and more things	True	False
2) Consumerism is good for the environment	True	False
3) Consumerism means more waste	True	False
4) Only the packaging of new things we buy will ever be waste	True	False
5) We should repair or reuse old things to reduce our waste	True	False

Name: _____ 49

Waste Management Issues

Waste Management



With the global population growing, the waste we produce is also growing, but at a much higher rate. People now have access to more material goods that they consume and then need to dispose of.

This is a very serious problem for our environment as it is getting out of control. There are many concerns to the methods we use to handle the waste.

Waste Disposal Sites

In many countries around the world, waste is collected at the source (home, business) and sent to a waste disposal site. The garbage at these waste disposal sites is most often incinerated. **Incineration** means the burning of waste. Many of the incinerators around Canada burn up to 200 truckloads of garbage a day. It has been reported that up to 50% of the waste that goes into the incinerator cannot be burned.

Landfill Sites

Most people call a landfill site a dump. This is the opposite of sanitary landfill and involves dumping the garbage in a huge pile. The issue with landfill sites is that they are often fire hazards that can cause wildfires and forest fires. Dumps are also the perfect feeding grounds for rats who carry diseases that can spread to humans.

Sanitary Landfill

The other way the garbage is dealt with is through the use of sanitary landfills. At a sanitary landfill, a thin layer of waste is put into a trench alongside a layer of soil. This layering continues until the trench is full. A full trench looks like a large hill. Once the sanitary landfills are full, these places can be repurposed as golf courses or toboggan hills because of the hilly landscape.

Name: _____ 50

Waste Management Issues

Questions

Use information from the text to support your answer

1. Why is waste management needed? Why is it becoming more challenging?

2. What do [illegible] best way to manage waste?

Visualizing

Draw what [illegible] you were reading

Multiple Choice

Circle the correct answer

1. Landfills can be repurposed for	Golf	Ponds
2. Most garbage is	Incinerated	Piled
3. Sanitary landfills layer garbage and...	Waste	Soil
4. A landfill site is commonly called a...	Heap	Dump
5. Dumps are feeding grounds for	Rats	Deer

Environmental Effects - Incinerating Waste

Why Do We Incinerate Waste?

We incinerate waste mainly because it helps reduce the amount of garbage we send to the landfill, and it can also produce energy. The process of burning waste, or incineration, can convert waste into heat energy. This heat energy can be used to make electricity that power[illegible]omes and cities!

How D[illegible]?

Incinerat[illegible] work[illegible]st[illegible]:

1) First, truck[illegible] waste [illegible]cinerator.
2) The waste is the[illegible] where it gets burned. This burning turns the waste into a[illegible]s.
3) The ash falls to the bottom o[illegible] fu[illegible]ted to be put in a landfill. The gases rise into the atmosphere[illegible]

What Happens to the Environment?

Incineration can be helpful because it makes a lot of wa[illegible] le[illegible]. For example, burning 3 bags of trash can create just 1 bag of ash[illegible] i[illegible]o have some problems. Here are a few:

- Air Pollution: Even though the gases are cleaned, some pollution can still escape into the air. This pollution can include chemicals that are bad for our health and the health of animals.
- More Waste: The ash from incineration still needs to go somewhere, usually a landfill. So, we're still making waste.
- Energy Use: Incineration needs a lot of heat, which means using a lot of energy. This energy often comes from burning fossil fuels, which can add to climate change.

Name: _____ 52

Environmental Effects - Incinerating Waste

Questions Answer the questions below using evidence from the text

1) Why is waste incinerated? What are the advantages?

2) What a[illegible] incinerating waste?

Diagram Write the steps that h[illegible] incinerated. Then draw a picture of each step.

Name: ______________________ 53

Landfills - Benefits and Drawbacks

What are Landfills?

Landfills are like giant bins for our waste. They are places where we put things that we don't want or need anymore. From old toys to food scraps, lots of different waste can end up in a landfill.

The Benefits [illegible] Landfills

Landfills ha[illegible] good things about t[illegible]ple:

☑ Space [illegible] Was[illegible] [illegible]ide a place to put our garbage. Without landfills, our garbage mig[illegible] pla[illegible] we live, work, and play.

☑ Energy Productio[illegible] [illegible] and use the gas produced by rotting garbage to make electr[illegible] [illegible]ur homes and cities!

The Drawbacks of Landfills

But landfills also have some not-so-good things [illegible] a few:

☒ Takes up Space: Landfills use a lot of land, an[illegible] other things, like parks or homes.

☒ Pollutes the Environment: As garbage rots, it can make ha[illegible] gases aren't collected, they can escape into the air and hurt the [illegible]

☒ Harmful to Wildlife: Landfills can be dangerous for animals. They mig[illegible] things that are bad for them or get stuck in the garbage.

Conclusion

Landfills play a big role in handling our waste. They have benefits, like providing space for our garbage and sometimes making energy. But they also have drawbacks, like taking up land and hurting the environment and wildlife. So, remember to reduce, reuse, and recycle to help cut down the amount of waste we produce!

Name: _____ 54

Landfills - Benefits and Drawbacks

Think What are the advantages and disadvantages of using landfills?

Advantages	Disadvantages

Making Connections How do you [illegible] you [illegible]? Where does it go?

True or False Is the statement true or false?

1) Only food scraps can end up in a landfill.	True	False
2) Landfills don't use much land.	True	False
3) As garbage rots, it can make harmful gases.	True	False
4) Landfills are safe for animals.	True	False
5) Landfills can't be used for making energy.	True	False

Name: _____ 55

Life of a Consumer Product - Flowchart

Life of a Consumer Product
Check out the flowchart below to see the life of a consumer product (Xbox). Notice the different disposal methods.

Start Here

Idea

Building the Xbox
Materials:
- Plastic
- Metal

Xbox is Used
Xbox is purchased and played until it is old, breaks, or a new one comes out

Repaired
The broken Xbox is repaired and works again. No need to throw it away!

Incineration
Xbox is incinerated. The burning of the plastic and metal emits toxic fumes into the air. These emissions are ...ing our planet ...oying our

Landfill Site
The Xbox will sit in a landfill site for millions of years. Other trash will pile on top of it. It will be part of a huge pile. The pile of trash may light on fire or it may be a home for rats that carry diseases.

...posal
Xbox is ref... and needs ... be disposed of

Recycled
The Xbox is recycled properly. It is sent to an electronics recycling depot. The metals and plastics are reused to make new gaming systems and other things that use plastic and metal as materials.

Regifted
You don't need the Xbox anymore, but someone else will enjoy it. The Xbox stays out of a landfill and is not incinerated.

Name: _____ 5A

Life of a Consumer Product - Flowchart

Instructions Create your own flowchart like the one about the Xbox. Choose your own consumer product and be creative with your flowchart.

Name: _____ 97

Story - Journey of Robo the Robot

Draw Illustrate the story by adding pictures to the book.

The Journey of Robo the Robot

Once upon a time, there was a shiny robot named Robo. Robo was made from all sorts of m[illegible] like plastic, metal, and even some special electronic parts. Robo liv[illegible] girl named Emma. Emma loved to play with Robo. They wou[illegible] adventures together, solve puzzles, and sometimes, Robo would e[illegible] her homework.

As the years passed a[illegible] Robo started to break. First, it was Robo's screen that went bla[illegible] to grind, and finally, one day, Robo just stopped working altog[illegible] sad.

Name: _____ 60

Story - Journey of Robo the Robot

In this way, even though Robo was broken, its parts didn't end up in a landfill or get burned in an incinerator. Instead, they were given a new life in new products.

Emma felt happy knowing that Robo was helping to create new things and not harming the environment. She knew that Robo's adventure was not over, but it was just beginning anew. This made Emma understand the importance of recycling and how it helps to keep our environment clean.

Name: _____ 61

Toxic Waste

What is Toxic Waste?

Waste is anything we need to get rid of. **Toxic waste** is any waste that is harmful to people, plants, or animals. When we get rid of toxic waste, we need to be careful as it could hurt other living things.

Toxic [illegible] often made by factories, construction sites, hospitals [illegible] waste can be flammable, corrosive, or reac[illegible]

- Flammable – [illegible] amples: gas, oil, grease
- Corrosive – will burn, [illegible] erials. Example: battery acid
- Reactive – will explode eas[illegible] pressurized cans

Examples of Toxic Waste in our Households

At home, it is important to be careful with toxic [illegible] way old batteries in the garbage or dump oils down the drain. [illegible] environment because these materials can cause fires, explode, or cause burns and rusting.

When living things in our environment come in contact with toxic waste, they can get sick by consuming it.

Cleaning supplies are usually forms of hazardous waste. Most cleaners are chemicals that are not natural. They do not break down in our environment and they can get into our drinking water and make humans and other animals sick. When we pour chemicals down the drain, we are making our drinking water toxic!

Name: _____ 62

Toxic Waste

True or False Is the statement true or false

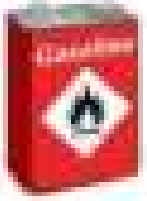
1) Throwing out bread is toxic waste	True	False
2) Old batteries are toxic waste	True	False
3) Many house cleaners are toxic waste	True	False
4) Toxic wa[illegible] make living things sick	True	False
5) We sho[illegible]t toxic waste	True	False

Toxic? [illegible] toxic or not?

Yes | No

Yes | No

Yes | No



Yes | No

Yes | No

Yes | No

Visualizing Draw what you were picturing while you were reading. Explain the picture

Name: _____ 63

Medicine - Types and Disposal

Liquid and Solid Medicines

Most medicines come in liquid and solid forms. We take medicine when we don't feet well. The type of medicine we take depends on how we feel. When we have a headache, we might take a pain reliever. When we have a bad cough, we might take cough syrup. If we have a runny nose, we could take allergy medicine.

Taking Medi[illegible]erly

There a[illegible]cines – prescription medicine and over-the-[illegible]ter m[illegible]

Prescription Me[illegible]

When we get medic[illegible] our [illegible]escription medicine. You cannot buy prescription medicine from [illegible] other saying you need it. It would be very dangerous to take a prescription me[illegible] telling you to.

It could make you very sick because [illegible]ng and type of medicine was not made for you. That's why you should never take medicine without a trusting adult.

When we get rid of a prescription medicine, we should not just throw it out. Instead, we should take it to a drug take back [illegible]. If we throw it in the garbage, someone else could find it and take it. Also, when it rains, the medicine can dissolve into the water. This means our drinking water could have medicine in it.

Over the Counter Medicine

When you get a cough or a headache, your parents might give you an over-the-counter medicine that they can buy from the store. This medicine can still be dangerous to take if you do not need it. Most medicines say to take it for only a few days because it can harm you if you use it everyday.

Never take an over-the-counter medicine without a trusting adult. There may be side-effects to taking it without food or taking too much. An adult can help you.

Name: _____ 64

Medicine - Types and Disposal

True or False Is the statement true or false

1) Prescription medicine is made just for you	True	False
2) Over-the-counter medicine can be bought at the store	True	False
3) You need a doctor to give you over-the-counter medicine	True	False
4) It is okay to take over-the-counter medicine by myself	True	False
5) Over-the-counter medicine is not dangerous	True	False

Making Connections When have you taken medicine before?

Questions Answer the questions below

1) What is the difference between over-the-counter medicine and prescription medicine?

2) Why should we not throw out medicine?

Name: _____ 65

Handling Fluids Safely - WHMIS

What is WHMIS?

WHMIS stands for the Workplace Hazardous Materials Information System. It is Canada's national hazard communication standard. WHMIS is needed to tell people about the fluids they will be handl[illegible] many fluids we use at home or at work c[illegible] if used incorrectly, handled[illegible] of incorrectly.

To k[illegible] people [illegible] established the WHMIS prog[illegible] and workers receive consi[illegible] health and safety informati[illegible] products they may be exposed to. When someone gets a new job, they wi[illegible] WHMIS training, which teaches them how to read symbols put on the lab[illegible]

WHMIS Symbols

Explosive	Explosives are highly unstable sub[illegible]
Compressed Gas	Gas is stored under pressure – be careful [illegible] disposing
Irritant	Will immediately irritate skin, eyes, or respiratory [illegible]
Flammable	Will self-ignite when exposed to water or air
Corrosive	Will cause corrosion/burns or eye damage on contact
Health Hazard	A cancer-causing agent or substance that causes damage over time
Oxidating	Chemicals that facilitate burning or make fires burn hotter/longer
Toxic	Substances, such as poisons that have an immediate and severe toxic effect
Environmental Hazard	Chemicals toxic to aquatic wildlife

Name: _____ 66

Handling Fluids Safely - WHMIS

Questions Use information from the text to support your answer

1) What is WHMIS? Why was it created?

2) Before W[illegible] created in 1998, what issues could have happened in the workpl[illegible]

Instructions Label each o[illegible]MIS [illegible]mbols

- Explosive
- Compressed Gas
- Irritant
- Flammable
- Corrosive
- Health Hazard
- Oxidating
- Toxic
- Environmental Hazard

Name: _____ 67

Handling Fluids Safely - WHMIS

Matching

Match the description to the name of the safety symbol.

Answer	Safety Symbol	Description
	Explosive	a) Will cause corrosion/burns or eye damage on contact
	Compressed Gas	b) Gas is stored under pressure – be careful handling, storing, and disposing
	[illegible]tant	c) Substances, such as poisons that have an immediate and severe toxic effect
	[illegible]	d) A cancer-causing agent or substance that causes damage over time
	[illegible]sive	e) Will immediately irritate skin, eyes, or respiratory
	Health Ha[illegible]	f) Ex[illegible] highly unstable substances that [illegible]
	Oxidating	g) C[illegible] toxic [illegible]ic wildlife
	Toxic	h) Chemical[illegible] facilit[illegible] or make fires burn hotter
	Environmental Hazard	i) Will self-ignite w[illegible] to[illegible] air

Word Search

Find the words from the word bank in the p[illegible]

Explosive	Gas
Compressed	Hazard
Environmental	Oxidating
Irritant	Toxic
Flammable	Health
Corrosive	Hazard

T	[illegible]	X	B	H	V	K	Q	E	V	I	S	O	S	B	[illegible]	C	E	W	T
E	V	[illegible]	L	V	[illegible]	N	B	C	P	L	A	M	[illegible]	A	B	L	E	A	T
W	[illegible]	R	O	[illegible]	[illegible]	V	D	E	S	S	E	[illegible]	P	M	O	C	I	C	O
M	T	V	[illegible]	W	H	[illegible]	S	W	F	H	S	A	L	[illegible]	[illegible]	M	[illegible]	[illegible]	X
U	L	L	A	T	N	E	M	N	O	[illegible]	I	V	N	E	M	N	V	[illegible]	I
X	H	N	L	E	H	F	Y	L	H	A	E	A	[illegible]	[illegible]	[illegible]	P	Q	H	A	C
E	[illegible]	A	E	P	[illegible]	E	N	Y	T	N	A	T	I	[illegible]	[illegible]	[illegible]	I	A	E	T
O	[illegible]	E	W	[illegible]	X	F	L	O	S	I	V	[illegible]	L	Y	H	[illegible]	[illegible]	A	Y
H	S	[illegible]	L	[illegible]	V	P	M	L	[illegible]	H	[illegible]	[illegible]	[illegible]	F	S	A	[illegible]	H	A
U	L	O	[illegible]	N	I	T	A	[illegible]	I	[illegible]	O	U	[illegible]	C	A	M	H	E	[illegible]

Name: _____ 68

Scavenger Hunt - Finding Products

Many products we buy are hazardous chemicals that need to be used properly and disposed of properly.

Your task today is to find different products online that have the safety symbols below. You can go online to a hardware store where chemicals are sold. Search for different cleaners, oils, batteries, fireworks, and acids.

Find ... swer the questions below

1) Find ... duct ... mable. Draw the symbol, product name, and picture of the product.

Symbol	Product Name	Pictu... roduct

2) Find a product that uses compressed gas. Draw the symbol, p... and picture of the product.

Symbol	Product Name	Picture of Product

Name: _____ 69

Scavenger Hunt - Finding Products

Find	Answer the questions below

3) Find a product that is corrosive. Draw the symbol, product name, and picture of the product.

Symbol	Product Name	Picture of Product

4) Find a product that is [illegible] the symbol, product name, and picture of the product.

Symbol	Product Name	Pic[illegible]

5) Find a product that is explosive. Draw the symbol, product name, and picture of the product.

Symbol	Product Name	Picture of Product

Name: _____ 70

Electronic Waste

What is E-Waste?

Electronic waste, also known as e-waste, is any electronic device that is no longer wanted or is broken. This can include things like televisions, computers, [illegible] phones, and even video games.

Why Do [illegible] of E-Waste Safely?

- It's [illegible] E- [illegible] dangerous. Some electronics have harmful things inside them [illegible] cu[illegible] cadmium. If these get into our environment, they can make p[illegible] and
- It Takes Up Space: Elect[illegible] ak[illegible] space. If we throw them away with our regular trash, they fill up a[illegible]
- It Wastes Resources: Inside your electronics [illegible] metals like gold, silver, and copper. By recycling, we can use [illegible]

How to Get Rid of E-Waste Safely

We can keep e-waste out of the trash by doing these things:

- Recycle: Many cities have e-waste recycling programs. They have sp[illegible]ins at recycling centers where you can drop off your old electronics. Some electronics stores even have bins where you can bring in old gadgets.
- Donate or Sell: If your device still works, consider donating or selling it. There are many charities or people that would be happy to have it.
- Return: Some companies let you return their products when you're done with them. They'll make sure it's either recycled or properly disposed of.

Name: _____ 71

Electronic Waste

Questions Answer the questions below using evidence from the text

1) Why is it important to get rid of e-waste properly?

2) How [illegible] e-waste?

Draw Draw pictures of ele[illegible]w

True or False Is the statement true or false?

1) E-waste means unwanted electronic devices.	True	False
2) E-waste can include video games and televisions.	True	False
3) It's safe to throw e-waste in regular trash.	True	False
4) E-waste can contain harmful things like lead.	True	False
5) There are precious metals like gold in electronics.	True	False

Name: _____ 72

Activity - E-Waste Code Relay

Objective — What are we learning more about?

Students will learn about what items are considered e-waste and how they should be correctly disposed of, using a fun relay race that teaches the principles of coding.

Materials — What you will need

- A
- Pic ards o items (some e-waste like old phones, broken computers ste like paper, glass bottle)
- Two bins or r "E d "Trash"

Instructions — co activity?

1) Set up a start line and place the b labe le" and "Trash" at a distance.

2) Distribute the picture cards to every stude

3) Put students into teams and line each team up at th in the relay race.

4) For the coding part of the game, have students listen to your coding commands. You can call out coding movements, like jump, hop on one foot, run, side shuffle, skip, gallop, bear crawl, etc. They will be components of a computer program, so they will need to follow the coding instructions.

5) When the teacher says go and calls out a command, the first student in each line will move to the correct bin (E-Waste or Trash) to get rid of their waste.

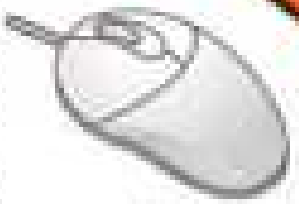
6) They should return to their team and tag the next person to go.

Name _____ 73

Activity - E-Waste Code Relay

Cut | Cut out the cards below

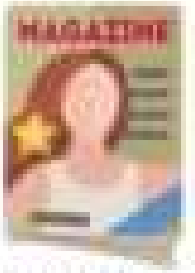
Fridge

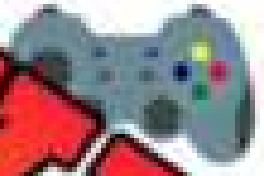


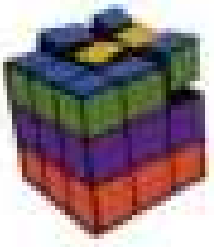
Name _____ 7A

Activity - E-Waste Code Relay

Cut Cut out the cards below



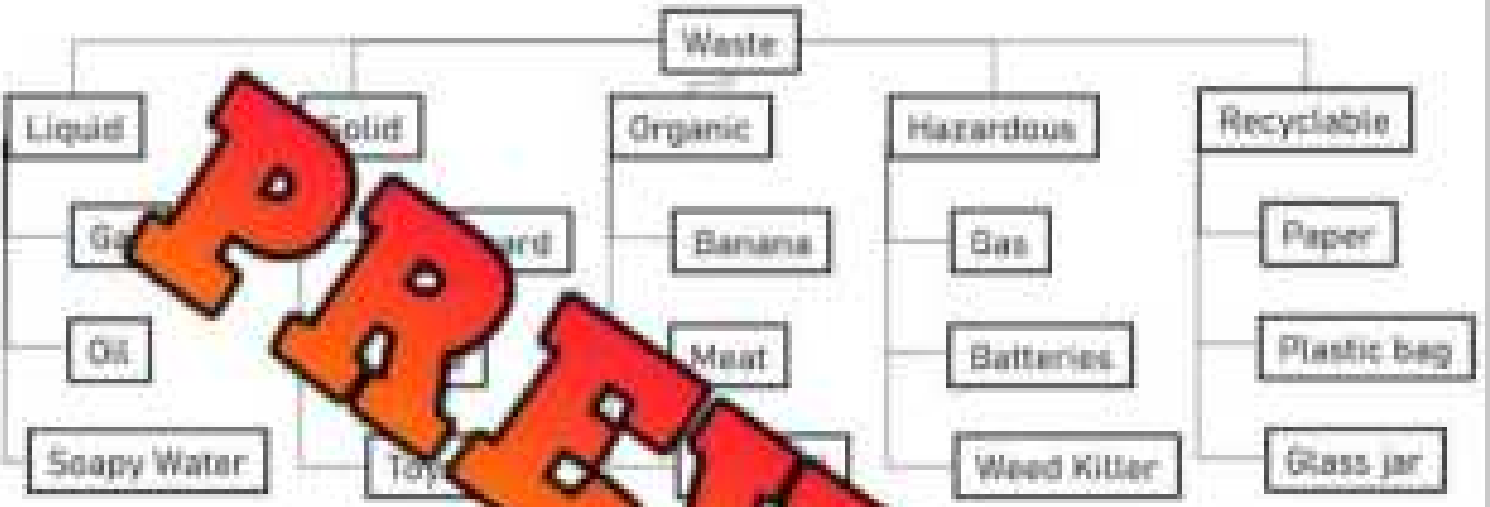




Name: _____ 75

Classifying Types of Waste

Classifying Types of Waste
All waste can be classified into one of the following 5 categories: liquid, solid, organic, hazardous, and recyclable. Some waste belongs to more than one category. For example, cardboard is recyclable and is also a form of solid waste. Check out the example below of how waste can be classified.



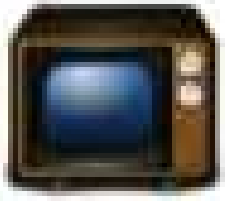
Your Turn Come up with some ex[illegible] of e[illegible] forms of waste below

Did any of the waste you chose belong to two different categories of waste? Explain:

Name: _____ 76

Identify the Type of Waste

Directions: Circle the type of waste it is. There may be more than one option to circle.

 Soapy	Liquid Solid Organic Hazardous Recyclable	 Motor Oil	Liquid Solid Organic Hazardous Recyclable
 Pizza	Liquid Solid Organic Hazardous Recyclable	 Cardboard Box	Liquid Solid Organic Hazardous Recyclable
 Tin Can	Liquid Solid Organic Hazardous Recyclable	 Apple	Liquid Solid Organic Hazardous Recyclable
 Old TV	Liquid Solid Organic Hazardous Recyclable	 Juice	Liquid Solid Organic Hazardous Recyclable
 Glass Jar	Liquid Solid Organic Hazardous Recyclable	 Meat	Liquid Solid Organic Hazardous Recyclable

Name: _____ 77

Wasted Materials in the Classroom

When students bring a lunch from home, they often have things to throw out after lunch. If you look in the garbage after lunch, what things will you find? Are there any materials in there that could have been recycled?

When you put things in the garbage, it is either burned or put in a landfill. If garbage goes to a landfill, it stays there forever, until it decomposes.

Question What things do you see in the garbage after lunch?

1)	
2)	
3)	
4)	
5)	

Draw things you see in the garbage

Question Are there things that could have been recycled?

	Name
1)	
2)	
3)	

Draw things that could have been recycled

Name: _____ TR

Plan - Less Waste in our Class

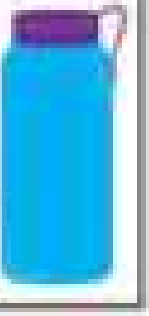
Waste is not good for our environment. To make less waste in your class, here are some ideas you could do.

1) No waste lunches – bring only food that you will eat and eat all your lunch!

2) Use environmentally friendly packaging – get your parents to pack your lunch with no single-use plastics. Instead, use reusable bags.

3) Set up a compost – put food scraps in the compost, not the garbage.

4) Use both sides – ask your teacher to print on both sides and use scrap paper for notes. Keep a pad of which is paper that is Good On One Side.



5) Use only reusable items – for example, use a reusable water bottle.

6) Don't throw things out – instead, when you have things you don't want anymore, don't throw them away – give them to other people.

Plan What can your class do to make less waste?

	Ideas
1)	
2)	
3)	

Activity - My Plan to Reduce Waste

Objective What are we learning more about?

To encourage students to think about their personal habits and how they can change them to reduce waste.

Instructions How do we complete the activity?

1) R[illegible] thinking about all the wa[illegible] u ma[illegible] k. Write down all the things you[illegible] like food scraps, plastic pa[illegible] per, [illegible]

2) Categorize: Next, g[illegible] different categories: [illegible] p[illegible] paper waste, and others. [illegible] elp[illegible] what types of waste you produce [illegible].

3) Identify Changes: For each category, try [illegible] think of at least one thing you could do to reduce waste. For example, could you use a reusable water bottle instead of disposable plastic bottles? Or could you use both sides of a piece of paper before recycling it?

4) Create a Plan: Write a plan for each change you've identified. Be specific about what you're going to do, when you're going to start, and how you'll remember to stick to your plan. You might want to create a poster of your plan to hang up somewhere you'll see it often.

5) Share Your Plan: Share your plan with your family and friends. They might want to join you in reducing waste!

Name: _____ 80

Activity - My Plan to Reduce Waste

Plan	Plan your reducing waste poster

1) Write down all the things you usually throw away, like food scraps, plastic packaging, paper, or old toys.

2) Categorize the [illegible] under each category below. Add things you may have forgotten.

Plastic	[illegible]	[illegible]	Food	Glass

3) Write 3 specific things you will do to reduce the waste you made above.

1	
2	
3	

Name _____ 81

Activity - My Plan to Reduce Waste

Poster Draw your poster below

Name: _____ Date: _____

Unit Test - Matter: Waste Unit

Multiple Choice /10

1) Compost can be made from: a) Fruits b) Metals c) Plastic d) Glass	2) Worms in compost help to: a) Eat b) Swim c) Sleep d) Decompose
3) E-Waste a) App b) Tables c) Computers d) Books	4) Incineration means a) Using a landfill b) Recycling waste c) Using less d) Burning waste
5) Plastics should be... a) Recycled b) Thrown in the garbage c) Incinerated d) Used a lot for packages	...ter is what type of waste? ...quid b) Sol... c) ... d) Hazard...
7) Batteries are what type of waste? a) Liquid waste b) Solid waste c) Gas waste d) Hazardous waste	8) Cheese should a) Recycled b) Thrown in the garbage c) Incinerated d) Composted
9) Which is not one of the 7 Rs? a) Reduce b) Reuse c) Require d) Repair	10) Which can't be recycled? a) Chip bags b) Cardboard c) Tin can d) Plastic bottle

Definitions (1 marks each) /3

Term	Definition (what does it mean)
Waste:	
Hazardous Waste	
Flammable Material	

Short Answer Questions (2

1) Why is it helpful to repair older

2) What is composting? Why is it helpful to the environment?

3) Give 2 examples of each of the types of waste:

Solid: _____

Liquid: _____

Gas: _____

Long Answer Questions **/10**

1) What can you do to reduce the amount of waste you make? Give at least 5 ways.

2) How is waste managed? Where does it go [illegible] environment?

Workbook Preview

Grade 4 – Science Unit

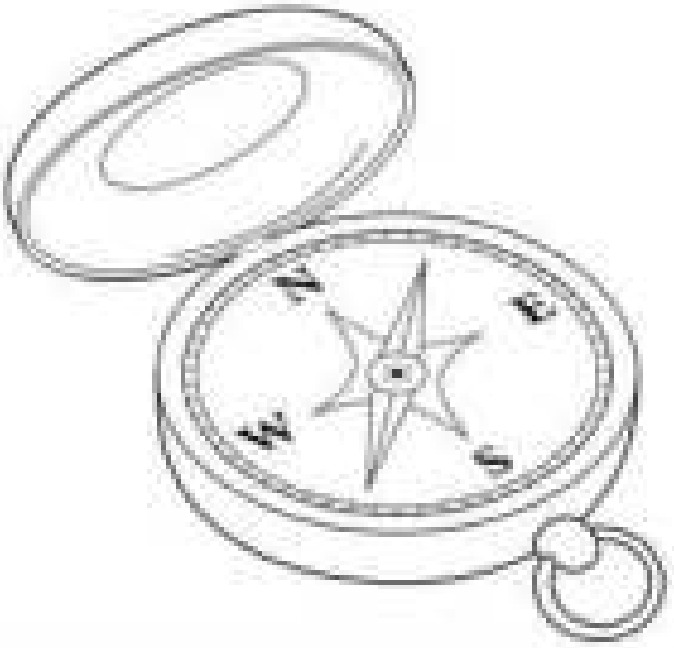
Organizing Idea: Energy: Understandings of the physical world are deepened by investigating matter and energy.

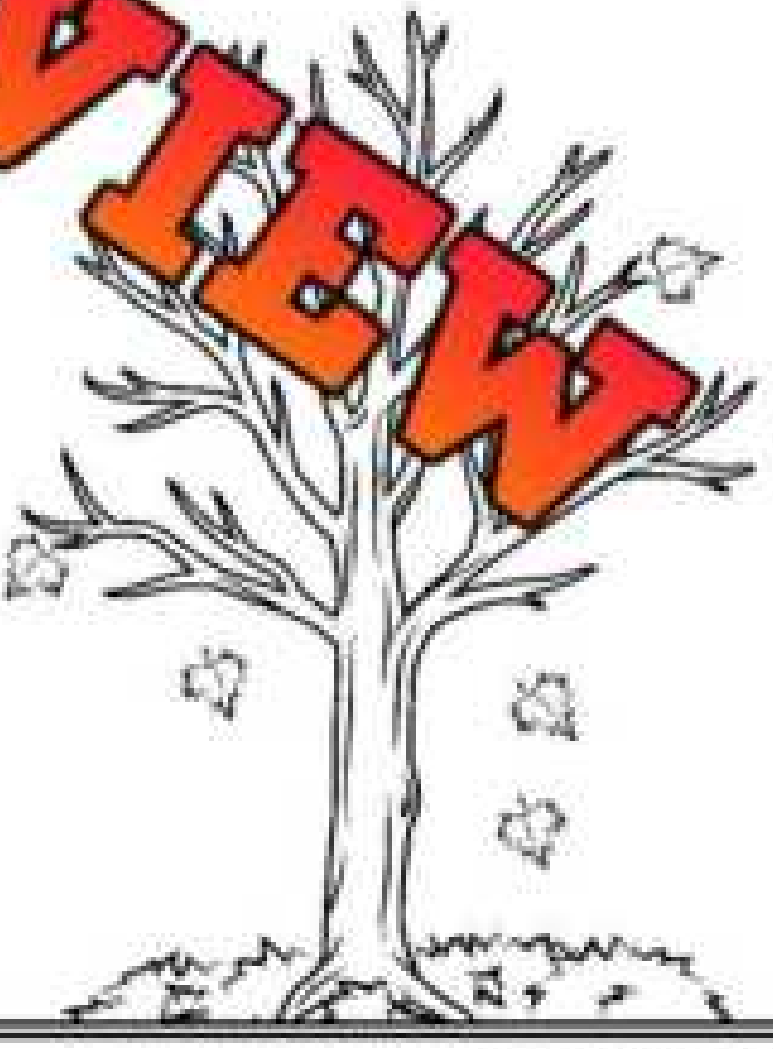
Guiding Question: How can forces affect objects from a distance?

	Learning Outcome – Students investigate how forces can act on objects without contact.	**Pages**
NCF.1	Non-contact forces occur between objects that are not in direct contact.	7 – 12, 21 – 34, 54, 59 – 60, 64 – 65, 68 – 69
NCF.2	Gravity on Earth is a non-contact force that pulls objects	13 – 20
NC		5
NC		
	Non-contact forces can act through some materials.	
NCF.5	Magnetic force is strongest at the magnetic poles. Magnets have two magnetic poles, known as north and south. Opposite magnetic poles attract each other and like magnetic poles repel each other. Both magnetic poles attract magnetic material.	37 – 42, 55 – 59
NCF.6	Some materials can become magnetized by interacting with a magnet.	50 – 53
CS.1	Students examine and apply design processes to meet needs.	43 – 44, 61 – 63, 66 – 67

NAME: _____

NON-CONTACT FORCES





Name: _____ 7

Forces - Push and Pull

What is a Force?

A **force** is any push or pull that causes an object to move. Think about it, if an object moves, a force must have acted on the object.

A friend may have pushed a book across the table to you, or maybe they pulled a pencil from your hands. These are two examples of push and pull forces that cause objects to move.

Pushing Force

A **push** is when we move an object away from us. The child on this swing is the object being moved. The man is pushing the child using a pushing force. If he doesn't apply enough pushing force, the child will move, but they won't swing very far!

Pulling Force

A **pull** is when we move an object closer to us. A fun game of tug of war is an example of two teams using pulling forces. The team that uses the most pulling force will win. Check out more examples below.

- Lifting a bag – we pull the object closer to us
- Opening a drawer – we pull the drawer open

Name: _____ 6

Forces - Push and Pull

Push or Pull Is the example a push or pull force?

1) Shooting a basketball into the net	Push	Pull
2) Plugging in a cord to an outlet	Push	Pull
3) A tow-truck towing a car behind them	Push	Pull
4) Kicking a	Push	Pull
5) Climbi	Push	Pull

Think ...ple of a push and a pull force

Push	
Pull	

Visualizing Draw what you were picturing while you were reading ...re

Name: ______________________ 9

Push or Pull?

Directions Is the picture a push or pull?

Push | Pull

Push | Pull

Push | Pull

Push | Pull

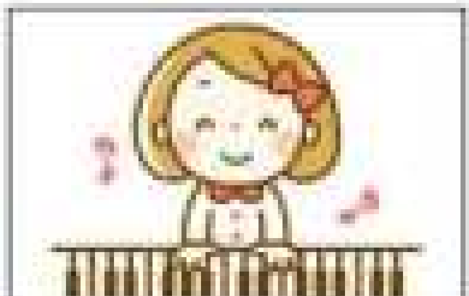
Push | Pull

Push | Pull

Push | Pull

Push | Pull

Push | Pull



Push | Pull

Push | Pull

Push | Pull

Non-Contact Forces

Contact and Non-Contact Forces

Forces are a push or a pull that causes the movement of an object. Forces can be non-contact or contact forces.

Non-Conta

A **non-** n an objec out t Examples of no rce are gravitational fo ect force, and magnetic force

When an object moves wi being touched, a non-contact force ha d on t

Gravity is the most common non-contac hat n all of us right now! **Gravity** is the pulling force that keeps us on n also push or pull an object towards it or away from it. Magn Lastly, electric forces are non-contact. An example is static elec move your hair on a trampoline without touching it!

Contact Forces

A **contact force** is any force that uses contact to move an object. If you see something move, was it touched by something else? Perhaps it was the wind moving a tree branch, or someone kicking a soccer ball. Either way, these are contact forces as something touched the object to make it move.

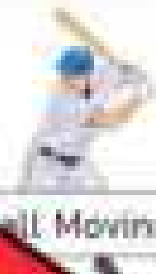
Name: ______________________ 12

Non-Contact Forces

Definition — What do the terms below mean?

Non-Contact Force	
Cont[illegible]	

Push or Pull — D[illegible] show a push or pull force?

Leaves Falling 	[illegible] 	 [illegible]ll Moving
Contact Non-Contact	Contact Non-Contact	[illegible]tact

Making Connections — Give an example of when you have se[illegible] below

Non-Contact Force	
Contact Force	

Name: _____ 13

Gravity - A Pulling Force

What is Gravity?

Gravity is the force that pulls objects to the centre of the Earth. Without gravity pulling us, we would fall right off the Earth's surface and float away!

Gravity is also the reason why when you throw a ball into the air, it comes back down. When you throw a ball, you are applying a force by pushing it into the air. Gravity is much stronger than the force and the ball will come back down instead, higher and higher.

Gravity and our Weight

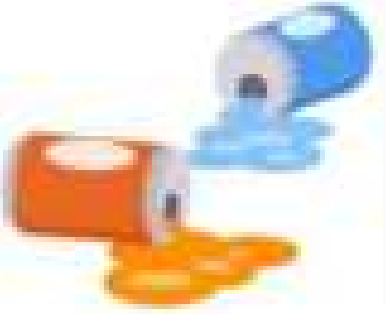
Our weight is based on gravity. Weight is a measure of the force of gravity pulling us down. This means our **weight** is how hard gravity is pulling us towards the Earth's surface.

On other planets or on the moon, we weigh a different amount because their gravitational pull is stronger or weaker. Someone weighing 96 pounds would weigh only 16 pounds on the moon.

This means that gravity's force is not very strong on the moon. If you applied a pushing force into the ground by jumping, you would go a lot higher on the moon because there is less pulling force bringing you back to the moon's surface.

Gravity in our Lives

When you spill a drink, gravity pulls the liquid as far towards the centre of the Earth as it can. The same with a pencil that fell off a desk. Gravity is a non-contact force that never stops!



Name: ______________________ 1A

Gravity - A Pulling Force

Making Connections | What does this remind you of in your life?

____

____

____

____

Question | A... ...uestions below using evidence from the text

1) What is gravity? ...es ...

____

____

____

2) How is the force of gravity different on the ... than ...?

____

____

____

Word Scramble | Unscramble the words below using the word bank

Gravity	Force	Non	Contact	Pulling	Spill	Drop	Fall

ACOCTNT		NLULPIG	
LLFA		ITYARVG	
OECFR		PODR	
LSLIP		ONN	

Name: _____ 15

Gravity - Science Experiment

Information | What is this experiment about?

What affects the forces of gravity? If we drop two objects that weigh the same but are different in shape, which will fall first? What if the objects are different weights but have the same shape?

Research Question

Out of the 5 items we chose, which item will fall the fastest (have the strongest gravitational [illegible]? Which will fall the slowest?

Hypothesis [illegible]jects in order of how fast they will fall

_____

_____

_____

Materials

1. 5 different objects – choose [illegible] wit[illegible]d resistance (no feathers)
2. Stopwatch
3. High point to stand on

Procedure

1. Move to the high point where you will drop yo[illegible]
2. Have a friend ready with a stopwatch
3. The stopwatch operator says go when they are ready, [illegible] person up high drops the object
4. When the object hits the floor, the stopwatch operator clicks st[illegible]
5. Do this for all 5 objects and record your times in the chart below

Object	Time

Name: _____ Id: _____

Gravity - Science Experiment

Rank Rank the objects in order of how fast they fell

Rank 1 - Fastest 5 - Slowest	Object
1	
2	
3	
4	
5	

Result Answer the questions below on the experiment

1) Was your hypothesis correct? Why or why not?

2) What did you notice about the results? Does the weight affect the gravitational pull on the object? Does the shape of the object affect

3) Why do you think you saw these results?

Name: _____ 17

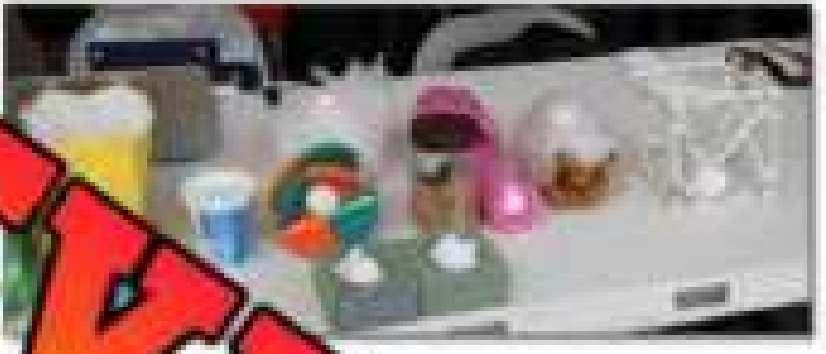
Experiment - Egg Drop

Research Question — What are we learning about?

The egg drop experiment is a classic science experiment that demonstrates the principles of physics, particularly the concepts of force, gravity, and Newton's Laws of Motion. The goal of the experiment is to create a contraption that will protect an egg from breaking when dropped from a certain height.

Materials — What you will need for the experiment

- ❑ Egg
- ❑ A variety of materials (straws, paper, cardboard, tape, rubber bands, glue, etc.)
- ❑ A high surface such as a stairway, a ladder, or a bleachers to drop the egg from



Method — How you will conduct the experiment

1) Gather materials: Provide each group with a variety of materials they can use to create their egg-protecting contraption.
2) Plan and design: Allow each group to plan and design their contraption using any combination of the materials they were provided with. They can also look up egg drop experiment online to find ideas for creative contraptions.
3) Build: Once the group has a plan, they can begin to build their contraption. They should be careful to use the materials to protect the egg, not to overbuild or over-weight the egg.
4) The Final Drop: After the group is satisfied that their contraption is successful, each group can take turns dropping their egg from the highest point (stairway, ladder, or bleachers) to test their contraption.
5) Observation and conclusion: Observe the results, and examine how their contraption worked, what materials protected the egg best, and how they could improve their design.

Name: _____ 18

Plan Answer the questions below to plan your egg holder

1) What materials will you use to support your egg?

2) Draw a diagram of your egg holder. Label the materials.

Results What happened with your [illegible] below:

1) What was pulling the egg down to the ground? Was the force [illegible] heights?

2) If you could make the egg holder again, what would you do differently? Explain.

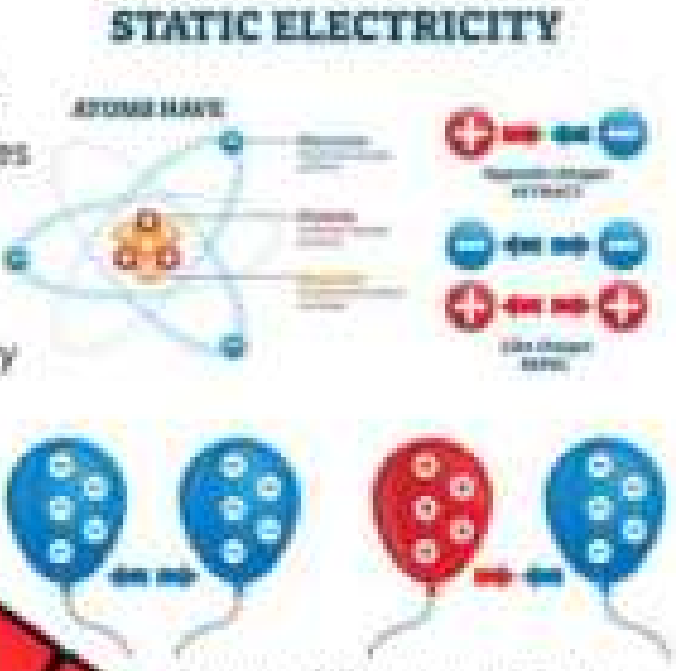
Name: _____ 21

Electrostatic Force

Electrostatic Force

Everything is made up of tiny particles that are too small to be seen. These tiny particles can have an electrical charge, either positive or negative.

When particles are the same, they repel (push away) each other. If they are opposite, they attract (move towards) each other.



Most objects are neutral because they have the same number of positive and negative charges. When two objects touch or nearly touch, charged particles can move from one object to the other and can affect whether the object will repel or attract other objects. When objects move due to their charge, it is called an electrostatic force.

The Cat

This poor cat has static in it. This is an example of electrostatic force. The styrofoam and cat have opposite charges, which means they are attracted to each other.

This is a non-contact force because the styrofoam is moving without being touched. The styrofoam is being pulled towards the cat's body. You may have experienced this on a trampoline when your hair moves and sticks straight up.

Name: _____ 22

Electrostatic Force

Questions Answer the questions below using evidence from the text

1) What does electrostatic force mean?

2) What ... the cat in the photo? Explain.

3) What do the terms below ...

Repel	
Attract	

Word Search Find the words in the wordsea...

Static	Repel
Attract	Object
Positive	Negative
Cat	Charge
Pull	Particles

Name: _____ 25

Experiment - Magic Spoon

Research Question — What are we learning about?

Can I pick up salt and pepper grains using static electricity? Do I need to touch the salt and pepper or can I move the grains using a non-contact force?

Materials — What do I need to do the experiment?

- ✓ 1 Teaspoon
- ✓ 1 Teaspoon
- ✓ Plastic spoon
- ✓ Dish cloth
- ✓ Black piece of paper (optional)

Method — How do we complete the experiment?

1) Put the salt and pepper on the black piece of paper
2) Rub the spoon on a dish cloth for about 10 seconds
3) Hold the round part of the spoon up to the salt and pepper mixture
4) Watch for the particles to jump from the paper up to the spoon

Name: _____ 26

Experiment - Magic Spoon

Observations | What did you notice?

1) What happened to the salt and pepper when you put the spoon over the mixture?

2) Did [illegible]per cling to the spoon? Why might that be the case?

3) How could you use this method to s[illegible]ixt

Draw | Draw a diagram of what happened. Label the spoon, salt, [illegible]epper

Name: _____ 29

Experiment - Rolling a Can

Research Question — What are we learning about?

To learn about static electricity by making a can roll without touching it.

Materials — What do I need to do the experiment?

- ✓ An em[illegible] can
- ✓ A bal[illegible]
- ✓ A [illegible] hair
- ✓ Th[illegible] (optional)
- ✓ Tape [illegible] (optional)

Method — [illegible] experiment?

1) Make sure the soda can is [illegible]
2) Place the soda can on its side on a [illegible] table.
3) Blow up the balloon and tie it closed.
4) Rub the balloon quickly back and forth on the [illegible] hair. This will create static electricity!
5) Hold the balloon close to the soda can without touching it. [illegible] happens!
6) Optional: create a start and finish line using tape. Then have students time how long it takes for them to get the can from the starting line to the finish line.

Name: _____ 30

Experiment - Rolling a Can

Observations	What did you notice?

1) What happened to the can when you brought the balloon near it?

2) Why do you think the can moved without being touched?

3) What happens if you [illegible] balloon?

4) How can we make the can move faster or slower?

5) What do you think would happen if we used a bigger or smaller can? Would it move the same way?

Name: _____ 33

Lightning - Electrostatic Forces

HOW LIGHTNING IS FORMED

How Lightning Is Formed

Lightning is an electrostatic current that travels from one electrically charged object to another. When a thundercloud forms, raindrops bump into each other causing a static electric charge.

In the diagram, you can see the thundercloud is becoming negatively charged at the bottom. When this happens, the positively charged objects on the earth's surface will become attracted to the negatively charged thundercloud. Once the charge is strong enough, their attraction will cause lightning, which is an electrical current between the two objects that are oppositely charged.

The diagram shows the thundercloud making lightning strikes with a tree, shrub, and the ground because they are positively charged.

Name: _____ 34

Lightning - Static Electricity Force

Questions Answer the questions below using evidence from the text

1) What is lightning?

2) How does lightning form?

Visualizing Draw what you w[illegible] reading. Explain the picture

True or False Is the statement true or false?

1) Lightning forms because of magnetic forces	True	False
2) Lightning forms when thunderclouds change their charge	True	False
3) Opposite charges attract which makes electrostatic currents	True	False
4) Lightning is an electrostatic current	True	False
5) Lightning happens when objects have the same charge	True	False

Name: _____ 35

Magnetic Force

Magnetism

You've seen magnets and how helpful they can be. We use them for many purposes, including sticking things on our fridge. They work because of magnetism.

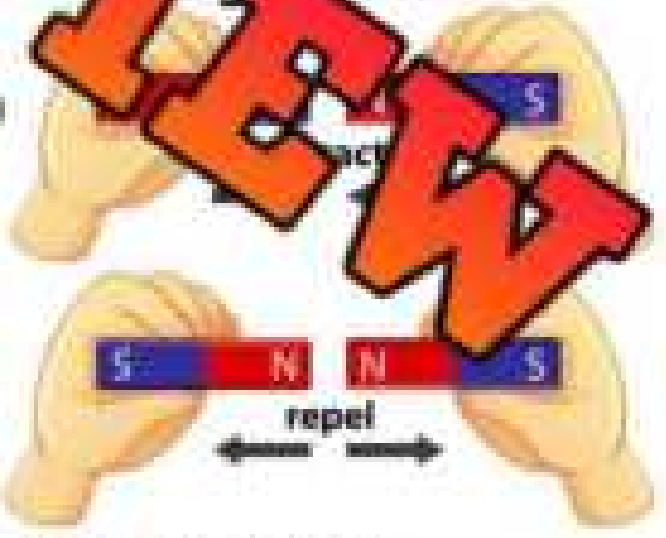
Magnetism is an invisible force that happens when magnets either attract or repel each other.

Magnetism is a force because it pulls or pushes objects if they are made of a magnetic material. Magnetic materials are metals made from iron, nickel, cobalt and many more.

If you try to stick a magnet to your fridge that is not made of a magnetic material, it will not have any effect. Magnetic materials have tiny particles called electrons. When the electrons spin in a certain way, they will attract or repel other magnets depending on how they

Magnets

Magnets use magnetism, which is a non-contact force. A magnet can pull something towards it or push something away from it without touching it. This means magnets can create a force that moves another object.



A **magnet** is an object that can attract or repel other magnets. We sometimes say someone is magnetic if they attract a lot of friends.

Magnets have a north and a south pole. You can attach two magnets by putting opposite poles together. If you try to put the same poles together, they will repel each other.

Name: _____ 36

Magnetic Force

Questions

Answer the questions below using evidence from the text

1) Why is magnetism an example of a non-contact force?

2) What is... materials are magnetic?

True or False

...e or false?

1. Magnets are made from plastic mater...	True	False
2. The south pole of a magnet will be attracted t...	True	False
3. Magnetism is an invisible force that pushes and pu...	...ue	False
4. Iron is a metal that has magnetic properties		False
5. Magnets have 2 poles – a north and south pole		...se

Word Search

Find the words in the wordsearch

Magnetic	Repel
Attract	Poles
North	South
Fridge	Force
Metal	Iron

V J K B F M A G N E T I C E
W R A I Q G B D F X O O R M
A J T R E P E L Z Z M M T W
G Y T V D M E T A L I O K O
I K R T H P O L E S B A S M
R Q A O V A M N U F O R C E
O U C S O U T H B N O R T H
N F T F R I D G E H V K V F

Name: _____ 37

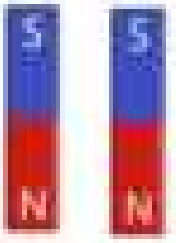
Attract or Repel

Magnets Will the magnets attract or repel each other?

1)

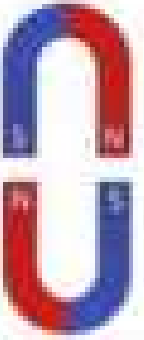
Attract	Repel

2)



Attract	Repel

3)

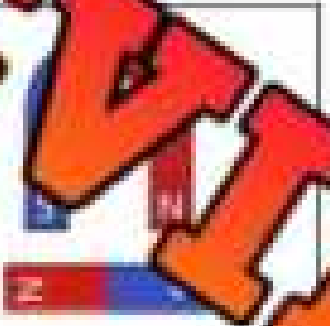


Attract	Repel

4)

Attract	Repel

5)

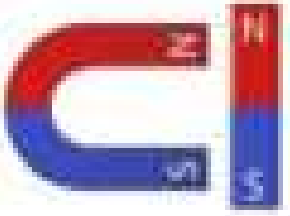


Attract	Repel

6)

Attract	Repel

7)

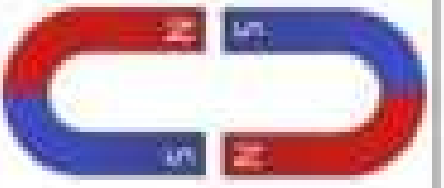


Attract	Repel

8)

Attract	Repel

9)



Attract	Repel

Name: _____ 38

Experiment - Magnetic Car

Research Question What are we learning about?

Can I create a car that I can move using magnets?

Materials What do we need?

- ✓ 2 ma… bar magnet and another st… the best.
- ✓ A toy car
- ✓ Tape
- ✓ A racetrack … can … provided or mak…

Method How do we complete th… erim…

1) Tape the bar magnet to the toy car

2) Use the other magnet to pull the car. You will need to adjust how far your hold the magnet away from the car

3) Now that you know how to move your car, try moving it around the racetrack. You may need to flip the magnet to repel or attract the car. We found it easier to repel the car around the track.

Name: _____ 39

Experiment - Magnetic Car

Results	What happened?

1) What force is moving the car?

2) Is the fo[illegible]cting the car or is it a non-contact force?

[illegible]	Non-Contact Force

3) Did you [illegible] with the magnet? Explain.

4) If you repelled the car, did you line up the nort[illegible] of [illegible]agnet to the south pole of the car's magnet? Or did you line up th[illegible] pol[illegible]

Same Pole	[illegible]

5) Draw a car that is powered by magnetism.

Name: _____ 41

Maglev Cars: Zooming into the Future!

What are Maglev Cars?

Have you ever seen a car floating in the air? Sounds like something from a science fiction movie, right? But guess what? It's real! There are cars called 'Maglev cars' that can do just that. Maglev is short for "Magnetic Levitation," which means these cars float above the track instead of rolling on wheels.

How Do Th

Magle[illegible]ple of magnets. Remember how two [illegible] each other? That's exactly how Maglev cars work! They have magn[illegible] tracks they run on have magnets too. These magnets are set so the[illegible]r, and as you might remember, similar poles repel. This repulsion l[illegible] making it float in the air.

Benefits of Maglev Cars

- Speedy: Maglev cars are really fast because t[illegible] them down
- Smooth Ride: No wheels also mean no bumps. So,[illegible]
- Less Noise: Since there's no contact with the track, Magle[illegible]
- Eco-friendly: They use electricity instead of fuel, so they are bette[illegible]

Drawbacks of Maglev Cars

- Expensive: Building tracks for Maglev cars is pricey.
- Limited Use: They can only go where tracks have been built. You can't just drive one anywhere like a regular car.
- Power Hungry: They use a lot of electricity, which can be a problem if there isn't a strong enough power supply.

Name: _____ 42

Maglev Cars: Zooming Into the Future!

Questions Answer the questions below using evidence from the text

1) What is a Maglev Car? How does it work?

2) What are some benefits and drawbacks of a Maglev Car?

Draw Look up pictures of real Maglev trains online and draw your own

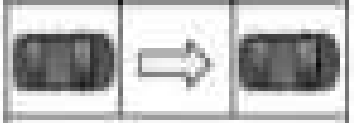
Multiple Choice Circle the correct answer

1) Maglev cars are _____.	Expensive	Inexpensive
2) Maglev cars are _____.	Fast	Slow
3) Maglev cars use _____.	Gravity	Magnets
4) The car magnets _____ the track's magnets.	Repel	Attract
5) A maglev car has lots of friction, so it is _____.	Loud	Quiet

Name: _____ 43

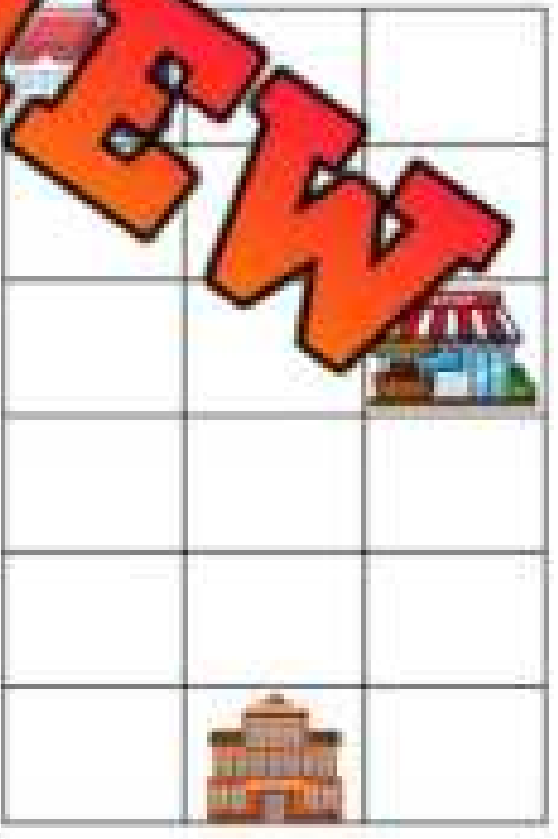
Coding - Maglev Cars

Maglev cars can be self-driving. The driver enters where they want to go, and the car moves to that location. The car interacts with the track to pull it to where it needs to go. If the car needs to go forward, the magnets in the track in front of the car turn on, attracting it. If it needs to go backwards, the magnets behind the car turn on.

This is a self-driving maglev c…	Right makes it turn right	Left makes it turn right	Forward makes the car move forward by the number shown
			
It understands 3 commands		Left	Forward 2

Directions Write code to get the car to … store, and then back home

Codes – Forward, Turn Left, Turn Righ…	
Line 1	
Line 2	
Line 3	
Line 4	
Line 5	
Line 6	
Line 7	
Line 8	
Line 9	



Name: _____ 44

Coding - Hagley Cars

Directions Write code to get the car to the school, to the arena, to the store, and then back home

Codes – Forward, Turn Left, Turn Right	
Line 1	
Line 2	
Line 3	
Line 4	
Line 5	
Line 6	
Line 7	
Line 8	
Line 9	
Line 10	
Line 11	
Line 12	
Line 13	
Line 14	
Line 15	
Line 16	

Name: _____ 45

Magnetic or Not?

A magnetic material will be strongly attracted to a magnet. A magnet is a material or object that produces a magnetic field with a north and south pole. Test to see if the following materials are magnetic or not. If the material is magnetic, it will be attracted or repelled by the magnet.

Procedure | What to do

1. Gather th[illegible]ials in the table below and a magnet
2. Make an[illegible] guess whether the material will be magnetic or not
3. Touch [illegible] magnet and fill in whether it was magnetic or not

Material	[illegible] (Magnetic or Not)	Magnetic or Not
Pencil		
Coin		
Paper		
Cardboard		
Paperclip		
Eraser		
Popsicle Stick		
Rubber Band		
Brad Nail		
Scissors		

Questions | Use information from the text to support your answer

1. From the experiment you just did, what types of materials are magnetic?

_____

_____

2. Did any of the results surprise you or were all your estimates correct? Explain.

_____

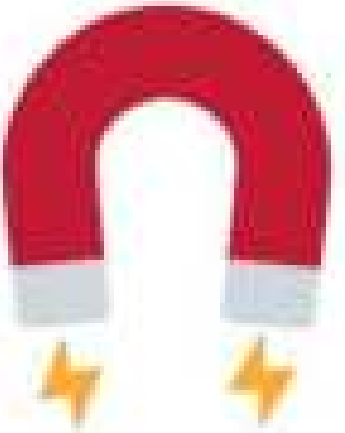
_____

Name: _____ 46

Experiment - Magnetic Strength and Distances

Research Question	What are we learning about?

To understand how the strength of a magnet changes with distance.



Materials	What do we need?

- ✓ M… …ze and strength)
- ✓ Ruler or ta…
- ✓ Small meta… …s (li… …ps)

Method	How do we … …rt?

1) Lay the ruler or tape measure flat on a tabl…
2) Place the magnet at one end of the ruler.
3) Begin by placing a paperclip at the same end as the magnet. Slowly move the paperclip away from the magnet until it is no longer attracted to the magnet. Record the distance at which the paperclip is no longer attracted to the magnet.
4) Repeat this process with the other paperclips. Each time, start the paperclip closer to the magnet and move it away slowly until it is no longer attracted. Record each distance.
5) Repeat steps 3 and 4 at least three times to get an average distance for each paperclip.

Name _____ 47

Experiment - Magnetic Strength and Distances

Observations	What happened?

Paperclip	Distance - In CM
Paperclip 1	
Paperclip 2	
Paperclip 3	
[illegible]	
[illegible]	
Average (Add up the 5 distances and div[illegible]	

Results	What happened?

1) How does the distance between the magnet and the p[illegible] affect the strength of the magnetic force?

2) If you were trying to pick up a heavy magnetic object, where would you put the magnet?

Name: _____ 48

Experiment - How Materials Affect Magnets

Research Question — What are we learning about?

To understand how different materials can affect the strength of a magnet.

Materials — What do we need?

- ✓ Magn[illegible] same size and strength)
- ✓ Diff[illegible]
  - ❑ [illegible]per
  - ❑ Plas[illegible]
  - ❑ Glass
  - ❑ Metal – [illegible]
- ✓ Metallic objects (sm[illegible]rclip

Method — How do we complete [illegible]erim[illegible]

1) Start by placing a magnet and a paperclip [illegible] table so that the paperclip is attracted to the magnet.

2) Slowly move the paperclip away from the magnet until it is where it is no longer attracted to the magnet. Measure this record it as the base meesurement.

3) Place one of the materials (let's start with cardboard) between the magnet and the paperclip. Move the paperclip closer to the magnet until it is attracted again. Measure this distance and record it.

4) Repeat this process with each of the different materials, always measuring the distance at which the paperclip is attracted to the magnet.

5) Compare the measurements for each material to the base measurement.

Name: _____ 49

Experiment - How Materials Affect Magnets

Observations | What happened?

Object We Are Measuring	Distance It Attracted The Paperclip
Paperclip 1 – Nothing In Between	
Paperclip 2 – Cardboard	
Paperclip 3 – Paper	
[illegible]	
[illegible]	
Paperclip [illegible]	

Results | What happened?

1) What materials affected the magnet the most and which the least?	
The Most	
The Least	

2) Why do you think these materials affected the strength of the magnet the most?

3) What other factors might affect the strength of the magnet more than what the material is simply made of?

Name: _____ 50

Magnetizing an Object

How to Magnetize Objects

Magnetizing objects means that you make an object become a magnet. A paperclip is not magnetic, but if you use one of the following techniques, you can turn a paperclip into a magnet for a short period of tim

Rubbin

If you r magn ection along a metal object, you can make the object magnetic. You in the same direction because you are lining up all of the atoms direction.

When you are done, wil tic as the object will be attracted to other magnetic materials. Yo w magnet will only last for a short perio of time until the atoms line up in their original spots.

Striking

To perform this technique, align your object so that it is pointing along the north-south axis of the Earth. You can use a compass to find out which direction this is. Strike the object with a hammer repeatedly. This shakes the atoms out of their original spots, causing them to realign to the Earth's magnetic field.

Now your object will become a magnet that attracts other magnetic materials. Eventually the object will lose its magnetic powers as the atoms line up in their original spots.

Name: _____ 51

Magnetizing an Object

True or False

Is the statement true or false?

1. You can turn metal objects into magnets	True	False
2. Metal objects will become magnets forever	True	False
3. Rubbing a magnet along a metal object makes it magnetic	True	False
4. Objects h[illegible]oms in them	True	False
5. You can [illegible]bject in any direction and it will be magnetic	True	False

Questio[illegible]

A[illegible]uestions below using evidence from the text

1) How can you tu[illegible]al o[illegible]magnet?

2) Can any object become magnetic? Explain.

Word Scramble

Unscramble the words below using the word bank

Magnet	Striking	Rubbing	Atoms	Particles	Metal	Objects	Direction

SAMTO		NBUGBIR	
TLMEA		GETMNA	
TIGNISRK		STEBJCO	
ITNREDICO		RSCLAEPTI	

Name: _____ 52

Experiment - Magnetizing an Object

Research Question | What are we learning about?

To understand how objects can be magnetized using a permanent magnet

Materials | What do we need?

- ✓ Steel [illegible] magnetic
- ✓ Ba[illegible]
- ✓ S[illegible] paper clips)

Method | How [illegible] experiment?

1) Start by explaining to the [illegible] of metals (like iron, nickel, and cob[illegible] become magnets when they are exposed to a ma[illegible]

2) Give each student a steel nail and a bar magnet.

3) Ask the students to rub the bar magnet along the length of the nail in one direction, from the head to the point. Do this about 20-30 times. This aligns the tiny magnetic fields within the nail with the magnetic field of the bar magnet.

4) Once done, ask students to test if their nail has been magnetized. They can do this by seeing if it can pick up small metal objects like paper clips.

Name: _____ 53

Experiment - Magnetizing an Object

Results	What happened?

1) What happened when you struck the metal nail with the magnet?

2) Why does the [illegible] magnetic?

3) Does the nail become more magnetic as you [illegible] rubbing for only 30 seconds versus 1 minute of rubbing. Which works [illegible]

4) How long does the nail stay magnetic? Will it be magnetic forever now?

Name: _____ 54

Examples of Non-Contact Forces

Examine Describe the non-contact forces at work in the pictures below

1)

2)

3)

4)

Name: _____ 55

How a Compass Works

What is a Compass?

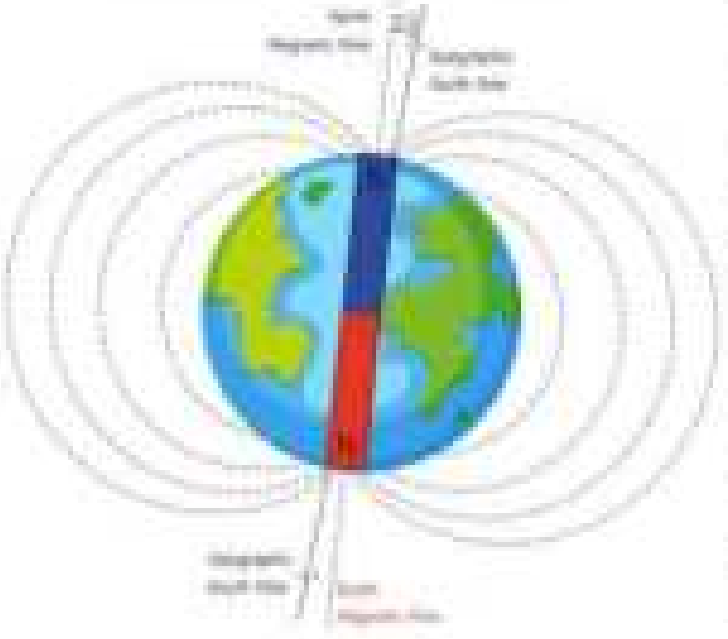
A compass is a navigational tool that tells people which direction they are going. The compass was invented in 1300 by an Italian explorer named Flavia Goia.

Combined with a map, a compass was very important for sailors to know which direction they were going. This is because when in the middle of an ocean, you cannot see any landmarks or the sun. Therefore, it is impossible to know what direction you are going!

How a Compass Works

We have learned that the Earth is a magnet that has its own magnetic field. Deep in the Earth's core, there is a north pole that attracts and repels other magnets.

EARTH'S MAGNETIC FIELD



A compass needle is made from a magnetic material. The needle points to the directions east, west, north, and south. When you hold a compass, the inside of the magnet will be attracted or repelled by the Earth's poles.

Depending on how you hold the compass, the needle will move so that the north pole is attracted to the Earth's south pole. The movement of the needle will show you which direction you are facing.

Name: ______________________ 56

How a Compass Works

Making Connections — What does this remind you of in your life?

____

____

____

____

Quest... — An... ...uestions below using evidence from the text

1) Why were co... ...port... ...ilors?

____

____

____

2) How does a compass tell us which direction... ...goi...

____

____

____

Draw — Draw a picture of a compass. Label it N, E, S, W

Name: ______________________ 57

Magnets Harmful Effects on Technology

Magnets Effect on Magnetized Objects

Many great technologies use magnetism in order to work. Credit cards and hard drives store information using the force of magnetism. Read below how you can damage these objects by touching a magnet to them.

Magnets Ca[illegible]e Computers

A com[illegible]e that holds information about th[illegible]mput[illegible] documents and games you download [illegible] hard[illegible] The hard drive works because of a [illegible]. This means the hard drive uses [illegible].

If you hold a strong magn[illegible] to [illegible] could ruin the magnetic field in the ha[illegible]e. Th[illegible] wipe the hard drive clean and delete all your [illegible] and [illegible]. It could also break the hard drive.

Magnets and Credit Cards

The thin strip on a credit card uses magnetism to store informati[illegible] card.

If a strong magnet touches the magn[illegible]c strip on the credit card, it can erase all of the information about the card.

This happens because the electrons change their charge when a magnet is put close to it. This is just like when we rub metal with a magnet, we can change the metal's magnetic ability.

Name: _____ 58

Magnets Harmful Effects on Technology

Questions

Answer the questions below using evidence from the text

1) How does a magnet affect a hard drive?

2) What w[illegible] to a credit card?

True or False

[illegible] or false?

1. A hard drive makes a computer run [illegible]	True	False
2. A hard drive stores information using magn[illegible]	True	False
3. The thin strip on a credit card uses magnetism	[illegible]ue	False
4. Touching a magnet to a computer can wipe clean a ha[illegible]		False
5. You can wipe a hard drive clean using a weak fridge magnet.		[illegible]se

Word Search

Find the words in the wordsearch

Magnet	Damage
Harmful	Technology
Hard	Drive
Clean	Wipe
Credit	Card

Q	F	J	T	D	H	D	E	W	F	U	H	D	V
Z	V	L	M	C	R	E	D	I	T	B	A	E	G
C	A	R	D	A	M	A	G	E	D	U	R	P	L
P	G	C	L	E	A	N	S	U	Z	E	D	W	B
M	T	E	C	H	N	O	L	O	G	Y	S	I	L
H	S	H	C	H	A	R	M	F	U	L	Z	P	T
T	V	L	D	R	I	V	E	V	H	Q	B	E	N
F	P	X	B	B	M	A	G	N	E	T	W	Y	F

Name: _____ 59

Devices Using Non-Contact Forces

Devices that Use Magnetism

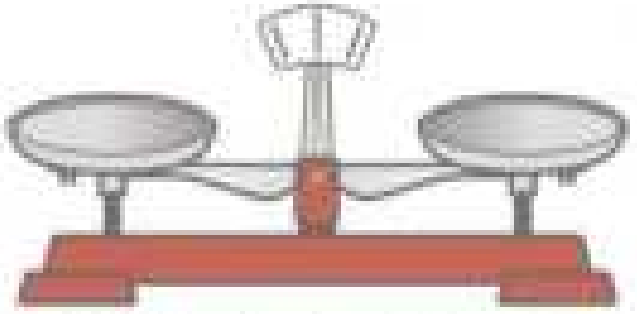
Magnets are used in the following devices:

- ❑ Computer hard drives to store information
- ❑ Microphones, speakers, headphones, and telephones all use magnets to create a magnetic field that allows sound waves to travel loudly
- ❑ Doorbells use magnets to move a plate that comes in contact with another plate to make the "ding" sound.

Devices Using Electrostatic Forces

An electrostatic mop is used to collect dust and particles because it is made of polyester and polyamide materials that have a unique electricity when they spin on the ground.

As they build-up static in the mop, the dust particles stick to the mop just like a balloon attaches to the hair on your head. You may notice when handling these mops that you will get small shocks!



Devices Using Gravitational Forces

A balance is used to find out how much an object weighs. It works by placing the object on the platform.

The heavier the object, the more gravity will pull it down. This will exert more force on the platform and will raise the other side up higher.

Name: _____ 60

Devices Using Non-Contact Forces

Questions Answer the questions below using evidence from the text

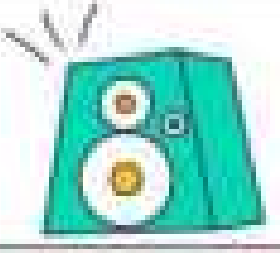
1) Which invention that uses these forces do you think is the most important?

2) Can you think of another invention that uses one of these forces? Explain.

Visualizing Draw what you were picturing while you were reading. Explain the picture

Which Force? Write the force that is used in the devices below



Name: _____ 61

Coding - Bank Cards and Magnets

Magnets and Bank Cards

Bank cards have a magnetic strip that stores codes on it. The codes link to a bank account. When you swipe your card, the card reader detects the magnetic code in the card. It connects to your bank account so that the transaction can be made. A transaction is when money is taken from the card's bank account and sent to the store owners bank account.

The code uses an IF/ELSE statement.

Directions If there is [illegible] the purchase, it will say approved. If there is not, it will say [illegible].

	Cost of Purchase	Money in Acc[illegible]	IF or	Approved or Declined?
1)	$50	$150		
2)	$120	$95		
3)	$209.99	$210		
4)	$318.75	$318.75		
5)	$452.25	$385.99		
6)	$491.50	$492.10		
7)	$509	$511		
8)	$750.99	$750.97		
9)	$825.75	$825.50		
10)	$999.99	$999.99		

Name: _____ 62

Research - Bank Cards and Magnets

Research Learn more about the invention of bank cards

1) Who invented the first bank card?

2) What was the Charge-It card? How did it work?

3) What is an ATM?

4) ATM's were made before online debit cards. Do ATM cards connect to a person's bank account?

5) What is a debit card? How does it work?

Name: _____ 63

Research - Bank Cards and Magnets

Research Learn more about the invention of bank cards

6) Make a connection – do you or anyone you know have a debit card? Have you used it? Explain

7) What would li[illegible] debit cards?

8) Draw a debit card below.

Name: _____ 64

How Hard Drives Work

What is a Hard Drive?

A hard drive is like the brain of your computer. It's where all your documents, pictures, and software live when you're not using them. But it's not magic—it's magnets!

How Does a Hard Drive Work?

A hard drive stores information on a round piece called a disk. This disk is coated with a special kind of paint that can be magnetized. Imagine the disk as a circle with millions of tiny spots on it. Each spot can be a '1' or a '0'. This is called binary code, and it's the language computers use.

Role of Magnets in Hard Drives

Now, here is where the magnets come in. There's a part, called the read/write head, which hovers above the disk. This head has a tiny magnet in it. When your computer wants to write a '1' or '0', it moves the head to the right spot and uses the magnet to change that spot's magnetism. If the magnet points one way, the spot is a '1'. If it points the other way, it's a '0'.

When your computer wants to read the information, it does the opposite. It moves the head over the spot and checks which way the magnetism is pointing. That way, it knows if the spot is a '1' or a '0'.

Spinning and Searching

The disk in the hard drive is always spinning very fast, like a merry-go-round. The read/write head can move in and out, just like you might move towards the center or edge of the merry-go-round. Between the spinning and the moving head, the computer can find any spot on the disk super quickly!

Name: _____ 65

How Hard Drives Work

Questions Answer the questions below using evidence from the text

1) What is a hard drive? Why do we need them?

2) How do har[illegible]

Making Connections What does this remind you [illegible]

How do you use hard drives? Do you want a big hard drive or small h[illegible]e? Do any of your gaming systems, tablets, or computers use hard drives?

Name: _____ 66

Coding Activity - Hard Drive

Leah is working on her computer. To find the information she has saved on her hard drive, the arm will move to the correct binary code. To find the binary code, use ordered pairs. Start with the x-axis (horizontal number →) as the number you will write as the first ordered pair. Use the y-axis (vertical number) as the second number in the ordered pair.

Name: _____ 67

Coding Activity - Hard Drive

Code Write the binary code to find the files below on the hard drive

File	Ordered Pair – Binary Code
	(00000, 000)
	
	
	

File	Ordered Pair – Binary Code
	
	
	

Questions Answer the questions below

1) Why do you think a computer uses binary code and not letters?

2) What files do you save on computers you have used?

Name: _____ 68

Photocopiers Using Static Electricity

Static Electricity and Photocopiers

Static electricity is just like when you rub a balloon on your hair and it sticks up! But do you know photocopiers use the same trick to copy your documents? Let's dive deeper!

Making [illegible] Photocopier

Inside a photocopier is a special drum. This drum gets a static electric charge. Then it's hit with a bright light. The light shines on the paper you want to copy. If the paper is white, light bounces back and hits the drum. This makes the [illegible] charge.

Toner and Static Electricity

Then, there's something called toner, which is a powder that has an opposite charge to the drum. Remember how opposites attract? Because of that, the toner sticks to the charged parts of the drum.

Making the Copy

Next, a blank piece of paper is rolled over the drum. This paper is given a stronger charge than the drum, so the toner jumps from the drum to the paper! Then, the paper is heated up, so the toner melts and sticks to the paper. And there you have it, your copied document!

Name: _____ 69

Photocopiers Using Static Electricity

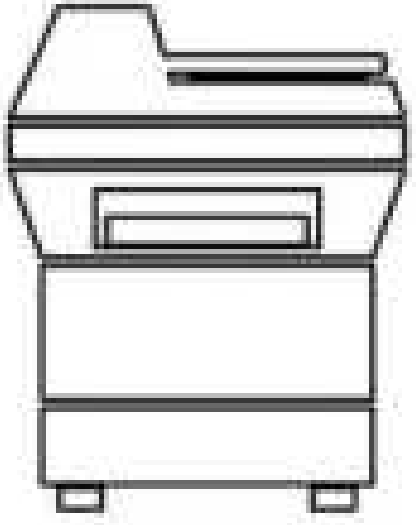
Questions Answer the questions below using evidence from the text

1) What is the drum inside the photocopier charged with?

2) How does the toner get from the drum to the blank paper?

3) Have you ever used a photocopier? If so, when and where

Draw Draw your own photocopier and colour the one



Name: _____ 7)

Forces - Activities

Word Search

Find the word bank words in the puzzle!

Word Bank

- ❑ Force
- ❑ Push
- ❑ Pull
- ❑ Object
- ❑ Electrostatic
- ❑ Magnet
- ❑ Charge
- ❑ Repel
- ❑ Attract
- ❑ Gravity
- ❑ Movement
- ❑ Metal
- ❑ Iron
- ❑ Nickel
- ❑ North
- ❑ South

Word Scramble

Read the clue and then unscramble the word

ROITELSTCCETA		JOBCTE	
REFOC		ETAMNG	
KNEELC		LPERE	
ETMLA		SHUP	
HRCGAE		TGVARYI	

Name:_____ Date:_____

Unit Test - Forces

Multiple Choice /10

1. An example of a pulling force is...	2. A ball comes back down to the Earth because of...
a) Kicking a ball	a) Electrostatic Force
b) Punching a punching bag	b) Gravity
c) Playing tug of war	c) Friction
d) Pushing so... a swing	d) Muscular Force
3. Lightning ... of which force?	4. How many poles are there on a magnet?
a) Elect...	a) 1
b) Gravity	b) 2
c) Friction	c) 3
d) Muscular Force	
5. A balloon sticks to our hair beca...	...terial is magnetic?
a) Static electricity	...
b) Magnetism	b) Alu...
c) Friction	c) ...
d) None of the above	d) Wood
7. A compass works because of?	8. Bank cards ...
a) Electrostatic Force	a) Electrostatic Force
b) Gravity	b) Gravity
c) Friction	c) Friction
d) Magnetism	d) Magnetism
9. Photocopiers work using...	10. Who came up with the theory of gravity?
a) Electrostatic Force	a) Galileo Galilei
b) Gravity	b) Thomas Edison
c) Friction	c) Isaac Newton
d) Magnetism	d) Ben Franklin

Definitions– What does the term mean (1 mark each) /3

Term	Definition (what does it mean)
Gravity	
Electrostatic force	
Mag	

Short Answer Answer each question. Each question is worth 3 marks

1) What is a non-contact force? Give exa

2) How can you make a steel nail magnetic?

3) How does the distance from a magnet to a magnetic object affect the strength?

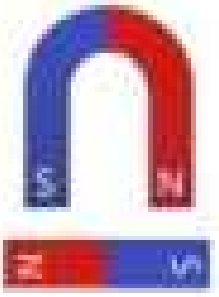
Magnets

Will the magnets attract or repel each other?

1)

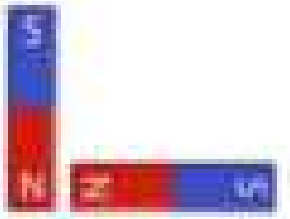
Attract	Repel

2)



Attract	Repel

3)



Attract	Repel

Long Answer

Answer the questions below – Each question is worth 5 marks

1) How does a compass work? What does it use?

2) Who is Isaac Newton? What theory did he made? How does it explain the world around us?

Workbook Preview

Grade 4 – Science Unit

Organizing Idea: Earth Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.

Guiding Question: How does Earth sustain life?

	Learning Outcome – Students investigate the systems of Earth and reflect on how their interconnections sustain life	**Pages**
ES.1	Earth scientists call Earth's systems the spheres, including the lithosphere, atmosphere, hydrosphere, biosphere. The lithosphere is the outer layers of Earth's surface, is made of rocks, contains soils and minerals that support life. The atmosphere is a gas layer that surrounds Earth, warms Earth's surface, reduces extremes of temperature, contains oxygen, which is used for breathing.	7 – 26, 35 – 39,
ES.2	Sunlight is more direct at the equator than at the poles. The long-term temperature at the equator is warmer than it is at the poles. In Alberta, sunlight is more direct, and the length of daylight is longer, in summer than in winter.	65 – 77
ES.3	Water is a basic need for plants and animals. Water provides habitat for many organisms. First Nations, Métis, and Inuit laws of nature honour water as being sacred because water sustains life. Laws of nature guide First Nations, Métis, and Inuit in their responsibility to protect water and sources of water. First Nations, Métis, and Inuit laws of nature include: how nature provides gifts of life, living in harmony with the land.	55 – 62

	Learning Outcome – Students investigate the systems of Earth and reflect on how their interconnections sustain life	**Pages**
ES.4	Changes in one system that can impact another system include changes in: number of organisms, food sources, habitat, water distribution and cleanliness, weather patterns Governments, conservation groups, and First Nations, Métis, and Inuit communities collaborate with Parks Canada to conserve, restore, and protect Canada's natural and cultural heritages through initiatives such as: culture camps, science camps, land management and conservation of important sites, cultural centres	87 – 92
ES.5	[illegible] are materials from nature that are used to meet [illegible] include: air, water, soil, minerals, metals, forests, [illegible]	78 – 86
ES.6	Conserv[illegible] pres[illegible] protection of Earth's systems from pollut[illegible] Conservation practi[illegible] natural and human-made areas. Conservation can involve creatin[illegible] national parks. First Nations, Métis, and Inuit have a long [illegible] has informed conservation practices and beli[illegible]	93 – 100, 112 – 117
ES.7	Conservation can be practised through personal actions, including use of electricity, e.g., turning off lights when leaving a room; use of water, e.g., taking shorter showers; reducing waste, e.g., using reusable packaging Conservation can be practised through community or global actions, such as: use of energy-efficient alternatives, e.g., solar panels; supplying water to support crops (irrigation); community recycling or composting programs	108 – 111, 118 – 126
Computer Science		
CS.1	Students examine and apply design processes to meet needs.	27 – 34, 40 – 44, 101 – 107

NAME: _____

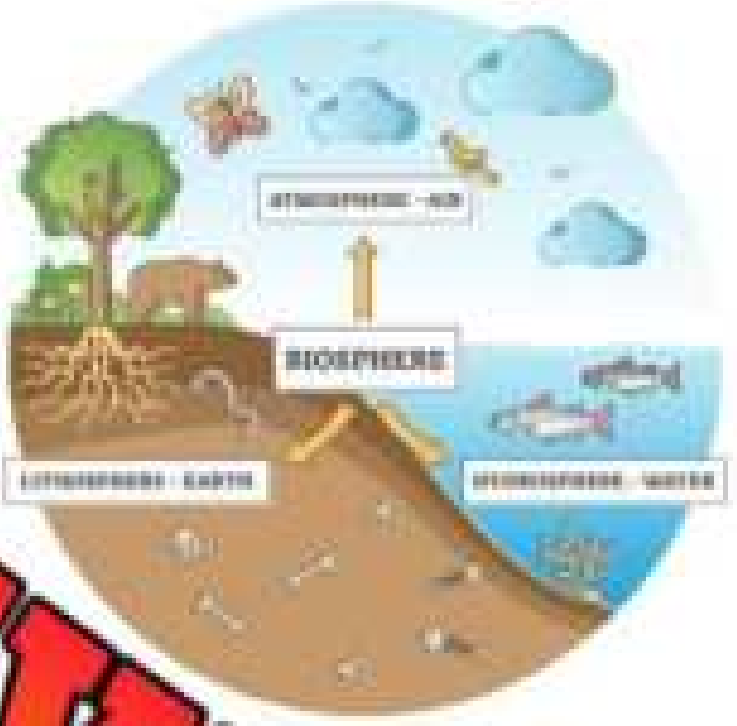
EARTH SYSTEMS

Name: _____ 7

Earth's Systems: The Four Spheres

Introduction

Our Earth is made up of different parts or systems, also known as spheres. These four spheres include the Lithosphere, Atmosphere, Hydrosphere, and Biosphere.



The Lithosphere

The Lithosphere is Earth's rocky part, including the crust and upper mantle. It's the ground we walk on and mountains we climb.

The Atmosphere

The Atmosphere is a layer of gases surrounding our planet that provides us with the air we breathe and protects us from space's harsh conditions, like the sun's rays and the warmth of the sun.

The Hydrosphere

The Hydrosphere includes all the water on Earth, in lakes, rivers, glaciers, underground, or in the ocean. It's the water we drink and the rain that waters plants. It's very important as water is necessary for all known forms of life.

The Biosphere

Lastly, the Biosphere is where all life exists. The biosphere includes all living organisms on Earth, including humans, animals, and plants. It overlaps with parts of the other spheres, including forests (lithosphere), coral reefs (hydrosphere), and birds (atmosphere).

Name: _____ 8

Earth's Systems: The Four Spheres

True or False

Circle whether the statement is true or false

1) The Lithosphere is made up of gases.	True	False
2) We breathe in air in the Atmosphere.	True	False
3) The Hydrosphere includes all the water on Earth.	True	False
4) The Atmosphere is the solid part of the Earth.	True	False
5) Birds are found in the Lithosphere.	True	False

Describe

Describe each of the spheres below

Lithosphere	
Atmosphere	
Hydrosphere	
Biosphere	

Questioning

Write 3 questions you have about Earth's systems/spheres

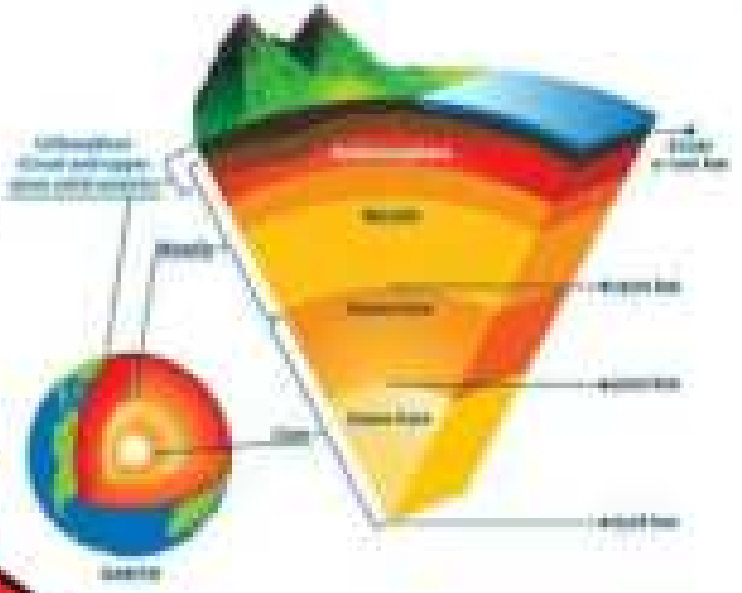
1)	
2)	
3)	

Name: _____ 9

The Lithosphere: Earth's Outer Layer

What is the Lithosphere?

The lithosphere is the top layer of the Earth's surface. When you walk on the ground, climb a hill, or touch a rock, you are in contact with the lithosphere.



Layers of the Lithosphere

The crust and the upper mantle make up the two layers of the lithosphere.

- The Crust: This is the layer that we live on and interact with daily. It includes the continents and the ocean floor.
- The Upper Mantle: Beneath the crust is the upper part of the mantle. Even though it's rocky, it's very, very hot, and parts of it can flow very slowly.

What's in the Lithosphere?

The lithosphere is mostly made of rocks. These rocks can be as large as mountains or as small as a grain of sand. There are three types of rocks in the lithosphere: igneous, metamorphic, and sedimentary.

How Does the Lithosphere Help Life?

The lithosphere helps life in many ways:

- Soils: The lithosphere has soil, which is made of tiny rock pieces and stuff from dead plants and animals. The soil gives plants a place to grow and holds water.
- Minerals: The lithosphere has minerals too. Minerals are found in rocks. They are things like iron, calcium, and potassium. Plants and animals need minerals.

Name _____ 18

The Lithosphere: Earth's Outer Layer

True or False Circle whether the statement is true or false

1) The crust is part of the lithosphere	True	False
2) The lithosphere is made up of only one layer	True	False
3) The upper mantle is cooler and more solid than the crust	True	False
4) The litho[illegible] can contain rocks as big as mountains	True	False
5) Mineral[illegible] found in the lithosphere	True	False

Questio[illegible] An[illegible]estions below using evidence from the text

1) What is the litho[illegible]

2) Why do we need the lithosphere? How does it [illegible]life?

Visualizing Draw what you were picturing while you were reading. Explain the picture

The Rock Cycle

The Rock Cycle

The **Rock Cycle** is the process by which rocks change forms from one type to another. There are three main kinds of rocks: igneous rock, metamorphic rock, and sedimentary [illegible] Each type of rock can change int[illegible] through the [illegible] compacting, cementing, weath[illegible] m[illegible]ing, heating, and pres[illegible]

Magma and Sediment

Magma and sediment are sub[illegible] become rocks and enter the rock cycle. M[illegible] that is underground.

Sediments are particles from rock [illegible] and [illegible] these sediments eventually will become sedimentary rock in the f[illegible]

Igneous Rock

Igneous rock is hardened magma that can happen below or [illegible] become one of the other types of rocks through the following proces[illegible] magma, eroding into sediment, or be compacted and pressurized to becom[illegible]morphic.

Metamorphic Rock

Metamorphic rock is igneous or sedimentary rock that has been heated and squeezed under heat and pressure. It can erode into sediment or melt into magma.

Sedimentary Rock

Sedimentary rock is compacted sediment. Sediment can be in the form of tiny rock materials or remains of living things. When these tiny materials are compacted together, they form a weak rock known as sedimentary rock.

Name _____ 14

The Rock Cycle - Questions

True or False Circle whether the statement is true or false

1. Metamorphic rock is hardened magma	True	False
2. Rocks can change forms under physical processes like heating	True	False
3. Sediments are big chunks of rock	True	False
4. A sedimentary rock is very strong and tough to break	True	False
5. Igneous rock is expected to become metamorphic	True	False

Questions Answer the questions below using evidence from the text

1) What is the rock

2) How can rocks change from one form into another

Summarize What is the main idea and supporting details from the reading passage

Name: _____ 18

Formation of Different Rocks

Explain How are each type of rock formed? Use the diagram to help

1) How are sedimentary rocks formed?

2) How are [illegible]phic rocks formed?

3) How are igne[illegible]

4) How do igneous rocks turn into [illegible]

5) How do metamorphic rocks turn into sedimentary [illegible]

True or False Circle whether the statement is true or false

1) When magma is cooled, it turns into metamorphic rock	True	False
2) Igneous and metamorphic rocks can be weathered into sediments	True	False
3) Sediments are compacted and cemented into sedimentary rock	True	False
4) Igneous rock cannot become metamorphic rock	True	False
5) Through heat and pressure, magma becomes metamorphic rock	True	False
6) Metamorphic rock can melt into magma	True	False

Name: _____ 23

Underground Drones

History of Drones

A **drone** is an aircraft with no on-board crew or passengers. Drones are also called "Unmanned aerial vehicles" (UAVs). Drones are controlled by a remote control.

The first drone was made in Britain during the First World War. It was named "Britain's Aerial Target." It was tested and showed promise, but it wasn't used in the war.

Fast f[illegible]d over 100 years, and drones are now in many different ways, from monitoring [illegible]ange to carrying out search and re[illegible] natural disasters.

Underg[illegible] Dro[illegible]

Mining compan[illegible]using [illegible]nd drones to help their mining p[illegible]t into mines to search caves, co[illegible]d m[illegible]underground tunnels.

Underground drones are useful in the fo[illegible]ays:

- ✓ They have technology that can record [illegible] gas l[illegible]
- ✓ They can identify geological features like ca[illegible]ang[illegible]ound lakes
- ✓ They can send quality videos of what miners can e[illegible]hey g[illegible]rground
- ✓ They can map out any dangerous areas before sending [illegible]

The technology has only been around since 2017, but it will be very [illegible] send drones underground to learn more about a mine will keep humans s[illegible]

In the past, human surveyors were sent deep into these mines to do the research themselves. Drones will save them from potential collapses, unsafe gas conditions, and from getting trapped underground.

Drone Operators

A new job industry is becoming more popular as drones are being used more and more. To get into the drone industry, you'll need A Transport Canada Advanced RPAS Pilots License and a Class 5 Driver's License.

Name _____ 2A

Underground Drones

True or False Is the statement true or false

1) An underground drone can map out an underground mine	True	False
2) Underground drones will save people's lives	True	False
3) You can drive a drone as a professional without a license	True	False
4) Drones can be sent into dangerous areas to protect humans	True	False
5) Underground mines have been around a very long time	True	False

Questi the questions below

1) Is the mining [illegible] can drones be used for?

2) How is science and technology helping [illegible] underground drone technology, how are humans affected?

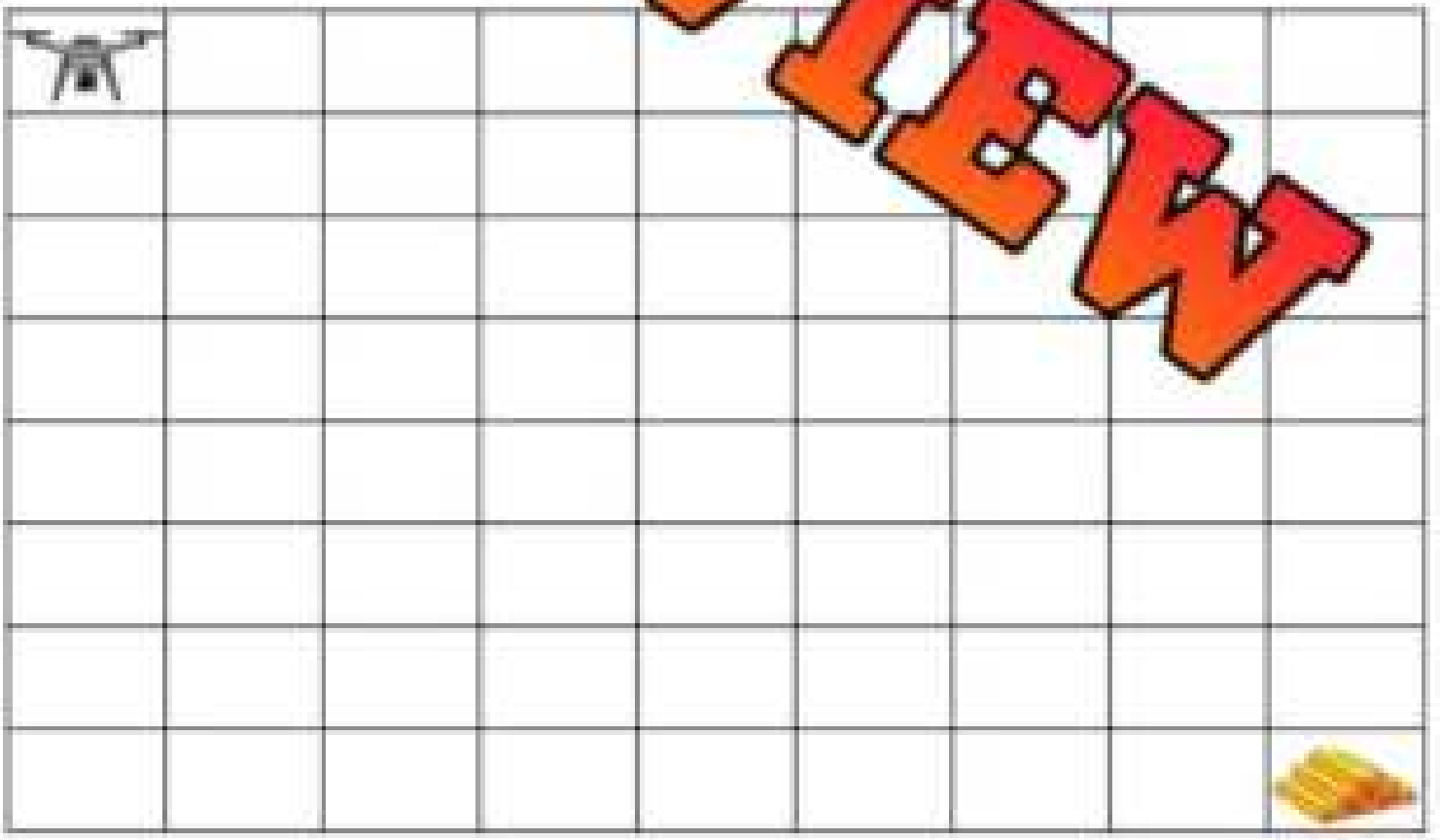
Visualizing Draw what you were picturing while you were reading. Explain the picture

Name: _____ 27

IF/THEN Statements - Underground Drones

Directions Follow the if/then statements to move the drone to the gold

1)	If sedimentary rock is the softest	then	Move down 3 spots
2)	If heat and pressure change rocks	then	Move right 5 spots
3)	If metamorphic rock is the weakest	then	Move left 4 spots
4)	If ig[illegible] rocks are cooled lava	then	Move down 2 spots
5)	If [illegible] combination of minerals	then	Move right 3 spots
6)	[illegible]	then	Move down 1 spot
7)	If steel [illegible]	then	Move left 3 spots
8)	If rocks can [illegible]	then	Move left 7 spots
9)	If rocks and miner[illegible] va[illegible]	then	Move right 2 spots
10)	If sediments are small par[illegible]	then	Move down 1 spot



Name: _____ 28

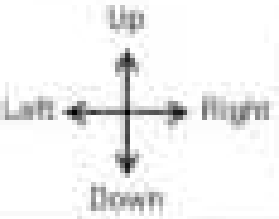
Writing Code - Underground Drones

Nova is a robot drone that helps gathers information about underground mines. Nova is controlled by a remote control.

Mining Use the map to write code on the back of the page

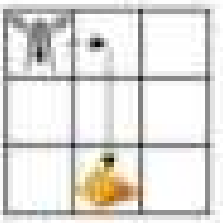
Name: _____ 29

Writing Code - Underground Drones



Commands - Use the example below to learn the code

Move 1 right
Move 2 down



Mining Tell Nova where to dig so that they get to all the materials

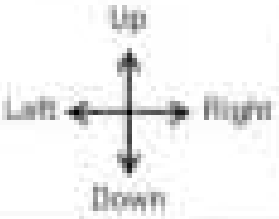
1) Find the [illegible]er and emerald

2) Find the platinum and dia[illegible]

3) Find the silver, graphite, and granite

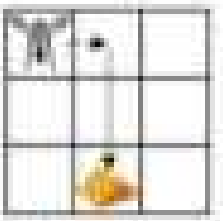
Name: _____ 30

Writing Code - Underground Bronze



Commands - Use the example below to learn the code

Move 1 right
Move 2 down



Mining Collect the minerals/rocks below using as few lines of code as possible. You can pick up the rocks/minerals in any order

4) Find the [illegible]n ore, copper, diamond, gold, and emerald.

5) Find copper, bronze, obsidian, granite, silve[illegible] gold[illegible] ore. Don't touch the lava!

Name: _____ 31

STEM Assignment - Underground Drone

Create your own underground drone. You'll need to write code for each of the buttons your done has. For each function, a new code needs to be written.

Questions Answer the questions about your machine below

1) What buttons does your machine have? What functions does it perform?

2) How does yo[illegible] use[illegible]te one example line of code for the machine to proces[illegible]ol[illegible]on is pressed. THEN turn on light

3) How much does it cost to make your machi[illegible]

4) Who will you sell your machine to?

5) How much will you sell it for?

6) If you sell 3 machines today, how much money will you make? Remember to subtract how much the machine costs to make!

Name: _____ 32

STEM Assignment - Underground Drone

Examples

If the up button is pressed

THEN move the drone up

If the gas button is pressed

THEN test the gas, display the type of gas on screen 1

IF/THEN Write code for your invention

If

THEN

If

THEN

If

THEN

If

THEN

If

THEN

If

THEN

If

THEN

Name: _____ 33

STEM Assignment - Underground Drone

Draw your invention. Make sure the drone has:

- ✓ Wings so it can fly
- ✓ A camera
- ✓ A remote control with buttons on it

Name: _____ 34

STEM Assignment - Underground Drone

Write two advertisements for your underground drone.

1) Write a radio advertisement that will only be heard. What features does your drone have? How will it help miners? How much does it cost?

2) Write a poster advertisement. Use less writing and more pictures to showcase your amazing drone. Include the price and maybe a sale?

1) Radio advertisement

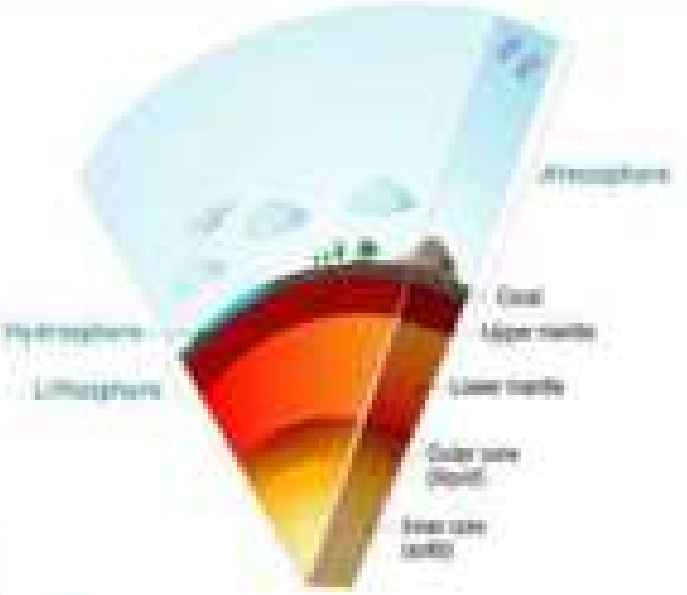
2) Poster advertisement

Name: _____ 35

The Atmosphere: Earth's Invisible Shield

What is the Atmosphere?

Think of Earth wearing a giant, invisible coat. That's what we call the atmosphere! It's a layer of gases that goes all around our planet. Without this protective coat, Earth would be very much different, and not very friendly.



Keeping Earth Cozy

One of the cool jobs the atmosphere has is to keep Earth warm. During the day, the Sun sends its heat to the Earth. But when the Sun sets at night, the heat starts to escape back into space. Here's where the atmosphere comes in, acting like a cozy blanket that traps some of the warmth near Earth's surface. This makes our planet comfortable for us to live.

Smoothing Out Temperature Extremes

The atmosphere also helps to level out temperature extremes. It keeps Earth from getting too hot during the daytime and too cold during the night. Without the atmosphere, daytime could feel like an oven, and nighttime could feel like a freezer!

The Atmosphere: Earth's Protective Shield

Besides warming our planet and giving us air to breathe, the atmosphere acts like a superhero shield for Earth! It protects us from small space rocks called meteoroids. Most meteoroids burn up in the atmosphere before they can reach Earth's surface. This is why we see shooting stars! Without the atmosphere, these space rocks could hit Earth and cause damage.

Name: _____ 36

The Atmosphere: Earth's Invisible Shield

True or False Circle whether the statement is true or false

1) The atmosphere is not needed for life on Earth	True	False
2) All meteoroids that come towards Earth make it to the surface	True	False
3) The atmosphere traps in heat when the Sun sets	True	False
4) The atmosphere doesn't let too much of the Sun's heat in	True	False
5) Without the atmosphere, it would be a warm paradise on Earth	True	False

Questions Answer the questions below using evidence from the text

1) What is the atmosphere?

2) Explain the three ways the atmosphere helps protect us.

1	
2	
3	

The Layers of the Atmosphere

The Layers of Earth's Atmosphere

1. Troposphere

- This layer is where all of the weather occurs, so whenever you experience wind, rain, or sunshine, it's thanks to [illegible] troposphere!
- Almost [illegible] we breathe, including oxygen and nitro[illegible] along with clouds and flying birds.

2. Strato[illegible]

- The ozone [illegible] the [illegible]phere, shielding us from the Sun's [illegible]
- It's the preferred fligh[illegible] it's stable and has few weather disturbances.

3. Mesosphere

- The coldest layer of all, the mesosphere, pro[illegible] meteors by causing most of them to burn up.
- Whenever you spot a shooting star, you're witnessing [illegible] the mesosphere!

4. Thermosphere

- The thermosphere may be super hot, but the air is too thin for us to feel the heat.
- This layer is home to the mesmerizing Northern and Southern Lights (Auroras) and the International Space Station orbits Earth here.

5. Exosphere

- The exosphere is the final layer of Earth's atmosphere, where our atmosphere fades into the vastness of space.
- Although mostly empty, the exosphere is where many satellites orbit the Earth.

Name: _____ 38

The Layers of the Atmosphere

True or False Circle whether the statement is true or false

1) Birds fly in the exosphere.	True	False
2) The ozone layer is in the troposphere.	True	False
3) Airplanes fly in the mesosphere.	True	False
4) Shooting [illegible] burn up in the mesosphere.	True	False
5) Satell[illegible] exosphere.	True	False

Questio[illegible] each of the layers of the atmosphere

Troposphere	
Stratosphere	
Mesosphere	
Thermosphere	
Exosphere	

Name _____ 39

The Layers of the Atmosphere

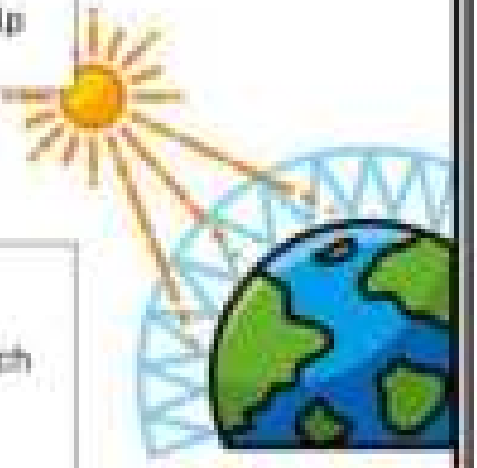
Draw Draw a diagram of the layers of the atmosphere

Name: _____ 40

Coding Activity - Layers of Atmosphere

Objective — What are we learning about?

To learn more about the atmosphere in a fun and engaging way. This is a physical activity that uses the principles of coding to help students understand the different layers of the atmosphere.



Materials — What do we need?

- ✓ Flash[illegible] names of the different layers of the at[illegible]
- ✓ F[illegible]s wi[illegible] haracteristics and facts about each layer
- ✓ Open spac[illegible]nt

Method — How [illegible] experiment?

1) Setup: Lay out the flashcards with th[illegible]rs in order from the ground up in a line across the room or fiel[illegible]

2) Creating Human Code: Divide the students i[illegible]ps o[illegible]group will represent a "program" and each student in th[illegible]er of the atmosphere.

3) Atmosphere Fact Cards: Give each group a set of fact ca[illegible]ou[illegible] facts can include things like "this layer is where weather occurs" or "this layer is where satellites orbit". The facts should correspond to the layers of the atmosphere.

4) Programming: The task for each group is to assign the correct facts to each member, representing the correct layer of the atmosphere. They need to "program" their group by discussing and matching the facts to the layers.

5) Execution: Once the groups have assigned the facts, each group will present their "program". When someone says, "run" or "start", they will line up in the order of the layers, and each student will say out loud the name of the layer they represent and the facts they were assigned.

6) Debugging: If a fact is wrong or misplaced, the other students can help "debug" the program by suggesting corrections.

Name _____ 41

Coding Activity - Layers of Atmosphere

TROPOSPHERE

STRATOSPHERE

MESOSPHERE

THERMOSPHERE

EXOSPHERE

Name: _____ 42

Coding Activity - Layers of Atmosphere

Set 1

This is the layer where we live and where weather happens, like rain and snow.

This layer is where the northern and southern lights (aurora borealis and aurora australis) occur.

This layer contains the ozone layer, which protects us from the sun's

This is the outermost layer of the atmosphere, where space begins and satellites orbit.

This is the layer where most meteors burn up when they enter Earth's atmosphere.

Set 2

This layer is above the troposphere and extends up kilometers.

It's the layer closest to Earth's surface and extends up kilometers.

This layer is above the mesosphere and extends up to about 600 kilometers.

This layer has the lowest density of molecules as there are less air molecules, making the air is thinner

This is the least explored layer of the atmosphere because it's too high for aircraft and too low for satellites.

Name: _____ 44

Coding Activity - Layers of Atmosphere

Set 5

Most of Earth's air mass (around 75-80%) is in this sphere.

The International Space Station orbits in this sphere.

It's very cold and has very little water vapor.

It gradually fades into space and has very few particles, mostly hydrogen and helium.

Most meteors burn up in this sphere as they fall towards Earth, causing shooting stars.

Set 6

This layer is above the stratosphere and extends up to about 85 kilometers.

This sphere is the outermost layer of the atmosphere, extending from the thermosphere up to 10,000 kilometers.

Birds and airplanes fly in the lower part of this sphere

Despite its high temperatures, this layer would feel cold to us because of the thin atmosphere.

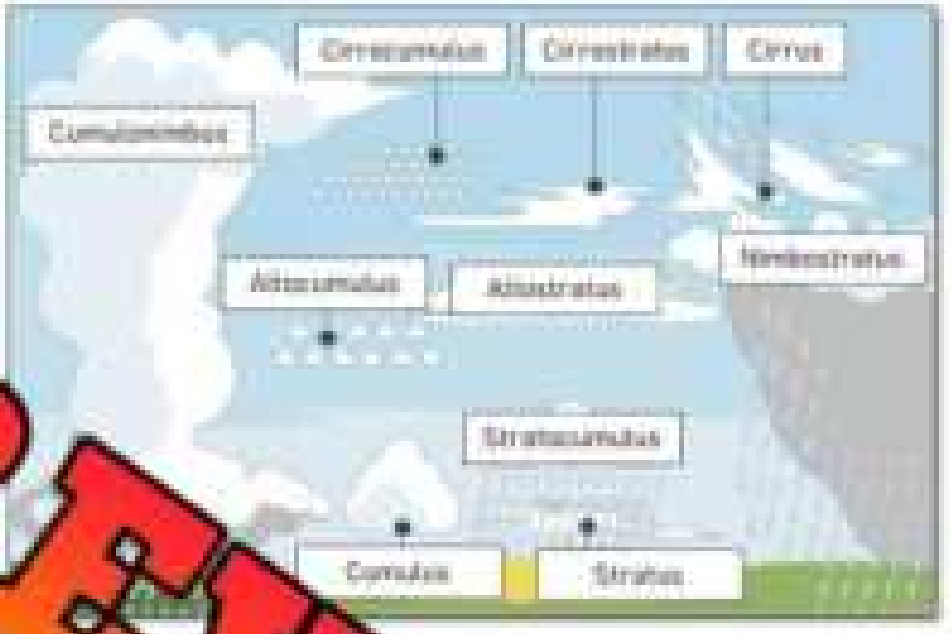
Most commercial airlines cruise in the lower part of this layer where the air is stable.

Name: _____ 69

Types of Clouds

Understanding Clouds: Types and What They Mean

Clouds are a fascinating part of our sky. They come in different shapes, sizes, and can tell us a lot about the weather. Here are some common types of clouds:



Cumulus Cl
Cumulus c
and wh
precip
the sky. Th
the weather is g
clear. However, wh
grow bigger and talle
can turn into cumulonimbu
clouds, which bring thunderst

Stratus Clouds
Stratus clouds are like big gray blankets ng th usually found low in the sky and can cover the whole sky. These clouds oft g dri y weather. If you've ever been in fog, you've been in a stratus t's ound!

Cirrus Clouds
Cirrus clouds are thin and wispy, found high up in the sky. Th d because it's very cold up high. Cirrus clouds usually mean good weath to cover the whole sky, it might mean a change in the weather is com

Cumulonimbus Clouds
Cumulonimbus clouds are towering, dark clouds that bring thunderstorms, heavy rain, snow, or even tornadoes. They can reach high up into the atmosphere and sometimes have an anvil shape at the top.

Nimbostratus Clouds
Nimbostratus clouds are thick, dark clouds that cover the sky and bring steady rain or snow. Unlike cumulonimbus clouds, they don't bring thunder or lightning.

By looking at clouds, we can tell a lot about what the weather is going to do. So, next time you're outside, take a look up at the sky and see if you can spot these different types of clouds!

Name: _____ 50

Types of Clouds

True or False

Circle whether the statement is true or false

1) Cumulus clouds often indicate good, clear weather.	True	False
2) Stratus clouds are high in the sky and made of ice crystals.	True	False
3) Fog is a type of stratus cloud that's touching the ground.	True	False
4) Nimbost[illegible] clouds are known for bringing thunder and lightning.	True	False
5) Cirrus [illegible] fluffy and white, resembling cotton.	True	False

Match[illegible]

Writ[illegible] from the description beside the correct type of cloud

Answers	Typ[illegible]	
	Cumulus	[illegible]ds that bring thunderstorms, heavy [illegible]r ev[illegible]ers.
	Stratus	[illegible] gr[illegible]ing the sky, often bringing driz[illegible]ly, g[illegible]ath[illegible]
	Cirrus	C) Thin and wispy [illegible] fou[illegible] up in the sky and usually indicate [illegible]ath[illegible]
	Cumulonimbus	D) Fluffy, white clou[illegible] cotton floating in the sky.
	Nimbostratus	E) Thick, dark clouds that co[illegible] steady rain or snow.

Draw

Draw the types of clouds below

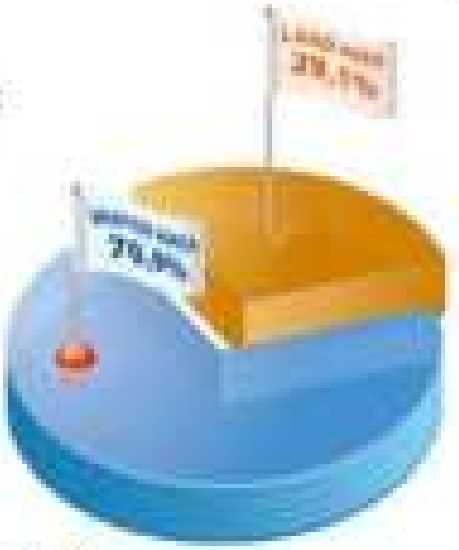
Cumulus	**Stratus**	**Cirrus**	**Cumulonimbus**	**Nimbostratus**

Name: _____ 51

What is the Hydrosphere?

What is the Hydrosphere?

Have you ever looked at a globe? Notice how much of it is blue? That's water, and all of it together is called the hydrosphere. The hydrosphere includes all the places on Earth w[illegible] water is found, whether it's a drop of dew on a [illegible] vast, deep ocean.



Places You Find [illegible]

You can find th[illegible]here [illegible]laces! Here are a few:

- Oceans: This is the [illegible] of t[illegible]sphere. Oceans cover more than 70% of Earth's surface.
- Rivers and Lakes: Flowing rivers a[illegible]ful [illegible]part of the hydrosphere too.
- Glaciers and Ice Caps: Even frozen water c[illegible]s the Arctic, Antarctica, and high mountains are part of the hy[illegible]
- Groundwater: Water underground that you can't see is [illegible] hydrosphere. This water can be found in soil and rocks.
- Water Vapor: This is water in gas form. It's in the air all around us!

Water: The Essence of Life

Water is super important for life on Earth. Animals, plants, and humans all need water to live. Animals drink water and live in it. Plants need water to grow. Humans use water for drinking, cooking, cleaning, and lots of other things. Even our bodies are mostly water!

Name: _____ 52

What is the Hydrosphere?

True or False Circle whether the statement is true or false.

1) The hydrosphere includes all the water on Earth.	True	False
2) Oceans cover less than half of Earth's surface.	True	False
3) Glaciers and ice caps are part of the hydrosphere.	True	False
4) There is [illegible]ter underground.	True	False
5) Water [illegible] air is part of the hydrosphere.	True	False

Questi[illegible]g [illegible]te 3 questions you have about the reading

1)	
2)	
3)	

Questions Use information from the text t[illegible]

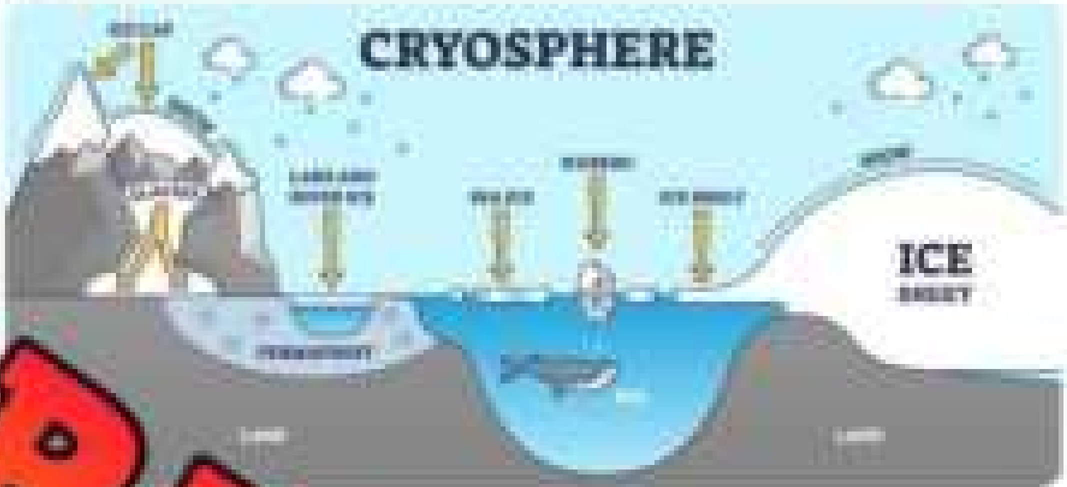
1) What is the hydrosphere? Where is most of the water found?

2) Why is the hydrosphere important to plant and animal life?

Cryosphere – Glaciers

What is the Cryosphere?

The **cryosphere** is the part of the earth's surface that has solid water – ice.



What a[illegible]

A **glacier** [illegible] slo[illegible] moving, large pi[illegible] that [illegible]n over a long period of time. Most glaciers are made of freshwat[illegible]

- Ice Sheet – Ice sheets are [illegible]ier. Ice sheets are the size of continents as they must be bigger t[illegible]lometres. The only ice sheets on Earth are in Antarctica and Greenl[illegible]
- Ice Cap – Ice caps are smaller than ice sheet[illegible]0,000 square kilometres. Most ice caps are found near th[illegible] of the earth. Canada has the Devon Ice Cap on Devon Island in Nuna[illegible]
- Icebergs – Icebergs are floating pieces of ice that are more than 1[illegible]es long. They are found in oceans or lakes. Icebergs are made when they break off a larger glacier. Icebergs are made of freshwater, as they begin their live on land.
- Sea Ice – Sea ice is frozen ocean water; therefore, it is made of saltwater. Sea ice floats on the ocean's surface.
- Ice Shelf – Ice shelves are permanent floating sheets of ice that are connected to a landmass. When ice breaks off an ice shelf, it can become an iceberg.

Name: _____ 54

Cryosphere - Glaciers

Questions Use information from the text to support your answer

1) What is a glacier?

2) Wh… …here are they found?

Order Put the glaciers below in … …om … (1) to largest (6)

Iceberg	Ice Cap	Ice Sheet	Ic…	…	Lake/River Ice

Multiple Choice Circle the best answer

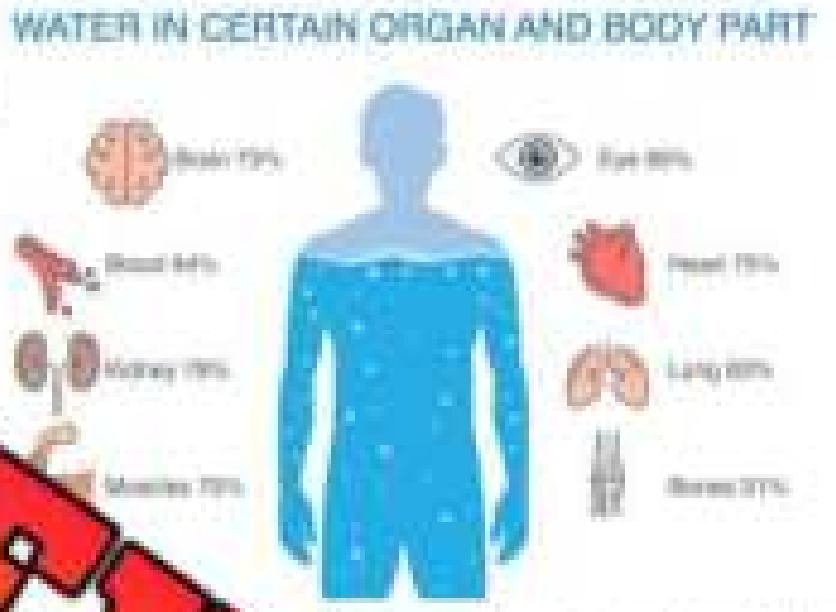
1) The largest glacier is an	Ice cap	Ice sheet
2) An ice sheet must be larger than	100,000 km^2	50,000 km^2
3) A glacier that is smaller and is made of freshwater	Sea Ice	Iceberg
4) Sea Ice is made of	Freshwater	Saltwater
5) Most glaciers are made of...	Freshwater	Saltwater
6) Glaciers are...	Moving	Still

Name: _____ 55

All Living Things Need Water

Water

All living things need water to live. Our bodies are made of 75% water. It is very important to drink enough water every day. Most people should drink at least [illegible] Our bodies lose water [illegible] go to the bathroom, when we sweat and when we breathe.



Water makes our bodies [illegible] healthy. Our blood is made of 95% water. Even our brain does not work well if we don't drink enough water. When we don't drink enough water, we say we are dehydrated.

Plants Need Water

Plants use water to make food for themselves. They take in water from their roots. The water moves up through the plant's stem and into the leaves. The chloroplasts in the leaves use the water to make sugar for the plant to eat.

Without water, a plant will die. This is because they can't make their own food without water. Even a cactus needs a bit of water! A cactus will need to take in water once every month.

Most plants that grow in Canada need to have 2 cm of water each week. Plants will grow best when it rains a lot.

Name: _____ 56

All Living Things Need Water

Questions Answer the questions below about the machine you chose

1) Why do we need water?

2) Why do [illegible] water?

Visualizing Draw what you were [illegible] reading. Explain the picture

Word Search Find the word bank words in the puzzle

A	B	E	U	D	B	O	D	I	E	S	G	L	H	W	E	C
E	I	F	D	Z	D	X	Q	H	L	T	Z	L	T	A	O	A
L	X	E	Y	U	B	L	Q	F	E	A	R	T	H	T	T	C
S	E	K	R	N	E	O	H	E	A	L	T	H	T	E	T	T
N	E	F	R	E	S	H	F	D	C	Q	U	K	O	R	L	U
P	S	W	D	R	I	N	K	P	L	A	N	T	S	T	E	S

Word Bank	
❑ Water	❑ Fresh
❑ Drink	❑ Bodies
❑ Health	❑ Need
❑ Earth	❑ Bottle

Name: _____ 57

Bodies of Water - Plants and Animals

Bodies of Water - Plants and Animals

Water is home to a diverse range of plants and animals. From the smallest pond to the vast ocean, each body of water has unique life forms. Let's dive in and explore some of them!

Ponds and Lakes

Ponds and lakes are freshwater bodies of water. They're home to a wide array of plants and animals.

- Plants: Cattails, and duckweed are common. They provide shelter and food for animals.
- Animals: Frogs, ducks, and many kinds of fish live here. Insects like dragonflies and water striders skate across the water's surface.

Rivers and Streams

Rivers and streams are moving bodies of water. They are full of life too!

- Plants: Waterweeds and reeds grow here. These plants are strong and can handle the fast water flow.
- Animals: Fish like trout and salmon live here. Otters, beavers, and even bears can be found nearby.

Oceans

Oceans are the largest bodies of water. They're saltwater, not fresh.

- Plants: Seaweed and kelp are common. They create underwater forests that many creatures call home.
- Animals: There's a huge range! Tiny shrimp, colorful fish, dolphins, whales, and sharks all live in the ocean.

Coral Reefs

Coral reefs are "underwater cities" in the ocean.

- Plants: Algae live in the coral and give it bright colors.
- Animals: Coral reefs are some of the most diverse habitats. They house clownfish, sea turtles, eels, and starfish.

Name: _____ 58

Bodies of Water - Plants and Animals

True or False Circle whether the statement is true or false.

1) Ponds and lakes are saltwater bodies.	True	False
2) Ducks live in ponds and lakes.	True	False
3) Trout and salmon live in rivers and streams.	True	False
4) Oceans [illegible]shwater bodies.	True	False
5) Coral r[illegible]und in lakes.	True	False

Describe [illegible]scribe [illegible] aquatic habitats and the plants and animals that live there.

Ponds and Lakes	
Rivers and Streams	
Oceans	
Coral Reefs	

Name: _____ 61

Plant Profile - Cactus

Cactus Plant

Cacti are special plants that can live in dry places like deserts. They have tough parts called stems, pads, or branches with spikes instead of leaves. A cactus can go without rain for more than a year, while most other plants need it often.

How C[illegible]ve in D[illegible]

Cacti have spe[illegible]ive[illegible] places:

- ❑ Storing Water: [illegible] their stems, roots, and leaves. So, even if it doesn't rain, they [illegible] to grow.
- ❑ Night-time Photosynthesis: Cacti [illegible] when it's cooler. This way, they don't lose much water.
- ❑ Wide, Shallow Roots: Cacti have roots that [illegible] face to soak up any water nearby.
- ❑ Slow Growth: Cacti grow slowly, which means they need less [illegible]

Growing a Cactus

Cacti like sandy soil because it lets air reach their roots and doesn't hold too much water. When watering a cactus, make sure the soil dries quickly. If too much water stays in the soil, the cactus's roots can rot. This is because a cactus can only hold so much water before it becomes full.

Name: _____ 62

Plant Profile - Cactus

Multiple Choice — Circle the correct answer

1) Cactus plants grow best in which type of soil?	Silt	Sand
2) Cactus plants can survive how many days without water?	100	1 Year
3) If you over water a cactus, it will get	Root Rot	Wet Roots
4) Cactus pl[illegible]d what in their roots?	Air	Rocks
5) A cactu[illegible]	Spikes	Leaves

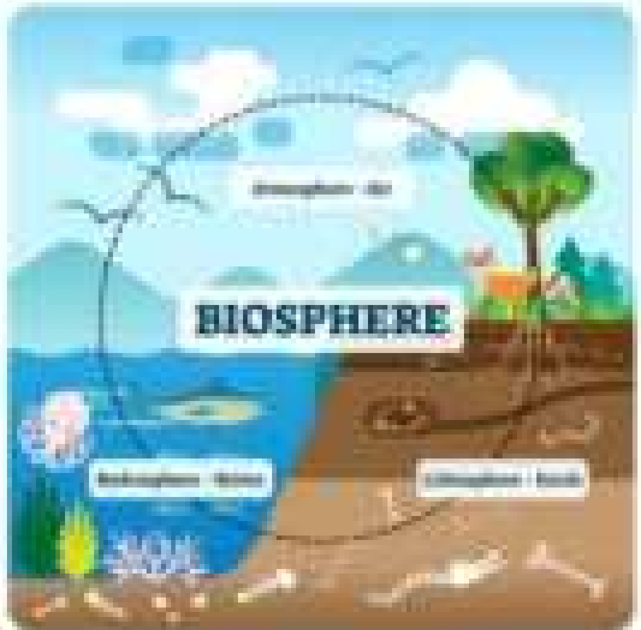
Draw [illegible]l a cactus plant

Word Bank
Roots
Spines
[illegible]m

Question — How does a cactus survive in a dry environment?

Name: ______________________ A3

What is the Biosphere?



What is the Biosphere?

The biosphere is like a giant, global house where every living thing on Earth resides! From the tiniest microbe to the tallest giraffe, from deep sea creatures to birds in the sky, everything ... life is part of the biosphere.

Where ... Biosphe...

The biosphere i... c... ...vers many regions on ... ...re ... ...nd. Here's where you can fi... ...

- Land: On land, life can be fo... ...all ... This includes lush forests, hot deserts, high mountains, and even yo... back...
- Water: Life loves water! From the deepest oc... ...che... ...llest ponds, you'll find members of the biosphere. This inclu... ...thy plankton.
- Air: Yes, even in the sky! Birds, insects, and bats are all airborne ... biosphere.
- Underground: Even below the surface, there is life. This includes earthworms in soil, moles in burrows, and bacteria in rocks deep within Earth!

Why is the Biosphere Important?

The biosphere is essential because it includes all life on Earth, and life supports life! Every creature plays a part. Bees help flowers by pollinating them. Plants give us oxygen to breathe. Even small creatures like worms help make the soil good for plants.

Name _____ 64

What is the Biosphere?

Draw Draw living things in water, on land (underground too), and in the air

Questions Use information from the [illegible] answer

1) What is the biosphere?

2) How does life support life? How do living things help other living things?

Name: _____ 65

Survival Needs

What do organisms need to survive?

In order for any organism to survive, it needs certain things. Think about what you need to survive? All living organisms (plants and animals) need 5 basic things: **sunlight, water, air, food (nutrients)**, and a habitat with the ideal **temperature**.

Water

Water is n[illegible] and animals alike, however, the amount of wat[illegible]ies from organism to organism. For example, a frog needs much mor[illegible]

Air

Air is made from several gas[illegible]tant are oxygen and carbon dioxide. Without oxygen, animals will die and [illegible] plants will not survive.

Food & Nutrients

All living organisms need energy to function. Energy [illegible] organisms to grow, reproduce, move, and to work.

Temperature

The temperature has to be just right for each organism to survive. Certain plants will not survive in colder or warmer temperatures. Some animals migrate from colder temperatures during the winter to warmer temperatures just to survive.

Sunlight

All living organisms need sunlight because it provides us with the source of all energy. It also provides heat for plants and animals.

Name _____ 66

Survival Needs - Questions

Making Connections What does this reading remind you of in your life?

True or False Circle whether the statement is true or false

1. Sunlight is only [illegible] by plants	True	False
2. Both plants and animals [illegible] ive	True	False
3. The amount of a need is [illegible] species	True	False
4. All living organisms need a habitat [illegible] ture	True	False
5. Sunlight is only necessary so that organisms [illegible]	True	False

Questions Answer the questions below using [illegible]

1) What are the 5 basic survival needs? Why are they important?

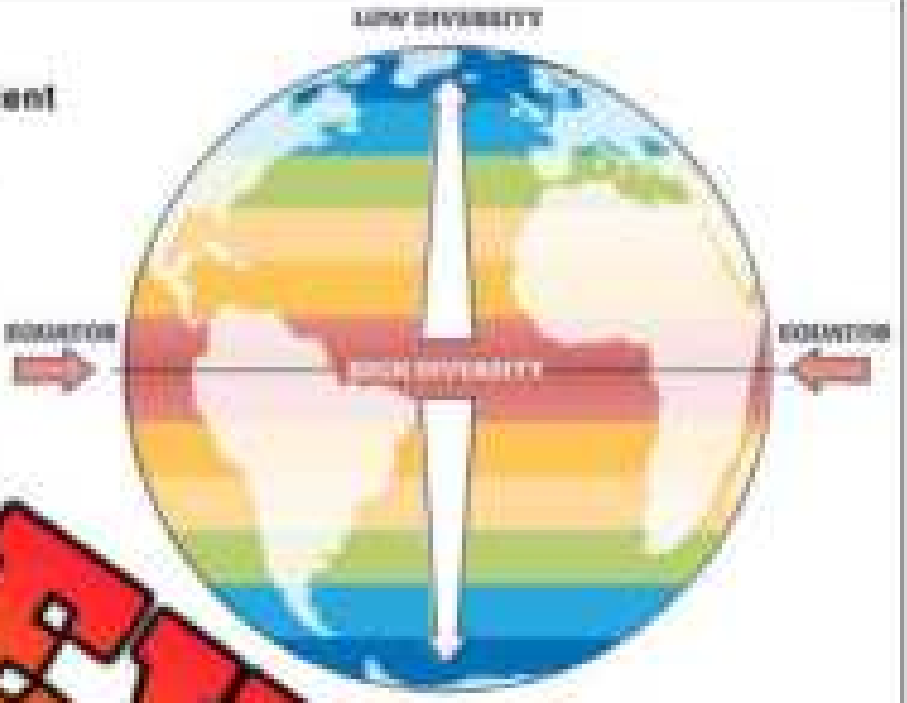
2) Do all living things need the exact same amount of these needs? Explain using an example.

Name: _____ 69

Longitudinal Biodiversity Gradient

Biodiversity on Earth

The **latitudinal biodiversity gradient** shows which areas around the world have the most Biodiversit[y]



gradient, the m[ost] ty be found along the [equator] because the climate along th[e equator] most mild. This means the temperatur[es] and [rainfall] are all almost the same all year.

The temperature is warm and the days are lon[g] near the equ[ator] that is why the places near the equator are great for plants and animals t[o]

As you get further from the equator, the climate changes from mild to extreme. The climate on the poles is very difficult to survive in as the temperatures go from -29°C to 23°C. Organisms that live in these climates must be adapted so they can survive in very cold temperatures and warmer temperatures as well.

Name: _____ 70

Longitudinal Biodiversity Gradient

Questions Answer the questions below using evidence from the text

1) Why is it easier to live near the equator?

2) Why [illegible] near the north or south pole?

Questioning What questions do [illegible] the information?

1)	
2)	

True or False Circle whether the statement is true or false

1) The temperature changes a lot if you live near the equator	True	False
2) Florida is near the equator, so it is warm all year	True	False
3) Animals living away from the equator need to adapt to changing weather	True	False
4) More plants and animals live near the poles	True	False
5) More plants and animals live near the equator	True	False

Name: _____ 71

Biodiversity - Canada and the Amazon Rainforest

Biodiversity in Canada

In Canada, we live closer to the poles than to the equator. Our climate is difficult for many different species to survive in. We don't have the biodiversity that is found in countries closer to the equator. In Canada, there are around 80,000 different species, not [illegible]ng bacteria and viruses.

[illegible] this is our temperate climate with four different seasons. [illegible] to survive in the winter and summer (ex. furnaces and air c[illegible]ing). [illegible]ecies and organisms do not have these luxuries. Instead, some mig[illegible]ther [illegible]rvive the extreme changes in weather.

Amazon Rainforest

The Amazon Rainforest is in South America, near the equator. It is home to the most biodiversity in the world. In fact, there are over 2.6 million different species living in the rainforest!

The Amazon Rainforest is a great place to live. It is warm all year round. The days are long, so there is lots of sunlight for plants to grow. Also, it rains a lot! Plants and animals need water to survive!

Name: _____ 72

Biodiversity - Canada and the Amazon Rainforest

Questions Answer the questions below using evidence from the text.

1) Why don't we have as much biodiversity in Canada as the Amazon Rainforest?

2) Is th… …sity in the Amazon Rainforest? Explain why or why not.

Visualizing Draw what you were pictu… …reading. Explain the picture.

True or False Circle whether the statement is true or false

1) It is easier to survive in Canada then the Amazon Rainforest	True	False
2) The Amazon Rainforest is near the North Pole	True	False
3) Canada is closer to the North Pole than the Amazon Rainforest is	True	False
4) There are over 2.6 million species living in Canada	True	False
5) There are over 2.6 million species living in the Amazon Rainforest	True	False

Name: _____ 78

Regions of Canada Map

Word Bank
Western Cordillera
Appalachian Mountains
Interior [illegible]
Canadian [illegible]
[illegible] Lawrence Lowlands
[illegible] Highlands
[illegible]

Directions: Label the physical regions of Canada on the map using the word bank provided.

Name: _____ 79

Natural Resources in Canada

Natural Resources

We call materials and substances that we find in our environment **natural resources**. Think about that. This means that anything you find in your yard is a natural resource.

Some natural resources are worth more than others. The dirt you find in your yard isn't worth much as soil can be found almost anywhere. Gold on the other hand, is a valuable natural resource because it is hard to find! Examples of other natural resources include water, trees, air, oil, coal, natural gas, iron, and copper.

Valuable Natural Resources

A natural resource is valuable based on how easy it is to find and how important the resource is. Read the list below to learn more about 5 natural resources that are found in Canada.

1. Water – Even though there is a lot of water, only 2.5% of that water is drinkable or useable for consumption.
2. Air – We NEED clean air to survive. Air is an important natural resource. Clean air is needed, and some places will pollute the air from power plant exhaust as well as exhaust from vehicles.
3. Coal – It is estimated that we will run out of coal in [illegible] years. Coal provides us with electricity that we use to power our electronics.
4. Oil – Some experts believe we will run out of oil in [illegible] years. Oil is used as fuel for our vehicles. It takes millions of years for new oil to be produced.
5. Natural Gas – We use natural gas to power many of the machines in our homes such as our furnace, air conditioners, stoves, and BBQs.

How Regions Benefit from Natural Resources

When one region has access to valuable natural resources, they benefit because they can sell this resource to other provinces or territories. They can also sell to other countries around the world.

For example, Alberta and the Interior Plains produce the most oil in the world! This means they can sell the valuable oil to other places in order to make money for their province. It also means that many people move to Alberta to get jobs on the oil sands. These jobs usually pay a lot because of all the money the companies are making by selling the oil. These companies pay heavy taxes to the government of Alberta, meaning Alberta benefits as well for having these natural resources on its land.

Name: _____ 80

Natural Resources in Canada

True or False

Circle whether the statement is true or false

1. Air is considered a natural resource because it exists in our environment	True	False
2. Some natural resources are more valuable than others	True	False
3. Soil is a valuable natural resource because it is hard to find	True	False
4. Oil is a nat[illegible] resource that has benefitted Alberta	True	False
5. Water is [illegible]able resource because water is found easily	True	False

Quest[illegible]

[illegible]he questions below using evidence from the text

1. What are nat[illegible] [illegible] examples. Try to think of 1 that is not from the reading.

2. How do natural resources help provinces and [illegible] Why [illegible]aluable?

Summarize

What is the main idea and the supporting details of the reading?

Name: _____ 81

Natural Resources in Canada's Regions

Canada is a vast country with seven distinct physiographic regions, each with its own unique natural resources. Here is a list of the natural resources found in each of Canada's seven physiographic regions:

Interior Plains

- Wheat and other agricultural crops
- Oil and natural gas
- Potash and coal
- Grasslands and wildlife habitats

Western Cordillera

- Forests and timber
- Minerals such as copper, gold, silver, and coal
- Hydroelectric power
- Fish and marine life

Canadian Shield

- Minerals such as gold, silver, nickel, copper, and zinc
- Forests and timber
- Freshwater resources such as lakes and rivers
- Hydroelectric power

Hudson Bay Lowlands

- Peat and other organic materials
- Fish and marine life
- Important wildlife habitats

Appalachian Mountains

- Forests and timber
- Minerals such as coal, iron ore, and lead
- Hydroelectric power

Arctic Lowlands

- Oil and gas reserves
- Minerals such as diamonds, gold, and uranium
- Fish and marine life

Great Lakes/St. Lawrence Lowlands

- Agricultural crops such as dairy, corn, soybeans, and fruits
- Forests and timber
- Minerals such as iron and zinc

Name: _____ 82.

Natural Resources in Canada's Regions

Organize Which regions are high in the natural resources below?

Fishing	
Minerals	
Oil and [illegible]	
Forests	
Good Soil for Farming	

Think If you wanted a job in [illegible] where would you move?

1) Which natural resources are found in British C[illegible]

2) Which natural resources are found on the east and west coast of C[illegible]

3) Which part of Canada has the best mining – the coastal regions or inland regions? Why?

4) Which part of Canada has the best forestry – the coastal regions or inland regions? Why?

Name: _____ 83

Natural Resources in Alberta

Natural Resources in Alberta

Alberta is a province in Canada that has an abundance of natural resources. Natural resources are things that come from the earth that we can use in many ways. Let's learn about [illegible] important natural resources [illegible]

- Forests – Alberta [illegible] forests that cover a large [illegible] These forests are important because they supply wood for building things like [illegible] paper. They also help clean the air we breathe and offer homes to [illegible]

- Fish – Alberta has a lot of fish in its [illegible] lakes. [illegible] important because they provide food for people and animals. Some of the [illegible] fish in Alberta are trout, northern pike, and walleye.

- Oil and Gas – Alberta is well-known for its oil and gas [illegible] These are important because they are used for heating homes, running cars, [illegible] things like plastic. Alberta is one of the largest producers of oil and gas [illegible] world.

- Water – Alberta has a lot of water in its rivers and lakes. Water is important because it provides drinking water for people and animals. It also helps plants grow and offers habitats for fish and other animals.

Forests, fish, oil and gas, and water are some of the most important natural resources in Alberta. It's essential to take care of these resources so that they can continue to serve us in the future.

Name: _____ 84

Natural Resources in Alberta

True or False

Circle whether the statement is true or false

1) Forests are one of Alberta's most important natural resources	True	False
2) Wood isn't very important in our day-to-day lives	True	False
3) Oil is used to make plastics	True	False
4) Alberta h[illegible] of water in its oceans	True	False
5) We can u[illegible] resources as we want because we have lots	True	False

Word [illegible]ch

[illegible] the words in the word search

Natural	Re[illegible]
Geography	Forests
Fish	Mining
Energy	Economy
Conserve	Extract
Future	Salmon
Trout	Cod

Reflect

Which natural resources are most important in your community?

Name: _____ 85

Resource Towns in Alberta

What is a Resource Town?

A **resource town** is a community that grows because of the resources available in the area. Quite often, one natural resource is found in an area. When this happens, people move to that area so they can work for companies that extract the resource.

As more and more people move to the area, shops, businesses, and residential areas (houses) begin to develop as well. This is an example of how a natural resource can lead to communities developing around it. We call these communities resource towns.

Resource Town: Fort McMurray

In 1964, the first oil sands project in Fort McMurray began. The Great Canadian Oil Sands (now Suncor Energy) was given permission to build a factory that separates bitumen from oil sands. Many people throughout North America moved to the oil sands to find jobs. The town grew from 2,614 people to 10,000 people by the mid-1970s.

Ten years later, a second project led by Syncrude Canada began. The town grew to nearly 37,000 with more jobs available. By the late 1990s, Fort McMurray's population grew to 47,705 people. In 2020, Fort McMurray had a population of 137,000. With so many people living in Fort McMurray, other services were needed to keep the people safe and happy. City workers were needed to offer water, sewage removal, roads, snow removal, and many other services. Many businesses like banks, grocery stores, and restaurants were needed as well. This meant that the small town that was build around the oil sands became a large urban city with everything people needed.

Name: _____ 86

Resource Towns in Alberta

Questions

Use information from the text to support your answer

1) Why do communities often develop near natural resources?

2) Why [illegible]idered a resource town?

Making Connections

Are th[illegible] ar[illegible]town that draw people to it?

True or False

Circle whether the statement is true or false

1) The first oil sands project in Fort McMurray was in 1672	True	False
2) Many people moved to Fort McMurray to work at the oil sands	True	False
3) The population grew from just 2,000 to 137,000 in only 56 years	True	False
4) Oil in Alberta is very valuable	True	False
5) Communities grow when surrounded by valuable natural resources	True	False

Name: _____ 87

Interconnections Between Earth's Spheres

Interconnections of Earth's Spheres

Earth is made up of different family members, or "spheres": the Lithosphere, Atmosphere, Hydrosphere, and Biosphere. Each of these spheres are closely interconnected as they help each other in many ways.

	Lithosphere	Atmosphere	Hydrosphere	Biosphere
Lithosphere	-	canoes make hat	When it rains, the rainwater comes down and makes the land wet	The soil in the land helps plants grow big and strong
Atmosphere	Ash from erupting volcanoes goes up into the air	-	s in the rivers	Plants breathe in the air and it to make own food
Hydrosphere	Rainwater can wash soil from the land into rivers and lakes	When the sun shines, it heats up the water, causing it to turn into water vapor and go up into the air	-	ding plants and animals need water to grow and stay healthy
Biosphere	When plants and animals die, they can turn into soil, making the land richer	Plants take in a gas called carbon dioxide from the air and give off oxygen which we need to breathe	Animals like fish live in water and birds drink it	-

Name: _____ 88

Interconnections Between Earth's Spheres

Questions Answer the questions below using evidence from the text

1) Are Earth's systems connected? Explain.

2) Wh[illegible] all of our spheres healthy?

Biosphere How is the biosphere [illegible] other spheres?

Lithosphere and Biosphere	
Hydrosphere and Biosphere	
Atmosphere and Biosphere	

Name: _____ 89

Changes in One Sphere Affect Others

Change in Biosphere: A forest full of trees is removed to make space for a new city	
Lithosphere	The land where the trees once grew becomes bare. The tree roots are not there to hold the soil together anymore. This can lead to soil erosion, where the soil gets washed away more easily when it rains
Hydrosphere	The soil that gets washed away can end up in our rivers, lakes, or oceans, making the water muddy and not so clean. Also, trees usually help drink up water from the ground. Without the trees, there might be too much water left, which can lead to flooding
Atmosphere	Trees are amazing because they breathe in a gas called carbon dioxide, which is bad for us, and breathe out oxygen, which we need to live. Without trees, there could be more carbon dioxide left in the air. This extra carbon dioxide can make the Earth warmer, a process known as

Questions Answer the questions b[illegible] from the text

1) What is the change that is affecting other spheres?

2) How is the change affecting the other spheres below? Paraphrase information from the text. Add any other effects you can think of.

Lithosphere	
Hydrosphere	
Atmosphere	

Name: _____ 90

Changes in One Sphere Affect Others

Change in Biosphere: The number of bees is decreasing rapidly	
Lithosphere	With fewer bees to pollinate flowers, there may be fewer plants. This could change the way our landscapes and gardens look.
Hydrosphere	Fewer plants due to less pollination could lead to more water runoff when it rains, as plants help to absorb water. This would cause flooding.
Atmosphere	With fewer plants due to less pollination by bees, there could be less oxygen because plants create oxygen when they grow.

Questions Answer the questions below using evidence from the text.

1) What is the change that is affecting the biosphere?

2) How is the change affecting the other spheres below? Use information from the text. Add any other effects you can think of.

Lithosphere	
Hydrosphere	
Atmosphere	

Name: _____ 93

Ways to Conserve Earth's Systems

What is Conservation?

Conservation means taking care of our planet and its many different parts, like the air, the water, the land, and all the animals and plants.

Lithosphere: The Land We Live On

- Recycling: When we recycle, we use old things to make new ones, reducing trash and keeping [illegible] clean.
- Co[illegible]: [illegible]st our food waste. This returns nutrients to the soil, helping plants [illegible] and [illegible] healthy.

Hydrosphere: Our [illegible] Wat[illegible]

- Saving Water: By turning [illegible] brush our teeth, or taking shorter sh[illegible] s[illegible] water.
- Cleaning Up: Picking up trash and not [illegible] keep [illegible], lakes, and oceans clean, which is better for fish and other water [illegible].

Biosphere: Home to All Life

- Protecting Animals: Keeping animals safe helps keep [illegible] liv[illegible] protect animals by not destroying their homes or hunting them to [illegible].
- Growing Gardens: Planting flowers, vegetables, and other plants provides food and shelter for insects, birds, and other creatures.

Atmosphere: The Air Above Us

- Using Public Transit, Biking, or Walking: Cars can make the air dirty. By driving less and using other ways to get around, we help keep the air clean.
- Using Less Energy: When we use less electricity, like turning off lights when we leave a room, we create less pollution that can dirty the air.

Name: _____ 9s

Ways to Conserve Earth's Systems

Plan Fill in the table below to plan how you can conserve to help Earth's systems

List 5 things you can do to conserve so that Earth's systems can be healthy.	
1	
2	
3	
4	
5	

2) How will you doing these things help the Earth's system?

3) Why is it important for all humans to conserve? Why do we need to work together?

Name: _____ 99

Experiment - Making A Water Filter

Research Question What are we learning more about?

Can we filter dirty water and make it clean again using the materials below?

Materials What will you need for the experiment

- ❑ 2-litre [illegible] bottle, emptied and clean
- ❑ Dirty [illegible] dirt, coffee grounds, old crunched up [illegible] or tiny pieces of foam)
- ❑ Measuring cup
- ❑ Spoon
- ❑ Stopwatch or [illegible] and
- ❑ Filtering materials [illegible] find activated charcoal, gra[illegible] co[illegible] fine), cotton balls
- ❑ Coffee filter

Procedure How will you complete the e[illegible]

1) Cut the top off the 2-litre bottle and flip it over to fi[illegible] of the bottle
2) Place the coffee filter or paper towel into the bottom of the fi[illegible]
3) Add all your materials as layers into your filter. Do this strategically in terms of size of materials.
4) Record the order of your materials on the back of this page. Draw a diagram of the filter
5) Stir the dirty water and measure a cup of it
6) Pour the dirty water into the filter. Time how long it takes for the water to pass through the filter
7) Carefully scoop out the filter materials. Make a note of which materials took what out of the water.

Observations What did you notice as you completed the experiment

1) Which materials did you use for the layers in your filter?

2) Draw a d[illegible] of the layers of your filter. Label each layer.

3) How long did it take for the water to pass through t[illegible]

4) When you took the materials out, did you notice which materials took out which parts of the dirty water?

Name: _____ 101

STEM - Water Testing Technologies

Changing Technologies

For farmers, the most important thing is the quality of their soil and water. In the past, farmers had to send their soil and water samples to science laboratories to test the quality. The process was time-consuming and cost a lot of money.

Today, farmers can use something called an AgroPad to test their water and soil quality. To run the test, you take an AgroPad (a card about the size of a bank card), and put a drop of water or soil on it. In less than 10 seconds, the card will change colours.

Next, you use the AgroPad app on your smartphone to scan the card. The app will then give you the information you need to understand the quality of your water and/or soil. The app will show the pH, magnesium, aluminium, and nitrogen levels found in the soil and water. If farmers know what is in their soil and water, they can add the nutrients it needs to be healthy. Healthy plants and soil = better crops and more food for everyone!

The AgroPad was made by IBM, a company helping family farms around the world. IBM understands that 80% of the world's food comes from family farms. These family farms need to be supported by the latest science and technology.

Multiple Choice

Circle the correct answer.

1) The AgroPad is made by	Microsoft
2) The AgroPad can test the quality of water and	Air
3) You can find out if your water or soil has too much	[illegible]
4) You can add _____ if your soil is low in something	[illegible]
5) Family farms grow what percentage of food worldwide?	[illegible]

Question

How is technology helping farmers around the world?

_____

_____

_____

_____

Name: _____ 102

STEM - Water Testing Invention

Create your own invention that tests the quality of water and adds nutrients to make the water quality better. Use the legend below to know what to add.

Test Results	What to Add When High Levels	What to Add When Low Levels
Levels of pH	Sodium bisulfate	Sodium Bicarbonate
Levels of chlorine	Hydrogen peroxide	Chlorine
Levels of m[illegible]um	Sodium	Magnesium
Levels o[illegible]	Malic acid	Aluminum
Leve[illegible]	Chlorine	Nitrogen

IF/THEN [illegible] your invention

If the pH is high and m[illegible]

THEN

If chlorine is high and nitrogen is low

THEN

If nitrogen is high and aluminum is low

THEN

If the levels of pH, magnesium and nitrogen are high

THEN

If the pH, nitrogen, magnesium, and aluminum are low

THEN

If the pH and chlorine are high, but the aluminum and magnesium are low

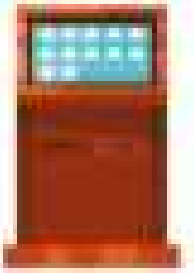
THEN

Name: _____ 103

STEM - Water Testing Invention

Draw your invention. Make sure the invention has:

- ✔ A place to put the water
- ✔ A screen to tell you the results
- ✔ A start button
- ✔ Any other buttons it will need to work



Name: _____ 104

STEM - Water Testing Invention

Questions | Answer the questions about your machine below

1) How does your water testing machine work?

2) What b[illegible] machine have?

3) For at least 2 buttons, w[illegible] hine what to do when the button is pressed. For example, if on bu[illegible]

4) How will your machine help people? Explain its impact on the world.

Name: ____________________ 105

STEM - Water Testing Invention

STEM | Math connection – answer the questions below

1) How much does it cost for you to make your machine? Think of the parts you will need and estimate a price.

2) How ma[illegible] will you make at first?

3) How much w[illegible] [illegible] in total?

4) How much will you sell o[illegible]?

5) How much net profit will you earn if you se[illegible] make? For net profit, you'll find the gross and subtract the co[illegible]

6) If you wanted to make $100,000 in profit, how many units would you need to sell?

Name: _____ 106

Writing Code - Calgary's Water Service

Automation is so much more efficient than manually performing work. Furthermore, automation makes less mistakes, as there are no user-errors. That is why the City of Calgary has hired you to automate their billing service.

They would like you to write a code that charges people based on how much water they use. Below is what they want to charge residents for how much water they use:

Tier	Amount of Water	Cost
1	Up to 6 cubic metres	$1.00/m³
2	7 to 25 cubic metres	$1.50/m³
3	180 cubic metres	$2.00/m³
4	n 180 cubic metres	$3.00/m³

Coding

W ing ments that will send a bill to residents in Calga ge

Name: ______________________

Writing Code - Calgary's Water Service

STEM Fill in the code below by calculating the cost of the water for the resident

1) Fill in the blank below to determine how much the resident owes.

```
email = input ("please enter your email so we can send you your bill")
if resident uses [ 40 m³ ] of water
    then set [ balance owed ] to [          ]
    send [ balance owed ] to [ email ]
```

2) Describe how the code works.

____

____

____

3) Fill in the blank below to determine how much the resident owes.

```
email = input ("please enter your email so we can send you your bill")
if resident uses [ 112 m³ ] of water
    then set [ balance owed ] to [          ]
    send [ balance owed ] to [ email ]
```

4) Fill in the blank below to determine how much the resident owes.

```
email = input ("please enter your email so we can send you your bill")
if resident uses [ 351 m³ ] of water
    then set [ balance owed ] to [          ]
    send [ balance owed ] to [ email ]
```

Name: _____ 108

Water Conservation

Water Conservation

Yes, it looks like we have a lot of water around us. But only 1 percent of Earth's water can be used for drinking. So, we should use it wisely.

Water conservation means we save water by using less. We should conserve water for the reasons below.

- ✓ Freshwater is being used faster than it is being made
- ✓ Our population is growing and the amount of water we can use is shrinking
- ✓ We [illegible]

How to Conserve Water

- ✓ Take short showers and use a low-flow shower head
- ✓ Don't leave the tap running [illegible] your teeth
- ✓ Stop leaky toilets and drips
- ✓ Buy appliances that use less water (dishwashers, washing machines)
- ✓ Set up a rain barrel to collect rainwater you can use to [illegible] your garden

Questions Answer the questions below.

1) Why is it important that we conserve water?

2) How will you help conserve water?

Name: _____ 109

Personal Water Consumption - Survey

Water in the World

There is a lot of water in the world, but not a lot of freshwater. Only about 1% of all water can be used for drinking.

Also, to turn dirty water from our homes into drinking water, it takes a lot of work. For these reasons, we need to save water when we can.

Survey — Answer the questions below

	Answer
1) Do you take short showers?	
2) While brushing your teeth, do you let the water run?	
3) Do you let the water run while you shave?	
4) Do you take long, medium, or short showers?	
5) Does your toilet have a full and half flush?	
6) Do you have a pool that you need to fill with water?	
7) Is your shower a high flow or low flow? Is it strong?	
8) Do you wash dishes with running water?	
9) Do you run a dishwater without it being completely full?	
10) Do you use your washing machine without a full load?	
11) If you have a pool, do you use a solar cover to stop water from evaporating?	
12) Do you water your gardens or lawn a lot?	

Water Wasting | Answer the questions below

1) Do you waste a lot of water? Explain how you waste water below.

2) Use some of [illegible] from the previous page to come up with ways you could conserve water in your daily [illegible]

Name: _____ 112

How the Indigenous Use Water

Honouring Water - First Nations, Métis, and Inuit

Water is honoured by indigenous groups. Water is the most important gift on Mother Earth. It provides an interconnection between living things as all living things need water. Water flows between us, within us, and it replenishes us. Water is the blood of Mother Earth.

The Indigenous understand that water is the giver of all life. Without clean water, all life dies. The Indigenous do not waste water or pollute water.

How the Indigenous Use Water

For most Indigenous groups, water is needed for all aspects of life. They use it to grow food. They use rivers and lakes to travel from one place to another. Many use canoes to move from place to place.

The Inuit use water in the form of ice to travel. They use sea ice to move around as the sea ice is connected to the land. This allows them to move from community to community. It also connects them to where they find food like seals, walruses, and fish.

Water Pollution

The Indigenous understand that pollution is not good. When Mother Earth is sick, they feel sick too. They do not pollute the same way other groups do. Before Europeans came to present-day Canada, there was no gas burning vehicles. There were no factories. Instead, the Indigenous enjoyed a healthy environment with clean air and water.

First Nations Versus Fossil Fuels is an organization of First Nation members that oppose the water and air polluting burning of fossil fuels.

Name: _____ 113

How the Indigenous Use Water

Questions	Answer the questions below

1) How do the Indigenous use water?

2) Why [illegible] Indigenous groups?

Multiple Choice	Ch[illegible]

1) The Indigenous pollute more or less than [illegible]	Less
2) To the Indigenous, water is...	Useless
3) When the environment is unhealthy, the indigenous [illegible]	[illegible]ealthy
4) The Inuit move around on...	[illegible]
5) Many Indigenous groups use _____ to move on water	[illegible]

Visualizing	Draw what you were picturing while you were reading. Explain the picture

Name: _____ 114

Parks Canada and Heritage Sites in Alberta

What is Parks Canada?

Parks Canada is a special agency that takes care of Canada's national parks, national historic sites, and marine conservation areas. Their job is to protect these special places for all of us to enjoy and learn from. They also make sure that these places are safe for the plants, animals, and people who visit or live there.

Protecting Heritage Sites

Heritage sites have special meaning because of the important things that happened there in the past. Parks Canada helps to protect these sites in many ways. They repair old buildings, take care of artifacts, and even recreate events from the past for visitors to experience.

Heritage Sites in Alberta

Alberta has some very special heritage sites that are taken care of by Parks Canada. Let's learn about a few of them:

- Banff National Park: This is Canada's first National Park. It has stunning mountains, clear blue lakes, and lots of wildlife. Parks Canada helps to keep the park clean and safe for all the plants, animals that live there and the people who visit.
- Rocky Mountain House National Historic Site: This is a special place where you can learn about the fur trade, which was a very important part of Alberta's history. Parks Canada takes care of the old buildings and artifacts and even puts on special events where visitors can experience what life was like during the fur trade.
- Head-Smashed-In Buffalo Jump World Heritage Site: This site was used by the Blackfoot for thousands of years to hunt buffalo. Today, Parks Canada helps to preserve the site and teaches visitors about its history.

Name: _____ 115

Parks Canada and Heritage Sites in Alberta

Questions

Use information from the text to support your answer.

1) What is Parks Canada? What do they do?

2) Why is [illegible]portant? What would happen if we didn't have Parks Canada?

Making Connections

[illegible]e [illegible] these heritage sites?

True or False

Circle whether the statement is true or false.

1) Parks Canada takes care of Canada's zoos.	True	False
2) Heritage sites are places with special meaning.	True	False
3) Banff National Park is Canada's first National Park.	True	False
4) Parks Canada teaches visitors about Alberta's history.	True	False
5) Parks Canada helps to keep the parks clean and safe.	True	False

Name: _____ 116

Parks Canada Works With Indigenous Groups

Parks Canada Working With Indigenous Groups

Parks Canada works with Indigenous groups, like First Nations, Métis, and Inuit people, to take care of our special places in nature. They do this in many different ways.

Learning from Each Other

One of the ways they work together is by learning from each other. In Alberta's Banff National Park, Parks Canada works with local First Nations, the Stoney Nakoda and Blackfoot. The Indigenous people teach Parks Canada about the animals and plants in the park, and how to keep them safe. Parks Canada shares their knowledge about how to keep the park safe for visitors.

Sharing Stories and Traditions

Parks Canada also works with Indigenous groups to protect their stories and traditions. In Batoche National Historic Site in Saskatchewan, the local Métis people teach visitors about their history. They show how to weave sashes and dance a special dance called the Red River Jig. This way, their traditions are kept alive and shared with others.

Taking Care of the Land Together

Sometimes, Parks Canada gives back land to Indigenous groups. In the Mealy Mountains of Labrador, a new national park reserve is being created. The local Innu people will help take care of this park together with Parks Canada. This means they both make decisions about how to protect the park and its animals and plants.

Name: _____ 117

Parks Canada Works With Indigenous Groups

Questions Use information from the text to support your answer

1) How does Parks Canada work with the Métis in Saskatchewan?

2) How does Parks Canada work with the Inuit community?

3) Why do you think it is helpful for Parks Canada to work with Indigenous groups? Consider who has lived on the land lo

True or False Circle whether the statement is true or false

1) Parks Canada works alone to take care of natural places	True	False
2) At Batoche National Historic Site, Métis people share their traditions	True	False
3) Parks Canada never gives back land to indigenous groups	True	False
4) Métis people show visitors sash weaving and the Red River Jig	True	False
5) Innu people help manage the new Mealy Mountains park	True	False

Name: _____ 120

Role Play - Humans Destroying Habitats

Objective — What are we learning about?

To help students understand and demonstrate how human activities can damage habitats.

Materials — What do we need?

- ✓ Scri[illegible]ons
- ✓ C[illegible]
- ✓ A[illegible] for re[illegible]d performance
- ✓ Camera or [illegible]ording (optional)

Method — How [illegible]periment?

1) Cut out the human activities [illegible]d each one up. Place them in a hat.
2) Divide the class into small groups of 3-4 [illegible]s.
3) Each group will pick a piece of paper from [illegible]y written on the paper will be the theme for their skit.
4) Give the groups time to research their chosen human activ[illegible] understand how the activity damages habitats and what eff[illegible] animals, plants, and the environment.
5) Each group will then brainstorm and write a short skit that shows how this human activity damages a habitat. Make sure the skit includes a solution or a call to action to solve this problem.
6) Groups will need to rehearse their skit, deciding who will play each role and how they will perform their skit.
7) Finally, each group will perform their skit for the class. After each skit, have a class discussion about the human activity and what we can do to lessen our impact on habitats.

Name: _____ 121

Role Play - Humans Destroying Habitats

Deforestation: Cutting down trees removes the habitat of many animals and plants, leading to loss of biodiversity.

Urbanization: Building cities and expanding human settlements often destroys natural habitats.

Pollution: Dumping waste into rivers, oceans, or on land can poison habitats and make them uninhabitable.

Overfishing: Removing too many fish from the sea disrupts the balance of aquatic ecosystems.

Mining: Taking resources from the earth can lead to habitat destruction and pollution.

Agriculture: Large-scale farming often involves clearing land and using pesticides which can destroy habitats.

Climate Change: Human activities leading to global warming can cause habitats to change faster than wildlife can adapt.

Poaching and Hunting: Illegal or excessive hunting can deplete wildlife populations and disrupt habitats.

Name _____ 122

Role Play - Humans Destroying Habitats

Planning | Plan your skit below

1) What is the human activity for your skit?

2) How wil[illegible]ut this skit?

a) Wha[illegible] have? Who will play who?

b) What will happen in yo[illegible]

c) What will the solution to the human activity be?

Name: _____ 123

Conservation Infographic - Composting

Questions Answer the questions b

1) What did you learn from the infographic?

2) What do you like about this infographic?

3) What could the author have done better?

Name: _____ 125

Infographic Assignment - Conservation

Create an infographic that teaches the audience about what we can do to keep our Earth systems healthy. You could focus on one of the following conservation related ideas:

Reducing Waste	Saving Water	Stopping Deforestation	Using Renewable Energy	Saving Endangered Species

Research Answer the questions below to find information for your infographic

1) What co[illegible] did you choose?	
2) Find at least 5 [illegible]/or[illegible]e can do to help:	
3)	
4)	
5)	
6) Optional:	
7) Optional:	

Research | Answer the questions below

3) Why is this issue important? How is it impacting Earth's systems? List how it is impacting certain spheres - the atmosphere, biosphere, lithosphere and hydrosphere.

4) What [illegible] your infographic? Practice them below.

5) What text will you include? Write the text below.

Name: _____ Date: _____

Unit Test - Earth Systems

Multiple Choice /10

1) Which sphere includes all the water on Earth? a) Hydrosphere b) Lithosphere c) Atmosphere d) Biosphere	2) Which sphere includes all living things? a) Hydrosphere b) Lithosphere c) Atmosphere d) Biosphere
3) Which sphere mountains belong to? a) Hydrosphere b) Lithosphere c) Atmosphere d) Biosphere	4) Which sphere does air belong to? a) Hydrosphere b) Lithosphere c) Atmosphere d) Biosphere
5) Which body of water holds the most water? a) Glaciers b) Rivers c) Oceans d) Groundwater	6) Which layer of atmosphere is furthest from Earth's surface? a) Troposphere b) Exosphere c) Thermosphere d) Mesosphere
7) Which **doesn't** belong to the lithosphere? a) Earth's crust b) Soil c) Upper Mantle d) Inner Core	8) Where is the coldest air on Earth? a) At the equator b) At the north pole c) At the south pole d) In Canada
9) Which natural resource is most important in Alberta? a) Saltwater b) Oil and gas c) Fruit plants d) Gold and silver	10) Oceans have which type of water? a) Freshwater b) Glacial water c) Saltwater d) Brackish water

Definitions (1 marks each) /8

Term	Definition (what does it mean)
Biosphere	
Atmosphere	
Combustion	

Short Answer Questions (2 marks each)

1. What three types of rocks are part of the lithosphere?

2. Where on Earth is there the most biodiversity? Why is there more biodiversity there?

3. Name 4 natural resources Alberta has a lot of.

Workbook Preview

Grade 4 – Science Unit

Organizing Idea: Living Systems: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions

Guiding Question: In what ways do the structures of organisms support survival?

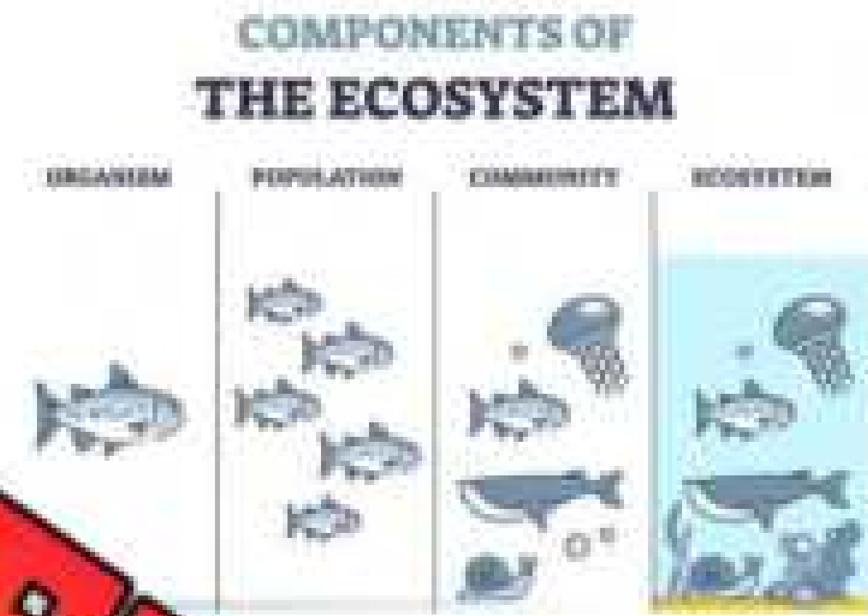
	Learning Outcome – Students analyze organisms and relate external structures to functions.	**Pages**
LS.1	Organisms are living things that respond to stimuli and include plants, humans, and other animals	6 – 10
LS.2	Organisms can be classified in various ways, including by appearance habitat structures	11 – 19, 21 – 31
	Functions of external structures in an organism include eating moving protecting sensing reproducing	
LS.4	Plants can detect sensory stimuli, such as light, gravity, temperature, and touch, which help them grow and survive.	86 – 101
LS.5	Sensory organs of animals include ears eyes nose tongue skin Sensory organs in animals help them meet their needs in various ways, such as by detecting food other animals danger temperature	102 – 118
Computer Science		
CS.1	Students examine and apply design processes to meet needs.	20, 41 – 43, 46, 119 – 121

NAME: _____

LIFE SYSTEMS

Ecosystem - Organism, Species, Community

Ecosystems



An **organism** is a single plant or animal. Therefore, you are an organism.

A **sp**[illegible] group of orga[illegible] a species, and [illegible] single organism. O[illegible] of species include dogs, ca[illegible] and [illegible]s are not a species. They are a type of animal.

A **community** is a group of different spe[illegible]t li[illegible]me area. This means that you live in a community with other hum[illegible] anim[illegible]ies like dogs and squirrels, as well as different plant species.

An **ecosystem** is the community of plants and animals living in a[illegible] and the non-living things there too. Ecosystems have the basic needs for the organisms that live there. The non-living things in ecosystems include water, air, and rocks.

For example, humans live in areas where food can grow and where water can be found. No humans live in Antarctica because the habitat in Antarctica does not give the basic needs humans need to survive.

Name: _____ 7

Ecosystem - Organism, Species, Community

Definitions What do each of the terms below mean?

Organism	
Species	
Community	
Ecosystem	

Questions Answer the questions below using e[illegible]m

1) What animal species live in the ecosystem around you?

2) What kinds of non-living things can you find in your ecosystem?

Name: _____ 8

Organism, Species, Community, Ecosystem

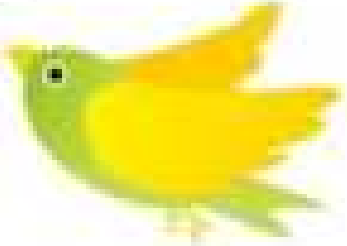
Label Is the picture an example of an organism, species, community or ecosystem

1)

2)

3)

4)



5)

6)

7)

8)

9)

Name: _____ 9

Living Things In Your Area

Animals What animals live in your area? Can you think of 20 you commonly see?

1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

11	
12	
13	
14	
15	
16	
17	
18	
19	
20	

Plants Plants are living things too. What plants do you se

1	
2	
3	
4	
5	

6	
7	
8	
9	
10	

Name: _____ 10

Scavenger Hunt - Finding Common Plants

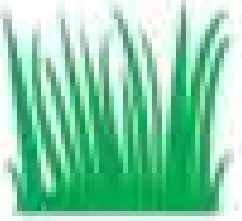
Directions Look around your school yard for the common plants below. Put a check if you find the plant.

☐ 

M

☐ 

Dandelion

☐ 

Grass

☐ 

Daisy

☐ 

☐ 

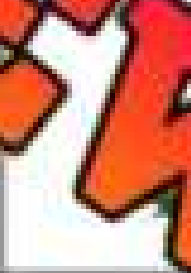
Buttercup

☐ 

Tulip

☐ 

Orchid

☐ 

Thistle

☐ 

Maple Tree

☐ 

Yarrow

☐ 

Ivy

Name: _____ 11

How We Sort Living Things

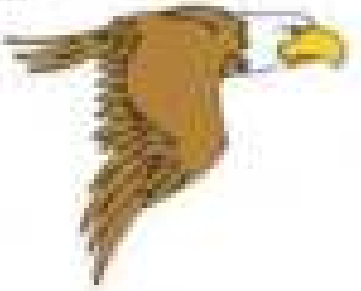
How We Sort or Classify Living Things

Have you ever wondered how we know a dog is a dog or a rose is a rose? It's because scientists classify, or sort, all living things, called organisms, into different groups. They do this by looking at their appearance, where they live (habitat), and their structures.

Classifying by Appearance

The way [illegible], or its appearance, is one of the simplest ways to classify it.

- Animals with Feathers: [illegible]s like sparrows, eagles, and penguins.
- Animals with [illegible]: [illegible]s, cats, and bears.
- Plants with Flowers: [illegible]ants [illegible]sies, and sunflowers.
- Plants with Needles: [illegible] cactuses.



Classifying by Habitat

Where an organism lives, or its habitat, is another [illegible] way to [illegible] it.

- Jungle Creatures: Animals like monkeys and [illegible]. Plants like [illegible] and orchids.
- Desert Dwellers: Animals like camels, snakes, and [illegible]s like [illegible].
- Ocean Life: Animals like whales, dolphins, and sharks. [illegible]
- Mountain Movers: Animals like mountain goats, eagles, and snow [illegible]e evergreen trees and edelweiss.

Classifying by Structures

We can classify organisms by their special parts, or structures.

- Organisms with Wings: Animals like birds, bats, and butterflies.
- Organisms with Fins: Animals like fish, dolphins, and sharks.
- Organisms with Roots: Plants like trees, grasses, and flowers.
- Organisms with Antennae: Animals like insects, lobsters, and snails.

Name: _____ 12

How We Sort Living Things

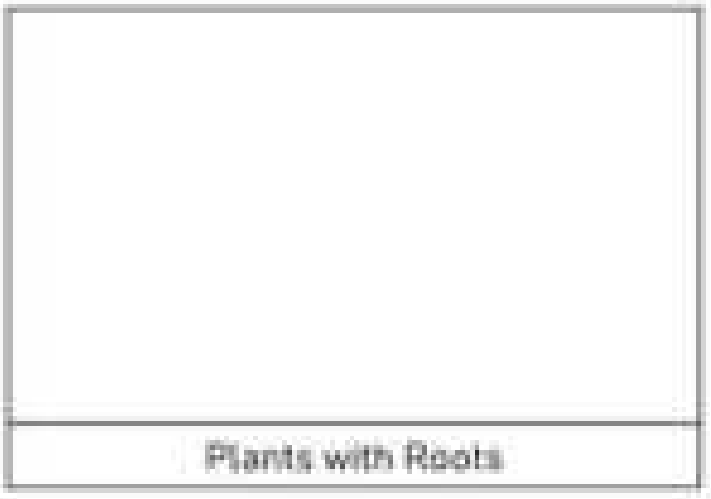
Draw Draw organisms with the characteristics below. Use ones from the reading or think of your own

Ocean Organisms

Desert Organisms

Organisms with an Antennae

Animals with



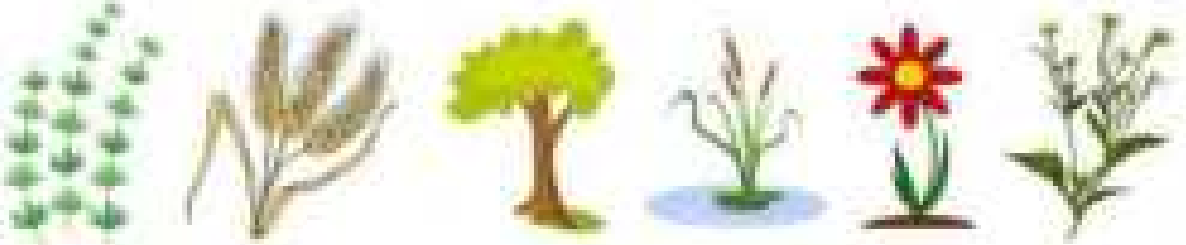
Plants with Roots

Animals with winds

Name: _____ 13

Sorting Common Plants

Directions Circle the examples of the common plant types below

Shrubs	
Trees	
Creepers	
Climbers	
Herbs	

Name: _____ 1A

Creeper or Climber

Directions Circle the examples of the common plant types below

Creeper	Climber

Melon

Creeper	Climber

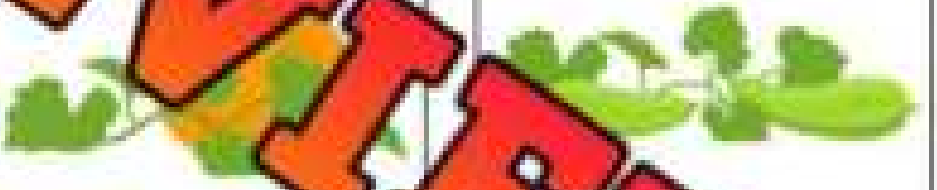
Grapevine

Creeper	Climber

Zucchini Plant

Creeper	Climber

Passionflower Vine

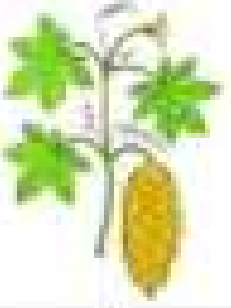


Creeper	Climber

Pumpkin

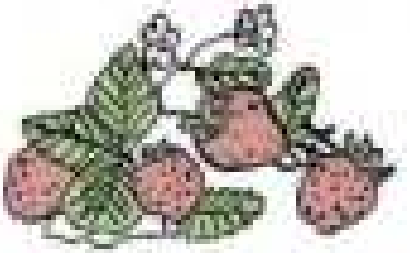
Creeper	Climber

Watermelon



Creeper	Climber

Bitter Gourd



Creeper	Climber

Strawberry

Classifying Animals - Vertebrates and Invertebrates

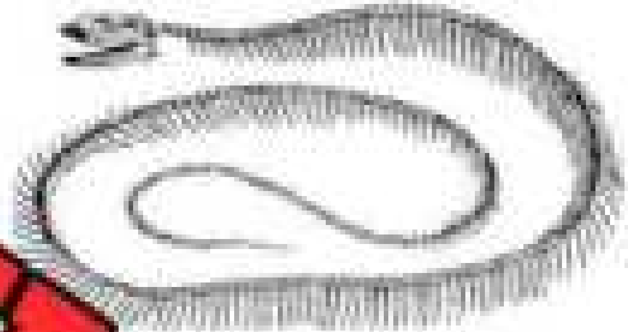
Animal Kingdom – Vertebrates vs Invertebrates

We can split the animal kingdom into two groups: Vertebrates and Invertebrates. **Vertebrate** animals have a backbone, while **invertebrate** animals do not.

Horses have [illegible]

Grouping Animals – Vertebrates

Vertebrate animals include mammals, reptiles, birds, amphibians, and fish. Each of these animals have backbones.



What ar[illegible]ones?

A **backbone** is a [illegible] and we have spines [illegible] feel [illegible] to the back of your head [illegible] neck and back, and into your hip[illegible] have around 33 bones in our spines. These [illegible] ca[illegible]ertebrae.

Snakes are reptiles and they have ba[illegible]ones a[illegible] [illegible]kbone has way more bones than we have. Snakes have between 200 an[illegible]ert[illegible] lot of bones!

True or False — Is the statement true or false

1. Humans have more backbones than snakes	[illegible]	False
2. Snakes have between 200-400 bones	[illegible]	False
3. Mammals, fish, reptiles, birds, and amphibians all have backbones	True	False
4. Humans are not vertebrates	True	False

Explain — What is the difference between vertebrates and invertebrates?

Name: _____ Id:

Types of Animals - Mammals

Mammals

A mammal is a type of animal. We know if an animal is a mammal if it can:

- Breathe air
- Has a backbone
- Grows hair or fur
- Give birth to live young
- Drink milk from their mothers
- Are warm-blooded

Mammals are the most common animals on earth. We are mammals. You were born from your mother, not from an egg. We are warm-blooded, and have a backbone. Almost all humans have hair and we breathe air. Our mothers could make us milk when we were babies.

Examples of Mammals

There are over 6,000 different types of mammals. Here is a list of some mammals: humans, gorillas, rats, mice, dogs, cats, whales, dolphins, elephants, cows, bats, horses, and more!

Fill in the Blanks — Write the missing word in the blank

1. There are more than _____ types of mammals.
2. Mammals are the _____ animals on earth.
3. Mammals are born from their mothers, not from an _____
4. Mammals are warm-_____ animals.

Think — Write 3 things you learned about mammals

1)	
2)	
3)	

Name: _____ 17

Types of Animals - Reptiles

What are Reptiles?

Reptiles are vertebrate animals that share these things in common:

- Four legs (snakes do not, but use to)
- Most lay eggs but some have live young
- Are cold-blooded
- Have scales for skin, not fur or hair
- Breathe air with their lungs
- Have dry

What Do Re[illegible]nd Hunt?

Most r[illegible] eat mostly insects. Larger reptiles like lizards and snakes will hunt [illegible] and [illegible] kill their prey with venom before they eat them.

When som[illegible] in [illegible] they will hide or camouflage themselves to look like their surroundings [illegible] colour of their skin to hide from predators.

Examples of Reptiles

There are about 10,000 types of r[illegible]. S[illegible] lizards, turtles, snakes, crocodiles and ev[illegible]saurs.

Think! Write 3 things you lear[illegible]ut r[illegible]

1)	
2)	
3)	

Multiple Choice Circle the best answer

1. Do reptiles have dry or moist skin?	Dry	Moist
2. Reptiles are cold or warm blooded?	Cold	Warm
3. Reptiles eat mostly..	Mice	Insects
4. There are how many types of reptiles?	2,000	10,000
5. Which animal changes their colour?	Snakes	Chameleons

Name: _____ 18

Types of Animals - Amphibians

What are Amphibians?

Amphibians are vertebrate animals that are born in the water. As amphibians get older, they will grow lungs that allow them to breathe outside of the water. This means that adult amphibians can live on land or in the water.

Amphibians are animals that have these things in common:

Cold-blooded	Lay eggs	Moist skin	Webbed feet

Amphibians are Cold-blooded

Like fish, reptiles, and insects, amphibians are cold-blooded. Being cold-blooded means their bodies do not automatically change their temperature. They need to use their surroundings to cool off or warm up. Humans are warm-blooded. This means our bodies change our temperature to keep us at a constant temperature. When we get too warm, we release water as sweat to cool our skin.

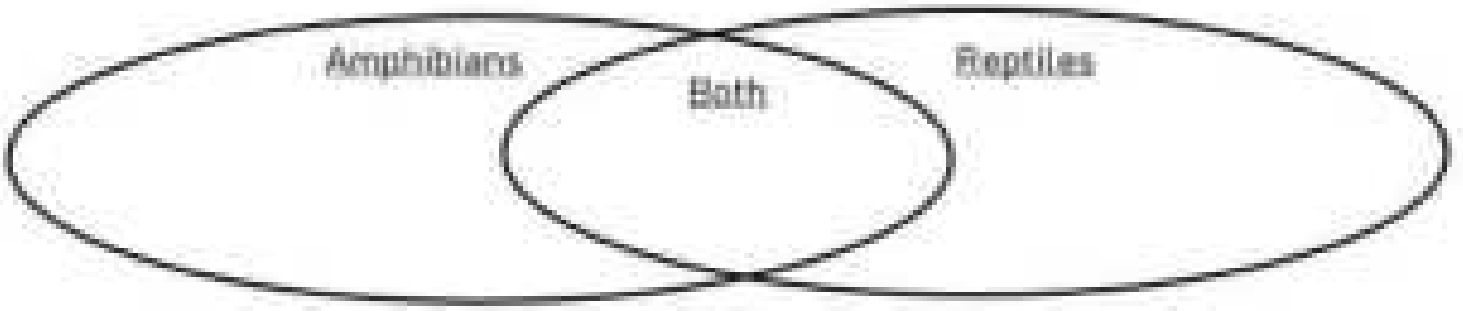
Examples of Amphibians

- Frogs, salamanders, newts, and toads

True or False Is the statement true or false?

1) Amphibians are born on land		False
2) Amphibians are born with lungs		
3) As amphibians get older, they can breathe outside of water		False
4) Snakes are amphibians	True	False

Compare Compare reptiles with amphibians



Name: _____ 21

Types of Animals - Birds

What are Birds?

Birds are very cool animals that are a lot different than other animals. There are over 9000 different types of birds. Birds have these things in common:

- ✓ Have feathers
- ✓ Warm-blooded
- ✓ Lay eggs
- ✓ Have wings but not all birds fly
- ✓ Vertebrates - have backbones

How Do Birds Fly?

Almost all birds can fly because they have wings. Birds flap their wings to change the air pressure around their wings. This gives them lift, just like an airplane.

The peregrine falcon is one of the fastest birds. It can fly at speeds of over 160km per hour! Some birds, like penguins, cannot fly.

Examples of Birds

- Parrots, penguins, hummingbirds, toucans, swallows, herons, woodpeckers, eagles, owls and more!

Question	What do all birds have in common?
1)	
2)	
3)	
4)	
5)	

Multiple Choice	Circle the best answer	
1) Which bird cannot fly?	Toucan	Penguin
2) Which bird is one of the fastest?	Peregrine Falcon	Eagle
3) All birds have	Feathers	Scales
4) All birds have	Fins	Wings
5) Birds can fly because of changing	Air pressure	Weather

Name: _____ 22

Vertebrate Animals

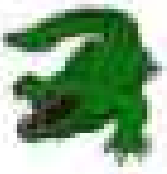
Backbone or Not? Circle the vertebrate animals

1)   

2)  

3)  

4)  

5)  

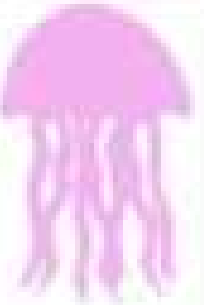
6)   

7)   

Name: _____ 23

Groups of Animals - Invertebrates

What are Invertebrates?



Invertebrates are animals that do not have backbones. This means they have no spine or bony skeleton. Most of the animals in the world are invertebrates that have no spine. In fact, 97 percent of all animals are invertebrates.

Types of Invertebrates

Worms, insects, and spiders are the most common types of invertebrates. These animals are small and have no backbones. Insects make up the largest group of invertebrates in the world. There are a million different types of insects.

Most fish are not invertebrate animals living in water. Jellyfish, sponges, starfish, and corals are also invertebrates living in water.

Exoskeletons

Spiders, insects and scorpions have exoskeletons. An **exoskeleton** is a skeleton on the outside of their bodies that protects the animal's insides. It may seem like they have a backbone, but their exoskeleton

Think | Write 3 things you learned about invertebrates

1)	
2)	
3)	

Multiple Choice | Circle the best answer

1. Spiders, insects, and scorpions have...	backbones	exoskeletons
2. Jellyfish are...	vertebrates	invertebrates
3. What percent of animals are invertebrates?	97	87
4. Invertebrates have no...	backbone	skeleton
5. The largest group of invertebrates are...	worms	insects

Name: _____ 2A

Types of Animals - Insects

Insects

Insects make up the largest group of animals in the world. There are over 1 million species of insects! Insects have no backbone. This means they are invertebrates. Insects have exoskeletons instead of backbones. Examples of insects are grasshoppers, dragonflies, and butterflies.

Exoskeletons

Insects do not have bones like we do. Instead, they have exoskeletons that protect their insides. An exoskeleton is a hard shell that keeps the insect's organs safe.

Insect Body

An insect has three parts: a head, thorax, and abdomen. The head has an insect's mouth and eyes. Insects do not have noses. They have antennae instead. They use their antennae to smell, feel the temperature, and find friends. The thorax is the chest of an insect. The thorax is connected to the abdomen. The abdomen is the back part of the insect. All insects have legs but not all have 4 wings.

Multiple Choice Circle the best answer.

1. An exoskeleton is...	a	
2. An example of an insect is a...	Lizard	
3. The middle of an insect is the...	Abdomen	Thorax
4. How many legs does an insect have?	2	6
5. Insects are the largest or smallest type of animal?	Largest	Smallest

Draw Draw a picture of an insect. Label its head, thorax, abdomen, wings, and legs.

Name: _____ 27

Experiment - Vertebrates vs Invertebrates

Research Question What are we learning more about?

Can invertebrates or vertebrates support more weight?

Materials What do we need for our activity?

1) Pla… …gh to make two …
2) One pipe…
3) Weights – wo… … work

Method How do we compl… …e exp…

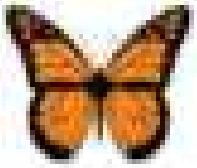
1) Make an animal like the one in the pic…
   i. Make 4 legs
   ii. Make a body
   iii. Attach the legs to the body
   iv. Put a head on the body
2) Make another animal using the same steps as above

3) Put a pipe cleaner through the body to act as a backbone
4) Put one block on each animal and observe
5) Keep adding blocks until one of the animals collapses

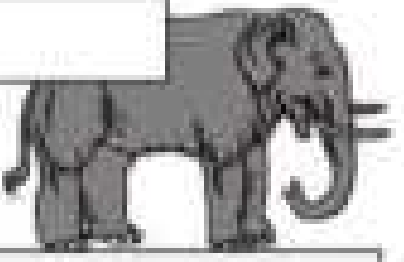
Name: _____ 28

Experiment - Vertebrates vs Invertebrates

Observations | How many blocks did each type of animal hold?



	Number of Blocks
Vertebrates	
Invertebrates	



Results | Answer the questions below

1) Which type of animal could hold more weight?

Vertebrates | Invertebrates

2) Which type of animal is usually bigger?

Vertebrates | Invertebrates

3) Why do you think the bigger animals can hold more blocks?

4) If an invertebrate animal gained a lot of weight, what could happen?

5) Write a list of animals that are invertebrates and vertebrates

Invertebrates	Vertebrates

Name: ______________________ 30

Vertebrate or Invertebrate?

Backbone or Not? | Circle whether the animal is a vertebrate or invertebrate

	Vertebrate Or Invertebrate		Vertebrate Or Invertebrate
	...rtebrate Inv...		Vertebrate Or Invertebrate
	Vertebrate Or Invertebrate		Vertebrate Or ...ertebrate
	Vertebrate Or Invertebrate		Or Invertebrate
	Vertebrate Or Invertebrate		Vertebrate Or Invertebrate

Name: _____ 31

Physical Characteristics of Animals

Word Search

Find the words from the word bank

❑ Animals	❑ Invertebrate	❑ Vertebrate	❑ Backbone	❑ Insects
❑ Mammals	❑ Reptiles	❑ Birds	❑ Worms	❑ Spiders

O	M	I	[illegible]	S	E	C	T	S	J	G	M	F	Z	P	C	F	H	J	C
Q	S	V	[illegible]	T	E	B	R	A	T	E	N	O	P	W	X	N	Z	I	
L	E	[illegible]	[illegible]	[illegible]	L	Z	D	X	H	B	V	P	X	A	P	J	F		
H	N	[illegible]	V	[illegible]	[illegible]	N	V	E	R	T	E	B	R	A	T	E	P		
F	I	P	W	[illegible]	W	[illegible]	[illegible]	S	E	R	E	P	T	I	L	E	S		
B	V	R	N	L	[illegible]	[illegible]	[illegible]	[illegible]	R	C	Y	Q	I	V	D	L	Z		
L	D	N	M	M	S	[illegible]	[illegible]	[illegible]	[illegible]	D	S	U	W	D	K	S			
Y	W	T	T	G	F	N	P	V	[illegible]	[illegible]	[illegible]	O	N	E	L	B	H		
S	M	A	M	M	A	L	S	Z	Z	Q	[illegible]	[illegible]	[illegible]	[illegible]	A	L	S	T	
L	E	Z	A	W	O	R	M	S	P	I	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	B	V	C	
S	S	B	F	N	U	V	O	N	K	K	Q	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	C	

Word Scramble

Unscramble the words from the word b

MMAAMLS		VBRETREATE	
AMINLAS		IECTNSS	
WRDSM		BRDIS	
RLPTEIES		ITREAENRTBVE	
BBOACKNE		SDIRPES	

Name: _____ 32

Meeting Our Needs - Locomotion

Meeting our Needs

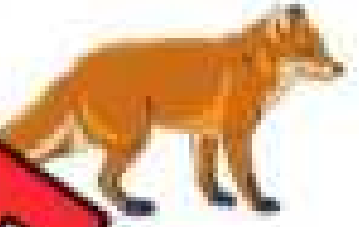
Locomotion means how people move from one place to another. Animals have body parts that allow them to move in a certain way. The number of legs an animal has affects how it moves.

1) Legged – moving using legs

Most animals have legs to move. Animals can have a different number of legs, from two to thousands of legs. Snails have no legs while millipedes have over one thousand legs!

Humans are **bipeds** because we walk on two legs. Penguins and humans are the only bipedal creatures that walk on two legs.

A **quadruped** animal walks on four legs. Most mammals and reptiles are quadrupeds. Some examples are deer, cows, lizards, lions, moose, cats, and dogs.



2) Limbless – moving without legs using their bodies

Animals that are limbless have no legs. These animals use their bodies to move them around. They have skin that can move in waves back and forth. They use the waves to push them forward or backwards. Examples of limbless animals are snakes, slugs, snails, worms, and even seals!

3) Rolling – rotating the body over the land

Some animals will move their bodies into a loop. They do this so they can roll down a hill or let the wind roll them. Examples of animals that roll are hedgehogs, armadillos, and caterpillars.

Name: _____ 33

Meeting Our Needs - Locomotion

True or False

Circle whether the statement is true or false

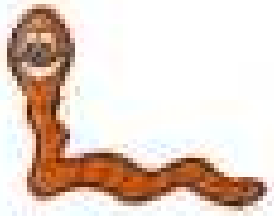
1) A bipedal animal has 4 legs	True	False
2) A bear only has two legs	True	False
3) Snails have no legs	True	False
4) Hedgeh[illegible] roll to move fast	True	False
5) Pengu[illegible]pedal animals	True	False

Making [illegible]ection

What does this reading remind you of in your life?

Locomotion

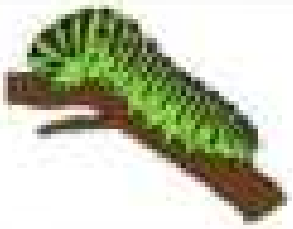
Circle the locomotion [illegible]th



Legs	Roll	Limbless

Legs	Roll	Limbless

Legs	Roll	Limbless



Legs	Roll	Limbless

Legs	Roll	Limbless

Legs	Roll	Limbless

Name: _____ 34

Tracking Animals – Animal Tracks

Tracking Animals – Animal Tracks

Humans aren't the only ones who leave evidence of their actions as they move around. Just like we can analyze the footprints of humans, we can also track animals based on the animal tracks they leave in the ground. An **animal track** is an imprint left in the soil, snow, mud, [illegible] ground surface by an animal walking across it. Animal [illegible] by hunters to track their prey and by naturalists to identify animal [illegible]

If the animal [illegible] track, the species of the animal can be determined based on the com[illegible] of si[illegible] features of the feet. Some features we can look for in an animal t[illegible]

- Width/length – A fox print is [illegible] print
- Number of Toes – Bears have five toes, while ca[illegible] have four
- Nails – Canines tend to leave a nail print while felines don't since they can retract their nails.
- Depth – The heavier the animal, the deeper the print will be. A moose track will be deeper than a deer track.
- Webbing – Webbing is usually found on animals that swim a lot in the water.
- Stride and Straddle – The stride length can set animals apart. A stride is measured from the heel of one print to the heel of the next print on the same side. Straddle is the width of the steps taken. It is measured from the outside of the right track to the outside of the left track.

Name: _____ 35

Animal Tracks - Questions

True or False — Is the statement true or false

1. Hunters and naturalists track animals using their prints/tracks	True	False
2. A track is an impression left in the ground by an animal	True	False
3. Straddle is a measurement of the stride length of an animal	True	False
4. Tracks are left in snow, soil, mud, or other ground surface	True	False
5. A deer will make a deeper impression in the ground than a moose	True	False

Visualiz — ere picturing while you were reading. Explain the picture

Questions — Use information from the text

1) What is an animal track? Why are animal tracks evidence of animal

2) How can hunters and naturalists figure out which animal left a track? What do they look for in the track?

Name: _____ 38

Experiment - Animal Tracks

Research Question How are animal tracks different from each other?

When animals walk, they create tracks in the ground that are unique to that animal community. We can track animals if we know their tracks/footprint.

Materials What do we need?

- ✓
- ✓ Parchment
- ✓ Toothpicks
- ✓ Animal tracks guide
  your own research guide

Lion Print

Method How do we complete the experiment

1) Use the "Animal Tracks Guide" or take time to research tracks of your favourite animals.
2) Draw the tracks on the back of this page
3) Take a small piece of clay and roll it into a ball.
4) Flatten the ball into a cookie shape. Make one cookie for each track you want to make.
5) Place the flattened clay on a piece of parchment paper
6) Use your finger and toothpick to create the animal tracks
7) Set the tracks aside so they can dry

Name: _____ 39

Plan	Draw some animal prints you want to make

Research	Answer the [illegible]

1) Why is it helpful for scientists to be able to track [illegible] help them understand a species' community?

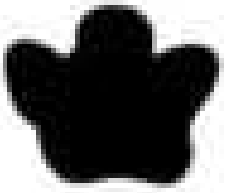
2) Make a connection – What animal tracks do you see in your neighbourhood?

Name: _____ 40

Animal Tracks Guide


Frog


Leopard


Rhino


Swan

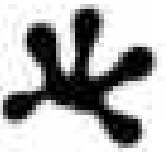

Hippo


Turtle


Badger

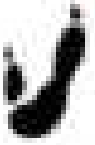

Hedgehog


Llama

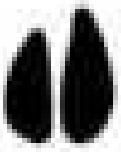

Gecko


Sparrow


Dog


Kangaroo


Fox


Deer


Beaver

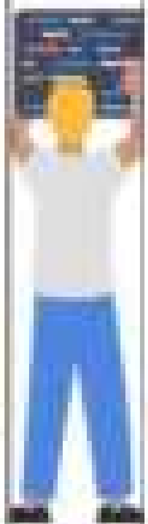

Lion


Zebra

Design and Code Your Animal Tracker

Animals can be tracked by not only looking at their footprints, but also by using GPS trackers, cameras, and speed monitoring to measure an animal's speed. Imagine a machine that could track animals using these different tools.

Your ... will be to design a machine ... program it so that it can trac... will use **pseu...** ... to plan out how to ... som... ...out using a specific cod... ...it... writing out the ... a rec...



Pseudocode Example

```
Start program

If GPS signal is ON then
   Find animal's location
End If

If camera is ON then
   Capture image of animal
End If

If speed monitor is ON then
   Measure animal's speed
End If

End program
```


Materials — What ...d?

- ✓ Paper and colored pencils or m...
- ✓ Sticky notes

Method — How do we complete the experim...

1) Fill in the back side of this page to plan your animal trackin...

2) Write using simple pseudocode a coding action for each thing your animal tracking machine will do. Write one coding action per thing the machine does.

3) Arrange the sticky notes in order from the first thing the machine will do to the last thing it will do

4) Draw your animal tracking machine making sure to include buttons it needs and technology it needs as well. You will need to label the machine.

5) Share your machine with the class.

Name: _____ 42

Design and Code Your Animal Tracker

Questions	Answer the questions about your machine below

1) How will your animal tracking machine track and find animals?

2) What [illegible] need?

3) What steps will the machine [illegible] animal?

4) How much will you sell the machine for?

5) How much does the machine cost?

6) If you sold 10 units, how much profit would you make?

Name: _____ 43

Design and Code Your Animal Tracker

Draw your tracking machine. Make sure you have:

- ✓ A screen to tell you what is happening
- ✓ A start button
- ✓ Any technology the machine needs (ex. a camera)

Code Write the code from your sticky notes below.

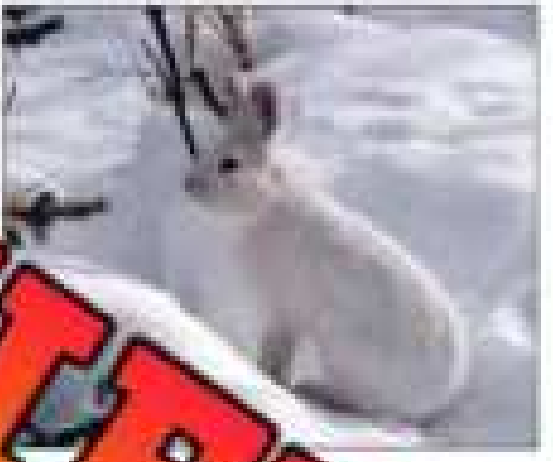
Name: _____ 44

Adapting Species

What Does Adapting Mean?

Plants and animals are designed to live and thrive in their habitat. They have **adapted**, which means their bodies have changed to allow them to survive in the conditions they live in.

Over time, species will change so they have characteristics that help them survive. Evolution is a theory that explains how animals adapt. **Evolution** is the process by which different l[illegible]op and change into more advanced versions that allow them to survive [illegible]e in.



Charles Darwin

In 1859, Charles Da[illegible] of evolution. He believed that [illegible] natural selection. **Natural selec**[illegible] where certain individuals of a species ar[illegible] surviving than others and will therefore, survive and have more children (reproduce).

When they have children, their children are like [illegible]. For [illegible], rabbits live all over and have dark or white fur. In places where the[illegible] would be an advantage as the rabbits could hide from predators easi[illegible] rabbits surviving in places with heavy snowfall, more white furred rabbits [illegible]es and their babies will also have white fur. Eventually all the rabbits living in a cold place will have white fur as they are the ones who survive.

Survival of the Fittest

The phrase **survival of the fittest** refers to the animals who are best able to survive in their environment. The white furred rabbits are the fittest bunnies for an environment that receives heavy snowfall.

The white furred rabbit has adapted to its habitat. Its adaptation is its white fur.

Name: _____ 45

Adapting Species

True or False Circle whether the statement is true or false

1. Adapting to an environment means animals change so they can survive	True	False
2. Not all plants and animals can survive in all environments	True	False
3. A white furred rabbit will survive best in desert environments	True	False
4. Charles D[illegible]me up with his theory of evolution in 1859	True	False
5. All ani[illegible]are the same (all rabbits are the same)	True	False

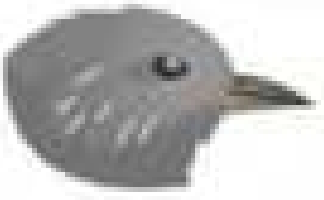
Questio[illegible] [illegible]n from the text to support your answer

How do animals ad[illegible]e[illegible] in their environment?

Instructions Which beaks would be best for di[illegible]g se[illegible]r grabbing?

Medium Ground Finch

Warbler Finch



[illegible]e[illegible]ch

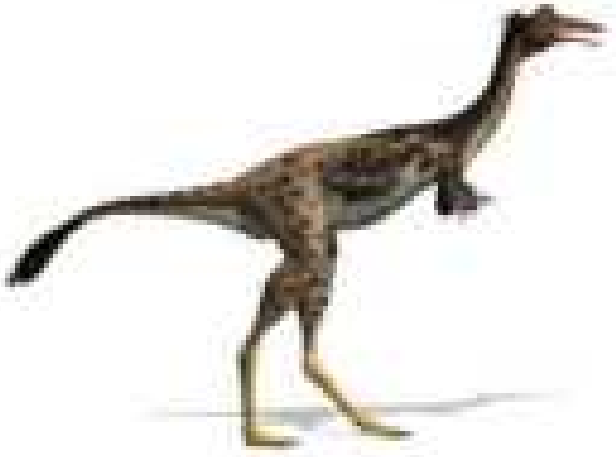
Name: _____ 46

Reading Code - Evolving Birds

Birds are a great example of evolution in action. They're believed to have evolved from theropod dinosaurs over 150 million years ago.

Directions The original is a dinosaur that evolved into a bird. When the program is run, the dinosaur should change into a bird.

If ► clicked
Draw (feathers) on the dinosaurs instead of scales
Draw (beak) on the dinosaur instead of the mouth with teeth
Draw (wings) on the dinosaur instead of the arms
Draw (short legs) on the dinosaur instead of long legs
Draw (tail feathers) on the dinosaur instead of the tail

Original	Output
	

Name: _____ 49

Terrestrial Habitat - Desert

Terrestrial Habitats

Desert habitats are areas of land that do not get much precipitation (rain or snow). Desert habitats are therefore **barren**, meaning they have little to no plants growing. Because of this, not many animals live in desert habitats as most animals need plants and water to survive.

The organisms that can survive in the desert have adaptations that give them an advantage to surviving in desert conditions.

Hot and Cold Deserts

Since deserts are characterized by little precipitation, desert habitats are in cold climates as well as hot climates. The Arctic is a desert because it receives little snow.

Characteristics of a Hot Desert Habitat

Temperature	Hot all year. Temperatures between 22 – 40° C
Precipitation	Very little rainfall. Less than 25 cm per year
Plant Life	Cactus, Tumbleweed, Wildflowers, Fan Palms, Poppies
Animals	Bat, Quail, Armadillo, Coyotes, Gila Monster, Squirrels
Adaptations	• Long roots go deep underground to find water • Plants like cacti can store water in their stems and leaves • Animals like camels can store water in their fat • Animals burrow underground to escape the heat

Characteristics of a Cold Desert Habitat

Temperature	Cool summers and freezing winters. Temperatures between 30 to -40° C
Precipitation	Very little rain or snow, around 20-40 cm per year
Plant Life	Pearlwort, Rice Grass, Sagebrush, Saltbush, Black Sage
Animals	Moles, Weasels, Arctic Fox, Penguins, Jerboas, Snow Leopard, Camels
Adaptations	• Plants can grow in dry soils that have a lot of salt in the soil • Plants grow in groups so they can stay warm and sheltered • Animals have thick furs that keep them warm and store water • Some animals like polar bears have antifreeze proteins in their blood keeping them warmer in freezing temperatures

Name: _____ 50

Terrestrial Habitat - Desert

Questions Answer the questions below using evidence from the text

1) What is a desert? Is a desert always hot?

2) What plants made to survive in the desert? List 3.

Draw Draw a desert habitat with organisms ...your habitat

Desert Plants And Their Parts

Desert Plants
Deserts are hot, dry places with very little rain. But that doesn't mean they're empty! Many plants have adapted to survive in these harsh conditions. Let's explore some of them and understand how they do it!

Cacti: The Water Storage Experts
Cacti are th[illegible]erstars of the desert. Here's how they are designed to [illegible]

- Thi[illegible]ave a special skin that is thick and wa[illegible]ater loss. It's like having a built-in water bottle!
- Spines: The [illegible] h[illegible]lved into sharp spines. These spines provide shade and pr[illegible]acti [illegible] looking for a water snack.
- Shallow but Wide Roo[illegible] wi[illegible]allow root systems. This means when it does rain, they can qui[illegible] a[illegible] as possible from a wide area.

Aloe Vera: The Soothing Survivor
Aloe Vera is another plant that thrives in [illegible] desert. [illegible]es it:

- Fleshy Leaves: Aloe Vera has thick leaves th[illegible] wat[illegible] these leaves is a gel that's not only beneficial for [illegible] the plant survive when water is scarce.
- Root System: Just like cacti, Aloe Vera has a wide and shallo[illegible] ro[illegible] system that quickly soaks up any available water.

Joshua Tree: The Slow and Steady Winner
The Joshua tree is a unique plant found in the desert. Here's how it manages to survive:

- Spiky Leaves: The leaves of Joshua trees are tough and spiky, which helps protect them from being eaten by desert animals.
- Deep Root System: Unlike cacti and Aloe Vera, Joshua trees have a deep root system, which allows them to reach water that's far below the desert surface.
- Slow Growth: Joshua trees grow very slowly and use very little energy, which means they don't need as much water to survive.

Name: _____ 52

Desert Organisms And Their Parts

Draw Draw the organism and label its parts that help it survive. Then explain why it can survive in its environment.

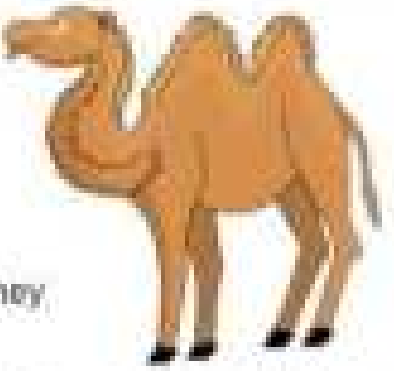
Cactus	

Joshua Tree	

Name: _____ 53

Desert Animals And Their Parts

Desert Animals
The desert might seem like a tough place to live, but several animals have learned how to thrive there. Let's explore three amazing desert animals and see how their bodies have adapted to survive.



Camels: The Desert Ship
Camels are often known as the "ships of the desert." Here's how they are built to

- Hump: ...one or two humps that store fat. When food is hard to find, they us... energy.
- Long Eyelash...: ...have long eyelashes and hairs in their ears to keep out blowing
- Wide Feet: Their wi... walk on hot sand without sinking in.

Fennec Foxes: The Desert Fox
Fennec foxes are small, adorable creatur... the desert. Here's how

- Big Ears: These foxes have very large ... hear even the smallest creatures moving under the sand, a... also ... the fox cool by releasing heat.
- Thick Fur: They have thick fur which helps to keep th... in ... desert nights and protect them from the hot sun during the day.
- Small Size: Their small size helps them to lose heat faster and ke...

Gila Monster: The Desert Lizard
The Gila monster is a fascinating desert dweller. Here's how it is equipped to survive:

- Thick Skin: Gila monsters have thick, bumpy skin that reduces water loss and protects them from the hot sand.
- Venom: They have venom in their saliva which they use to paralyze their prey, making hunting easier.
- Burrowing: Gila monsters spend most of the day in burrows to stay cool, coming out to hunt when it's cooler at night.

Name: _____ 54

Desert Animals And Their Parts

Draw Draw the organism and label its parts that help it survive. Then explain why it can survive in its environment

Camel	

Fe	

Gila Monster	

Name: _____ 55

Terrestrial Habitat - Grasslands

What are Grassland Habitats?

A **grassland habitat** is an area of land that is wide open, with mostly grasses and flowers and not many trees.

Grasslands do not get as much rain as forests, but they get more rain than deserts. This is why some low growing plants can survive, but very few tall trees can grow. Without many tall trees, there are no forests in grassland habitats.

Examples of Grasslands

Grasslands are unique from deserts and forests. They are located all over the world but have different names depending on where they are located.

- Prairies – In North America, grasslands are called prairies. In Canada, the prairie grasslands are located in Alberta, Saskatchewan, and Manitoba. The Prairies are great areas for farming because they are flat and have rich soil.
- Steppes – In Russia, Asia, and Ukraine, the steppes are very dry and grassy habitat. They also have no trees and tend to have short grasses.
- Pampas – The grasslands in South America are known as the pampas. They have flat lands with no trees and really tall grass, as tall as 3 metres.

Characteristics of Grassland Habitats

Temperature	Depending on the latitude and season, temperatures can range from -20 °C to 30 °C
Precipitation	Average rainfall, with amounts ranging from 25 cm to 100 cm
Plant Life	Various grasses including purple needlegrass, blue grama, buffalo grass, blue fescue, rather grass, and lemon grass.
Animals	Tiger, deer, lion, hyena, cheetah, zebra, bison, kangaroo, elephant
Adaptations	• Animals need speed because they can be seen from long distances • Camouflage because animals can be seen from long distances • Burrowing skills because animals cannot hide in trees • Plants need to be able to survive in windy conditions • Grasses have narrow leaves to minimize water loss

Name: _____ 56

Terrestrial Habitats - Grasslands

True or False Circle whether the statement is true or false

1) There are no grasslands in Canada	True	False
2) Grasslands are home to lions, tigers, and zebras	True	False
3) Lions live in the prairie grasslands in Canada	True	False
4) Prairie g[illegible]lands are good for farming	True	False
5) Pampa[illegible] very short	True	False

Questi[illegible] [illegible]tions do you have after reading the information?

1)	
2)	

Questions Use information from th[illegible] su[illegible] answer

1) What is the climate (temperature and precipitation) li[illegible] and [illegible]?

2) What adaptations do animals in grasslands have that help them survive?

Name: _____ 57

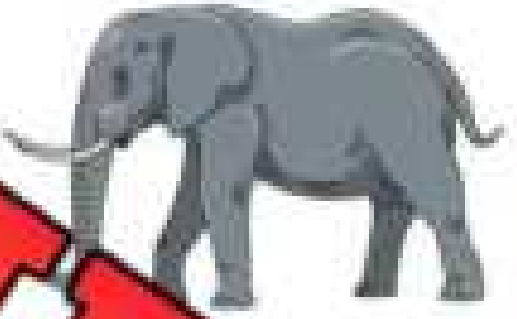
Grassland Organisms And Their Parts

Grassland Animals
Grasslands are wide, open spaces filled with...you guessed it, grass! Even though this might seem like a simple environment, it takes some amazing adaptations to survive here.

Prairie Grass: The Root of Survival
Prairie grass is a common plant found in grasslands. Here's how it thrives:

- Deep Roots: Prairie grass has incredibly deep roots, some going down 5 meters into the soil. These roots help the grass reach water deep underground and survive fires because its roots are safe below ground.
- Flexible Stems: The stems of prairie grass are flexible and can bend in the wind, preventing them from breaking during the strong winds that often sweep across grasslands.

African Elephants: [illegible]
African Elephants are [illegible] that are often found in the grasslands [illegible]. Here's how they are built to survive:



- Big Ears: Elephants have large ears [illegible] to keep themselves cool in the hot sun.
- Trunks: An elephant's trunk is a wonderful tool [illegible] food, drinking water, and even as a snorkel when swimming!
- Tusks: Their long tusks, which are actually overgrown teeth, [illegible] and strip bark from trees for food.

Prairie Dogs: The Underground Engineers
Prairie dogs are small, burrowing animals native to the grasslands of North America. Here's how they adapt:

- Sharp Claws: Prairie dogs have sharp claws that are perfect for digging. They live in underground burrows that provide protection from predators and harsh weather.
- Alertness: Prairie dogs are very alert and communicate with each other using a complex system of barks and chirps to warn about approaching danger.
- Small Size: Their small size helps them move quickly and escape from larger predators.

Name: _____ 58

Grassland Organisms And Their Parts

Draw Draw the organism and label its parts that help it survive. Then explain why it can survive in its environment

Prairie Grass	

Prairie Dog	

Name: _____ 61

Carnivore Animals and Their Parts

Carnivore Animals And Their Body Parts
Carnivores are animals that primarily eat other animals. From big cats like lions to small but fierce creatures like weasels, carnivores are perfectly designed for hunting and eating meat. Let's discover how their body parts help them survive.

1) Sharp Teeth: The Tools for Tearing
Carnivores have very sharp teeth that are built for biting and tearing meat.

- For example, lions have long, pointed canine teeth to grip their prey and sharp back teeth, or carnassials, to slice through meat like pairs of scissors.

2) Powerful Jaws: The Strong Hunter
Carnivores also have strong jaws that help them hold onto their prey.

- Sharks, for instance, have one of the most powerful jaws on Earth. They can bite with incredible force, making it easy for them to catch and eat their prey.

3) Claws: The Catchers and Slashers
Many carnivores have sharp claws that they can use to catch their prey or defend themselves.

- Tigers use their retractable claws not only to grab their prey, but also to climb trees and mark their territory by scratching tree trunks.

4) Forward-facing Eyes: The Focused Look
Most carnivores have forward-facing eyes. This gives them binocular vision, a special type of vision that helps judge distance accurately when hunting.

- Owls are an excellent example of this. Their forward-facing eyes help them to spot a tiny mouse from high in the sky and swoop down accurately to catch it.

5) Strong Muscles and Fast Legs: The Speedsters
Carnivores often have strong muscles and quick legs to chase down their prey.

- Cheetahs are built for speed, with a lightweight body and long, muscular legs. They are the fastest land animals, reaching speeds up to 60 mph to chase down their prey!

Name: _____ 62

Carnivore Animals and Their Parts

True or False Circle whether the statement is true or false

1) Carnivores primarily eat other animals.	True	False
2) Lions use their teeth to tear meat.	True	False
3) Sharks have weak jaws.	True	False
4) Tigers use their claws to climb trees.	True	False
5) Carnivores have eyes on the sides of their heads.	True	False

Visualize Draw a picture of what you were picturing while you were reading. Explain the picture.

Think Write 5 things you learned about the body parts of carnivores.

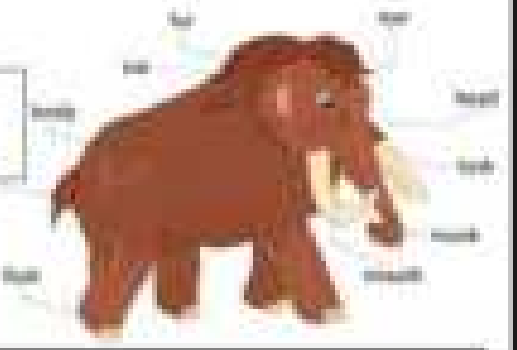
1)	
2)	
3)	
4)	
5)	

Name: _____ 63

Research - Animal Body Parts

Objective What are we learning more about?

To help students learn and understand how a specific animal's body parts aid its survival in its natural habitat.



Research Answer the questions below

1) What a[illegible]earn more about?

2) What habitat do[illegible] anim[illegible]

3) What important body parts does the[illegible] have[illegible] them on the left side and then explain how the body part helps the[illegible] survi[illegible]

Name: _____ 64

Research - Animal and Body Parts

Research | Answer the questions below

3) What important body parts does the animal have? Write them on the left side and then explain how the body part helps them survive.

4) Draw a rough copy picture of the an[illegible] the parts.

Research - Animal and Body Parts

Draw Draw the animal below. Label its body parts. Write a paragraph about its body parts and how they help them survive

Name: _____ 68

Parts of a Plant

Diagram Label the parts of the plant below and then colour the picture

Plants have 5 main parts that allow them to meet their basic needs. Each part needs to be working for the plant to grow and survive.

Word Bank

Stem Roots Flower Leaf Seeds

Name: _____ 69

Parts of a Plant - Roots

What is the Root?

The root of a plant is the part that is underground. The bigger the plant, the bigger the root will be.

Roots Three Main Jobs

The roots of a plant are important for these reasons:

1) They suck water and nutrients up out of the soil for the plant to use
2) They hold the plant in the ground and keep it upright
3) The root of a plant is food for the plant

Eating Roots

Yes, we eat roots. These are plants grown underground. Commonly eaten root vegetables are onions, carrots, ginger, garlic, potatoes, and beets.

True or False

Is the statement true or false

1) A carrot is a root vegetable because it grows underground	True	False
2) Strawberries are root vegetables that grow underground	True	False
3) The larger the root, the larger the plant will be	True	False
4) Roots bring water from the soil up to the plant	True	False
5) A roots only job is to hold the plant upright	True	False

Explain

What are the 3 main things that roots do for plants

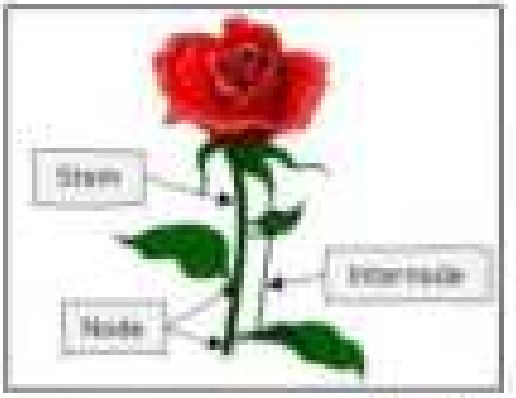
1)	
2)	
3)	

Name: _____ ??

Parts of a Plant - Stem

What is the Stem?

The stem of a plant is the part that comes out of the soil. A stem has **nodes** where branches grow. The stem between each node is called the **internode**.



Stem - Main Jobs

The stem has [illegible] jobs. They are:

1. To sup[illegible] so it can be upright
2. Ca[illegible] up and down to all parts of the plant.
3. Store [illegible]
4. Grow new pl[illegible] grow bigger

Eating Stems

Stems are edible. Many people [illegible] other stems. But, the most popular stems we eat are celery, asparagus, and r[illegible]

Question	Answer the question bel[illegible]

Why is the stem important? List at least 3 jobs they [illegible]

Visualizing	What were you picturing in your head while you were reading?

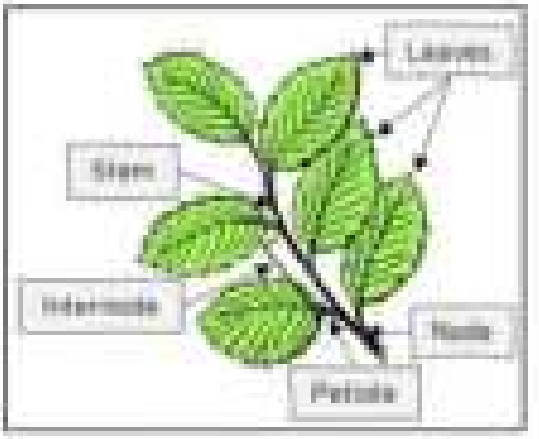
Describe your picture

Name: _____ 71

Parts of a Plant - Leaves

What Are Leaves?

Leaves are an important part of the plant that hang off the stem and petioles of a plant. Leaves have little holes in them that allow water and air to come and go.



Main Jobs - Leaves

Leaves make ... for the plant. They do so by:

1. Bringing ... machine because they are flat
2. Bring ... into the plant
3. Make ... by co... water, and carbon dioxide through the process of photosynthesis

Eating Leaves

You should not eat leaves from ... are good for us. Spinach, mint, and lettuce are all ... we commonly eat.

Word Search — Find the words!

Leaf	Stem	Node	Petiole
Internode	Light	Food	Water

O	V	E	I	P	F	V	F	E	D
Q	K	O	N	L	E	A	F	D	A
B	X	O	T	T	T	V	E	R	S
F	O	J	E	H	I	H	N	N	U
O	S	T	R	S	O	F	O	F	R
O	R	X	N	I	L	V	F	Y	S
D	E	Q	O	L	E	S	T	E	M
F	T	A	D	W	W	Q	J	N	S
R	A	V	E	D	O	N	H	S	S
I	W	P	N	V	J	J	R	C	O

Questions — ... the questions

1) How ... leaves ...

2) Can we eat leaves? Explain.

Name: _____ 7A

Parts of a Plant - Seeds

What Are Seeds?

Seeds are little cases with a baby plant inside. In flowering plants, the flower produces the seeds that are later spread on the soil surrounding it. Seeds are important because plants grow from seeds. Without seeds, we wouldn't have plants in the first place!

There are 3 main parts of a seed:

1) Seed Co... case that protects the embryo inside
2) Embryo... nt inside the seed coat
3) Sto... eats the stored food

Eating Se...

When you eat a f... pro... on the seeds inside. For example, a ... which is why it is a fruit. You can eat these seeds with no problems. O... seed... sunflower seeds, sesame seeds, flaxseeds, pumpkin seeds, and ch... ...eally good for you!

Multiple Choice

Circle the corr... answer

1) Seeds are little cases with a baby what inside?		Plant
2) The seed coat protects the		Flower
3) The stored food is eaten by the		
4) The embryo is a tiny	Pla...	...ed
5) Seeds grow into _____ when planted in soil.	Animals	Plants

Questions

Answer the questions below

1) Why are seeds so important?
2) What is the important part inside a seed? What will happen to it if it is given food?

Name: _____ Th

Seed Plant - Life Cycle

Seeds vs Bulbs

All plants begin their life as seeds, however, some plants will live underground in the form of a bulb. A **bulb** is a plant that lives underground and has its leaves grow up through the surface. Garlic is an example of a bulb. All other forms of plants are seed plants.

Most [illegible] plants live one or two seasons and most bulb plants are perennials, which mean [illegible] than 2 seasons. This is because they have different life cycles.

Life Cyc[illegible] Seed

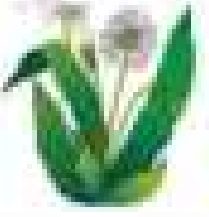
1. **Seed** - The [illegible] life as a seed. The seed has a hard shell that protects the [illegible]

2. **Germination** - The seed fal[illegible] the water and warmth from the air and the soil. This starts [illegible] which is when a plant grows from a seed to a sprout. The [illegible] and split in the soil and a sprout will form.

3. **Growth** – The plant will keep growing through the proce[illegible] The plant provides its own food and will grow if it receives its ba[illegible]

4. **Reproduction** – The flowers on a plant will produce seeds when they have been pollinated. In fruit producing plants, fruit will grow on the flowers at this stage.

5. **Spreading Seeds** – The seeds from the fruit or from the flowers will spread as animals eat them or as the wind blows them away. This begins the life cycle of a plant all over again!



Name: _____ 77

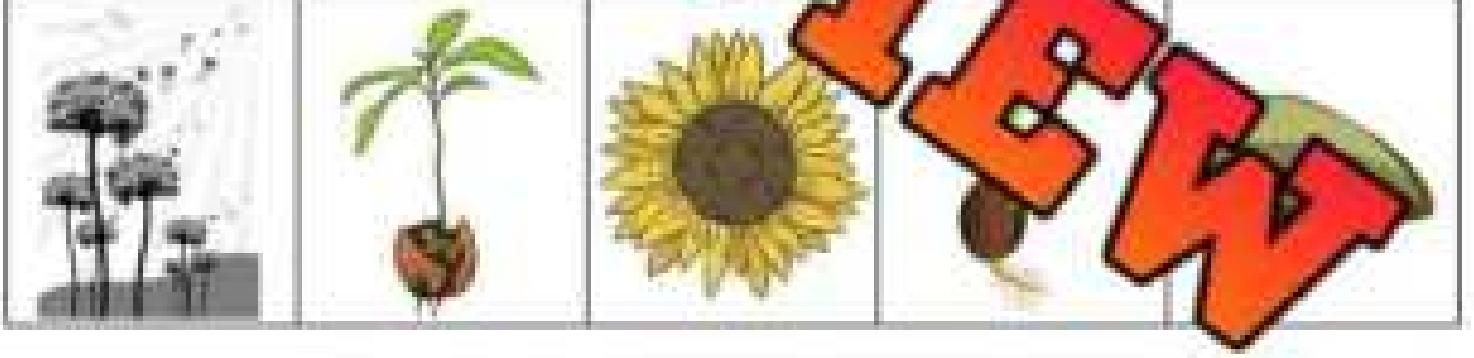
Seed Plant - Life Cycle

Questions Use information from the text to support your answer

1. What is the difference between a bulb plant and a seed plant?

2. What do[illegible]tion of a seed mean?

Ordering Put the stag[illegible]ife c[illegible]der from first to last – 1 to 5



True or False Circle whether the statement is true or false

1) Germination is when the seed coat splits open	True	False
2) A seed plant will continue to grow year after year	True	False
3) A perennial plant is a plant that grows for more than 2 seasons	True	False
4) A plant will continue growing even if it doesn't have its basic needs met	True	False
5) Only the wind spreads seeds on the soil	True	False

Name: _____ 79

Lab - Germinate Seeds on a Window

Research Question

What are we trying to learn more about?

Will a seed germinate (sprout) without soil if it is given sunlight and water?

Hypothesis

What do you think will happen?

Materials

What do you need for this experiment?

- Small plastic
- Dried, uncooked
- Paper towels
- Water

Procedure

What do you need

1. Cut the paper towel in half and fold it a few into the zipper storage bag
2. Soak the paper towel in water and slide it into the flat
3. Put two beans or seeds about three centimeters from the bott on one side of the paper towel. Make sure they don't fall to the bottom bag or else they will sit in the water. You can roll up a piece of paper towe put it on the bottom of the bag if the beans/seeds keep falling to the bottom.
4. Seal the bag part way, leaving an opening near the top so the growing plants can get some air
5. Tape the bag to the window so that the beans are facing indoors, so you can watch them grow.
6. Optional – do the same experiment but put the plastic bag in a dark closet. See if this grows better or worse.

Name: _____ 60

Lab - Germinate Seeds on a Window

Observations Write how many days it has been and draw what the seed looks like

Day	What is happening to the seed?

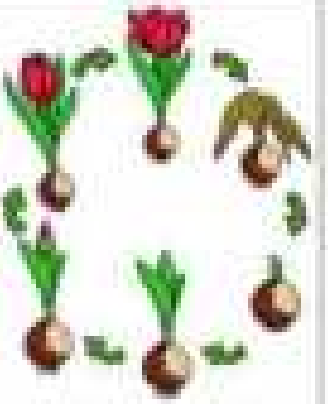
Day	What is happening to the seed?

Name: _____ 61

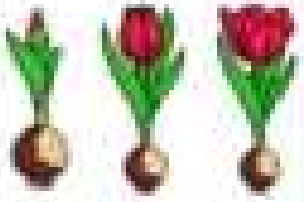
Bulb Plant - Life Cycle

Bulb Plants

A bulb plant lives through the winter inside the ground. A bulb will continue to grow year after year until it is harvested (pulled out of the ground). Bulb plants complete their life cycle underground.



Life Cycle of Bulb Plants – Stages

1) [illegible] 	[illegible] prepares for winter by forming roots in the ground. [illegible] from the soil around it. The bulb is in the [illegible] half-asleep as they don't grow in size [illegible] But, they do quietly work away at [illegible] roots.
2) Waking Up 	As the temperature warms [illegible] the [illegible] bulb begins to grow. You will see the [illegible] through the soil.
3) Bloom 	The bulb blooms after spending the winter [illegible] months gathering energy. It has rested and gotten through light, water, and warmth to bloom. This means it will turn into a plant that we can see above the ground.
4) Falling Asleep 	The bulb plant will fade into the ground as the temperatures get colder. The bulb is not dying! It is saving and gathering energy so it can grow again next year.

Name: ____________________ 82

Bulb Plant - Life Cycle

Matching Write the letter from the description beside each stage

	Dormant	a) The bulb feels the warmer weather. It will grow a shoot.
	Waking Up	b) The bulb prepares for winter. It is half asleep as it doesn't grow.
	Bloom	c) The plant grows bigger. The flower will open up.
	Falling [illegible]leep	d) The bulb feels the cold air and the shorter days.

Questions An[illegible] questi[illegible]w

1) Where does a bulb plant go th[illegible]ugh[illegible]e?

Underground Al[illegible]

2) What is the difference between a bulb plan[illegible]se[illegible]

____

____

____

Visualizing What were you picturing in your head while you were reading?

	Describe your picture ____________ ____________ ____________

Name: _____ 83

How Seeds Spread

How are Seeds Distributed?

When a plant grows into an adult plant, it is ready to make new plants. The plant produces seeds that are spread naturally in the environment. The wind and animals both spread seeds around so that plants can grow all over our environment.

How the Wi[illegible]ads Seeds

Seeds fro[illegible] are light. They can be carried long distances by the wi[illegible]inged" seeds that are shaped like helicopters. These se[illegible]ail fr[illegible]ly to new places as they fall.

A **samara** [illegible] winged seed. If these seeds fell straight down under a tree, they wo[illegible] they wouldn't have enough spac[illegible]

How Animals Spread Seeds

Animals spread seeds in a few different [illegible]

1. The most common way is when animals eat [illegible] them. When the animal travels to a new area, they poop out the[illegible] seeds will germinate in the new area and grow there.
2. Animals can also spread seeds by collecting them and bringing [illegible] locations. This can happen accidentally when seeds have hooks on the[illegible] attach to animals. An animal might brush up against a plant and the seeds can attach to the animal who then brings it to a new place, where they fall off.

3. Squirrels have a special relationship with oak trees. Squirrels eat acorns, which contain the seed of an oak tree. They take acorns and bury them in different places all over. They do this so they can eat these acorns later. Quite often, they forget where they buried the acorns and they end up growing into oak trees.

Name: _____ 84

How Seeds Spread

Questions Use information from the text to support your answer

1. How are seeds spread throughout our environment?

2. Why do oak trees and squirrels need each other?

What Squirrels Get	What Oak Trees Get

Questioning Write two questions you have about

1)	
2)	

True or False Circle whether the statement is true or false

1) The acorns squirrels bury sometimes grow into oak trees	True	False
2) A samara is a winged seed that spins like a helicopter	True	False
3) Acorns under an oak tree often grow right beside the tree	True	False
4) Dandelion seeds are light and blow easily with the wind	True	False
5) Seeds are spread mostly by people	True	False

Name: _____ 86

Plants Responding to Light

How Do Plants Respond To Light?

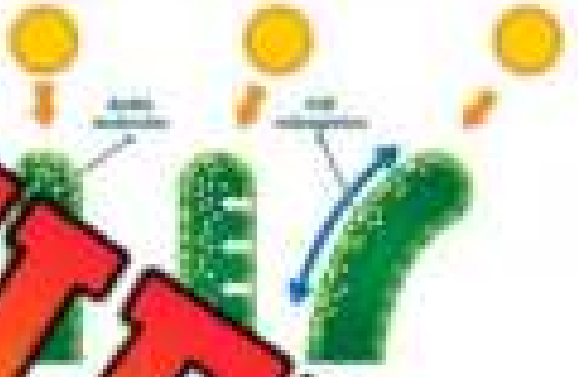
Plants need light in order to grow and stay alive. They will respond to light by growing towards light. This concept is known as phototropism.

What is Phot[illegible]opism?

Phototropi[illegible] when a plant grows towards light. Just lik[illegible] head to look at something that's b[illegible] also have a way of knowing where [illegible] and [illegible] grow towards it. This helps [illegible] get the [illegible] they need from the sun to surv[illegible]

The hormone auxin, is found [illegible] side of a plant. It makes the plant longer [illegible] side, so it can stretch further. This causes the pl[illegible] to bend towards the light.

So, the next time you see a plant growing towards [illegible] you [illegible] it because of phototropism!



Why Do Plants Grow Towards Light?

There are a few reasons why plants grow towards light:

1) Photosynthesis: Light is needed for the process of photosynthesis, where plants use energy from the sun to convert carbon dioxide and water into glucose (a type of sugar) and oxygen. This is how plants make their own food and energy.

2) Survival: By growing towards light, plants can maximize their chances of survival by getting as much energy from the sun as possible.

Name: _____ 87

Plants Responding to Light

True or False — Is the statement true or false?

1) Plants tend to grow away from light	True	False
2) On the shaded side of plants, you will find the auxin hormone	True	False
3) Auxin causes plants to stretch and get longer	True	False
4) Plants w[illegible]nd and grow towards light	True	False
5) Plants [illegible] light as water is more important	True	False

Visualiz[illegible] draw [illegible]ere picturing while you were reading. Explain the picture

Questions — Answer the questions below using [illegible]

1) What is photoptropism? Why does it happen?

2) If plants didn't grow towards light, would they grow as well?

Name: _____ 88

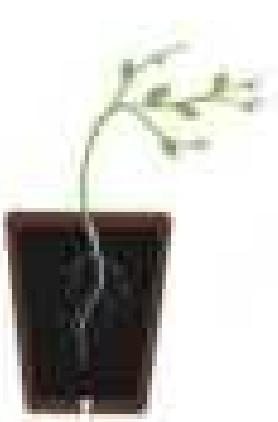
Activity - Plants Respond to Light

Objective What are we learning more about?

To understand how plants respond to light and understand the concept of phototropism.

Materials What do we need?

- ✓ S...
- ✓ Ca...rd b...
- ✓ Scissors
- ✓ Tape



Method How do we compl... the ...

1) Cut a small hole (around 2 inches in dia... on o... side of the cardboard box.

2) Place the potted plant inside the box and tape the box shut, leaving the hole open.

3) Place the box near a window where it will receive sunlight. The sunlight should only be able to enter the hole on the side of the box.

4) Observe the plant every day for one week. Make sure to keep watering the plant as you normally would.

Name: _____ 89

Activity - Plants Respond to Light

Observations | What changes have happened to the plant each day

Time	Description of the Plant
Day 1	
D	
Day 3	
Day 4	
Day 5	

Results | What happened? Describe the changes to the plant

Name: _____ 90

Plants Responding to Touch

How Do Plants Respond To Touch

You might think that only animals can respond to touch, but guess what? Plants can too! They can't feel in the same way humans do because they don't have nerves, but they have special cells that help them understand when they're being touched. This leads to some amazing reactions, like closing leaves, bending stems, or even changing how they grow.

Examples of Plants Responding to Touch

- Venus Flytrap: One of the quickest plants in responding to touch. The Venus flytrap has tiny hairs inside its leaves that detects insects. When an insect lands on its open leaves and touches two tiny hairs inside, the trap shuts in a split second, trapping the insect inside!

- Touch-me-not plant: Also known as the "sensitive plant," the touch-me-not is famous for its reaction to touch. When you stroke its leaves, they fold up rapidly. This is a protective measure to make itself look less appealing to predators.

- Fresh-Cut Grass: Have you ever noticed the unique smell of freshly cut grass? That's actually the grass's response to the "injury" of being cut. It releases chemicals which can deter pests, signal danger to other plants, and even attract helpful insects to ward off plant-eating bugs.

Name: _____ 91

Plants Responding to Touch

True or False Is the statement true or false?

1) When cutting grass, you are cutting a living plant	True	False
2) Plants do not respond to being touched	True	False
3) Some plants will close their leaves when touched	True	False
4) Plants a[illegible] living things	True	False
5) Sens[illegible] fold up when touched	True	False

Questio[illegible] [illegible]uestions do you have about the reading?

1)	
2)	

Questions Answer the questions below using [illegible].com [illegible]

1) Why do plants respond to being touched?

2) How do some plants respond to being touched? Give examples.

Name: _____ 92

Plants Responding to Water

Responding to Water

Just like we need water to stay hydrated and healthy, plants also need water to grow and thrive! But did you know plants have special ways to interact with water? They can even move and change depending on where water is.

1) Hydrotropism: Following the Water Trail

Imagine if you could stretch your arm to reach a glass of water from across the room. Well, some plants can do something similar through a process called hydrotropism!

In places where water is hard to find, like deserts, cacti have developed an amazing ability. Their roots can sense resources hidden deep in the ground. This is how they find the water they need to survive in the blazing sun.

But it's not just desert plants that use this trick. Willow trees near rivers also send their roots towards the water. This way, they're always sure to get a drink!

2) Transpiration: The Plant's Water Cycle

Plants need to drink, but did you know they also sweat? This process, where plants release water vapor, is called transpiration.

During transpiration, plants suck up water from the soil through their roots. The water then travels up the stem and reaches the leaves. Here, it evaporates from tiny openings called stomata, cooling down the plant.

3) Germination: The Birth of a New Plant

Have you ever noticed that seeds need water to start growing? This is called germination. When a seed soaks up water, it begins to sprout and starts the growth of a new plant. Think about a bean seed you might plant in a cup at school. Once it gets water, it starts to grow roots and then a tiny stem. This is the start of a new bean plant, all thanks to water!

Name: _____ 93

Plants Responding to Water

True or False Is the statement true or false?

1) Willow trees have roots that grow towards water, like a river	True	False
2) Cacti don't need water, so they do not respond to it	True	False
3) Some plants have roots that grow towards water	True	False
4) When yo[illegible]er a seed, it will germinate and sprout	True	False
5) Water v[illegible]lants through transpiration	True	False

Visualiz[illegible] draw [illegible]ere picturing while you were reading. Explain the picture.

Questions Answer the questions below using [illegible]m [illegible]

1) How do plants respond to water?

2) How does a willow tree growing near a river respond to water?

Name: _____ 94

Plants Responding to Gravity

Gravity: The Plant Superpower

Plants have a secret power! They can feel where they are in relation to the earth – they can tell up from down. This isn't a spell from a wizard, but a fascinating science trick about gravity!

Skyward Bound: Plants and Gravity

Have you s[illegible] reaching towards the sky? This is because they are responding to gravity [illegible] "gravitropism."

- Stems Reach [illegible] known as negative gravitropism, where stems grow away from [illegible]. The [illegible] any plant, like a sunflower, always aims to grow upwards, no matter [illegible]
- Roots Dig Deep: This is [illegible] where roots grow towards gravity's pull. The roots of all plants [illegible] into the soil. Picture the deep roots of a carrot or a radish!

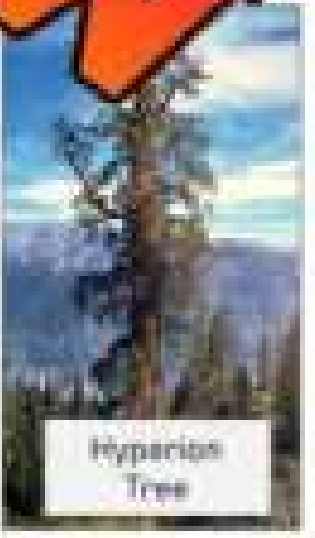
The Gravity Detectives: Plant Cells

Within the tips of roots and stems, plants have special cells [illegible] called "statoliths." These little grains move when the direction of gra[illegible] lets the plant know which way is up and down!

Growing Tall and Sturdy: Roots Responding to Gravity

As trees grow taller, they also need to grow thicker and stronger roots to support their weight, and gravity plays a big part in this.

For example, the Hyperion tree in California is 115 meters tall, weighs over 1.6 million pounds, and is 4.8 meters wide! To stand tall and not tip over, the tree has grown massive roots that burrow deep into the ground. It has also grown a wide trunk to keep it stable.



Hyperion Tree

Name: _____ 95

Plants Responding to Gravity

True or False Is the statement true or false?

1) Plants can feel gravity.	True	False
2) Plant stems grow towards gravity.	True	False
3) All plants' roots grow downwards.	True	False
4) "Statoli[illegible]elp plants sense gravity.	True	False
5) A taller [illegible]s thicker roots.	True	False

Visuali[illegible] draw [illegible]ere picturing while you were reading. Explain the picture.

Questions Answer the questions below using [illegible]m[illegible]

1) What is the difference between positive and negative gravitropism?

2) How do plants respond to gravity?

Name: _____ 96

How Plants Respond to Temperature

How Plants Respond to Temperature

Imagine if you wore a heavy winter jacket on a hot summer day! You'd feel uncomfortable, wouldn't you? Just like us, plants too respond to temperature. They have a way of knowing whether it's hot or cold and they change their behaviour accordingly.

A Warm [illegible] the Heat

When [illegible] plants have to adjust to survive. Here's [illegible]

- Transpiration: Plants [illegible] their leaves to cool down, like how we sweat when it's hot! Ca[illegible] desert [illegible] very slowly to save water.
- Growing Slowly: Some plants grow [illegible] to save energy. Bermuda grass is one such plant. It stays low [illegible] grou[illegible] summers.
- Shrinking Leaves: Some plants, like the deser[illegible] leaves to reduce water loss when it's hot.

Bundling Up: Plants in the Cold

When the temperature drops, plants have their own ways to keep warm.

- Going Dormant: Many trees, like oak and maple, drop their leaves and go into a "sleep" mode during winter. This is called dormancy.
- Growing Hairs: Some plants grow extra 'hairs' on their leaves to keep warm, like the 'woolly' leaves of the Lamb's Ear plant.
- Huddling Together: Snow tussock grass in cold places like New Zealand grows in bunches to help protect itself from the cold wind.

Name: _____ 97

How Plants Respond to Temperature

True or False Is the statement true or false?

1) Transpiration is like plant sweat.	True	False
2) Bermuda grass grows fast in the heat.	True	False
3) Plants can sleep, which is called going dormant.	True	False
4) All trees go dormant in the winter.	True	False
5) Cacti release water quickly when it's hot.	True	False

Visualize Draw what you were picturing while you were reading. Explain the picture.

Questions Answer the questions below using evidence from the text.

1) How do plants respond to rising temperatures? Give two examples.

2) What happens to many trees like oak and maple when the temperature drops, and why?

Name: _____ 98

Experiment - How Plants Respond

Research Question What do plants need to survive?

How do plants respond to light, water, and temperature?

Materials What do we need for our experiment?

1) 6 small [illegible] to plant seeds
2) Soil
3) Wate[illegible]
4) Fr[illegible]
5) Shr[illegible] pap[illegible]
6) Seeds - le[illegible], broccoli, and cauliflower germinate the fastest

Method [illegible] experiment?

1) Fill 5 cups with soil
2) In the 6th cup, do not add soil. Inst[illegible] shre[illegible] paper
3) Add your seeds to the soil, about 2 cm deep [illegible]s [illegible]th of the seed)
4) In one of the cups with soil, add a lot of s[illegible] [illegible]se
5) Place one cup in a closet, where it won't get s[illegible]
6) Place another cup in the fridge, where it is cold
7) Place four cups in a window where it will get the most sun. [illegible] should be the one with a lot of seeds and one should be the [illegible]er.
8) Water each of the cups two times a day. Do not water one of the [illegible] cups that are in the window (you should water the one cup with a lot of seeds)
9) Monitor the results by checking the cups each day

Hypothesis In which cup will the seed(s) grow the fastest?

Cup 1 In the Closet	Cup 2 In the Fridge	Cup 3 A lot of Seeds	Cup 4 Window with Water	Cup 5 Window no Water	Cup 6 Shredded Paper

Name: _____ 99

Experiment – Basic Needs of Plants

Observations Have any of the seeds sprouted? Put a ☑ or an ☒

Day	Cup 1	Cup 2	Cup 3	Cup 4	Cup 5	Cup 6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
15						
20						

Name: _____ 100

Experiment - Basic Needs of Plants

Results Explain what happened after the 20 days for each cup. Explain why the cup either grew a plant or did not.

Cup 1 In the Cl[illegible]	
Cup 2 In the Fridg[illegible]	
Cup 3 A lot of Seeds	
Cup 4 Window with Water	
Cup 5 Window no Water	
Cup 6 Shredded Paper	

Name: _____ 102

Animal Senses

Animal Senses: The Amazing World of Sensory Organs

Animals use their ears, eyes, noses, tongues, and skin to experience the world around them. Every animal, including humans have different abilities for sensing the world. That is why some animals can see or hear better than others.

Ears: The Sound Catchers

Let's start with ears, which animals use to hear sounds. Ears pick up sound waves and send them to the brain, which interprets them as different sounds. Dogs, for instance, have ears that can hear things far away that humans can't hear at all!

Eyes: The Sight Masters

Next are eyes, which help animals see the world around them. Some animals, like owls, have fantastic eyesight and can see in very low light. Meanwhile, rabbits have eyes on the sides of their heads to watch for predators in all directions.

Nose: The Smell Detectors

A nose helps animals smell. This is really important for many animals. For example, a bear has such a good sense of smell that it can find food from miles away! Dogs use their noses to recognize their friends and find their way home.

Tongue: The Taste Explorers

The tongue helps animals taste. Taste buds on the tongue let animals know if something is sweet, salty, sour, or bitter. Cats, for example, have fewer taste buds than humans, which is why they don't like sweet food.

Skin: The Touch Sensors

Finally, skin helps animals feel things through touch. Some animals, like dolphins, have very sensitive skin and can feel the smallest changes in water temperature. Even snakes, which don't have skin like ours, can feel vibrations through the ground with their bellies.

Name: _____ 103

Animal Senses

True or False Is the statement true or false?

1) Dogs have poor hearing.	True	False
2) Owls have excellent eyesight.	True	False
3) Rabbits have eyes on the front of their heads.	True	False
4) A bear c[illegible] food from miles away.	True	False
5) Cats lo[illegible]	True	False

Visualizin[illegible] Dra[illegible] picturing while you were reading. Explain the picture

Explain Write 3 things you learned about a[illegible]

1)	
2)	
3)	

Name: _____ 104

Super Hearing Animals

Super Hearing Animals

1. Dogs

Dogs have large, floppy ears that can move in the direction of sounds. They have more ear muscles than humans, which allow them to turn their ears like a radar dish to focus on sounds.

2. Cats

Cats also have ears that move towards sounds. The shape of a cat's ear funnels sound into the ear can... to hear. They also have a large amount of tiny ... which are highly sensitive to sound vibrat...

3. Bats

Bats have large ears compared to their body size ... them capture sound. They use these sounds to ... surroundings. This is called echolocation.

4. Dolphins

Dolphins have small ear openings on the sides of their heads, but their main hearing organ is inside their heads. They receive sounds through their lower jaw which conducts the sound vibrations to their inner ear.

5. Owls

Owls have asymmetrical ears. One ear is higher than the other, which helps them locate sounds in multiple dimensions. The feathers around an owl's face also help direct sound into their ears.

Name: _____ 101

Super Hearing Animals

Explain How does each animal hear better than humans?

Dog	
Cat	
Dolphin	
Bat	

True or False Circle whether the statement is True or False

1) Bats use echolocation to navigate their surroundings.	True	False
2) Dolphins hear best through their ear openings on their heads.	True	False
3) Owls have ears at the same height.	True	False
4) Dogs can rotate their ears to focus on different sounds.	True	False
5) Cats have tiny hair cells in their ears for hearing.	True	False

Think Which animal's hearing would you want to have? Explain.

Name: _____ 106

Super Hearing Animals

Many animals can hear better than humans because of the position and size of their ears. Choose an animal to draw and make changes to their ears and body that will help them be able to hear better.

Examples include:

1) Bigger ears
2) More ears
3) Ears at different heights
4) Ears on top of head
5) Ears that fold
6) Echolocation ability

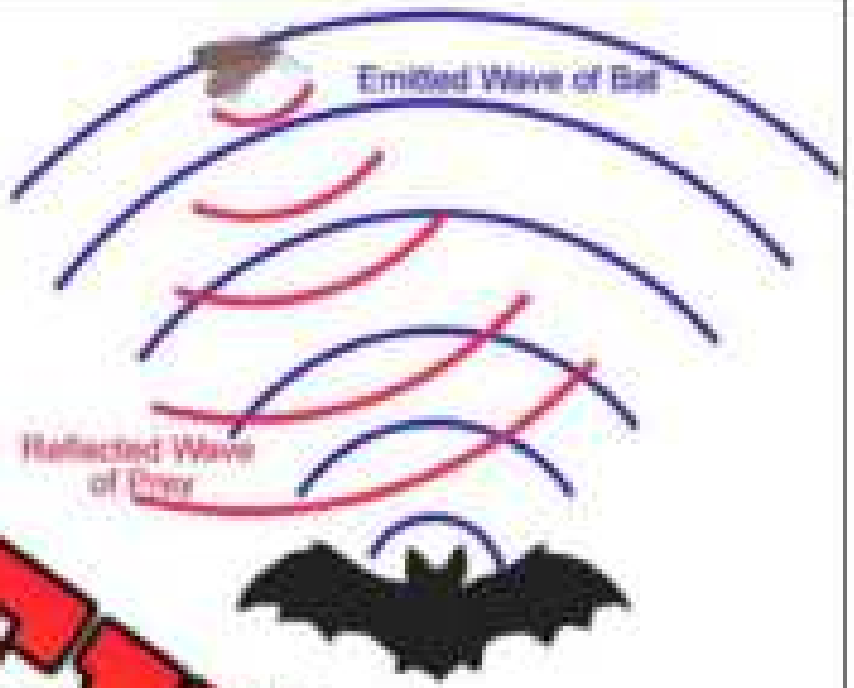
Draw [illegible] with super hearing. Explain the animal's hearing below

Name: _____ 107

Echolocation

What is Echolocation?

Echolocation is how animals emit calls out to the environment and listen to the echoes of those calls when they bounce off various objects near



They ses to tell them w p them navig th animal can tell h are from an object by mea long it takes for the sound th em.

The relative intensity of the s m where their surroundings are. This means if they make a loud soun quiet s to them, then the object is further away. Echolocation allows animals to s sound vision.

What Animals Use Echolocation?

The most notable animal that uses echolocation are bats. Other animals like toothed whales and dolphins also use echolocation. It is mainly used by birds and more specifically, cave dwelling birds.

Humans also use echolocation, but we need machines to do it as our ears and brains cannot process the calculations. When humans use echolocation, we call it **sonar**. Sonar devices are often used on boats to detect fish, structures, and anything under the boat. Sonar is used to detect things that have fallen to the bottom of oceans, such as aircrafts and sunken ships.

Name: _____ 108

Echolocation

Questions Answer the questions below using evidence from the text

1) What is echolocation? Why is it used?

2) What a[illegible]ocation?

Draw Draw a pict[illegible] echolocation to navigate

Wordsearch Find the words from the word bank.

Word Bank	
Echo	Location
Reflect	Sound
Waves	Sonar
Bats	Dolphins

V L O C A T I O N X D I R Z W W X
R Q O B A G V K V N E I X X A Z G
A T M H G S D S R J B D X Z V A E
H A A T R E F L E C T B P G E S C
B X P S O N A R A H H A Y R S Y H
U F G K D E M L B R O T D D X R O
M F D R D O L P H I N S O U N D Q

Name: _____ 111

Infrared Sensing

What is Infrared Sensing?

Infrared radiation is a type of electromagnetic radiation with longer wavelengths and lower frequencies than visible light. Infrared radiation is emitted by all objects. Infrared radiation is all around us, and we are constantly exposed to it. It is emitted by the sun, fire, light bulbs, ovens, heaters, and our own bodies.

Infrared Sensing is the ability to detect infrared radiation. Some animals have infrared sensors as they can see the infrared radiation coming off objects. This helps them hunt at night as they can see energy waves flowing off moving objects. Humans cannot see infrared radiation, but some other animals can.

Animals That Use Infrared Sensing

Mosquitos

Mosquitos and other blood-sucking insects use their infrared vision to feed themselves. They have infrared sensing to see the body heat we emit in the form of infrared radiation. Since most mosquitos are nocturnal, they need to use their infrared sensing to find their prey at night.

Mosquitos have two "pit organs" on the sides of their heads. These are infrared sensors, meaning they can sense the radiation we give off.

Vampire Bats

A vampire bat uses infrared sensors on their lips to locate blood vessels in their prey. Vampire bats are the only mammals to feed only on blood. Therefore, they need to be able to find blood in the blood vessels of their prey.

They are nocturnal animals, needing to see at night. They use their infrared sensors to see the carbon dioxide moving through the blood vessels. They often sneak up on sleeping cows, goats, or birds to suck the blood from their prey.

Name: _____ 112

Infrared Sensing

True or False — Is the statement true or false?

1) For nocturnal animals, infrared sensing isn't important	True	False
2) Many blood-sucking insects have infrared sensing	True	False
3) The pit organs that mosquitos have help them see infrared radiation	True	False
4) Humans [illegible] infrared radiation everywhere	True	False
5) Infrared [illegible] only comes off really hot objects	True	False

Visualize — Draw [illegible] were picturing while you were reading. Explain the picture

Questions — Answer the questions below using [illegible]

1) Why do nocturnal animals benefit from infrared sensing?

2) How do vampire bats use infrared sensing? Why do they need it?

Name: _____ 113

Ultraviolet Radiation - UV Sensors

What is Ultraviolet Radiation?

Ultraviolet (UV) radiation is a type of electromagnetic radiation with shorter wavelengths and higher frequencies than visible light. UV radiation is produced by the sun and other sources, such as welding torches and some types of lamps. It is also present in artificial sources of light, such as fluorescent lamps and LED lights.

Humans cannot see UV radiation with their eyes. Some other animals, like butterflies, [illegible] scorpions, and bees have UV sensors that allow them to see UV radiation.

How Animals Se[illegible]

Animals that can [illegible]violet [illegible] use specialized cells in their eyes called "UV receptors" to detect and [illegible] light. These receptors contain pigments called "photopigments" that are sensitive to specific wavelengths of light.

- In birds, for example, these UV receptors are located in the cones of the retina, which are responsible for color vision. Birds have a fourth cone cell that is sensitive to UV light, allowing them to see a wider range of colors than humans can.

- In insects, such as bees, the UV receptors are located in their compound eyes, which are made up of many small, individual eyes called "ommatidia." Each ommatidium contains a UV receptor, which allows the bee to see UV light in high resolution.

- In some reptiles, such as lizards, they have a specialized layer of scales called "shiny scales" which are located above the retina that reflects the UV light to the retina. This way, they can see the UV light without it being absorbed by the melanin in the skin or scales.

Name: _____ 114

Ultraviolet Radiation - UV Sensors

True or False Is the statement true or false?

1) UV radiation can be seen by humans	True	False
2) UV radiation has shorter wavelengths with higher frequencies	True	False
3) Insects have many smaller eyes called ommatidium	True	False
4) Birds have shiny scales that reflect UV radiation into their retina	True	False
5) Birds have UV sensors in the cones in their retina	True	False

Visualize ...u were picturing while you were reading. Explain the picture

Questions Answer the questions below u... ...et

1) What are UV sensors? How do they help animals see UV ra...

2) Choose an animal and explain how they can see UV radiation.

Name: _____ 115

Story - Animals Using UV Radiation

Story – Hector the Hummingbird

Once upon a time, in a lush tropical forest, there lived a little hummingbird named Hector. Hector was a very special hummingbird because he had the ability to see ultraviolet radiation, thanks to his UV sensors. He was able to see things that other birds in the forest could not, such as the vibrant UV patterns on some of his favorite flowers.

One day, Hector was out foraging for nectar, he spotted a flower that he had never seen before. It was bright orange in color that looked like a flame, and it reflected a lot of UV light. Hector couldn't resist the flower and flew over to investigate.

As he approached the flower, Hector was amazed to see that the orange petals were actually covered in a layer of UV-reflective nectar. He quickly realized that this flower was a special kind of flower that only produced nectar [illegible]. Hector was ecstatic, as this meant that he had found a new source of food that no other bird in the forest knew about.

With his UV sensors, Hector was able to enjoy the nectar from this flower for many days. He even managed to find other flowers that had similar UV-reflective nectar, and he became known as the best nectar-finder in the forest.

One day, a group of other hummingbirds, who did not have the ability to see UV, asked Hector how he always managed to find the best nectar. Hector explained to them about his UV sensors and how it allowed him to see things that they couldn't. The other hummingbirds were amazed and soon, they all wanted to learn how to see UV. So, Hector taught them all how to use their UV sensors and soon they were all enjoying the same delicious nectar as Hector.

Name: _____ 116

Story - Animals Using UV Radiation

Write Write your own story that helps teach about how animals use UV sensors.

Name: _____ 117

Magnetoreception

What is Magnetoreception?

Magnetoreception is the ability of some animals to sense and respond to the Earth's magnetic field. Imagine the Earth is like a big magnet, and it has north and south poles, just like a bar magnet you might have played with when you were a kid. Some animals, like birds, sea turtles, and fish, have special cells in their bodies that can sense which direction the magnetic field is pointing. They use this information to help them navigate and find their way around.

It's like having a compass in your body that helps you find your way, even when you can't see the stars or use a map. Pretty cool, right?

Animals That Use Magnetoreception

- ☑ Birds use magnetoreception for navigation, allowing them to fly in the correct direction even when they can't see the sun or stars. They also use it to find food and suitable breeding grounds.
- ☑ Sea turtles use magnetoreception to navigate the ocean and return to the beach where they were born.
- ☑ Fish use magnetoreception to navigate rivers and streams, and to find their way back to their home waters.
- ☑ Migratory insects, such as butterflies and beetles, use magnetoreception to navigate over long distances.
- ☑ Some mammals, like bats, use magnetoreception in combination with echolocation to navigate their environment.

Name: _____ 118

Magnetoreception

True or False Is the statement true or false?

1) Humans have magnetoreception	True	False
2) An animal with magnetoreception has a compass inside them	True	False
3) Magnetoreception is when animals use the magnetic field for directions	True	False
4) All anim[illegible] magnetoreception	True	False
5) Fish use[illegible]ception to find their way back home	True	False

Visualiz[illegible] draw [illegible]ere picturing while you were reading. Explain the picture

Questions Answer the questions below using [illegible]

1) What is magnetoreception?

2) How do animals use magnetoreception?

Writing Code Activity - Animals Responding

Objective — What are we learning more about?

Understand how animals respond to different situations (danger, food, or temperature) and represent these responses using offline coding.

Materials — What do we need?

- ✓ A la[illegible]er or poster board
- ✓ C[illegible]s
- ✓ S[illegible]imal [illegible] stickers (optional)
- ✓ Small cut-[illegible] and temperature symbols (can be drawn on paper and [illegible]

Method — How do we [illegible]?

1) Introduction to Coding: Explain to [illegible] that [illegible] way of giving instructions to a computer. When we [illegible], we [illegible] commands. For this activity, we'll be doing 'offline coding', [illegible] computer.

2) Identify the Variables: Explain that animals resp[illegible] temperature in different ways. Use a different colo[illegible] for each condition - a lion for danger, an apple for food, and a s[illegible] temperature.

3) Create a Coding Legend: Decide on simple 'code' commands for the a[illegible] movements. For example, an arrow pointing up could mean 'move forward', an arrow pointing right could mean 'turn right', and so on. Draw these commands in a 'Legend' on the side of the paper.

4) Set the Scene: Place or draw the animal at one side of the grid. Randomly place the danger, food, and temperature symbols on different squares of the grid.

5) Coding the Animal's Path: The aim is to 'code' a path for the animal to react to the symbols and reach the other side of the grid. For example, when the animal encounters a 'food' symbol, it might 'move forward' to eat. When it encounters a 'danger' symbol, it could 'turn right' to escape.

Name: _____ 120

Writing Code Activity - Animals Responding

Method How do we complete the experiment?

6) Writing the Code: In a column next to the grid, write down the 'code' for the animal's path, using the commands from your legend. Each time the animal moves or turns, a new command is written down.

7) Test the Code: Once the 'code' is complete, follow the instructions from the begin... moving the animal according to the coded commands. Did the animal react ...tely to the danger, food, and temperature symbols?

Plan ...how you will complete the coding activity

1) What animals ... use ...ity?

2) What variables will you use in your ...ivity? ...de a lion for danger, an apple for food, and a sun or snow... for te...

3) How will you code your way through the grid? Write or draw the c...nds you will use. Examples include an arrow pointing up could mean "move forward" and an arrow pointing right could mean "turn right".

Name: _____ 121

Writing Code Activity - Animals Responding

Coding Grid Draw the variables and animals on the grid below. Then write the code

Code

Legend

Name: _____ Date: _____

Unit Test - Living Systems

Multiple Choice /10

1) Vertebrate animals have...	2) Birds...
a) No backbone	a) Have fur
b) A backbone	b) Lay eggs
c) 2 legs	c) Are cold-blooded
d) More than 2	d) None of the above
3) Animals that [illegible] legs are...	4) A frog is part of which animal group?
a) Quadr[illegible]	a) Amphibian
b) Biped[illegible]	b) Insect
c) Unipedal	c) Reptile
d) Tripedal	d) Mammal
5) Which animal uses echolocat[illegible]	[illegible]en plants grow thick roots, they are [illegible]t to...
a) Bears	[illegible]
b) Lions	c) Ligh[illegible]
c) Dolphins	c) [illegible]
d) Rats	d) Gr[illegible]
7) A plant responds to heat by doing what?	8) When a s[illegible]o [illegible]ted...
a) Phototropism	a) Reproduction
b) Transpiration	b) Perennials
c) Photosynthesis	c) Spreading Seeds
d) Gravitropism	d) Germination
9) A group of organisms that have similar characteristics is called a...	10) An individual living thing is called a...
a) Species	a) Species
b) Organism	b) Organism
c) Population	c) Population
d) Community	d) Community

Definitions (1 marks each) /3

Term	Definition (what does it mean)
Organism	
Vertebrates	
Domain Plant	

Short Answer Questions (3 marks e

1. List 3 similarities/differences between a m[illegible]

2. What organisms live in the desert? How can they survive there?

3. What body parts do carnivore animals have? How do they help them survive?

Long Answer Questions **/10**

1) How do plants respond to light and water? Give examples and explain why they respond that way

2) Do all animals have the same sensory organs? How do animals perceive the world differently? Give examples of animals with different senses.

Workbook Preview

Grade 4 – Science Unit

Organizing Idea: Space: Understandings of the living world, Earth, and space are deepened by investigating natural systems and their interactions.

Guiding Question: How do objects in space impact daily life?

	Learning Outcome – Students investigate and describe objects in space in connection to daily life.	**Pages**
S4.1	The universe includes all of space and everything in it. Objects in space include the Moon, the Sun (a star), stars and their planets, planets and their moons.	7 – 21
S4.2	Most objects in space are more easily observed at night.	22 – 23
S4.3	Technologies for viewing objects in space include binoculars.	24 – 28
S		
S		
S		
S4.7	Earth's daily rotation and yearly revolution around the Sun causes the constellations to appear in different locations at different times.	37 – 40
S4.8	Polaris, the North Star, shows the approximate direction of the North Pole. The Orion constellation can be used to find the South Pole.	41 – 42
S4.9	The Moon has been used throughout history to measure time. Some cultures may use a lunar calendar in addition to the international standard calendar. Lunar calendars follow patterns of the Moon for timekeeping.	56 – 73
S4.10	The international standard (Gregorian) calendar is based on the amount of time it takes Earth to revolve around the Sun. Most people follow the international standard calendar in daily life.	74 – 77
Computer Science		
CS.1	Students examine and apply design processes to meet needs.	50 – 55, 78 – 79

NAME: _____

Space

Name: _____ 7

The Universe

What is the Universe?

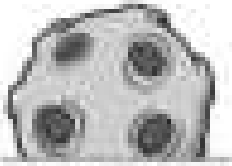
The **universe** is everything we can touch, feel, sense, measure, and detect. This means it is everything that is living, planets, galaxies, dust clouds, light, and even time. Before the universe was created, time, space, and matter did not exist.

Planet

Star

What is a g

A **gala** of gas, dust, and billions of stars and their solar s ether by gravity.



Natural Satellite

We live on E part of our solar system. Our solar system has eight planets and y **Way Galaxy**. When we look up at night and see the stars, we are se Way. Scientists estimate that the Milky Way has 400 billion stars. M st one planet orbiting them. In our solar system, the sun is the star ar ight p round it.

The Universe – An Unimaginably Large Entity

This picture was taken by the Hubble Space Telescope. It thousands of galaxies as each of the tiny dots are galaxies.

Each galaxy has upwards of 400 billion solar systems. Our solar system has 8 planets and one Sun, which means our Milky Way Galaxy could have upwards of 3.2 trillion planets and 400 billion Suns.

It is also estimated that there are approximately 2 trillion galaxies that we can see from our planet. That's a lot of stars, solar systems and planets!

The universe is home to many celestial bodies. A **celestial body** is an object in space. Celestial bodies include stars, planets, natural satellites (moons), comets, asteroids, galaxies, and meteors or meteorites.

Meteor

Name: _____ 6

The Universe

Questions Answer the questions below using evidence from the text

1) What is the difference between a solar system and a galaxy?

2) How [illegible] explain using the terms: galaxies, stars, and solar systems.

Visualizing Draw what you w[illegible] reading. Explain the picture

True or False Is the statement true or false?

1. Galaxies are larger than the Universe	True	False
2. A galaxy can have upwards of 400 billion solar systems	True	False
3. A solar system has 100 billion planets in it	True	False
4. The universe has around 2 trillion galaxies	True	False
5. There could be 3.2 trillion planets in our galaxy	True	False

Name: _____ 9

Solar System - Size, Structure, Age

What is a Solar System?

Our **solar system** is the collection of eight planets and their moons in orbit around the Sun. It also includes the smaller bodies in the form of asteroids, [illegible] and comets.

Age of [illegible]

Our solar [illegible] billion years ago. [illegible] billion years ago, gravity [illegible] cloud of dust and gas together [illegible]. The massive concentration of dust and gas created a molecular cloud that [illegible] form the Sun. With the birth of the Sun, the planets began to form [illegible] around it.

Size and Structure of the Solar System

The image above shows the size and structure of our solar system. As you can see, the size of the Earth is small compared to the size of Jupiter, Saturn and [illegible].

The furthest object that we can see in our solar system is Sedna, which is [illegible] billion km away from the Sun. This means the diameter of the solar system is [illegible].46 billion km.

There are eight planets in our solar system and one sun that each planet orbits around. An **orbit** is a regular, repeating path that one object takes around another. Therefore, all the planets orbit the Sun, as they all travel in a circle around the Sun. Since planets are further away from the Sun, it takes them longer. In fact, it takes Neptune 165 years to orbit the Sun once! Earth orbits the Sun every 365 days. Earth is the 3rd planet from the Sun, or some refer to it as the 3rd rock from the Sun.

Name: _____ 10

Solar System - Size, Structure, Age

Questions

Answer the questions below using evidence from the text

1) What is our solar system? When was it formed?

2) What is [illegible] solar system? Did anything surprise you about the size of the planets?

Questioning

Write 3 questi[illegible] the reading

1)	
2)	
3)	

True or False

Is the statement true or false?

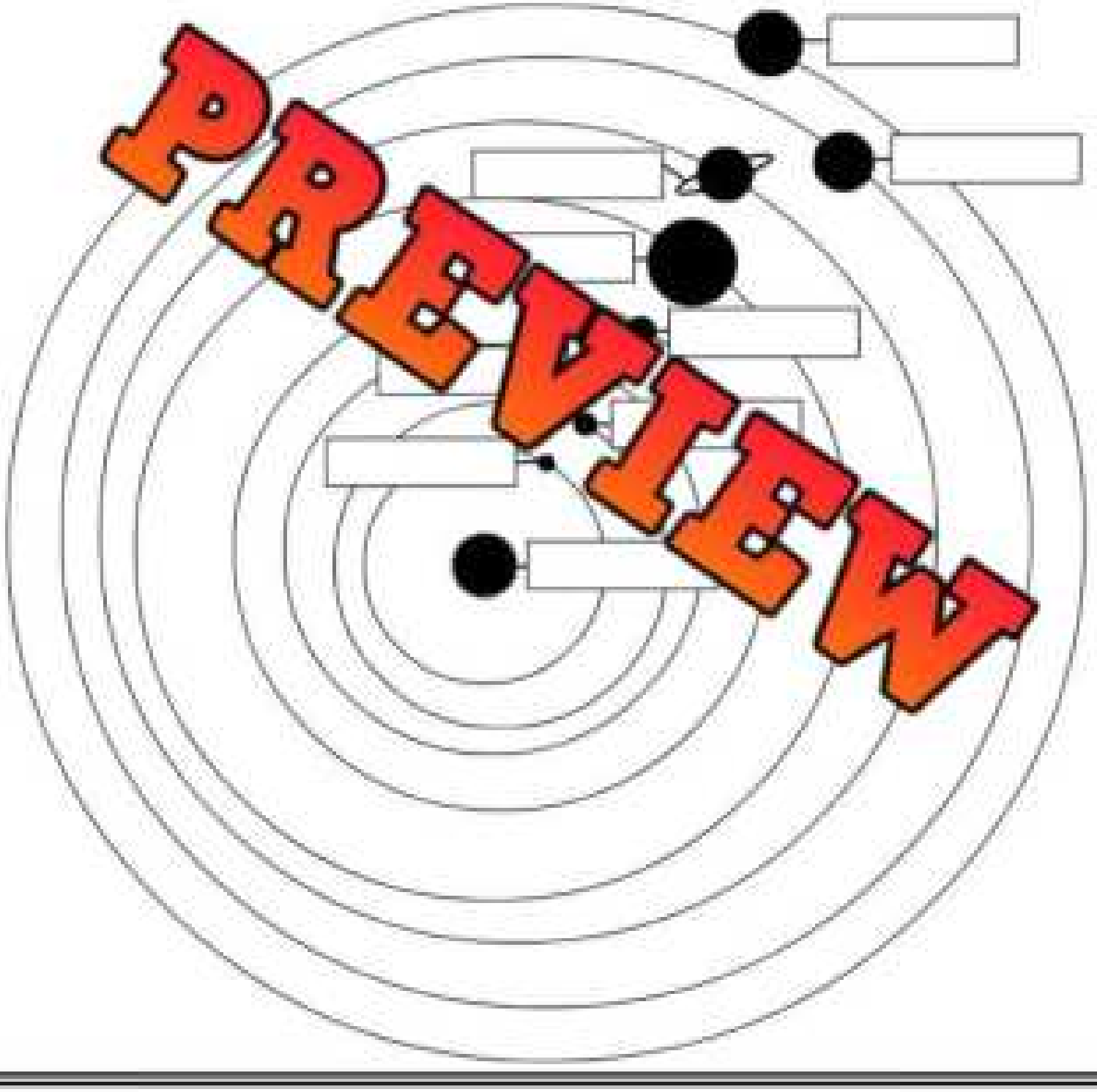
1) The Sun orbits around the planets	True	False
2) All the planets orbit the Sun every 365 days	True	False
3) The Sun is the largest object in our solar system	True	False
4) The Earth orbits the Sun every 365 days	True	False
5) Our solar system was formed 4.6 billion years ago	True	False

Name: _____ L1

Diagram of our Solar System

Diagram of our Solar System | Label the solar system using the word bank

Word Bank				
Mercury	Uranus	Earth	Jupiter	Saturn
Neptune	Mars	Venus	Sun	



Name: _____ 12

Exploring Objects in Space

What is a Solar System?
When we look up at the night sky, we see a world full of twinkling stars and other celestial bodies. There are so many exciting things in our universe to learn about!

The Moon
The Moon is the Earth's only natural satellite, which means it orbits, or goes around, the Earth. Here are some interesting things we learned about the Moon:

- It doesn't [illegible] any light of its own. The Moon appears bright in the night sky because it reflects [illegible] from the Sun.
- The [illegible] sphere; it's actually shaped like an egg!

The Sun
The Sun is the [illegible] at the center of our solar system. Here are some important things we learned about the Sun:

- The Sun's light gives [illegible] grow.
- It's so big that over a million [illegible]

Stars and Their Planets
Stars are gigantic balls of glowing gas that produce [illegible] They are like the Sun but very far away. Some stars have planets orbiting [illegible] our Sun does. Here are a few facts we learned about stars and [illegible]

- Some stars are bigger than the Sun, and others are [illegible]
- Not all stars have planets. The ones that do are called "[illegible]"

Planets and Their Moons
Planets are large objects that orbit stars. Our solar system has eight planets, including Earth. Some planets have moons, just like Earth. Here's what we learned about planets and their moons:

- Planets closer to the Sun, like Mercury and Venus, are hotter than those further away.
- The biggest planet in our solar system is Jupiter, and it has the most moons—79 at last count! Ganymede orbits Jupiter and it the biggest moon in our solar system.

Name: _____ 13

Exploring Objects in Space

Questions

Answer the questions below using evidence from the text

1) Why does the Moon appear bright in the night sky?

2) What is ... between a moon and a planet?

Think

Write 1 thing you ... the objects in space

Planet	
Stars	
Moons	

Multiple Choice

Circle the correct answer

1) What orbits the Earth?	Sun	Moon
2) The Sun is a...	Comet	Star
3) How many moons does Jupiter have?	1	79
4) What shape is the Moon?	Egg	Round
5) Moons orbit...	Planets	The Sun

Name: _____ /4

What are Moons?

What are Moons?

Moons are natural objects that orbit planets. Scientists call moons "natural satellites" because a satellite also orbits a planet. Most people think satellites are just machines we send into space to orbit a planet, but satellites can be natural too.

Planets and asteroids orbit the Sun, but moons orbit planets. Moons come in different sha[illegible]d sizes and are made of rock. Most moons are airless, but some have atmospher[illegible] hidden oceans. We know a lot more about the moon because in 1969, th[illegible]ded on the moon and took rock samples back to Earth to study them.

Moons and Planet[illegible]

The Earth has one moo[illegible]ere are 214 moons in our solar system. Most of the moons orbit aro[illegible] and Saturn. Smaller planets usually have less moons. Mars has [illegible], ar[illegible]y don't have any. Although scientists aren't 100 percent sure, they b[illegible] moons.

It was discovered in 2019, that Saturn has 2[illegible] moon[illegible]ists didn't know about. This gives Saturn a total of 82 moons. Saturn[illegible]er than the planet Mercury! Check out the size comparison in the pho[illegible] Earth's moon is larger than Titan, but Titan is larger than our moon.

The Earth's moon can be seen by us each evening on a clear nig[illegible]y far away! It is 384,399 kilometres from the Earth! It took the American astronauts 3 days travelling at an average speed of 3,280 kph.

How was Earth's Moon Formed?

There are many theories that try to explain how the moon was formed. No one knows for sure! The most accepted theory is that the moon formed when the Earth and another small planet collided. The debris from the collision began to orbit the Earth. Over time, the debris collected to form a moon.

Name: _____ 15

Questions - What are Moons?

Questions Answer the questions below using evidence from the text

1) What are moons? Do all planets have moons?

2) How w[illegible]oon formed?

Summarize What is th[illegible]ng and supporting details

True or False Circle whether the statement is true or false

1. Moons are natural satellites because they orbit planets	True	False
2. Moons orbit around the Sun, not around planets	True	False
3. Scientists know exactly how many moons there are in our solar system	True	False
4. Most moons have atmospheres (air) and oceans	True	False
5. Moons are made of rock materials	True	False

Name: ______________________ 18 Curriculum Connection

Planetary Systems in Space

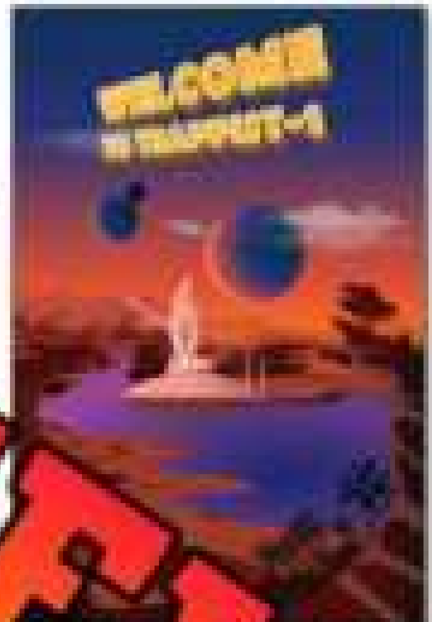
What are Planetary Systems?

A planetary system is a group of celestial bodies, including a star and everything that orbits it. Here are some key points:

- The star acts like the parent of the family. Its gravity makes the other bodies orbit it.
- Planets are like the star's kids, and they travel around the star in paths called orbits.
- Some p[illegible] have moons, which are smaller bodies that orbit the planets.

The TR[illegible] Closer Look

TRAPPIST[illegible] system located about 40 light-years a[illegible] 40 years for light to travel there!) What [illegible] find out!



The Star: TRAPPIST-1

At the center of this system is the [illegible]. It's a lot smaller and cooler than our Sun. [illegible] an "ultra-cool dwarf" star.

The Planets

TRAPPIST-1 is famous for its seven Earth-sized planets. The[illegible] TRAPPIST-1b, 1c, 1d, 1e, 1f, 1g, and 1h. Here are some fun facts:

- All 7 planets are a similar size to Earth. They could have rocky surface[illegible] ours!
- Three of the planets (1e, 1f, and 1g) are in the "habitable zone." This means they could potentially have liquid water on their surfaces.
- The planets are so close to each other that if you stood on one of them, you could see some of the other planets in the sky, just like we see the Moon from Earth!

Other Features

- The TRAPPIST-1 system is too far away for us to know if it has moons or comets. But, astronomers are using powerful telescopes to learn more about it every day.

Name: _____ 19

Planetary Systems in Space

Questions Answer the questions below using evidence from the text

1) Why is the star important in a planetary system?

2) What i… …he planets in the TRAPPIST-1 system? Write 3 things.

1)	
2)	
3)	

Draw Draw your own diagram of …ST-… …information you have

Multiple Choice Circle the correct answer

1) Is TRAPPIST-1 a star or planet?	Star	Planet
2) How many planets does TRAPPIST-1 have?	7	8
3) Is TRAPPIST-1 bigger or smaller than our Sun?	Bigger	Smaller
4) Are all seven TRAPPIST-1 planets in the habitable zone?	Yes	No
5) Is our Solar System a planetary system?	Yes	No

Name: _____ 20

Activity: Galaxy in a Bottle

Objective — What are we learning more about?

To help students understand the vastness and diversity of the universe in a fun and creative way.

Materials — What do we need for our experiment?

- ✓ Clear [illegible] bottle with a cap
- ✓ Dif[illegible]itter (each color represents a [illegible]verse)
- ✓ Cotton balls
- ✓ Water
- ✓ Food coloring [illegible]

Procedure — How do we [illegible]

1) First, talk to the students about the [illegible] of stars, galaxies, and different elements. Explain how each color of [illegible] represent a different element or type of celestial body, for instance, [illegible] gold for planets, and silver for asteroids.
2) Take the clear bottle and add a bit of water just to [illegible]
3) Stretch out some cotton balls and push them into the bottle, [illegible] covered.
4) Sprinkle the first color of glitter on top of the cotton balls. This repre[illegible] one element or celestial body in the universe.
5) Add another layer of cotton balls, pressing down so that the glitter gets encased between the layers. This is to show how the universe is layered.
6) Repeat the process with different colors of glitter and more cotton, creating multiple layers in the bottle.
7) Once the bottle is full, put the cap on tightly. Now you have your own little universe!
8) Students can shake the bottle to see how the "universe" changes, just like our actual universe is always in motion.

Name: _____ 21

Activity: Galaxy in a Bottle

Observations

What do you see?

1) Can you see individual "stars" or "planets" or do they all blend together?

2) How [illegible] galaxy change when you hold it up to the light?

Results

Answer the ques[illegible] below.

1) How is our actual universe similar to your galax[illegible]

2) Order the space components in order from smallest to larger:

Planets Galaxies Stars Solar System Moons Universe

Name: _____ 22

Space at Night vs During the Day

Observing Space Objects: Why is it Easier at Night?

Space is full of exciting objects like stars, planets, and galaxies. But, have you ever wondered why these objects are more easily observed at night? Let's explore why.

Light from the Sun

During the [illegible] Sun is the most dominant object in our sky. It [illegible] that it outshines most other celesti[illegible] towering brightness Makes it [illegible] other objects in the sky.

Darkness of the Ni[illegible]

When it's nighttime, the [illegible] facing away from the Sun. Wit[illegible] the Sun, the sky gets dark. This darkness [illegible] backdrop for observing other objects in space because there's no [illegible]

Absence of Skyglow

Skyglow refers to the brightness of the night sky in popul[illegible] caused by artificial lighting and can make it more challenging [illegible] However, during the darkest parts of the night, the skyglow reduces, [illegible] see these objects.

List of Objects Easier to See at Night

- Stars: Other than the Sun, stars are the most visible objects in the night sky.
- Planets: Planets like Venus, Mars, and Jupiter can be seen with our eyes at night.
- The Moon: The Moon is very visible at night, especially during its full phase.
- Meteor Showers: These are best observed in the darkest parts of the night.
- Galaxies: With a good telescope, you can see galaxies at night.

Name: _____ 23

Space at Night vs During the Day

Questions Answer the questions below using evidence from the text

1) Why are most objects in space easier to observe at night?

2) What is ... does it affect our observation of space objects?

Making Connections Are you ... during the day? How about at night? Explain

True or False Is the statement true or false?

1) The Sun outshines most objects in the sky.	True	False
2) We can only see space objects during the day.	True	False
3) Skyglow is caused by natural light.	True	False
4) Planets like Mars can be seen at night.	True	False
5) We can see galaxies at night with a telescope.	True	False

Name: _____ 2k

Technologies for Viewing Space

Technologies for Viewing Objects in Space

Welcome to our report about the exciting technologies used for observing objects in space. We will talk about three main tools – binoculars, telescopes, and planetariums. These are instruments that astronomers, scientists, and even everyday people use to explore the wonders of our universe.

Telescopes

Telescopes help us look closer and bigger. They can show more details and see farther than binoculars. They come in different sizes, from ones you can use in your backyard to big observatories and even in space like the Hubble telescope. With a telescope, you can see Saturn's rings, far galaxies, and nebulae (clouds of dust and gas in space).

Binoculars

Binoculars are like two small telescopes that you look through. They're often the first thing beginners use to look at space. They're small and light, so you can carry them around. You can see the moon, planets like Jupiter and Saturn, and even faraway star groups and galaxies with them.

Planetariums

A planetarium is a special room where you can see pictures of the night sky on a big dome ceiling. They use high-tech projectors to display images of the night sky onto a dome overhead. They simulate the motion of the stars and planets to recreate the sky at any point in time. Planetariums are great for people to learn about the objects in the sky without needing their own viewing equipment.

Name: _____ 25

Technologies for Viewing Space

Explain Describe the technologies below

Telescope	
Binocul	
Planetarium	

Making Connections Have you ... ese technologies?

True or False Is the statement true or false?

1) Binoculars are like small telescopes.	True	False
2) You can't see planets with binoculars.	True	False
3) All telescopes are the same size.	True	False
4) Telescopes can see farther than binoculars.	True	False
5) A planetarium shows a live view of the actual night sky.	True	False

Name: ______________________

Curriculum Connection

Activity - Making Binoculars

Research Question What are we learning more about?

Binoculars are handheld telescopes that allow us to see further. Binoculars focus our sight on smaller areas further away. Binoculars use lenses to magnify our sight. Our binoculars will not have lenses, but they will focus out sight.

Materials ... do we need for our experiment?

- ✓ 3 t... ro... person
- ✓ Staples, hot...
- ✓ Ribbon or stri... ack...
- ✓ Decorative materials ... cra... ckers, ribbon, etc.

Procedure How do we complete ... ctivity?

1) Cut one of the toilet paper rolls in half
2) Place the two rolls beside each other so they are lined up perfectly
3) Place the cut roll on top
4) Staple or glue the cut roll on top of the other two rolls.
5) Tape or staple the string/ribbon to the binoculars
6) Decorate the binoculars using different materials, like stickers and markers.
7) Look at something in the distance with and without the binoculars. Do you notice a difference?

Name: _____ 27

Hubble Telescope

What is the Hubble Telescope?

The Hubble Telescope is a big telescope that's not on Earth, but in space! It was named after a famous scientist named Edwin Hubble.

Why is Hubble Special?

The Hubble Telescope is special because it's above the Earth's atmosphere. This means it can see ... telescopes on Earth. It can take really clear pictures of stars, galaxies, ...

How Hubble Wo...

The Hubble Telescope ... through two solar panels. It can't go wherever it wants in space. ... path called an orbit. It's about 550 kilometres above Earth. That's hig... than ...

People on Earth control Hubble. ... Hubble where to look and when to take pictures. Then Hubble sends th... so scientists can study them. So even though Hubble ... very far away, it's always connected to us here on Earth.

What Has Hubble Seen?

Hubble has seen a lot of amazing things. It has looked at faraway galaxies, bright stars, and even the birth and death of stars. It has also taken pictures of planets in our solar system.

Cool Facts About Hubble

- It was launched into space in 1990.
- Hubble has traveled more than 4 billion miles in space!
- Hubble doesn't need a driver, it is controlled by people on Earth.

Name: _____ 28

Hubble Telescope

Think | Write 5 things you learned about the Hubble Telescope

1)	
2)	
3)	
4)	
5)	

Draw | Draw the Hubble [illegible]

True or False | Is the statement true or false?

1) The Hubble Telescope is on Earth.	True	False
2) Hubble was named after a scientist.	True	False
3) Hubble can see better than Earth telescopes.	True	False
4) Hubble gets power from the moon.	True	False
5) Hubble can go anywhere in space.	True	False

Name: _____ 29

Safe Sun Viewing

Looking at the Sun Safely

The Sun gives us light and warmth. But, did you know looking directly at the Sun can hurt your eyes? It's so bright that it can cause damage. But don't worry! We can still observe the Sun safely with the right tools and rules.

Why We Can't Look at the Sun

The Sun may not look like it, but it is extremely bright. It's so bright that our eyes can't handle it. The Sun sends out a lot of light, including types we can't see like ultraviolet (UV) light. This UV light is very powerful. If it gets into our eyes, it can hurt them.

It's like how our skin can get sunburned if you stay outside too long without sunscreen. Your eyes can get "sunburned" too, but it is not like a normal burn. It can cause a lot of pain and even make you lose your sight. That's why it's very important not to look directly at the Sun, especially without proper protection.

Using Safety Equipment

Special equipment is needed to look at the Sun. One of these tools is "solar viewing glasses." These glasses have super dark lenses that protect your eyes. You can't use regular sunglasses because they don't block enough sunlight.

Another way to look at the Sun safely is by using a "pinhole projector." It's something you can make yourself. It lets you see the Sun without looking at it directly.

Following Safety Rules

1) Never look directly at the Sun, even if the Sun doesn't seem very bright
2) Only use safe equipment. Regular sunglasses or binoculars are not safe

Name: _____ 3D

Safe Sun Viewing

Questions Answer the questions below using evidence from the text

1) Why can looking directly at the Sun hurt your eyes?

2) What [illegible] can we use to look at the Sun safely?

Making Connections What d[illegible]ind you of?

True or False Is the statement true or false?

1) We can't see ultraviolet light.	True	False
2) Regular sunglasses are safe for Sun viewing.	True	False
3) Our eyes can get "sunburned" by the Sun.	True	False
4) Binoculars are safe for looking at the Sun.	True	False
5) It's safe to look at the Sun if it doesn't seem bright.	True	False

Name: _____ 31

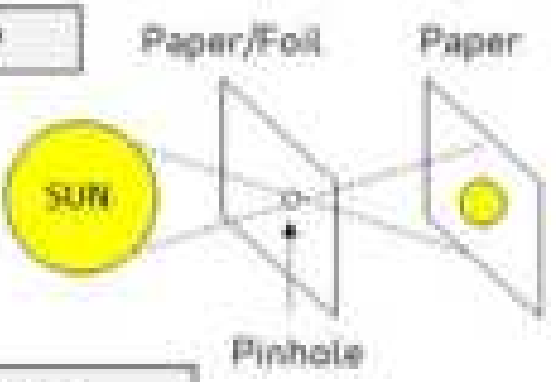
Experiment - Pinhole Projector

Objective — What are we learning about?

To create a simple pinhole projector that allows you to safely observe the Sun.

Materials — What do we need for our experiment?

1) Two p… cardboard
2) Alu…
3) T…
4) A…



Method — …o w… …e experiment?

1) Prepare the Projector: S… …in… …the cardboard. In the center of this cardboard, cut a small s… h… …about 1x1 inches.

2) Create the Pinhole: Next, take a sm… …ce of … …and cut it so it's just a bit larger than the hole you've cut in the car… Tape … …of aluminum foil securely over the square hole. Ensure it's fl… …mo…

3) Make the Pinhole: Now, it's time to make the actual p… …e … …carefully poke a tiny hole right in the center of the aluminum foil…

4) Set Up for Viewing: To use your pinhole projector, first make sur… … towards the Sun. You should be facing away from the Sun, not toward…

5) Position the Projector: Hold the piece of cardboard with the foil above your shoulder or to your side. Make sure the Sun is shining directly onto the foil side of the cardboard.

6) Position the Screen: Hold the second piece of cardboard (this will be your screen) in front of you, in the shadow of the first cardboard piece.

7) Observe: You should see a small, round, bright spot of light appear on the second piece of cardboard. This is the projected image of the Sun. Adjust the distance between the two pieces of cardboard to focus the image.

Name: _____ 32

Experiment - Pinhole Projector

Observations

What do you see?

1) Describe what you saw using your projection. Explain the shape and colour.

2) What [illegible] the Sun's projection if you move the second piece of cardboard [illegible]?

Results

Answer the questions b[illegible]

1) Why is the projection of the Sun the shape that it is?

2) Why can you look at the projection of the Sun, but not directly at the Sun itself?

Name: _____ 35

What Are Constellations?

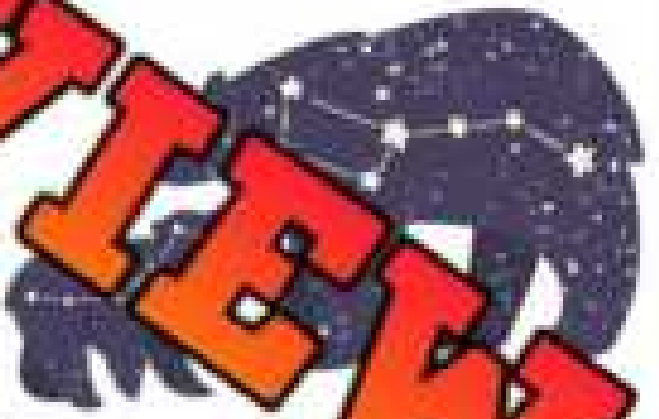
What Are Constellations?

When you look up at the night sky, you can see a lot of stars. A constellation is a group of stars that make a special shape. People long ago started noticing these shapes in the stars and gave them names. It's kind of like a big dot-to-dot in the sky!

Where Do Constellation Names Come From?

The names of constellations come from many different places. Many constellations have names that come from old myths. These myths were told by people like the Greeks and Romans. For example, the constellation Orion was named after a great hunter in Greek myths.

But not all constellations have old stories. Some constellations have names that come from the shapes they make. For example, "Ursa Major" means "Big Bear" and "Ursa Minor" means "Little Bear" because people thought these constellations looked like bears.



Are Stars in a Constellation Close Together?

When you look at a constellation, you might think the stars are close together, but that's not true! Stars in the same constellation can be very far away from each other, even millions of kilometers apart. They only seem to be close together because we are so far away from them.

Cool Facts About Constellations

- There are 88 recognized constellations.
- Different cultures around the world have different constellations.
- Constellations can help us know which way is north or south.

Name: _____ 36

What Are Constellations?

Questions Answer the questions below using evidence from the text

1) What are constellations?

2) Are the ... lation close together? Explain why they look close.

Draw Draw the two co... ...d Ursa Minor

Ursa Major	Ursa Minor

Multiple Choice Circle the correct answer

1) What is a constellation?	Shape	Star
2) Where do constellations get their names from?	Scientists	Stories
3) What does "Orion" represent in mythology?	Hunter	Bear
4) "Ursa Major" means what in English?	Little Bear	Big Bear
5) What makes stars in a constellation seem close together?	Size	Distance

Name: _____ 37

Earth's Movements and the Changing Sky

Earth's Daily Spin

Every day, Earth spins around in a circle. We call this spin "rotation." It's why we have day and night. When your part of Earth is facing the Sun, it's daytime for you. When your part of Earth is facing away from the Sun, it's nighttime.

How R[illegible]s

The spinning of Earth makes it [illegible] appear to move in the sky. As Earth turns, different stars come into view. That's why the night sky changes over the night. It isn't that the stars are moving. Instead, it is us spinning that allows us to see [illegible] in the sky.

Earth's Yearly Journey Around the Sun

But Earth doesn't just spin. It also moves around the Sun in a big circle. This movement is called "revolution." It takes a year for Earth to complete one trip around the Sun.

How Revolution Changes the Constellations We See

This yearly journey changes the night sky too. As Earth moves around the Sun, the nighttime side of Earth faces different directions in space. That means we get to see different stars at different times of the year.

Summer Constellations:
1) Cygnus (The Swan)
2) Lyra (The Lyre)
3) Aquila (The Eagle)
4) Sagittarius (The Archer)
5) Scorpius (The Scorpion)

Winter Constellations:
1) Orion (The Hunter)
2) Taurus (The Bull)
3) Gemini (The Twins)
4) Canis Major (The Greater Dog)
5) Cassiopeia (The Seated Queen)

Name: _____ 38

Earth's Movements and the Changing Sky

Questions Answer the questions below using evidence from the text

1) Explain how Earth's rotation causes us to see different stars at night.

2) Why do ... constellations at different times of the year?

Draw Draw your ... th moves.

Earth's Rotation	Earth's Revolution ... Sun

Multiple Choice Circle the correct answer

1) What is Earth's daily spin called?	Rotation	Revolution
2) Why do we have day and night?	Rotation	Revolution
3) Do stars move in the sky?	Yes	No
4) What is Earth's yearly journey around the Sun called?	Rotation	Revolution
5) Why do we see different stars at different times of the year?	Rotation	Revolution

Name: _____ 39

Experiment - Rotating Earth

Research Question Why do we have day and night?

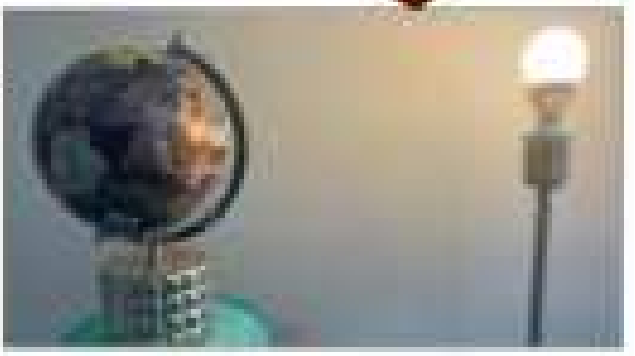
Why do we have a day with light and a night with no light?

Materials What do we need for our experiment?

1) Globe
2) Lamp or similar light
3) Dark room

Method How do we complete the experiment?

1) Take the lamp shade off the lamp
2) Put the globe about 20 centimetres away from the light
3) Point the globe so that Canada is being lit up by the light. Most of the world are dark while Canada is light.
4) Spin the globe slowly. Notice if some parts are now a bit darker and some places are now in the dark.
5) Keep spinning the globe until Canada is now in the dark. Which countries are now lit up?
6) Now switch the position of the lamp and the globe. Notice when you repeat the steps above that Canada is either further or closer to the Sun. This creates our seasons.



Name _____ 40

Experiment - Rotating Earth

Observations | Answer the questions below

1) When it is light in Canada, which countries are in the dark?

1)	
2)	
3)	
4)	
5)	

2) When Canada is positioned [illegible] to the Sun, which season is it?

Summer	Winter		Spring

3) When Canada is positioned so that it points [illegible], which season is it?

Summer	Winter	Fall	

4) Why do we have seasons? Describe the relative locations of the [illegible] Earth during each season.

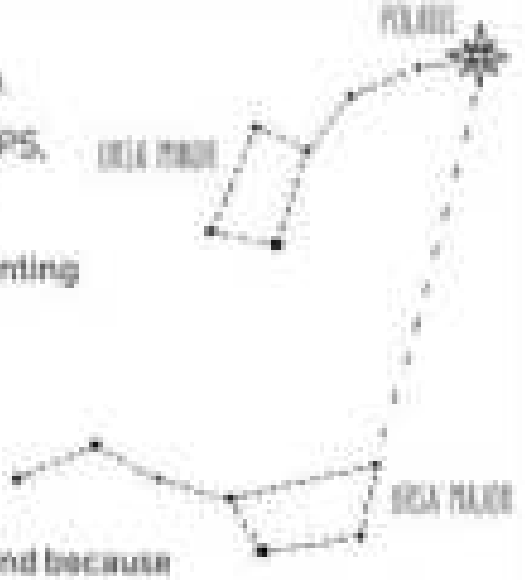
Summer	
Fall	
Winter	
Spring	

Name: _____ 41

Using Stars to Find Our Way

Using Stars for Navigation

For a long time, people have used stars to find their way. This is called navigation. Before we had compasses or GPS, sailors would look at the stars to figure out where they were. The North Star was like their compass, always pointing them North.



Orion and the Southern Hemisphere

If you're in the Southern Hemisphere, you can use the Orion constellation to find the North Star. Orion is easy to find because it has a pattern of stars that looks like a belt. If you draw an imaginary line through Orion's belt, this line points to the North Star.

Polaris, the North Star

There is a special star in the sky that always points North. It's called Polaris, or the North Star. It's not the brightest star, but it has an important job. No matter where you are, if you can find Polaris, you can find North. This is because Polaris is located almost directly above the North Pole of the Earth.

Local Names for the North Star

Different cultures and people have given the North Star their own special names. In Canada, many Indigenous groups have their own unique names about this star.

For example, the Inuit people refer to the North Star as "Nigirtsuitug." It means "the one that never moves." It describes the North Star's special position in the sky, always in the north, unmoving.

The Cree people call the North Star "Atchakos iskwew," which means "Star Woman." This name comes from a story about a woman who travelled to the sky and became a star.

Name: _____ 42

Using Stars to Find Our Way

Questions

Answer the questions below using evidence from the text

1) How does the North Star help people find their way?

2) Do all [illegible] call the North Star the same name? Explain

Draw

Draw the [illegible] Major

Multiple Choice

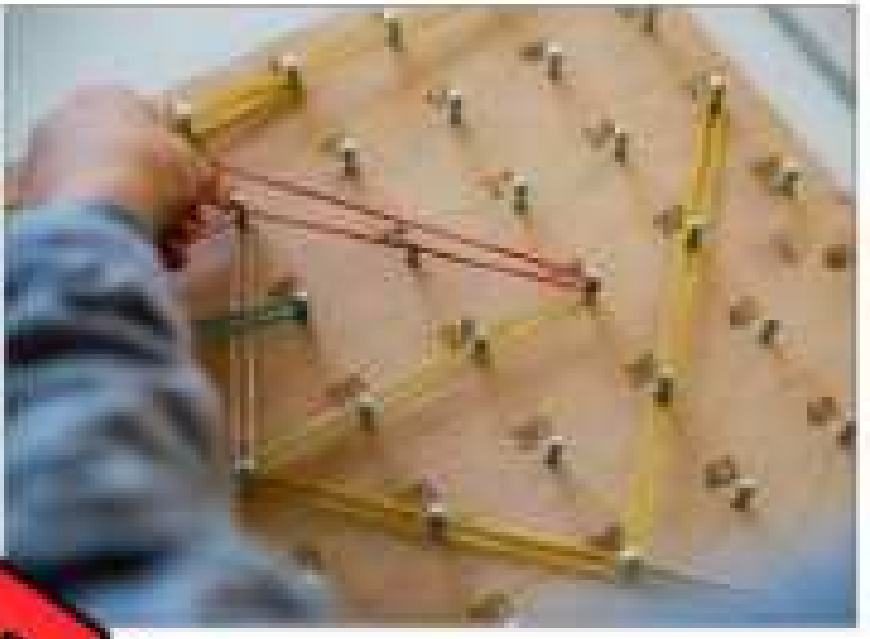
Circle the correct answer

1) Which hemisphere can Orion be seen in?	Northern	Southern
2) Which star can show us which direction is south?	Orion	Polaris
3) Is Polaris the brightest star in the sky?	Yes	No
4) Does the North Star move in the sky?	Yes	No
5) Which constellation is Polaris part of?	Ursa Major	Ursa Minor

Name: _____ 44

Experiment - Geoboard Constellations

Use a geoboard to represent 4 constellations. You can research your own, or choose from the options provided. Once you've created your geoboard c[illegible]ion, draw it using th[illegible]



Materials

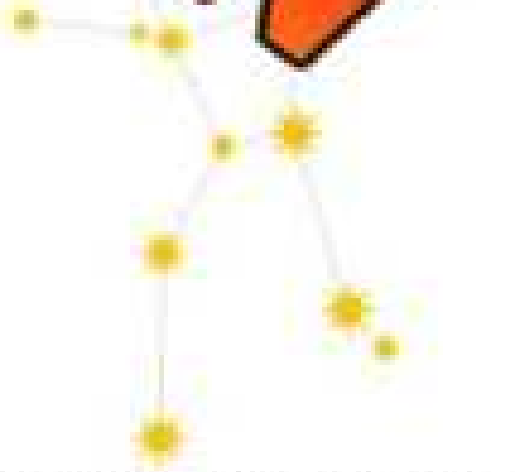
- Paper with dot paper
- Geoboard
- Elastics
- Constellations

[illegible]nstellation

Procedure

How you perform the experiment

1) Research or choose 4 constellations from the options provided to you
2) One at a time, represent a constellation using elastics on the geoboards. You likely won't be able to represent it perfectly, but do your best!
3) Draw each constellation on the dot paper before moving on to the next constellation



Hercules Constellation

Name: ______________________

Experiment - Geoboard Constellations

Examples Below are some examples of constellations you can use


Draco Conste...


D... Constellation


Serpens Constellation


Grus Constellation


Triangulum Constellation


Sc... ...ation


Perseus Constellation

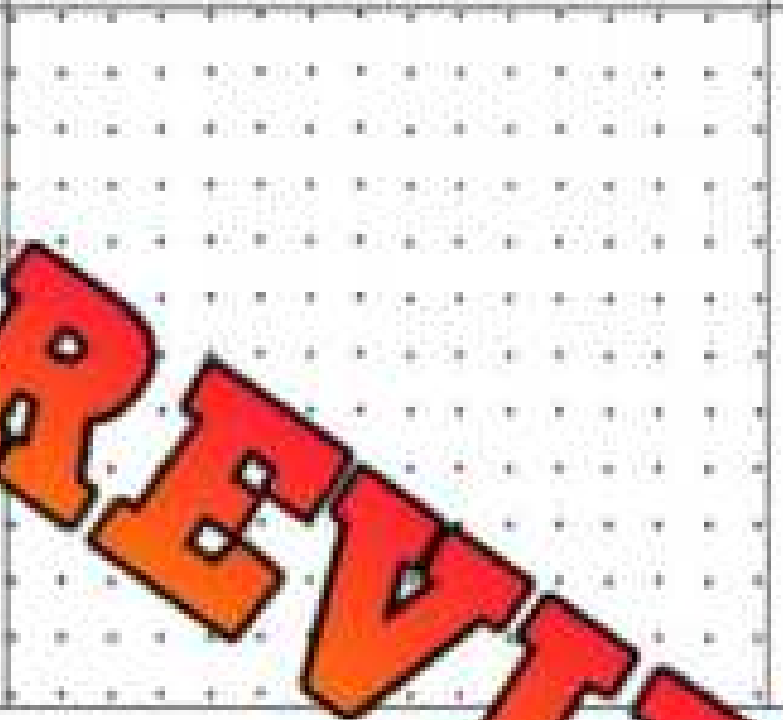

Pegasus Constellation

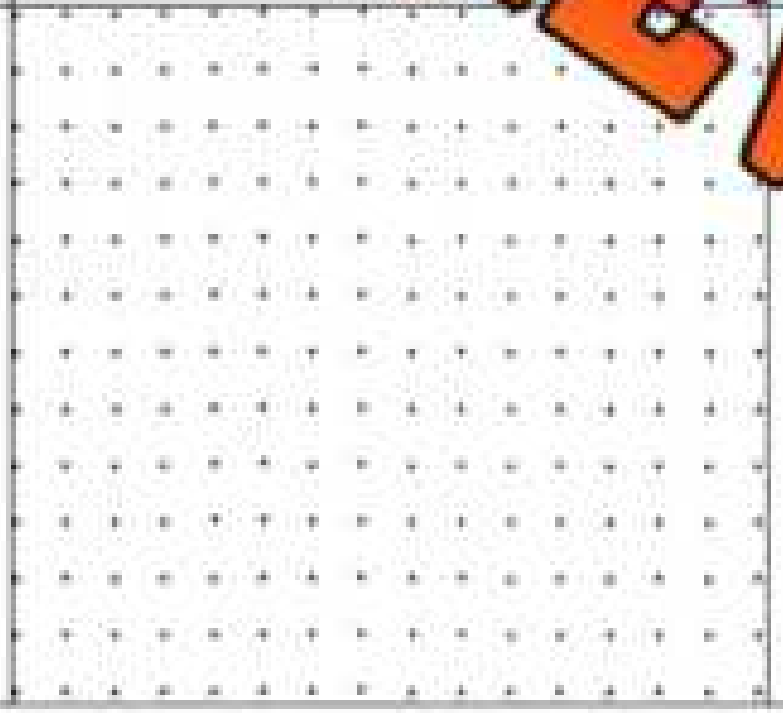

Orion Constellation

Name: _____ 46

Experiment - Geoboard Constellations

Draw Draw each constellation you decide to represent on your geoboard

Constellation Name	Drawing	How Many Stars
		

Constellation Name	Drawing	Many Stars
		

Name: _____ 48

Indigenous Constellation Story - Great Bear Hunt

Many Indigenous groups, including the Cree, Mi'kmaq, Haudenosaunee, and Haida share a story relating to the Big Dipper constellation.

The Great Bear Hunt

It is about a huge bear called Mista Muskwa, who roame[illegible]ver the lands. All living things were afrai[illegible]cause it was big, mean and power[illegible]

On[illegible] som[illegible]ecided to meet and plan to ge[illegible]bear[illegible]f the best hunters were [illegible]to bear. The best hunters ar[illegible]we[illegible]obin, Chickadee, Moose-bird, Blue Jay, Pigeon, Horned Owl a[illegible]Saw

The ravens did not like the plan. [illegible]ed th[illegible]ecause they followed it around and ate the bear's left-overs. So, th[illegible]s d[illegible]l Mista Muskwa about the plan to get rid of him.

Mista Muskwa was mad when he found out. He fo[illegible]ar[illegible]to scare them. But, when the hunters were not afraid, the bear tur[illegible]s what bullies do when confronted.

As he left, the hunters attacked and left Mista Muskwa bleeding. Mista Muskwa shook off the blood, like a wet dog shakes off water. As he did, the blood landed on the earth and painted the leaves red. That is why the leaves change colours in the fall season.

As he shook, he also splattered a drop of blood on the Robin's chest. Now, all robins have a red chest. To remind us all about bullies, Mista Muskwa was placed in the sky along with seven birds.

Indigenous Constellation Story - Great Bear Hunt

Yes/No — Is the answer to the question yes or no?

1) Do constellations tell a story to the First People?	Yes	No
2) Was Mista Muskwa a nice and kind bear?	Yes	No
3) Did the ravens want to protect Mista Muska?	Yes	No
4) Were the hunters who stopped Mista Muskwa the biggest animals?	Yes	No
5) Does the [illegible] have a red chest?	Yes	No

Questions — Answer the questions below using evidence from the text

1) Summarize the [illegible] Great Bear Hunt.

____

____

____

____

____

2) What lessons can be learned from the story?

____

____

____

Making Connections — What does this story remind you of?

____

____

____

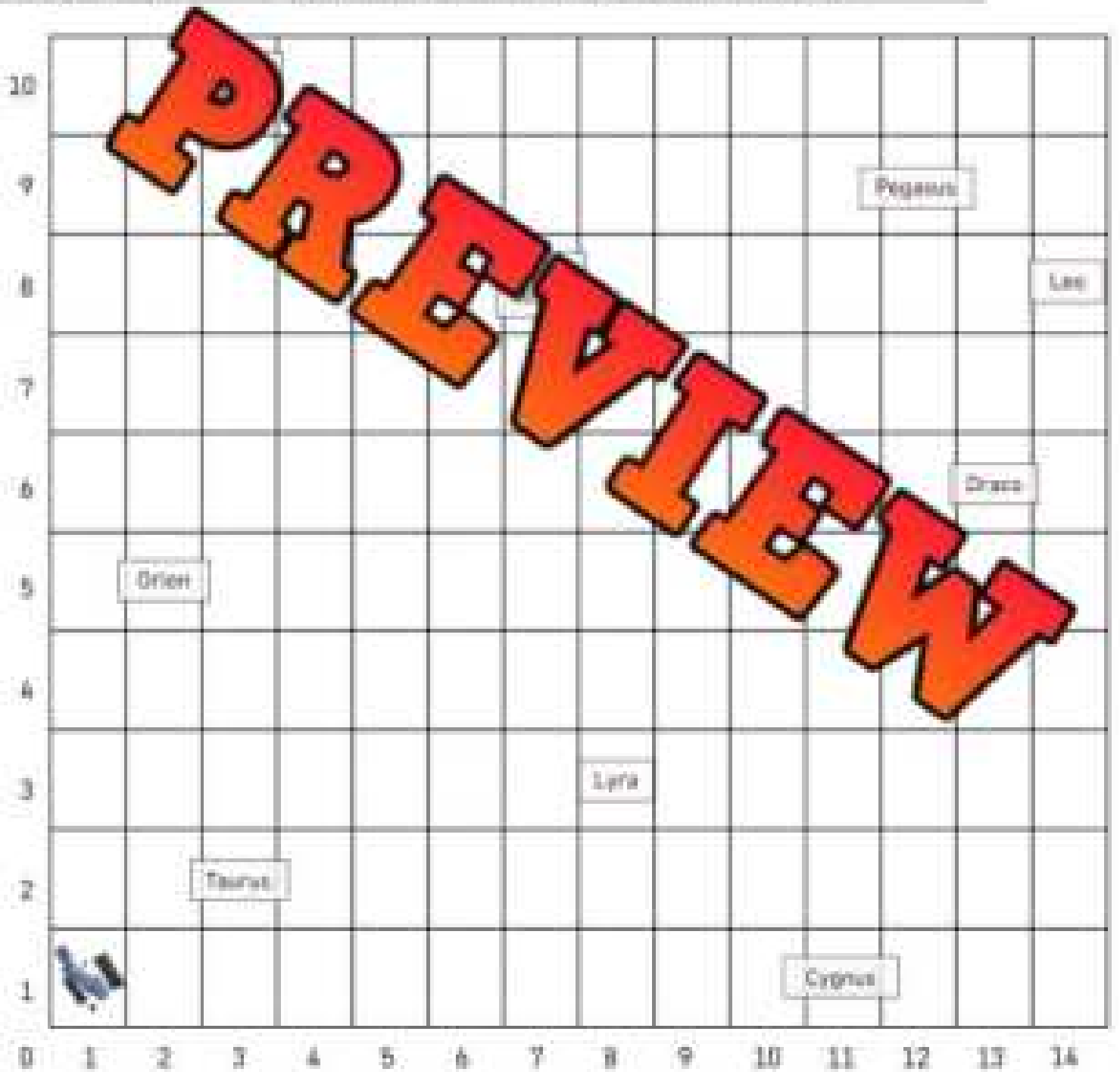
____

Name: _____ 50

Coding - Hubble Telescope and Constellations

The map below shows where certain constellations can be found. The Hubble Telescope is controlled by humans on Earth, but we need to tell it where to look. Use the map to move the Hubble Telescope to where it needs to be pointed.

Mapping Use this map to write the code on the next page



Name _____ 51

Coding - Hubble Telescope and Constellations

Coding Write code that points the telescope at all constellations in alphabetical order. Have the telescopes take pictures of each constellation.

Example C

- move to (
- take picture
- move to (8, 3)
- take 3 pictures of Ly

Code

Question Why do you think the Hubble Telescopes gets better images of space than telescopes on Earth?

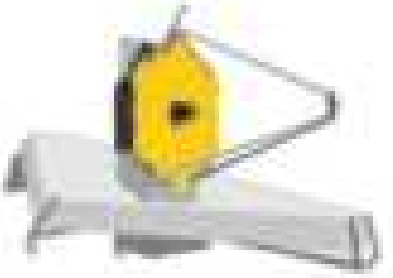
Name: _____ 52

STEM Assignment - Designing a Space Telescope

Create your own telescope that can see deep into space.

What tools does your telescope need?
- Solar panels, lenses, engine so it can move, propeller, antenna to communicate with Earth, etc.

What is your telescope capable of doing?
- Can it move anywhere in space, or does it orbit?
- Can it tr[illegible]ickly?
- Can it s[illegible]lark?
- Does i[illegible]vision allowing it to see living things?



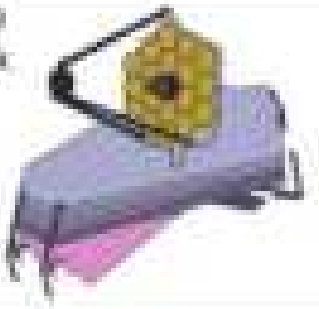
What [illegible] designed to do?
- Will it [illegible]
- Will it look [illegible] be habitable?

Questions	Answer [illegible]ons [illegible]ur telescope below
1) What is the name of your telescope?	
2) What tools will your telescope have?	
3) What is your telescope capable of doing?	
4) What will your telescope be designed to do? What is the goal of using the telescope?	

Name: _____ 53

STEM Assignment - Designing a Space Telescope

Write simple If/Then statements so that the controller of the telescope can send instructions for the telescope to follow. For example, to work a movement of the telescope, the code could look like this.



If the left arrow button is pressed

THEN turn left

IF/THEN Wr[illegible]or each tool that your telescope has so that you can control the tools

If

THEN

If

THEN

If

THEN

If

THEN

If

THEN

If

THEN

If

THEN

Name: _____ 54

STEM Assignment - Designing a Space Telescope

Draw Draw your telescope. Make sure it has the tools you included in your plan

Name: _____ 55

STEM Assignment - Designing a Space Telescope

Your space telescope has just been launched. You are at the controls. What did you discover on your first three days? Write down your observations in your journal entries below.

Journal Write your three journal entries below

Day 1 – Journal Entry

Day 2 – Journal Entry

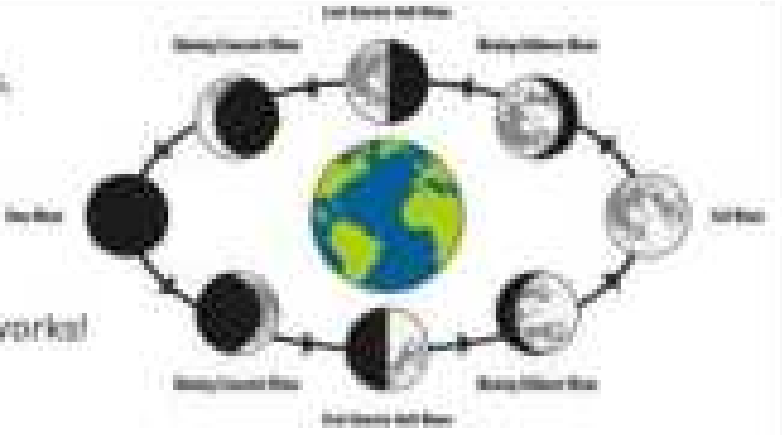
Day 3 – Journal Entry

Name: _____ 56

Measuring Time Using The Moon

The Moon: Our Ancient Calendar

Long before we had clocks or calendars, people kept track of time by looking at the Moon. The Moon has been used to measure time for thousands of years. Let's [illegible]re about how this works!



Moon [illegible]

Have you [illegible] the Moon looks different at different times? Sometimes it's full and round, [illegible] it's a thin crescent. These are what we call the Moon's "phases." The Moon [illegible] every month, from a New Moon (when it looks like there's no Moo[illegible] Full [illegible] back again.

Using the Moon to Measure Time

Because the Moon's phases repeat about every mo[illegible] people [illegible] them to measure time. This is where the word "month" comes fro[illegible] used to be "moonth," which means the amount of time it takes for the Moon to go [illegible] of its [illegible] This takes about 29.5 days, but we round it up to 30 or 31 days for our [illegible]

Lunar Calendars

Some cultures even created lunar calendars based on the Moon's cycles. For example, the Haida calendar uses the phases of the Moon to measure time. Each new month begins with the sighting of the New Moon.

The Moon's Impact Today

Even today, the Moon still helps us keep track of time. We divide the year into 12 months, which roughly lines up with the number of times the Moon orbits Earth in a year. The Moon's phases can also help farmers know the best time to plant crops.

Name: _____ 97

Measuring Time Using The Moon

Questions Answer the questions below using evidence from the text

1) Explain in your own words how the Moon was used to measure time.

2) Why is [illegible] based on the Moon?

Questioning Write 3 [illegible] the reading

1)	
2)	
3)	

Multiple Choice Circle the correct answer

1) The word "month" comes from which word?	Moon	Moonth
2) How long does it take for the Moon to go through all phases?	29.5 days	31 days
3) What calendar uses the phases of the Moon to measure time?	Haida	Gregorian
4) How many months do we divide the year into?	10	12
5) Which of these is a phase of the moon?	Blue Moon	Crescent

Name: _____ 58

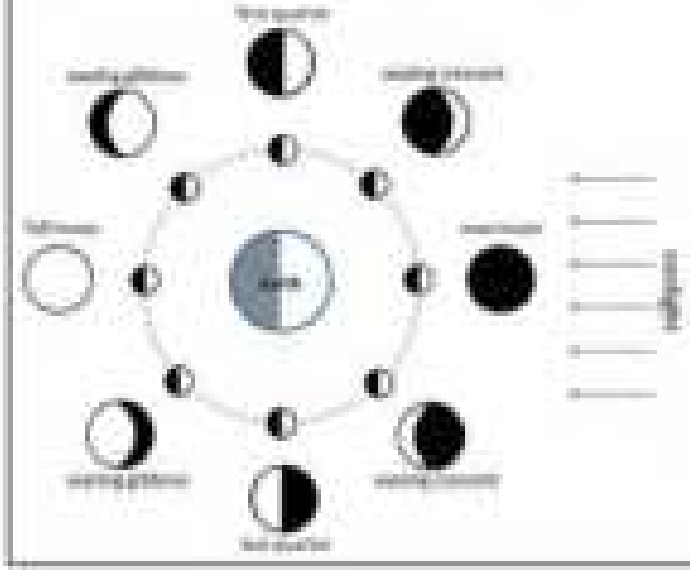
Phases of the Moon

What are the Phases of the Moon?

Have you ever noticed that the shape of the moon changes? Some nights the moon is a full circle, while other nights it is a small sliver. Astronomers have figured out that we have 8 main phases of the moon, meaning we have 8 different shapes of the moon that we can see on a clear night.

Why does the Moon change shape?

The Moon is shaped like a sphere, and it orbits around the Earth. The Moon takes about 4 weeks to finish one orbit around the Earth. **Orbit** means a repeated path around the Earth. Since the orbit is repeated over and over, we can predict exactly what phase of moon we will see in the future.



The moon will go through all 8 phases in the 4-week orbit. This is called a **lunar cycle**. We see a different shape because the Sun lights up different parts of the moon as it orbits around the Earth. A new moon can't be seen, while a full moon is completely visible on Earth.

The Sun always lights up half of the moon, but what we see depends on where the Moon is in its orbit around the Earth.

Name: _____ 59

Phases of the Moon

Diagram

Draw each of the phases of the moon

Waxing Crescent		Waxing Gibbous	Full Moon	Waning Gibbous	Last Quarter	Waning Crescent	New Moon

Questions

Answer the questions below using evidence from the text

1) Why do we have different phases of the moon?

2) What is the lunar cycle? If we see a full moon today, how many days until the next full moon?

True or False

Circle whether the statement is true or false

1. There are 9 phases of the moon	True	False
2. The lunar cycle is 28 days long	True	False
3. The Earth orbits around the moon	True	False
4. The sun always lights up half of the moon	True	False
5. We cannot see a new moon	True	False

Name: _____ 60

Experiment - Moon Phases

Recreate the moon phases using Oreo cookies. Follow the instructions below to complete the activity.

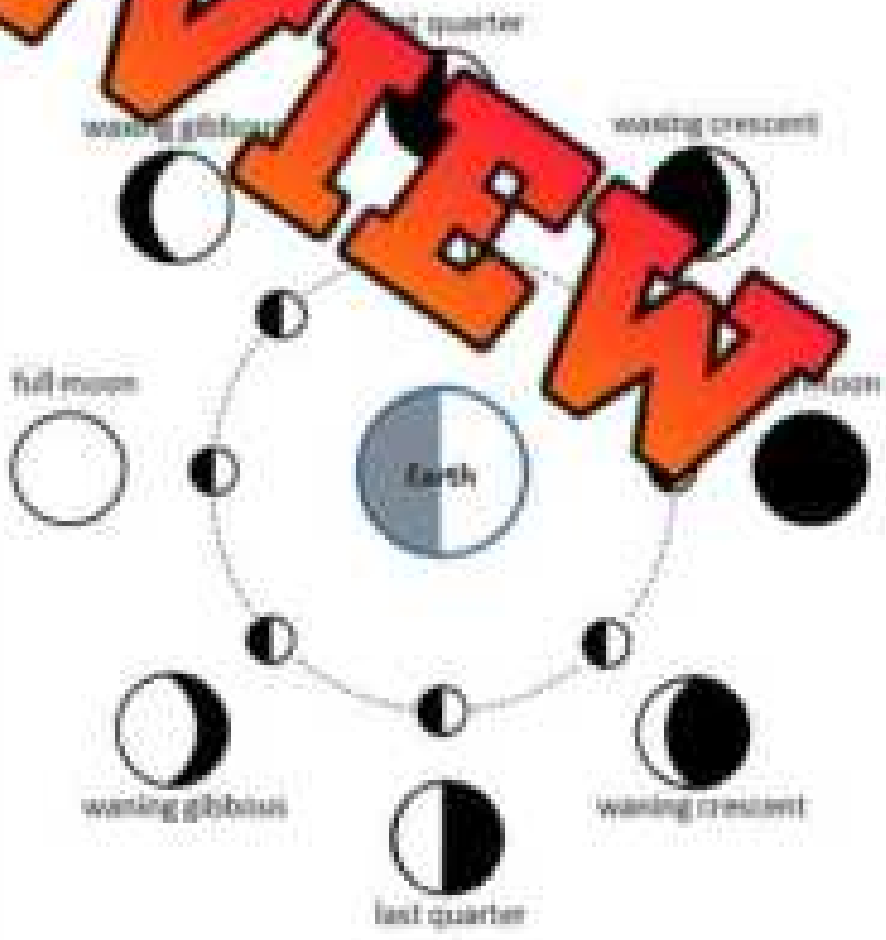
Materials

What you need

- 8 Oreo
- Pap
- A pop stick
scraping the

Procedure

1) Separate the cookie so that the icing is on one side of the cookie and not the other. Twisting the cooking a bit works to achieve this.
2) Use the popsicle stick to create each phase of the moon
3) Glue the phase of the moon onto the paper plate. Make sure to put them in order
4) Label the moon phases with their official name



Name _____ 6.1

Experiment - Moon Phases

Results | Answer the questions below

1) Does the Moon emit light or reflect light?

2) Does the Moon move around the Earth or does the Earth move around the Moon?

3) Why do [illegible] phases of the moon?

4) Why are the phases of th[illegible] astronomers know what moon phase we will have a month fro[illegible]

5) Go online and search "Moon Phase Calculator". W[illegible]se we will have on your next birthday. Then find out the moon on yo[illegible]hday [illegible] about your 60th birthday?

Date	Name of Moon	
Next Birthday		
30th Birthday		
60th Birthday		

Name: ______________________ 62

Moon Calendar of Alberta's Indigenous Groups

Moon Calendar of Alberta's Indigenous Groups
Indigenous groups in Alberta, Canada have been looking at the Moon for thousands of years to understand the changing seasons and to keep track of time. This way of measuring time is often called a "lunar calendar". Let's learn how it works!


moon phases

What is a Lunar Calendar?
A lunar calendar is a type of calendar that's based [illegible] Moon's cycles. Just like how ou[illegible] calendar is based on the Sun, a lunar calendar is based on the Moon. Bu[illegible]ths, a lunar calendar has "moons".

How do [illegible] Lunar [illegible] Work?
In Alberta, [illegible] like the Cree and Blackfoot used the lunar calendar. Each moon in th[illegible] what happens in nature during that time. Check out the exa[illegible]low.

Blackfoot Moons:

- Cold Maker Moon (January): [illegible] time of the year.
- Snow Moon (February): This moon a[illegible] deep.
- Rain Falling Moon (March): The moon of the [illegible]son.
- Flowers Blooming Moon (May): This moon mark[illegible]
- Long Days Moon (June): The moon of the longest days [illegible]
- Black Cherries Moon (August): This is when chokecherries are ri[illegible]

Cree Moons:

- Birch Moon (April): This moon comes when the birch sap starts flowing.
- Raspberry Moon (July): The moon when raspberries are ripe and ready to pick.
- Leaves Changing Colour Moon (September): The moon when leaves change colour.
- Flying Ducks Moon (October): This moon appears when ducks start their migration.
- Frost Moon (November): The moon when the first frost typically occurs.
- Freezing Moon (December): This moon presides over the coldest time of the year.

Name: _____ 63

Moon Calendar of Alberta's Indigenous Groups

Questions Answer the questions below using evidence from the text

1) How do the moons throughout the year relate to the environment changing?

2) What m… according to the Blackfoot/Cree Lunar Calendar? Explain what is happ… th?

True or False Is the sta…

1) A lunar calendar is based on the Sun's cycl…	True	False
2) A lunar calendar is based on months.	…ue	False
3) 'Cold Maker Moon' marks the coldest time.	…ue	False
4) 'Flowers Blooming Moon' indicates flower bloom.		…se
5) 'Flying Ducks Moon' signifies ducks hibernating		False

Visualizing Draw what you were picturing while you were reading. Explain the picture

Name: _____ 64

Story - Little Bear and the Lunar Calendar

Draw Illustrate the story by adding pictures to the book.

Little Bear and the Lunar Calendar

Once upon a time, in the vast lands of Alberta, there lived a young Cree boy named Lit[illegible]. Little Bear was curious and loved to learn about the world around h[illegible]mother, a wise and respected elder in their community, often[illegible] the night sky. Little Bear loved these stories, but what he loved [illegible] moons that shone brightly above them.

In January, during the [illegible], his grandmother pointed to the sky and said, "Look, Little Bear, it's [illegible] Moon." Little Bear looked up and saw the full moon's bright glo[illegible] the snowy landscape. He learned that in this cold time, the frost could [illegible] trees pop and crack.

Story - Little Bear and the Lunar Calendar

When August came, his grandmother said, "Now is the time of the 'Flying Up Moon.' Look at the young birds learning to fly." Little Bear watched as small birds fluttered awkwardly, trying out their new wings under the moonlit sky.

In September, the leaves started changing co[illegible] gr[illegible] pointed to the 'Leaves Changing Color Moon.' "The moon is [illegible] changing again, Little Bear. Winter is not far away [illegible]

Haida Lunar Cycle

Haida Lunar Cycle

The Haida have used the changing moon cycle for thousands of years. The moon helps them keep track of time, which is why they have their own lunar calendar. They noticed that every 29 and a half days, the moon would go through all of its phases or shapes.

This meant in each year, or 'cold' as the Haida call it, there are 12 or 13 moons. In one year, th[illegible] count 12 moons as a cold, and in the next year, they would count 13 moo[illegible]ery two years, the total of 25 would keep the calendar in synch [illegible] as well as the changing seasons. This is similar to how other groups o[illegible] to keep the calendar in synch.

In 2023, ther[illegible] 12 m[illegible] 2024, there will be 13 moons.

Keeping Track of the Lunar C[illegible]

The Haida noticed that the moon's cycle [illegible] represented on the back of a turtle's sh[illegible]

Turtle shells have 28 smaller outer edge s[illegible] scute on the outside represents the number of days [illegible] moon to the next. Also, the turtle has 13 larger scutes on [illegible] scutes represents the 13 moon cycles in one year. If they counted [illegible] would know a full year had passed and four seasons had passed.

Naming the Months on the Lunar Calendar

Each time there is a new moon, there is a new month. For example, from December 31 to January 28, the Haida call this month Geese Month because the geese migrate to the coast where they can be hunted. Each month is named after an important animal. Each month is 28 or 29 days long, depending on the year. An extra month is added every other year.

Name: _____ 69

Haida Lunar Cycle

Questions Answer the questions below using evidence from the text

1) Why is the moon important to the Haida people?

2) How [illegible] Cycle be represented on the back of a turtle?

True or False Is [illegible] se?

1) The Haida months change with the moon cycle.	True	False
2) There are always 12 months in the Haida C[illegible]	True	False
3) If there are 13 months in a year, there are 13 mo[illegible]	ue	False
4) There are 29.5 days between full moons.		lse
5) The moon isn't important to the Haida people.		alse

Visualizing Draw what you were picturing while you were reading. Explain the picture

Name: _____ 70

Haida Teachings - The Sun and the Moon

The Sun and the Moon - Haida Perspective

The Haida people believe that the sun and the moon are powerful supernatural beings that control the cycles of day and night, as well as the seasons. According to Haida teachings, the sun and the moon are considered to be powerful spiritual forces that have the ability to influence the natural world and the lives of peo

The S

According to Haid th sun is a powerful and spiritual sy sun r life, light, and knowledge, and h d protection to those who ho s honoured by celebrating it during ritual

The sun is also a symbol of renew ebirth and sets every day. The sun is also associated with the seven sacred te wi om, courage, respect, love, humility, honesty, and truth.

The Moon

The moon is important to the Haida people. The Haida people believe th oon has the power to bring about change in the natural world and that it is responsible for the cycles of life and death. The Haida people also believe that the moon has the power to influence the behaviour of animals, and the tides of the ocean.

The Haida people practice rituals and ceremonies to honor and thank the moon for its role in the natural world, such as the "Potlatch" ceremony that is usually held during a full moon. These ceremonies serve to acknowledge the importance of the moon in their culture and to give thanks for the blessings it brings.

Name: _____ 71

Haida Teachings - The Sun and the Moon

True or False Circle whether the statement is true or false

1) The moon represents life, light, and knowledge	True	False
2) The sun represents renewal as it rises and sets each day	True	False
3) Intelligence is one of the seven sacred teachings	True	False
4) A potlatch ceremony is held during a full moon	True	False
5) The moon is responsible for change	True	False

Explain Why were the moon and sun important to the Haida First People?

	The Moon

Questioning Write 3 questions you have about the reading

1)	
2)	
3)	

Name: _____ 72

Cree Story - Wesakechak

Once upon a time, long, long ago, in the days when the Earth was young, there was a Cree tribe living in the region now known as Alberta.

The tribe loved to tell stories, and their favorite story was about Wesakechak, the trickster god, and how he brought the Sun and the Moon into the sky.

According to the story, there was a time when the Earth was dark. The people could not see, and they bumped into each other. They asked Wesakechak for help.

Wesakechak was a mischievous god who loved to help people but also enjoyed a good joke. He thought long and hard to help the people and had a bright idea.

He traveled far and wide until he found a large glowing ember from a mighty fire. It was as bright as many fires combined. He took the ember and threw it high into the sky, where it became the Sun. It lit up the world and brought warmth to the people.

The people were happy but soon realized the Sun was too bright and hot to be in the sky all the time. They could not rest, and it was hard to do anything. Again, they asked Wesakechak for help.

Wesakechak then traveled to the west, where he found a beautiful pebble by a cool stream. He tossed the pebble into the sky where it stuck and became the Moon. The Moon was cooler and softer than the Sun, perfect for when the people needed to rest.

The people were finally happy. They had the Sun to warm and light their days, and the Moon to cool and softly light their nights. And that is how Wesakechak gave the Cree people the Sun and the Moon.

From then on, every time the Cree people saw the Sun rise and the Moon glow, they would remember Wesakechak and the great gifts he had given them.

Name: _____ 73

Cree Story - Wesakechak

True or False Circle whether the statement is true or false

1) Wesakechak was a Cree god.	True	False
2) Wesakechak found the Sun in the west.	True	False
3) The Sun came from a glowing ember.	True	False
4) The people were unhappy with the Sun.	True	False
5) The Sun and Moon were both gifts from Wesakechak.	True	False

Quest the questions below using evidence from the text

1) Describe how ... reading to the story.

2) What problem did the people face after the Sun ... and how was it resolved?

Visualizing Draw what you were picturing while you were reading. Explain the picture.

Name: ______________________

What is the Gregorian Calendar?

What is the Gregorian Calendar?

Did you know that there are many types of calendars? The one most of us use today is called the Gregorian Calendar. This is our international standard calendar.

How Does the Gregorian Calendar Work?

The Gregori[illegible]endar is based on the Earth's journey around the Sun. This journey is what w[illegible] takes about 365.25 days for the Earth to complete this journe[illegible]quarter of a day on our calendar, can we?

What Are Years, [illegible]s, an[illegible]

So, we say a year has 3[illegible] that extra quarter day? Well, we [illegible] u[illegible] years, we have an extra day from those [illegible]days. We add this extra day to our calendar. Th[illegible] year w[illegible] an extra day is called a leap year, and it has 36[illegible] This day is February 29th.

The complete list of leap years in the first half of the 21st century is therefore 2000, 2004, 2008, 2012, 2016, 2020, [illegible] 2036, 2040, 2044, 2048, 2052, 2056, 2060, 2064, 2068, 2072, 2076, 2080, [illegible] 2088, 2092, and 2096.

Using the Gregorian Calendar in Daily Life

Everyone around the world uses the Gregorian Calendar in daily life. It helps us know what day it is, when to celebrate holidays, and even when to start school. So, the next time you look at a calendar, remember that it's not just a bunch of squares and numbers. It's a tool that helps us keep track of our trip around the Sun!

Name: _____ 75

What is the Gregorian Calendar?

True or False Circle whether the statement is true or false

1) Gregorian Calendar is our international standard.	True	False
2) The Earth's journey around the Sun is called a year.	True	False
3) The Earth takes 365.25 days to orbit the Sun.	True	False
4) A leap ye[illegible] 367 days.	True	False
5) The Gre[illegible]ndar is based on the Moon's cycles.	True	False

Questi[illegible] [illegible]he questions below using evidence from the text

1) What is the Gre[illegible]endar[illegible]s it work?

2) Why do we need leap years?

Think How many days are in each of the years below?

	Year	Days
1)	2024	
2)	2026	
3)	2028	
4)	2030	

	Year	Days
5)	2048	
6)	2064	
7)	2072	
8)	2099	

Comparing Calendars: Lunar vs Gregorian

What is a Lunar Calendar?

A lunar calendar is a type of calendar based on the cycles of the moon. Here are some key points about lunar calendars:

What is the Gregorian Calendar?

The Gregori[illegible]ndar, also known as the international standard calendar, is based on the Earth's [illegible]round the sun. Here's what you need to know:

How are [illegible] Simi[illegible]

Both the lunar a[illegible]n ca[illegible]e used to keep track of time. They both have cycles (months and y[illegible] over. In addition, they are both based on the repeating events invol[illegible]or t[illegible]

How are They Different?

- Based on Different Things: The lunar calendar [illegible] on [illegible]'s cycles, while the Gregorian calendar is based on the Earth's [illegible]
- Length of Months: In a lunar calendar, each month is abou[illegible] (sa[illegible] 29.5 days), matching the moon's cycle. In the Gregorian calendar, months can have 28, 30, or 31 days.
- Starting the Year: Lunar calendars often start the year based on a particular phase of the moon. The Gregorian calendar starts the year on January 1, no matter what the moon looks like.
- Usage: Lunar calendars are often used for cultural or religious reasons. The Gregorian calendar is used for everyday activities and schedules worldwide.

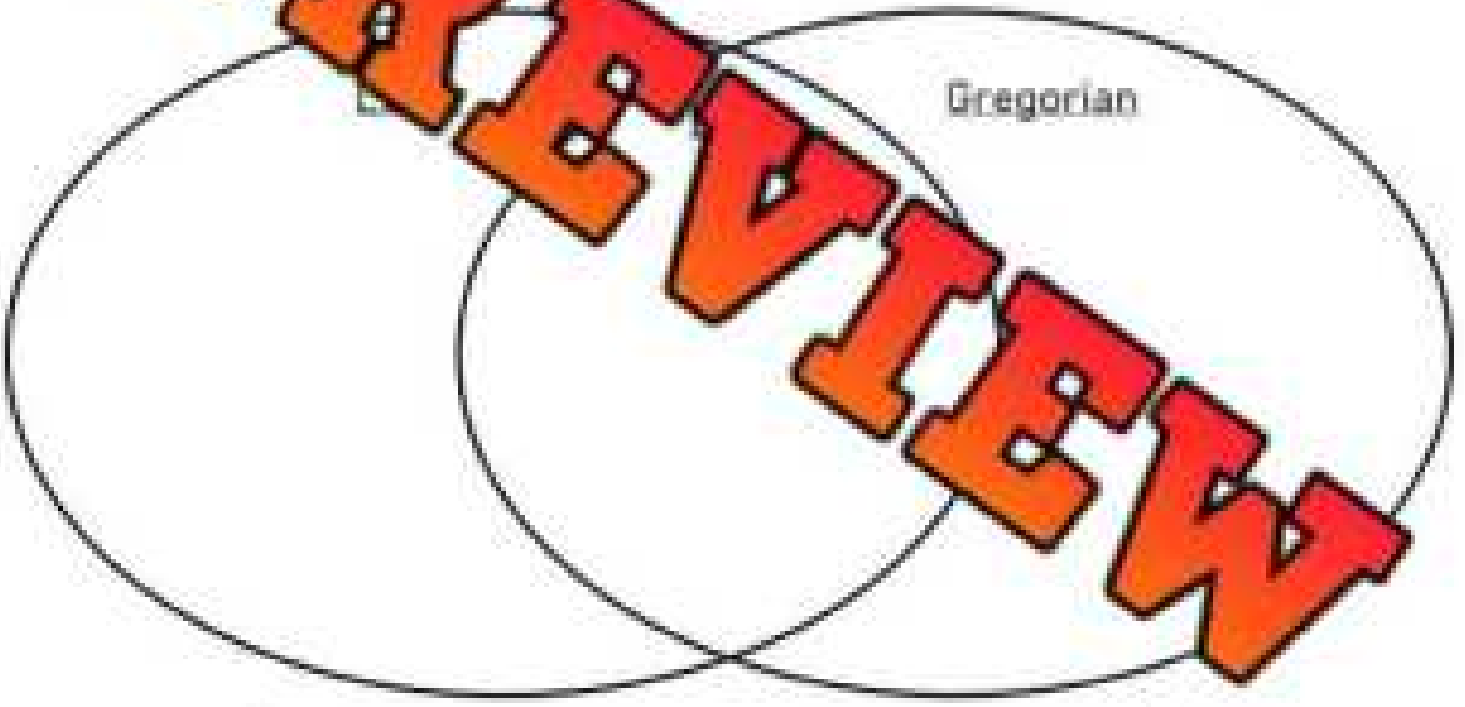
Name: _____ 77

Comparing Calendars: Lunar vs Gregorian

True or False Circle whether the statement is true or false

1) Lunar calendars are based on the sun.	True	False
2) Gregorian calendar has 10 months.	True	False
3) Both calendars have repeating cycles.	True	False
4) Gregorian calendar months vary in length.	True	False
5) The Gregorian calendar always starts the year on January 1.	True	False

Compare Compare the Lunar Calendar and Gregorian Calendar



Question Which calendar do you prefer? Explain.

Name: _____ 78

Paper Gregorian Calendar Code Wheel

Objective — What are we learning about?

Through this offline coding activity, students will enhance their understanding of the Gregorian calendar, including the sequence and length of each month.

Materials — What do we need for our experiment?

1) Two [illegible] cardstock or thick paper
2) A [illegible]
3) [illegible]
4) Scissors
5) Ruler
6) Pencil

Method — How [illegible] experiment?

1) Cut two circles from the cardstock [illegible] circle should be larger than the other one. The larger one will represent the months in a year, and the smaller one will represent the days in a month.
2) On the outer edge of the larger circle, write the [illegible]. Divide the circle equally so that each month has its own section.
3) On the outer edge of the smaller circle, write the numbers 1 to 31 around the circle. This will represent the possible number of days in a month.
4) Put the smaller circle on top of the larger one, lining up the 1 on the smaller circle with January on the larger one.
5) Push the brad through the centers of both circles to hold them together. This will let you spin the circles around.
6) Now you have a "Gregorian Calendar" code wheel! You can spin the smaller circle to see how many days are in each month. Remember, some months have 30 days, some have 31, and February has 28 or 29.
7) As a coding activity, the teacher can give each student a date (e.g., "April 5" or "October 23"). The student will then have to spin their "Gregorian Calendar" code wheel to find the given date.

Name: _____ 79

Paper Gregorian Calendar Code Wheel

Results | Answer the questions below

1) Which months have 31 days?

2) Which mo[illegible]ve 30 days?

3) How many da[illegible]y[illegible] Why is it different?

4) Can you find your birthday on the code wheel? [illegible]out [illegible]like Halloween or New Year's Day?

Important Dates	F[illegible]
Birthday: _____	
New Year's Day: _____	
Halloween: _____	
Valentine's Day: _____	
Easter: _____	
Canada Day: _____	

Name: _____ Date: _____

Unit Test - Space

Multiple Choice /10

1) Which planets are beside the Earth? a) Mars and Jupiter b) Mercury and Mars c) Venus and Mars d) Jupiter and [illegible]	2) Which is the largest? a) The Earth b) The Milky Way Galaxy c) Our Solar System d) The Universe
3) Which cal[illegible] people follow? a) Luna[illegible] b) Solar c) Gregorian d) None of the above	4) What is a Gregorian calendar based on? a) Sun b) Moon c) Earth d) Stars
5) What does Earth's rotation ca[illegible] a) Day and night b) Seasons c) Both d) None of the above	[illegible] Earth's movement around the Sun a) [illegible]on b) Orbi[illegible] c) [illegible]on d) Rotati[illegible]
7) Which star always points to the North? a) Sirius b) Orion c) Polaris d) Vega	8) The Earth o[illegible] ur[illegible] a) 24 hours b) 12 hours c) 30 days d) 365 days
9) What does a Full Moon in the lunar calendar signify? a) New month b) End Month c) Mid Month d) New year	10) Which telescope is in space? a) Planetarium b) James Webb Telescope c) Gregorian Telescope d) Hubble Telescope

Definitions– What does the term mean (1 mark each) /3

Term	Definition (what does it mean)
Universe	
Moon	
Constellation	

Short Answer Questions (3 marks each)

1. What technologies can be used to explore space?

2. Why should we never look at the Sun?

3. Why can we see space objects only at night and not during the day?

Long Answer Answer the long answer questions. Each question is 5 marks

1) What are the differences between the Gregorian Calendar and Lunar Calendar?

2) Describe the North Star. What is its scientific [illegible]? What [illegible] part of? How far apart are the stars in the constellation? Why is the North Star [illegible] for