



Preview – Information



**Thank you for your interest in this bundle.
Within this preview, you will see:**

- ✓ **A selection of worksheets included in each workbook. Keep scrolling to find the next resource included in the bundle.**

When you make a purchase, you will receive a folder with the .pdf workbook files inside.

Thank you for shopping with us. Please let us know if you have any questions at:

rob@supersimplesheets.com



Workbook Preview



Grade 3 – Science Unit

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

Guiding Question: How can materials change?

	Learning Outcome - Students investigate and analyze how materials have the potential to be changed.	Pages
M3.1	Processed materials are modified from natural materials and do not occur in nature. Processed materials are designed and manufactured for a specific purpose.	7-31
M3.2	Preview of 80 pages from this product that contains 196 pages total.	
M3.3	Matter is anything that takes up space and has weight. States of matter include solid, liquid, and gas. Melting is a change of state from solid to liquid. Freezing is a change of state from liquid to solid. Evaporation is a change of state from liquid to gas. Condensation is a change of state from gas to liquid	46 47-72
M3.4	A solid is a state of matter that has a definite shape and volume. A liquid is a state of matter that has a definite volume but no definite shape. A liquid flows and takes the shape of the container it is in. A gas is a state of matter that has neither definite shape nor definite volume. A gas flows easily and expands to the size of the container it is in. Volume is the amount of space a solid, liquid, or gas takes up.	53-72

Grade 3 – Science Unit

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

Guiding Question: How can materials change?

	Learning Outcome - Students investigate and analyze how materials have the potential to be changed.	Pages
M3.5	Substances are made of matter that has not been mixed with other matter, including water. The temperature at which a substance changes from solid to liquid is called the melting point. The temperature at which a substance changes from liquid to solid is called the freezing point. The melting and freezing points of a substance are the same temperature. The temperature at which a substance changes from liquid to gas is called the boiling point. The melting/freezing point of water is 0°C. The boiling point of water is 100°C	73-102
M3.6	The water cycle is a process in which water on Earth moves continuously between bodies of water, land, and the atmosphere. In the water cycle, water changes state from a liquid to a gas through evaporation, forms clouds through condensation, then falls back to Earth in a liquid or solid state (precipitation). Water can change state from solid to liquid and back again. Water can change state from liquid to gas and back again. In Alberta, the surfaces of many bodies of water change from liquid in the summer to solid in the winter.	103-108
M3.7	A reversible change is a change that can be undone, such as melting or freezing. A permanent change is a change that cannot be undone, such as cooking an egg or baking a cake	13-14, 16-22, 26
Computer Science:		
CS.1	Students apply creativity when designing instructions to achieve a desired outcome.	109-116

NAME: _____

MATTER



Raw Materials

What are Raw Materials?

Raw materials are the materials we find in our environment that have not been changed. They are unprocessed, meaning no one has changed the material. We get raw materials from plants, animals, and from underground. Underground raw materials are mined, which means dug from the ground.



Plant Raw Materials

- ✓ Wood
- ✓ Cotton
- ✓ Flowers
- ✓ Fruits and vegetables

Animal Raw Materials

- ✓ Milk
- ✓ Meat
- ✓ Fur
- ✓ Hair and wool

Mined Raw Materials

- ✓ Iron ore
- ✓ Metals
- ✓ Minerals
- ✓ Oil and coal

Making Connections

Describe how you use the types of raw materials

Plant Raw Materials	Animal Raw Materials	Mined Raw Materials

True or False

Is the statement true or false?

1) Raw materials are found in our environment	Yes	No
2) A desk is a raw material	Yes	No
3) A road is a raw material	Yes	No
4) Cheese is a raw material	Yes	No
5) Mined raw materials come from underground	Yes	No

Directions Is the picture a raw material? Yes or no?

Iron Ore



Yes

No

Oil



Yes

No

Furs



Yes

No

Plastic



Yes

No

Table



Yes

No

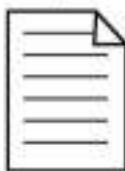
Almonds



Yes

No

Paper



Yes

No

Tree - Wood



Yes

No

Flour



Yes

No

Pickles



Yes

No

Wool



Yes

No

Cotton



Yes

No

Name: _____

9

Curriculum Connection
M3.1

Directions Cut and paste the raw materials into the correct categories

PLANT	ANIMAL	MINED

PREVIEW



Natural or Human Made Materials

We use materials to make the things we need. Some of the materials we use are found naturally in our environment. These are materials you can look outside and see. Other materials are made by humans. These materials you would never see in nature without a human making it and putting it there.

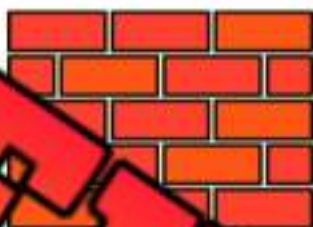
Directions _____ whether the material is natural or human-made



Natural

Human-Made

Wool



Natural

Human-Made



Natural

Human-Made

Steel



Natural

Human-Made

Clay



Natural

Human-Made

Wood



Natural

Human-Made

Leather



Natural

Human-Made

Stone



Natural

Human-Made

Glass



Natural

Human-Made

Plastic

Changing Materials

What are Materials?

Look around and you will see many objects and structures that are made from different materials. Most of these things are made from raw materials that have been changed.



We can change materials physically or chemically. A **physical change** is when only the look of a material has changed. Physical change can be reversed. A **chemical change** is when you change a material so that it is a new material. It cannot be reversed.

Examples of Physical Changes

- ✓ Cutting a material
- ✓ Warming or cooling a material
- ✓ Bending a material
- ✓ Stirring or mixing a material

Examples of Chemical Changes

- ✓ Cooking a material
- ✓ Burning a material
- ✓ A material rusting
- ✓ A food rotting

Draw

Draw examples of materials that have changed physically and chemically

Physical	Chemical

Yes/No

Is the answer yes or no?

1) When batter is cooked and turns into cookies, is it a chemical change?	Yes	No
2) When wood is cut, is it a chemical change?	Yes	No
3) When we heat up hot chocolate, is it a physical change?	Yes	No
4) Do we need to change materials chemically and physically?	Yes	No
5) Is cutting a paper a chemical change?	Yes	No

Activity - Physical or Chemical Change

Directions Is the picture showing a chemical or physical change?

Cutting Hair



Physical

Chemical

Burning



Physical

Chemical

Boiling



Physical

Chemical

Chopping



Physical

Chemical

Baking



Physical

Chemical

Freezing



Physical

Chemical

Boiled Egg



Physical

Chemical

Drilling



Physical

Chemical

Sewing



Physical

Chemical

Rotting Food



Physical

Chemical

Fireworks



Physical

Chemical

Mixing



Physical

Chemical

Where Materials Come From

Directions Write the materials that are found from the pictures below

Cloth

Rubber

Stone

Metal

Wood

Paper



Cloth

Rubber

Stone

Metal

Wood

Plastic



Cloth

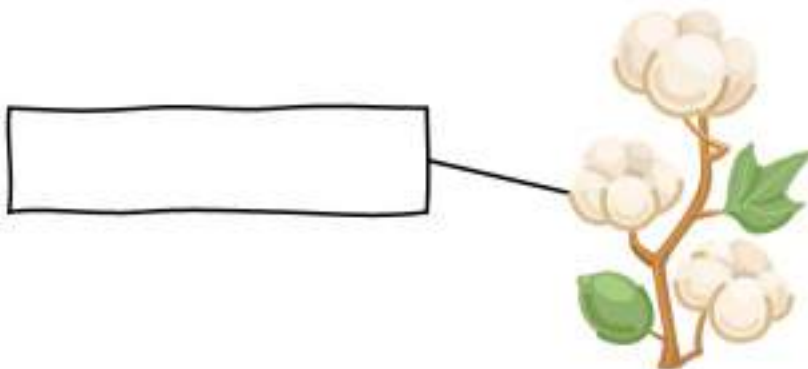
Rubber

Stone

Metal

Wood

Paper



Physical Change - Cotton

How Is Cotton Changed?

Did you know that about 75% of all clothing in the world has cotton in it? Cotton is a soft fabric that is used in many different types of clothing, including socks and shirts.

To change the raw cotton into fabric, many physical changes are done. Since no new material is made, the changes are all physical. Also, a physical change can be undone or reversed, but chemical changes are permanent. In this case, the fabric could be turned back into cotton, though it wouldn't look the exact same.

Making Cotton Fabric

- 1) Picking - Cotton is picked from the cotton plant
- 2) Separating - A gin machine separates the seeds from the cotton fibres
- 3) Carding - Turning cotton into long strands of cotton
- 4) Spinning - The strands are spun into yarn
- 5) Weaving - The yarn is weaved into fabric



Visualizing

Draw what you were picturing when you were

Explain the picture

Question

Why is making cotton fabric a physical change?

Physical Change - Cutting

Cutting Materials

When objects are made, they are cut to be a certain size. Cutting is a physical change because a new material is not made. Instead, we could put the material back together.

Cutting is the most used physical change that is done to almost every object. Cutting needs to be done to make sure our materials are the proper size. Having the right size allows our _____ to fit us or our spaces properly.

Check off _____ of changes made to materials by cutting.

- ✓ Cutting hair
- ✓ Cutting wood
- ✓ Cutting wood into pieces for pulp for paper
- ✓ Fabrics are cut to make clothes
- ✓ Steel is cut to size
- ✓ Cutting food for our meals



Making Connections

When was the last time you cut something? Why did you cut it?

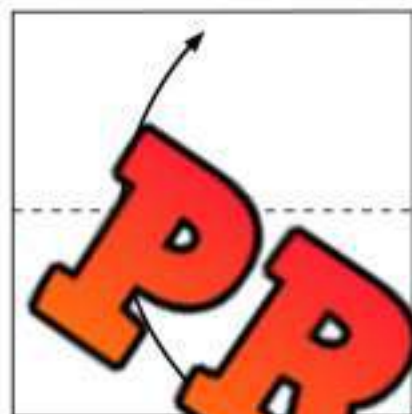
Yes/No

Is the answer yes or no?

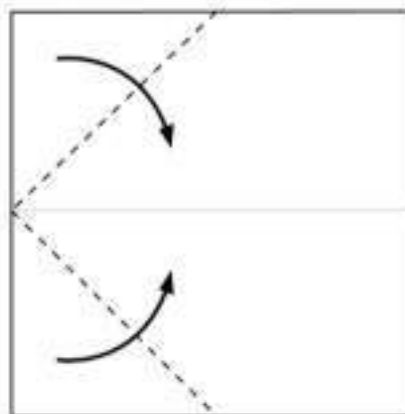
1) When we cut an object, are we making a chemical change?	Yes	No
2) Is cutting the stem off a strawberry a chemical change?	Yes	No
3) Is cutting up wood into tiny pieces for paper a physical change?	Yes	No
4) Is cutting materials important in making the things we need?	Yes	No
5) When you get your haircut, is your hair changing chemically?	Yes	No

Activity - Physical Change - Bending/Folding**Instructions**

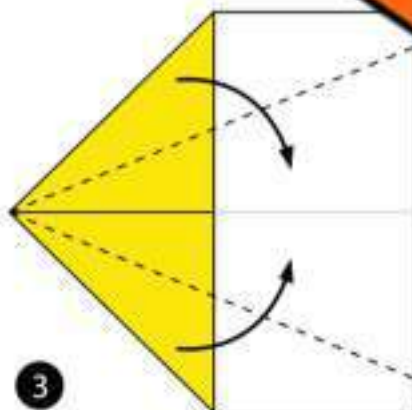
Bend and fold the paper to make a paper airplane



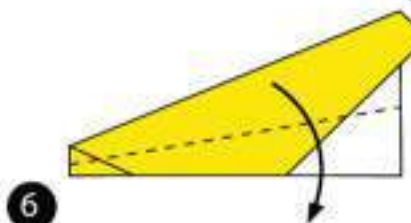
1



2



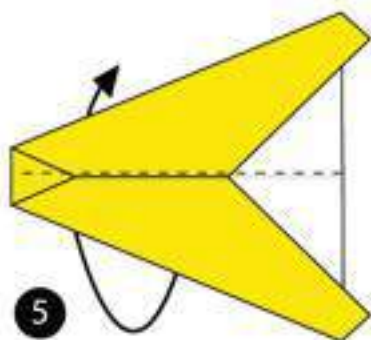
3



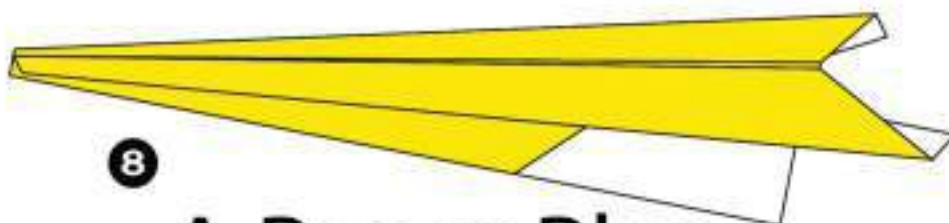
6



7

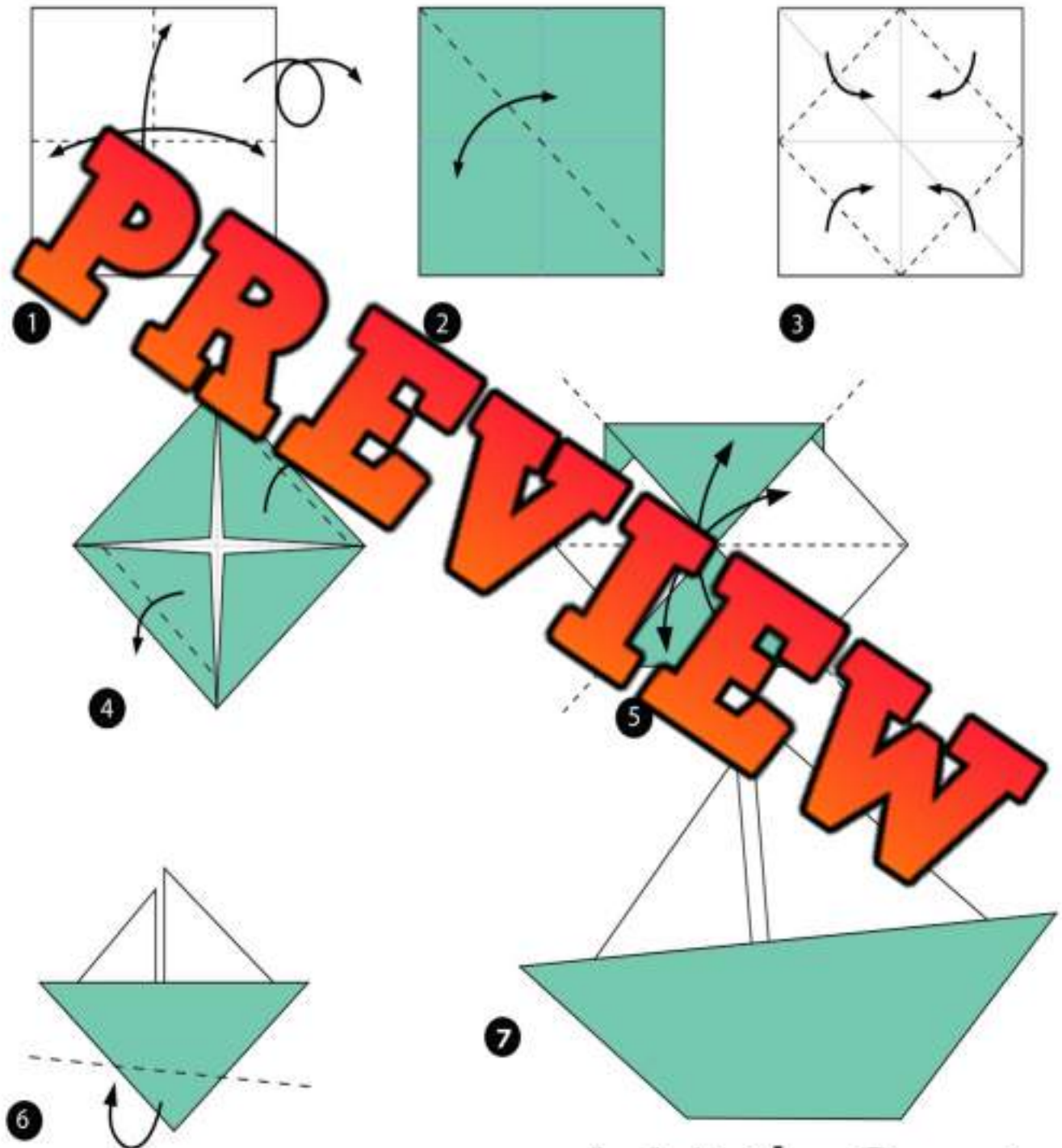


5



8

A Paper Plane

Instructions Bend and fold the paper to make a boat

A Little Boat

Making Paper - Physical/Chemical Changes

There are many steps in the process of making paper. Some of the changes made during each step are physical and some are chemical.

Directions Is the step a physical or chemical change?

1) Cutting down a tree	Physical	Chemical
2) Taking bark	Physical	Chemical
3) Chipping (cutting into tiny pieces)	Physical	Chemical
4) Cooking the wood chips	Physical	Chemical
5) Washing the chips	Physical	Chemical
6) Adding chemicals to the chips to make pulp	Physical	Chemical
7) Bleaching (cleaning) the pulp	Physical	Chemical
8) Forming the pulp into paper sized sheets	Physical	Chemical
9) Drying the wet pulp	Physical	Chemical
10) Cutting the dry sheets to size	Physical	Chemical

Word Search Find the words in the word bank

Word Bank	
Chemical	Physical
Cooking	Drying
Cutting	Cleaning
Forming	Wood
Chips	Pulp

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

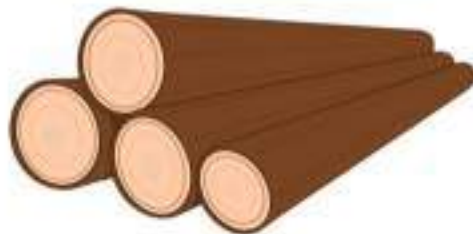
Materials - Wood and Paper Products**Directions**

Fill in the flowchart below by drawing pictures

Trees



Logs



Firewood

Lumber - 2

Pulp

Cardboard

Paper



Materials - Plastic

Plastic is made of fossil fuels. Oil and natural gas are fossil fuels found in the ground. They are used to make the plastics we use everyday.

To make plastic, oil and natural gas are heated. The plastic made is formed into water bottles, food packaging, auto parts and medical tools. The manufacturing of plastic is a chemical change where liquids are turned into solid, a new substance.

It takes the average plastic item between 10 to 1000 years to decompose. It is best to recycle plastic when we are done with it. That way, the plastic can be used again.



Fill in the Blanks

What is plastic used for?

Blank					
Food	Oil	Recycle	Water Bottle	Natural Gas	Underground

- 1) Plastic is made from heating _____ and _____.
- 2) Natural gas and oil are found _____.
- 3) Plastic is used to make _____.
- 4) A lot of the _____ we buy is packaged in plastic.
- 5) Plastic lasts a long time, so we should _____ it.

Question

Why is making plastic a chemical change? Why is it bad for the environment?

Chemical Change - Making Plastic

How is Plastic Made?

Plastic is a very important material that is used to make many objects in our lives. To make plastic, chemical changes are made to different materials.



How Plastic Is Made

- 1) Oil is pulled from the ground
- 2) The oil is heated, making a new chemical called naphtha (NAP-THA)
- 3) Other chemicals are mixed with naphtha to make plastic
- 4) The plastic is cooled to become a liquid
- 5) Dyes are added to the liquid to change the colour
- 6) The liquid is poured into a mold to make shapes with the plastic



Questions

Answer the questions below.

1) Why is making plastic a chemical change?

2) Look around, what plastic things do you see?

Yes/No

Is the answer yes or no?

1) Is making plastic a chemical change?

Yes

No

2) When oil is pulled out of the ground, is the oil changed chemically?

Yes

No

3) When the oil is heated, is it a physical change?

Yes

No

4) When the liquid plastic is poured into a form, is it changed chemically?

Yes

No

5) When the plastic is melted, is it changed physically?

Yes

No

Making Natural Rubber

How Is Natural Rubber Made?

Natural rubber is made from a rubber tree. The sap that comes out of a rubber tree can be used to make natural rubber. It is a bit different than unnatural rubber made from oil.

How Natural Rubber is Made

- 1) A tap is made into the tree, where sap pours out. The sap is called latex.
- 2) Acid is added to the sap. This makes clumps in the mixture.
- 3) The clumps are broken and rolled into sheets.
- 4) The sheets are heated to get rid of any water.
- 5) The rubber is cut into different shapes.



Which Change? How is the material changed in the steps of rubber making below?

Steps	Type of Change	
	Physical	Chemical
1) Sap is taken out of the tree	Physical	Chemical
2) Acid is added to the sap, making new clumps	Chemical	Chemical
3) The clumps are rolled and flattened	Physical	Chemical
4) The flattened rubber is heated	Physical	Chemical
5) The rubber is cut into shapes	Physical	Chemical

Draw Draw a picture of 3 different things that use rubber

--	--	--

Materials Used Now vs Then

Olden Times

People used natural materials long ago. Stonehenge in England is a circle of big rocks. It's strong, but it was hard to move those big rocks.

The Great Pyramid in Egypt was made from limestone blocks. They were heavy, but they've lasted thousands of years!



Middle Times

As time passed, people discovered new ways to shape stone and create bricks.

Castles started to appear in England, which is still standing, was built with sturdy and hardy bricks.

Using stone and brick is still done today, but they are expensive and hard to move around.



Materials Used Today

Today, we use many different materials. Small buildings and houses often use wood, bricks, and cement.

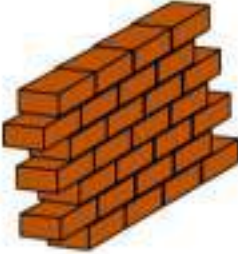
For skyscrapers, we use strong steel and sparkling glass. Look at the Burj Khalifa in Dubai! It's a towering structure made of steel and glass, standing as the tallest building in the world!



Bridges and Roads

Bridges like the Golden Gate Bridge in San Francisco use steel. It's sturdy, but it can rust. Roads use asphalt, which is strong, but it can get potholes.

Choose Is the material **natural** or **human-made**?

Questions Use information from the text to support your answers

1) Which materials were used to build the bridge?

2) What materials are used to make roads, homes, and skyscrapers?

Roads	
Homes	
Skyscrapers	

3) What are the downsides to the materials below?

Stone	
Brick	

Indigenous Use of Trees and Rocks

Using Trees

Indigenous communities made good use of trees.

They would chop down the tree, but they made sure not to waste any part of it.



- Houses: People built houses, known as wigwams or tipis, using tree trunks and branches.
- Canoes: They used bark to make canoes, a type of boat, to travel on water. They also used soft-wood like cedar to make canoes.
- Tools: The wood from trees was also used to make tools like bow and arrow for hunting.
- Toys: Kids even made toys from tree bark.
- Fire: Dry wood helped make fire to keep warm and cook food.

Using Rocks

Rocks were also very useful to Indigenous communities. Here's how they used them:

- Tools: Sharp rocks became tools for cutting and scraping.
- Cooking: Some rocks, when heated, were used for cooking. They could warm up food!
- Symbols: The Inuit used rocks to make Inukshuks. Inukshuks were used for directions and to mark important places, like good hunting areas.
- Building: Rocks also helped in building homes and fences.
- Art: People drew on rocks to make beautiful art called pictographs.



Questions

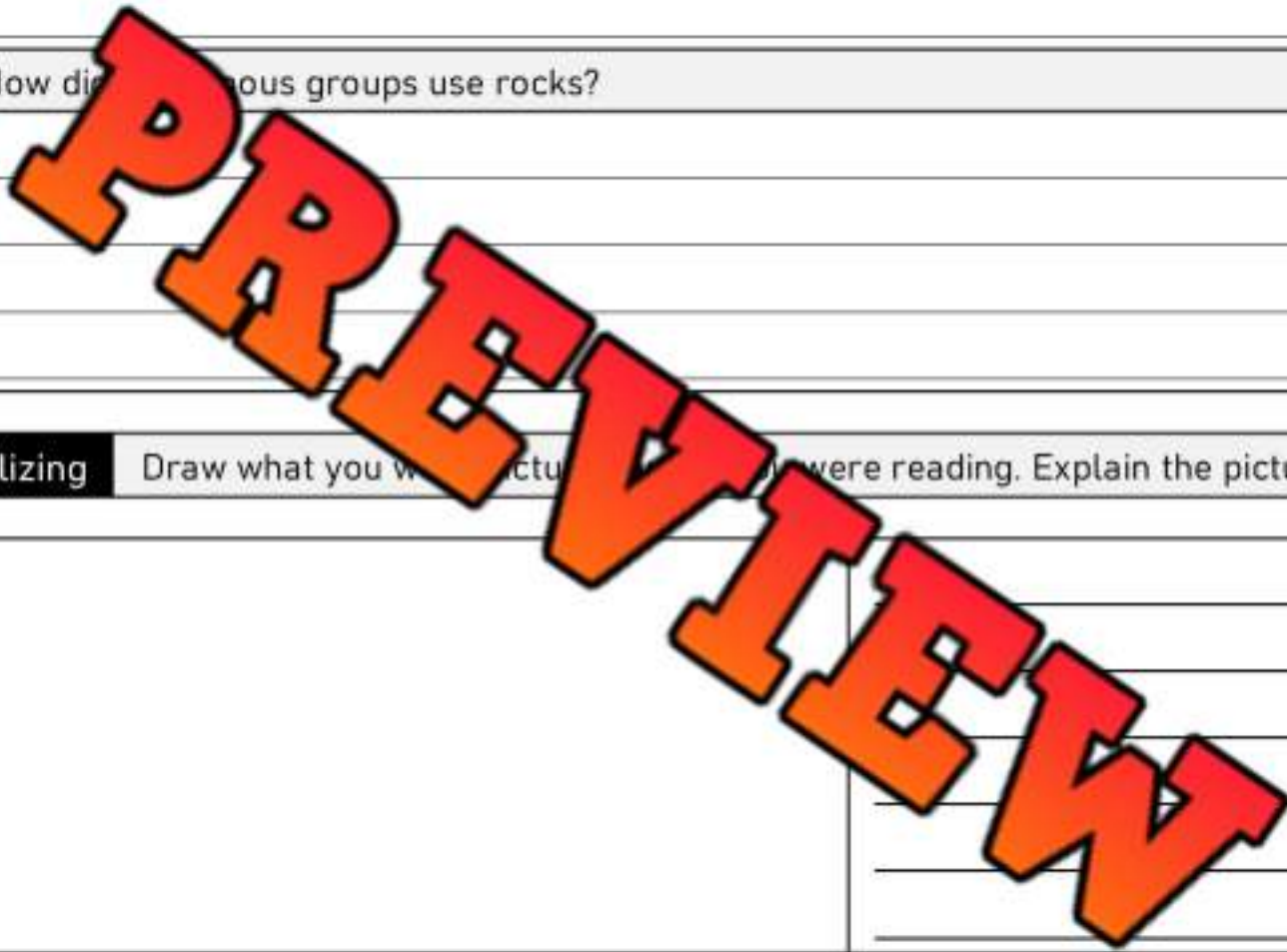
Answer the questions below using evidence from the text

1) How did Indigenous groups use trees?

2) How did Indigenous groups use rocks?

Visualizing

Draw what you were reading. Explain the picture

True or False

Is the statement true or false?

1) Some groups carved out hard wood to make canoes	True	False
2) They used cedar trees to make canoes	True	False
3) They cooked on rocks	True	False
4) The Inuit used rocks to make Inukshuks	True	False
5) Kids used rocks to make toys	True	False

Wigwam Shelter

First Nations lived in many different shelters. One of the most popular is named the Wigwam. Wigwam shelters are simple to make and easily transportable. A Wigwam can be built in just an hour! The steps to building a Wigwam are listed below in the wrong order. Can you figure out the correct order?



Directions Order the steps 1-6 beside each instruction

Instructions	
Step	Instructions
	Cover the wigwam with birchbark, woven material, or caribou skins
	Build a hearth on the floor for a fire
	Make a conical frame of wood poles
	Cover the leaves with
	Place tree leaves on the floor to keep out the cold
	Make a hole in the roof to let the smoke out

Questions

1. Why do you think the Wigwam was such a popular shelter?



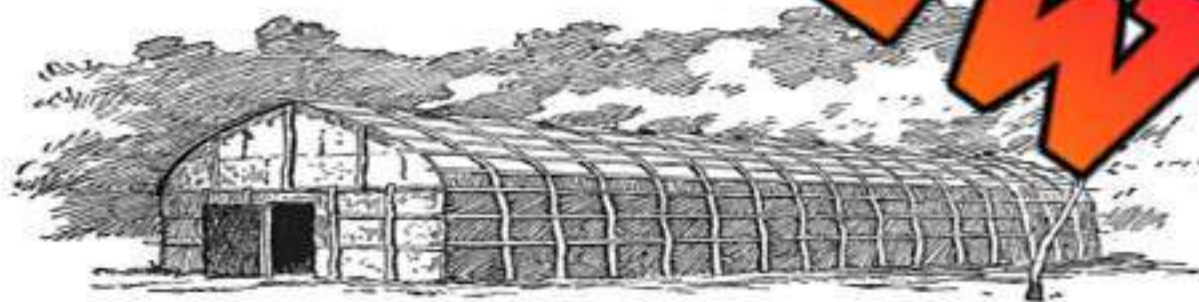
2. Why didn't the First Nations use brick, steel, and other strong materials?

Longhouse Shelter

The Haudenosaunee lived in permanent shelters named Longhouses. Longhouses were permanent because they were difficult to build, and impossible to move. The steps to building a Longhouse are written below in the incorrect order. Can you figure out the correct order?

Directions: Number the steps 1-7 beside each instruction

Step	Instructions
	Find a good location for the shelter
	For the roof, find more wood poles to run the opposite direction of the U-shaped poles
	Find a good location for the frame
	Make small holes in the roof for smoke to escape
	Bend the wood poles to form an upside down U
	Build sleeping platforms on the inside of the shelter
	Build a row of hearths for the fires



What are the benefits and drawbacks of a longhouse?

Inukshuks

What are Inukshuks?

Inukshuks are special rock structures made by the Inuit people. They are made by stacking rocks on top of each other to form the shape of a person.



Inukshuk

The Inuit use Inukshuks for three main reasons.

Navigation

Inukshuks are used to mark things that are something important.

- To mark a trail or path through the wilderness, especially in areas with no roads or markers.
- To indicate the direction to a nearby village, hunting or fishing grounds, or other important locations.
- To show the way to a good source of food, water, or shelter.

Communication

Inukshuks are used as a form of communication. They can tell hunters about the location of food, water, or shelter.

- To show that a hunting ground is nearby.
- To warn hunters or travelers of danger, such as a steep cliff or a fast-flowing river.

Culture

Inukshuks are part of Inuit culture. They are symbols of Inuit communities working together and helping each other out.



True or False

Circle whether the statement is true or false

1) An inukshuk is just a bunch of rocks on top of each other	True	False
2) Inukshuks can tell us something important	True	False
3) The Inuit use inukshuks to help each other out	True	False
4) Inukshuks could tell us there is danger nearby	True	False
5) Inukshuks are used by all Indigenous groups	True	False

Question How do you think Inuit use inukshuks to help them know where important areas are?

PREVIEW

Draw

Draw 2 inukshuks. Below each one, explain what they could represent?

Indigenous Use of Ice and Shells

Using Shells: Making Wampum Belts

The Indigenous people of Canada used shells to make something special called a Wampum belt. Wampum belts were used to remember important events or agreements. Let's see how they made them:

- 1) They found shells by the sea, especially white and purple ones.
- 2) They cleaned the shells very well.
- 3) After cleaning, they cut the shells into tiny bead shapes.
- 4) They made holes in each bead with a special tool.
- 5) They used a string to thread the beads together in a pattern. The pattern told a story or message.



Using Ice: Inuit Ways

The Inuit people, who live in the far North of Canada, have many ways to use ice:

- 1) Making Igloos: The Inuit made homes called igloos from ice. They cut blocks of ice and stacked them in a circle. They added more and more blocks to make the igloo bigger and rounder. It was warm inside!
- 2) Hunting and Fishing: They cut holes in the ice to catch fish or seals that swam underneath.
- 3) Traveling: In winter, they would ride across the ice on sleds pulled by dogs. The hard, smooth ice made it easy to move.
- 4) Storing Food: The Inuit would use ice and snow to keep their food cold and fresh.



Questions

How is a wampum belt made?

Draw

Draw a wampum belt that symbolizes an agreement you have made with someone



True or False

Is the statement true or false?

1) The Inuit need the ice to travel on	True	False
2) The Inuit use the ice to make igloos	True	False
3) Wampum belts were just used for fashion and didn't mean anything	True	False
4) Wampum belts are made of shells	True	False
5) Wampum belts are used to remember important events	True	False

Indigenous Use of Plants and Animals

Using Plants

The Indigenous people of Canada found many creative uses for plants:

- Clothing: They weaved plant fibers into clothing. Cedar bark, for example, could be turned into hats, mats, and clothes.
- Tools: They provided wood for making items like canoes, bows, and arrows.
- Containers: They used large, sturdy leaves or woven grass to make containers for storing food.
- Toys: Some plants were used to make toys and games for the children to play with.

Using Animals

Animals were very important to the Indigenous people, and every part was used:

- Clothing: Animal skins were turned into warm clothing. Deer skin, for example, was used to make soft, strong clothing items.
- Shelter: The hides of large animals were used to cover their homes like teepees or longhouses, to keep them warm and dry.
- Tools and Utensils: Bones, antlers, and even shells were transformed into tools and utensils for everyday use.
- Art: Feathers, bones, and hides were used to create beautiful pieces of art and jewelry.

Indigenous people made the most of plants and animals in their environment, always with respect and care.



Name: _____

45

Curriculum Connection
M3.2

Questions

Answer the questions below using evidence from the text

1) How did Indigenous groups use plants?

2) How did Indigenous groups use animals?

Draw

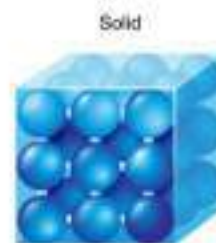
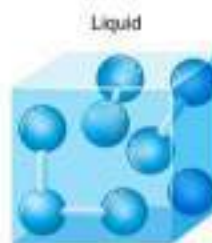
Draw ways that plants and animals are used by Indigenous groups

Three large empty rectangular boxes for drawing, arranged horizontally. A large, diagonal, orange and red 'PREVIEW' watermark is overlaid across the center of the page, partially obscuring the drawing area.

What is Matter?

What is Matter?

Everything is made of matter. Look around. The desks in your classroom are made of matter, the air we breathe and the water we drink are all made of matter. Even our bodies are made of matter!



Everything is even matter that has mass and occupies volume. Air is matter because air has mass and it takes up space. We know this because a balloon that is full of air weighs more than an empty balloon. Air also takes up space because when we blow up a balloon, the air pushes against the balloon, expanding it.

A desk is also matter. It has mass and it takes up space, meaning it has mass and it takes up space. When something takes up space, we say it occupies **volume**.



Particles - Atoms

All matter is made up of tiny particles called atoms. When you look at matter, you can't see the atoms. Even with the best light microscope, single atoms are too small to see. But, atoms are there. You are made of 7 billion billion atoms, or 7,000,000,000,000,000,000,000,000.

Phases of Matter

All matter can be grouped into three phases – solid, liquid, or gas. An example of matter that goes through the three phases of matter is water. Water can be ice as a solid, regular water as a liquid, and steam as a gas.

The atoms in a solid are very close together, while they get further apart in a liquid, and very far apart in a gas.

Questions

Use information from the text to support your answer

1) What does matter mean?

2) What are the three phases of matter? Explain how water can be all three phases of matter.

Questioning

Write questions you have about matter

1)	
2)	
3)	

True or False

Circle whether the statement is true or false

1. The atoms in a solid are further apart than in a gas	True	False
2. Matter is everything that takes up space and has mass/weight	True	False
3. Our bodies are matter	True	False
4. Our thoughts and dreams are matter	True	False
5. Matter is made up of tiny particles called atoms	True	False

Matter – Yes or No?

Is the example matter – yes or no?

Dream



Yes

No

Cereal



Yes

No

Human



Yes

No

Love



Yes

No

Time



Yes

No

Idea



Yes

No

Flower



Yes

No

Dog



Yes

No

Table



Yes

No

Wind



Yes

No

Rainbow



Yes

No

Sunlight



Yes

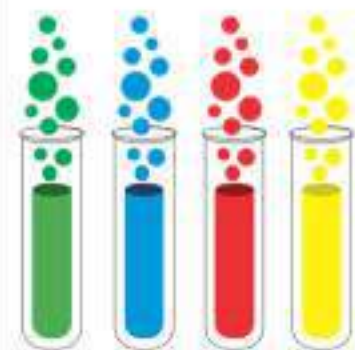
No

All About Liquids

Liquids

A **liquid** is a form of matter that can be poured. When you pour a liquid, it will always take the shape of its container. Pour liquids into cups when you are using them. The liquid will always take the shape of the cup you are using. The most common liquid is water.

Liquids all have weight and take up space. Liquids have a definite volume. If you put 1 cup of water into a bowl or into a tall glass, it takes up the same amount of space. The volume of a liquid refers to how much space the liquid takes up.

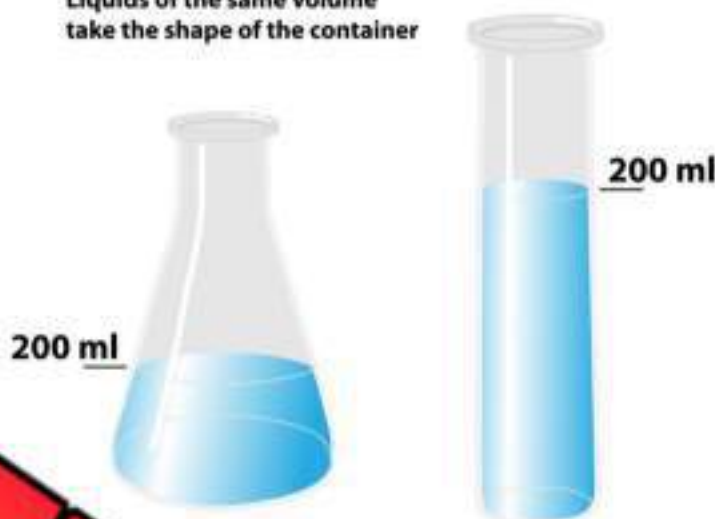


Properties of Liquids

- Do not have a definite shape
- Take the shape of their container
- Fill the bottom of a container or spread when they are not contained
- Maintain the same volume in different containers
- Are difficult to compress or squeeze because the particles are close together

Volume

Liquids of the same volume take the shape of the container



Liquids can change their state. Some liquids can be made into solids when you cool them to their freezing points. Liquids can be turned into gases when you heat them to their boiling point. The freezing and boiling point for each liquid is different.



Word Search

Find the word bank words in the puzzle

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

Word Bank

Liquids	Shape
Container	Flow
Temperature	Matter
Freezing	Volume

Fill in the Blanks

Liquids _____ on the line



- 1) Liquids will always take the shape of their _____.
- 2) The most common form of liquid is _____.
- 3) Liquids can change their states of _____.
- 4) Liquids will turn into solids when they are _____ (or cooled).
- 5) Liquids fill the _____ of their container.

Making Connections

What does this reading remind you of in your life?

Experiment - Flowing Liquids

Research Question

What are we testing?

Which liquids will flow the fastest, and which will flow the slowest?

Materials

What do we need for our experiment?

- Small clear plastic cups
- Small candies
- Various liquids (water, oil, corn syrup, etc.)
- Stopwatch (optional)

Method

How do we complete the experiment?

1. Fill each of the cups full of the different liquids.
2. Drop a candy into the first liquid. Use the stopwatch to time how long it takes to drop to the bottom of the cup.
3. Repeat this step for all liquids.
4. Record the length of time for each liquid on this page.

Hypothesis

Which liquid will flow the fastest and the slowest?

Fastest _____

Slowest _____



Observations

Record how long the candy takes to sink to the bottom

Liquid	Prediction (seconds)	Actual time (seconds)

Diagram

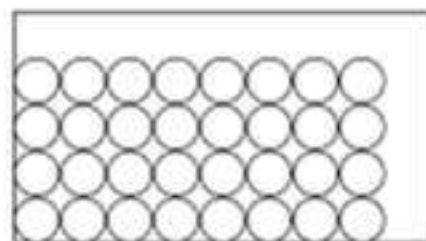
Draw a picture of your experiment. Draw the candy and show the candy flowing through the liquid

Characteristics of Solids

All About Solids

Solids can have a lot of different characteristics. Many solids are hard like your desk, the walls and floors. Solids can also be soft, like a cotton ball. Some solids like play dough and clay can be molded so you can change their shape.

They will still be solids. When you break a solid, it stays a solid, not a liquid. When you break a solid into more than one piece. When you break a solid into many small pieces and crumbs, but it will not become a liquid.



The particles do not move or spread out to fit the container

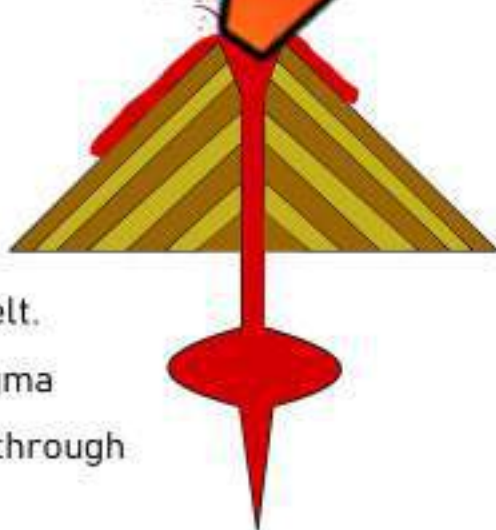
Therefore, solids:

- Can't be poured
- Holds their shape unless an outside force acts on it (example - cuts it)
- Has a definite shape (do not take the shape of their container)
- Is difficult to squeeze as the particles are packed closely together
- Is dense because there are many particles packed closely together
- Can be described in many ways, including hard, soft, rough, and smooth

Solids Can Melt

When a solid is heated to its melting point, it will turn into a liquid. Some solids, like ice, will change into a liquid at room temperature. Other solids, like rocks, will need to be heated at very high temperatures to melt.

Rocks will melt under the ground in magma. Magma is melted rock. When magma comes up to the surface through a volcano, it is called lava.



Questions

Answer the questions below using evidence from the text

1) What does it mean that solids do not take the shape of their container? Give an example.

2) What does it mean that solids hold their shape? Give an example.

Visualizing

Draw what you pictured while you were reading. Explain the picture

True or False

Is the statement true or false

1) When you break a solid into pieces, it becomes a liquid	True	False
2) When a solid melts, it becomes a liquid	True	False
3) A solid takes the shape of its container	True	False
4) Solids can be strong, weak, soft, or hard	True	False
5) Rocks can melt into liquids	True	False
6) Rocks cannot melt because they are too hard	True	False



Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Is the statement true or false?

1) Solids take the shape of their container.

True

False

2) When you break a solid, it becomes a liquid.

True

False

3) Rocks will melt into lava under the ground.

True

False

4) Solids can be soft, like a cotton ball.

True

False

5) Solids can be poured easily like water.

True

False

Name: _____

Mark

Is the statement true or false?

1) Solids take the shape of their container.

True

False

2) When you break a solid, it becomes a liquid.

True

False

3) Rocks will melt into lava under the ground.

True

False

4) Solids can be soft, like a cotton ball.

True

False

5) Solids can be poured easily like water.

True

False

Name: _____

Mark

Is the statement true or false?

1) Solids take the shape of their container.

True

False

2) When you break a solid, it becomes a liquid.

True

False

3) Rocks will melt into lava under the ground.

True

False

4) Solids can be soft, like a cotton ball.

True

False

5) Solids can be poured easily like water.

True

False

Name: _____

Mark

Is the statement true or false?

1) Solids take the shape of their container.

True

False

2) When you break a solid, it becomes a liquid.

True

False

3) Rocks will melt into lava under the ground.

True

False

4) Solids can be soft, like a cotton ball.

True

False

5) Solids can be poured easily like water.

True

False

All About Gases

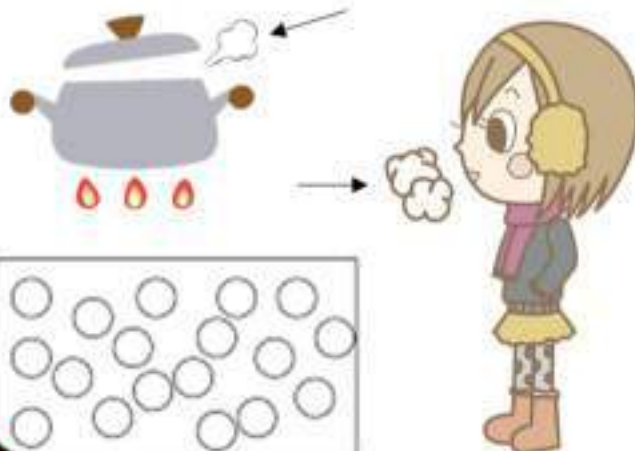
All About Gases

One form of matter that we cannot see is a gas. The air we breathe is a gas. Even though we can't see a gas, we know it is there. It might have a smell. We might even feel it, like we feel wind.

Examples of gases are steam, air, wind, perfume, balloon, helium.

How Gases Act

- Gases flow faster than liquids
- Gas particles are far apart
- Gases do not hold their shape



Yes/No

Circle the best answer

1) Can we see most gases?	☐ Yes ☒ No
2) Can gases hold their shape?	☐ Yes ☒ No
3) Do gases flow?	☒ Yes ☐ No
4) Do gases flow faster than liquids?	☒ Yes ☐ No
5) Is air a gas?	☒ Yes ☐ No

Draw

Draw examples of 2 different gases

--	--

Does Air Have Any Weight

Research Question

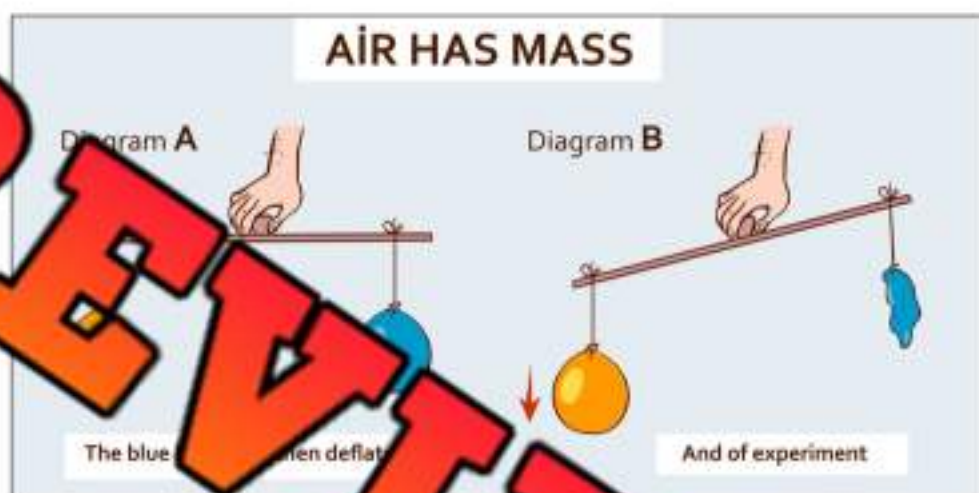
What are we testing?

Does air have any weight?

Materials

What do we need for our experiment?

- 2 balloons
- A metre stick
- String that is about 1 metre long



Procedure

How do we do the experiment?

- 1) Blow up the 2 balloons to the same size.
- 2) Cut two 15-centimeter-long pieces of string
- 3) Attach a balloon to opposite ends of the metre stick using the 15 cm string pieces
- 4) Tie the left-over string around the centre point of the metre stick
- 5) Hold the string up and observe the balloons
- 6) Make a hole in one of the balloons letting the air out
- 7) Observe what happens

Hypothesis What do you think will happen?**Result** Answer the questions below

1) Which balloon is more _____

The Popped Balloon _____ the Blown-Up Balloon

2) How do you know one balloon is heavier than the other?

3) Draw a diagram of the experiment. Label the popped balloon and the blown-up balloon.

All About Air

All About Air

Everything around you is matter. The air you breathe is matter. The juice you drink is matter. The chair and desk in the classroom are both matter. They are all different kinds of matter. Matter can be liquid, solid or gas.

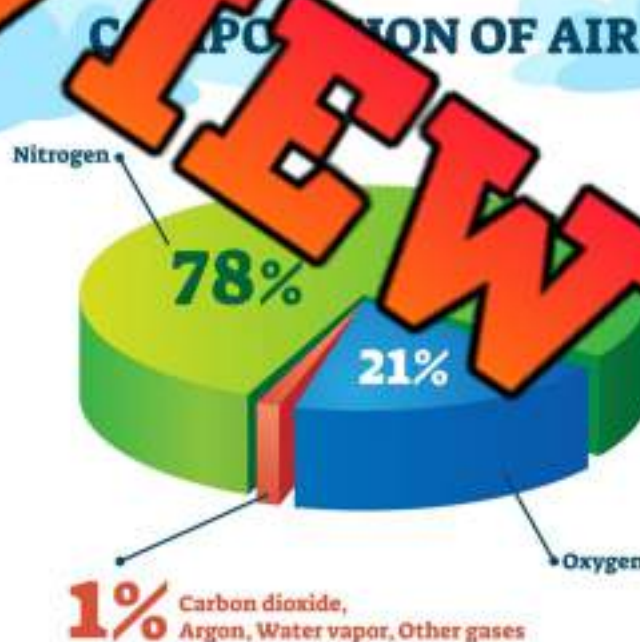
Air is a gas in the form of a gas. We cannot see air, but it is all around us. Air covers the Earth in a layer that is several kilometers deep. This layer is called the atmosphere. If you go to outer space, you leave the atmosphere and won't have air!

Air is made of several different kinds of gases. Air is made of:

- Nitrogen → 78 percent
- Oxygen → 21 percent
- Carbon Dioxide
- Water Vapour
- Argon
- Rare gases

Properties of Air

- We cannot feel air unless it is moving, like on a windy day
- We cannot see clean air
- Air has no colour, unless it is dirty
- We cannot smell air unless it is polluted. Clean air has no smell
- Air is a gas and a fluid. We know this because planes can fly through the air!



True or False Is the statement true or false?

1) Air is matter	True	False
2) Our air is made mostly of oxygen	True	False
3) Our bodies are matter	True	False
4) Air is a liquid	True	False
5) We can see or smell clean air	True	False

Search and Find Find answers to the questions below

1)	What are the states of matter? _____, _____, _____
2)	Name the two main types of air. _____, _____
3)	Can we see clean air? _____
4)	What kind of air can we see? _____
5)	What layer on earth has air in it? _____

Making Connections Have you ever seen dirty air? Explain.

Changes in State - Physical Changes Involving Heat

Changes in State – Physical Changes

When a solid, liquid or gas changes state, they have completed a physical change.

Changes in state are reversible because no new substance is formed. The matter's chemical composition is the exact same.

Water has the chemical makeup of hydrogen and oxygen (H_2O).

It does not matter if it is in liquid form, gas form, or solid form, it still has the same chemical makeup (H_2O).

Changes in State Involve Heat

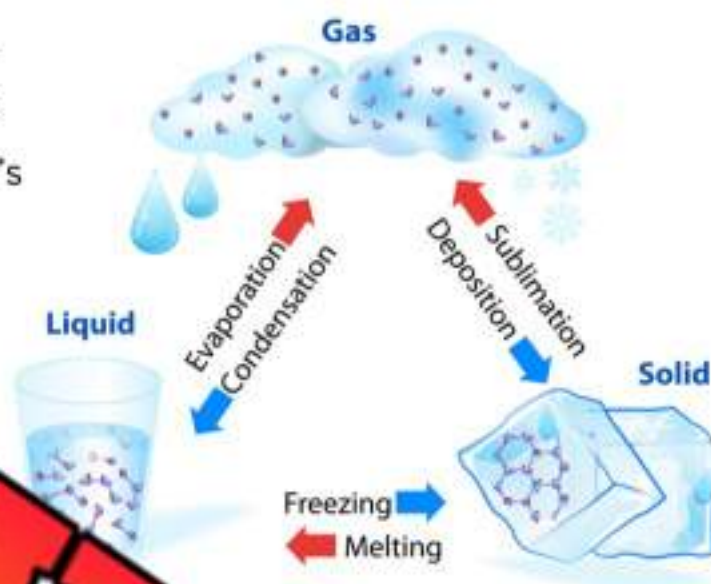
When matter changes state, it can be reversed by adding or removing heat. When matter absorbs heat, it could undergo the processes of evaporation, melting (fusion), or sublimation.

When matter releases heat, it could undergo the processes of freezing (solidification), condensation or deposition.

Heat changes the particles in matter by changing the attractions between particles. When heat is absorbed by matter, the particles in the matter lose attraction and begin to move faster. They collide with each other and spread out, changing the state to a liquid or a gas.

When heat is released by matter, the particles in the matter gain attraction and get closer together. If enough heat is released, the particles may slow down and begin to vibrate instead of move, causing a change of state to a solid.

STATE OF MATTER



Matter and Heat How is heat affecting the matter below?

Matter	Heat	New State of Matter?	Particles Movement – Circle One		
Water	Absorbed		Vibrate	Slow	Fast
Water	Released		Vibrate	Slow	Fast
Ice	Absorbed		Vibrate	Slow	Fast
Vapour	Released		Vibrate	Slow	Fast

Questions Answer the questions below using evidence from the text

1) If matter is left in the same state (if heat added or released), will it change phases? Explain using an example.

2) What happens when heat is released by matter?

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

	_____

Melting Point

What is Melting?

Melting is the process of a solid changing into a liquid when heat is applied.

For example, if you put an ice cube in a freezer, it will remain a solid because there is no heat added. If you take the ice cube out of the freezer, the room temperature is warmer, which means the ice will absorb the heat.

The heat will cause the particles inside the solid to move. This will cause the particles to spread out and flow into the bottom of the container. The particles are held in. If the ice is on a table or on the floor, it will flow and melt.

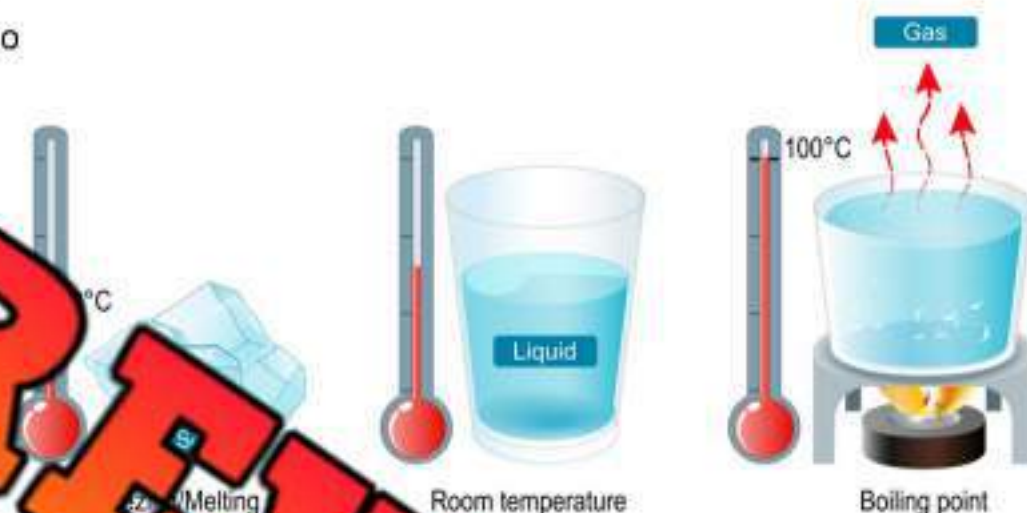
What is a Melting Point?

All solids have a melting point. The melting point for ice is 0°C . If you take an ice cube out of a freezer and then bring it outside into an environment colder than 0°C , it will stay a solid because it hasn't reached its melting point.

Room temperature is about 20°C . This means that ice melts fast when it is at room temperature.

Did you notice that the freezing and melting points are the same? This means that liquid water will freeze at below 0 and frozen water will melt at above zero.

Freezing, Melting and Boiling points of water





Fill in the Blanks

Write the missing word on the line

Word Bank

Solid	Melting	Liquid	Temperature	Same
Gas	Boiling			

Melting happens when a _____ reaches a temperature warmer than its
_____ point, turning it into a _____. For example, an ice cube
melts at a _____ warmer than 0 degrees Celsius. The melting point
is the _____ of a substance. Liquids don't melt, however they do
have a _____ point, where they change state to a _____.

Questions

Answer the questions below

1) What happens when a solid reaches its melting point?

2) When have you seen a solid reach its melting point?

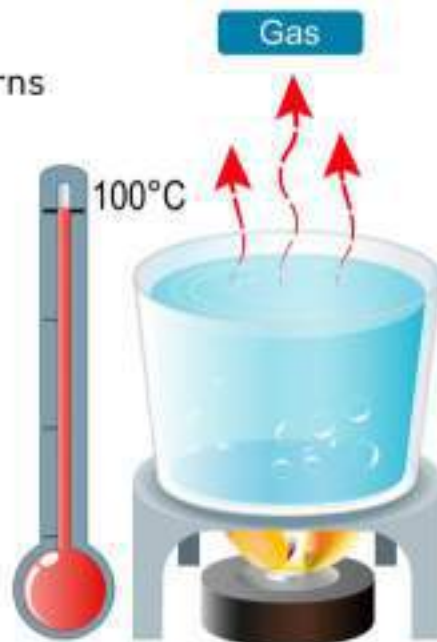
Boiling Point

What Does Boiling Point Mean?

The **boiling point** is the temperature at which a liquid turns into a gas. For example, water boils and turns into steam when it reaches 100 degrees Celsius.

Different liquids have different boiling points. When cooking, it is helpful to use different temperatures depending on what you're making. For example, many foods have different boiling points, meaning you might need to cook some on high.

It is also helpful to know that we can clean dirty water by boiling it. When we boil water, it kills bacteria, viruses, and parasites that live in the water. This means if you ever need to clean water, you can boil it to kill the germs living in your water.

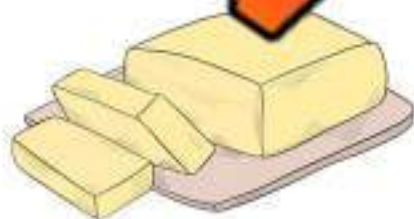


Boiling point

Different Boiling Points of Liquids

Depending on the liquid being heated, it will take longer to reach its boiling point. Ethanol will boil at 78.5 degrees Celsius while carbon tetrachloride will not boil until it is heated to 204 degrees Celsius.

- Water: 100 degrees Celsius
- Olive oil: 205 degrees Celsius
- Peanut oil: 165 degrees Celsius
- Coconut oil: 177 degrees Celsius
- Vegetable oil: 180 degrees Celsius
- Butter: 150 degrees Celsius
- Mercury: 357 degrees Celsius



Questions

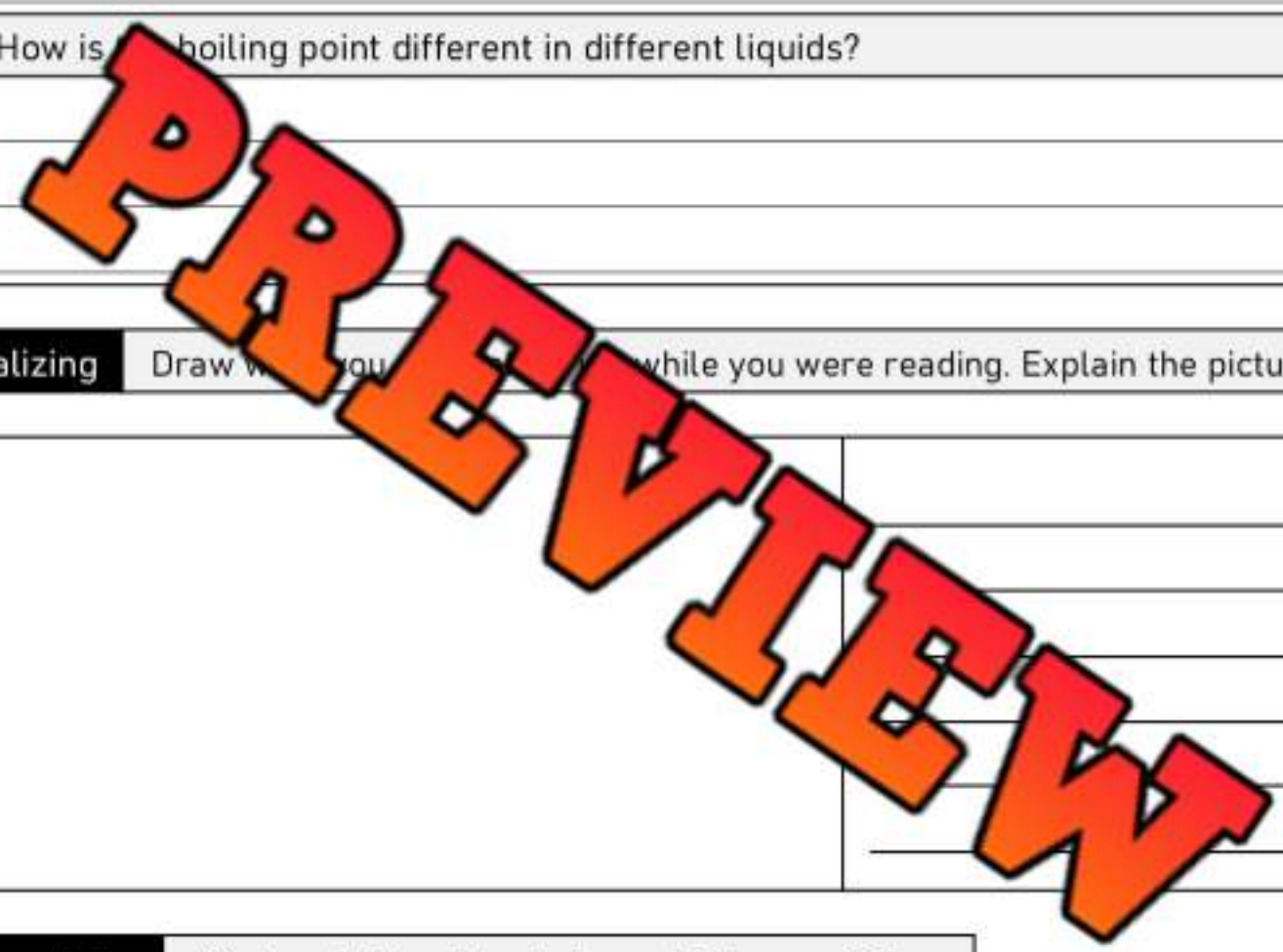
Use information from the text to support your answer

1) What does the boiling point of a liquid mean?

2) How is boiling point different in different liquids?

Visualizing

Draw what you saw while you were reading. Explain the picture

True or False

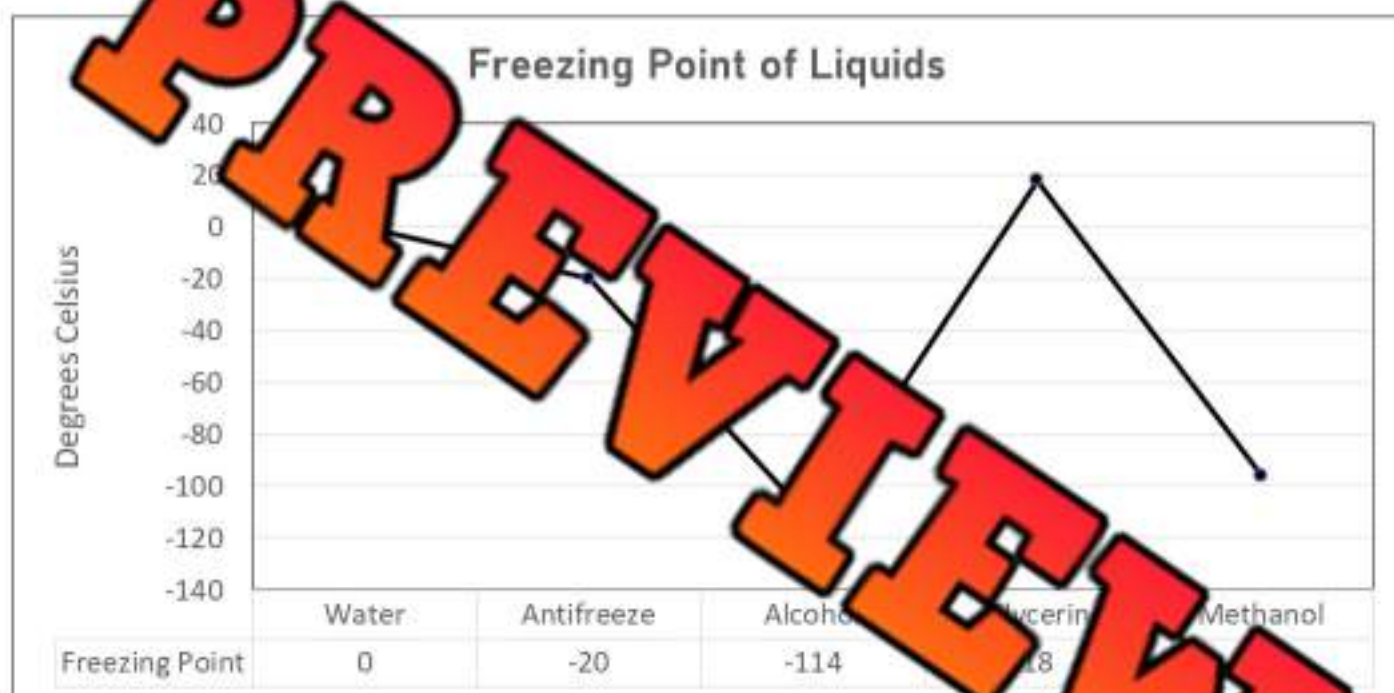
Circle whether the statement is true or false

1) Butter will boil at a lower temperature than water	True	False
2) You will need to boil water at a higher temperature than mercury	True	False
3) All liquids boil at 100 degrees Celsius	True	False
4) Boiling water will kill bacteria, parasites, and viruses	True	False
5) The boiling point of a liquid is when it will turn into a solid	True	False

Freezing Point

Freezing and Freezing Points

Freezing is the opposite of melting. **Freezing** is when a liquid changes state to a solid. Different liquids have different freezing points. Water has a freezing point of 0 degrees Celsius. Check out the graph below to see other liquid's freezing points.



Understanding Science to Help Our Lives

Water will freeze at 0° C, which means it would not make good anti-freeze for your car. Anti-freeze is used to stop water from freezing and damaging a car's engine. Anti-freeze is made of ethylene glycol, which has a freezing point of -20° C.

Windshield wiper fluid is made of methanol. Methanol has a freezing point of -96° C. This makes it a great choice to clean our windshields on very cold days!

When the weather is below 0, we need to drive very carefully as water on the roads will freeze and turn into slippery ice.



Fill in the Blanks

Write the missing word on the line



1)	Liquid water will freeze when the temperature is _____ zero.	Below / Above
2)	Water can be a liquid or a _____.	Mud / Solid
3)	Different liquids have different freezing _____.	Points / Places
4)	Water has a freezing point of _____ degrees Celsius.	-20 / - 96
5)	When the temperature is below zero, there could be _____ on the road.	Ice / Rain

Questions

Answer the questions below.

1) How does water freeze?

2) How can freezing water be dangerous?

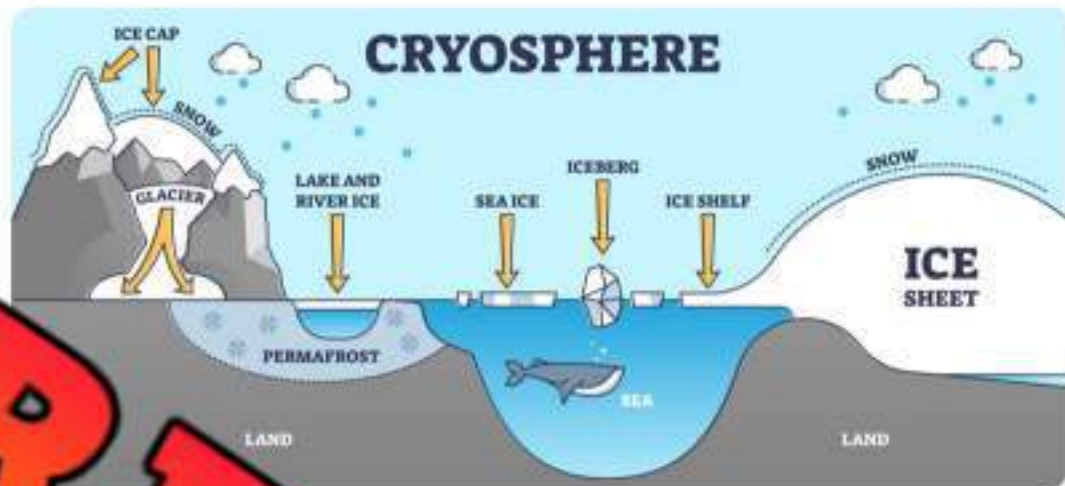
Making Connections

What does this reading remind you of in your life?

Cryosphere - Glaciers

What is the Cryosphere?

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



What are Glaciers?

A **glacier** is a moving, large piece of ice that flows over a long period of time. Most glaciers are made of freshwater.

- **Ice Sheet** – Ice sheets are the largest form of ice. Ice sheets are the size of continents as they must be bigger than 50,000 square kilometres. The only ice sheets on Earth are in Antarctica and Greenland.
- **Ice Cap** – Ice caps are smaller than ice sheets, and are less than 50,000 square kilometres. Most ice caps are found near the North and South Poles of the earth. Canada has the Devon Ice Cap on Devon Island in Nunavut.
- **Icebergs** – Icebergs are floating pieces of ice that are more than 15 metres 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 life 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.

Questions

Use information from the text to support your answer

1) What is a glacier?

2) What is a glacier? Where are they found?

Order

Put the glaciers below in order from smallest (1) to largest (6)

Iceberg	Ice Cap	Ice Sheet	Sea Ice	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

Evaporation

What is Evaporation?

Evaporation is the process in which a liquid turns into a gas. Evaporation happens when a liquid is heated to the point that the liquid particles begin moving faster. As the particles move faster, they begin to collide with each other. This results in the liquid becoming a gas as the particles become far apart.

Evaporation or Boiling

During evaporation, only the liquid at the surface (top) will turn into a gas.

During **boiling**, the particles throughout the liquid are also changing into a gas. Therefore, boiling requires the liquid to be exposed to a lot of heat but evaporation can happen even at room temperature. That is why your wet shirt will "dry" after gym class – yuck!



Fill in the blanks using words from the word bank

Word Bank			
Liquid	Evaporate	Faster	Disappear
Gas	Warm		

The process of a _____ changing into a _____ is called _____. A liquid will turn into a gas as a result of _____ being applied by the liquid. A spill will _____ as a result of being evaporated. The steam _____ flowing out of a kettle is a _____. The _____ temperature _____ the liquid will evaporate.

Questions Answer the questions below

1) Why do hand dryers use hot air instead of just air?

2) Where does the water go when it evaporates from a liquid?

3) Name some examples of when you have seen evaporation.

Examples of Evaporation

Evaporation at Home

At home, evaporation happens often. We understand that the water used to clean our clothes will evaporate when we hang them or when we put them in a drying machine.

When we spill a drink on a table, we will notice it will dry hours later. This is due to evaporation. If the drink was sugary, there will be a sticky substance on the table.



Evaporation in the Community

In the community, we can see evaporation during a rainy day, everything is wet and covered in water. Once it starts raining, the process of evaporation will dry up the puddles. If the sun is out, the evaporation happens even faster.

Evaporation in the Natural Environment

Animals use the process of evaporation to cool them down. They use **evaporative cooling** to regulate their body temperature. They do this by swimming in water or by wallowing in mud. The water is then evaporated off their bodies just like how humans sweat is evaporated.



Some animals also pant, which means they breathe rapidly with their mouth open to increase evaporation from the hot air they release from their mouths.

In the natural environment, we will notice that water levels in ponds, lakes, and rivers will lower after several hot days without rain. Rainfall will often even out the evaporation. When we see rain, it is because water from rivers, lakes, and ponds is evaporated and formed into a raincloud. Evaporation is key for our water cycle.

Questions

Use information from the text to support your answer

1) What is evaporation?

2) When have you seen evaporation today or recently? Describe it.

Examples

Write examples of evaporation in the settings below

At Home**In the
Community****In the Natural
Environment**

Lab Experiment - Evaporation

Research Question

What are we trying to answer?

- 1) What happens to water after it rains?
- 2) How does the sun, shade, and wind affect the process of evaporation?

Hypothesis

Answer the research questions below before we do the experiment

1) What happens to water after it rains?

2) How does the sun affect evaporation? Does shade speed up or slow down evaporation?

3) How does wind affect evaporation?

Materials

What you will need for the experiment

- 1) Pail/cup of water for each student
- 2) Paintbrush for each student
- 3) Chalk for each student
- 4) Stopwatch - optional

Procedure

Instructions - How to complete the experiment

- 1) Go outside and use the water and paintbrush to paint a simple picture on pavement in the sun
- 2) Use the chalk to make an outline of your picture
- 3) Use the results page to track how your picture looks after 2 minutes, 5 minutes, and 10 minutes.
- 4) Next, complete the steps above in a new shady location. Compare the results.
- 5) Lastly, complete the steps above but this time, blow on your picture or use a fan to simulate wind. You could also draw your picture on the side of the school as it will receive more wind than the pavement.

Lab Experiment - Evaporation Results

Observations Fill in the table below as you complete the experiment

Location	Time	Observations - Examples Below - No evaporation - Half evaporated - Completed evaporated
Sunny Location	After 2 Minutes	
	After 5 Minutes	
	After 10 Minutes	
Shady Location	After 2 Minutes	
	After 5 Minutes	
	After 10 Minutes	
Windy Location	After 2 Minutes	
	After 5 Minutes	
	After 10 Minutes	

Results Answer the research questions now that you have completed the experiment

What happens to water after it rains?

How does the sun affect evaporation? Does shade speed up or slow down evaporation?

How does wind affect evaporation?

Condensation

What is Condensation?

Condensation is when water changes from a gas to a liquid. Condensation is the opposite of evaporation, which is the changing of water from a liquid to a gas.

Why Does Condensation Happen?

Condensation happens when a gas touches a cooler surface. The cooler surface will cause the gas to release heat. When the gas cools, the particles begin to slow down, causing them to be more attracted to each other and form into water droplets.



Condensation in my life

Have you ever noticed your cold drink "sweats" on a hot day? Well, your drink doesn't actually sweat, but condensation is occurring. On a hot day, there is a lot of water vapour in the air. As the air cools, the water vapour begins to condense. When this warm air makes contact with your cold glass, the water vapour in the air condenses on the side of your glass. This forms water droplets on the cool surface.

Water Cycle - Formation of Clouds

Condensation is very important in the water cycle. As water evaporates from lakes, rivers, and oceans, the water vapour goes up into the atmosphere. It doesn't disappear! Instead, it rises until it comes into contact with a colder surface. In our atmosphere, the water vapour commonly clings to dust particles, salt crystals, or smoke particles from volcanoes.

We usually think of clouds only being in the sky, but they can be at ground level too! When we see a cloud near the ground, we call it fog. Walking through fog is just like walking through a cloud!

Visualizing

What were you picturing while you were reading? Draw it!



What words from the text made you draw this picture?


Multiple Choice Circle the correct answer

1) Condensation is when...	2) Condensation happens when...
a) vapor/gas turns into a liquid	a) water vapour suddenly freezes
b) liquids turn into a gas	b) water droplets form a liquid
c) a solid melts into a liquid	c) water freezes into ice
d) a gas turns into a solid	d) water heats up into a vapour

Fill in the blanks Fill in the blanks using words from the word bank

Word Bank				
Condensation	Surfaces	Condenses	Vapour	Volcanoes
Droplets	Water	Surfaces	Cold	

Condensation occurs when _____ is evaporated and
 _____ into water droplets. _____ from the evaporation
 collects on a _____ surface. This can be seen when a soft drink has water
 _____ on the can. The process of the _____ for _____ water droplets is
 called _____. A common example of condensation is the formation of
 _____. Evaporated water from lakes, rivers, and _____ is cooled
 _____ in the air, like dust, salt, bacteria, or even ash _____.

Question What is happening in the picture?


Lab Experiment - Condensation

Research Question What are we trying to answer?

Will hot water evaporate and condense on a colder surface? What will happen with the condensed water droplets?

Hypothesis Answer the research questions below before we do the experiment

1) Will hot water evaporate and condense on a colder surface? Explain.

2) What will happen with the condensed water droplets?

Materials What you will need for the experiment

- 1) 1 cup per group/person (glass or see-through)
- 2) 1 plate per group/person
- 3) Approximately 5-10 ice cubes per group
- 4) Hot Water



Procedure Instructions - How to complete the experiment

- 1) Pour about 5-10cm of hot water into the cup
- 2) Quickly put the plate on top of the cup and let it sit for about 30-40 seconds
- 3) Put your ice cubes on top of the plate
- 4) Record what happens!

Lab Experiment - Condensation Results

Observations

Fill in the table below as you complete the experiment

Step	What Happened
After hot water was poured and the plate was placed on top	
After the ice was added to the	

Results

Answer the questions that you noted the experiment

1) How was this experiment an example of condensation?

2) When the water poured down the side of the glass, what did that tell you about the environment?

3) Why did the water pour down the sides of the cup? How does this relate to our real-world water cycle?

Water Cycle

What is the Water Cycle?

Have you ever wondered where water goes after a heavy rainfall? Those puddles don't simply disappear! Water moves from one part of the environment to another.

No water is ever lost. The water is recycled. It goes through what we call the water cycle. The **water cycle** is the movement of water between the Earth's surface and the air, changing from liquid to gas and gas to liquid.

How does it work?

The water in the cycle moves through 4 main stages – *evaporation, condensation, precipitation, and collection*.

Evaporation

Heat from the Sun turns water in oceans, streams, ponds, and even puddles into water vapour.

The rising water vapour goes up in the sky and cools.

Condensation

When the water vapour rises high into the air, it cools.

When it cools enough, the water vapour condenses and turns into water droplets. When enough water droplets condense together and form a cloud.

Precipitation

As more and more water droplets add to a cloud, they become too heavy to stay in the air. The water droplets in the cloud fall to the Earth's surface as precipitation. **Precipitation** is the process of any form of water dropping to the Earth.

Collection

The water that falls from the clouds as rain or snow lands on the Earth. This water collects in oceans, rivers, lakes, and streams. Now it can be evaporated again!



Questions

Use information from the text to support your answer

1) How does water change states from a liquid to a gas in the water cycle? What does that make?

2) How would life be different if water didn't change states in the water cycle?

Multiple Choice

Select the correct answer.



1. When liquid turns into a gas...	Condensation	Evaporation
2. When gas turns into a liquid...	Condensation	Evaporation
3. When water falls from clouds...	Evaporation	Precipitation
4. Precipitation can fall as...	Clouds	Rocks
5. Condensation leads to...	Clouds	Puddles

Visualizing

Draw what you were picturing while you were reading the picture

Water Cycle Diagram

Diagram

Write the stages of the water cycle on the blanks below
Evaporation, Collection, Condensation, Precipitation

**Matching**

Match the term to the description by writing the letter next to the term

Answer	Term	Description
	Precipitation	a) Water stays in oceans, lakes, and rivers
	Condensation	b) Water falls from the sky
	Evaporation	c) Water is heated and turns to water vapour that rises
	Collection	d) Water cools and turns into water droplets in clouds

Experiment - Water Cycle

Research Question How does water move through our environment?

How does the heating and cooling of water move water around our environment?

Materials What do we need?

- ✓ Large bowl
- ✓ Mug or small cup
- ✓ Plastic wrap
- ✓ String or large rubber band
- ✓ Hot water - optional - you can use cold water as well
- ✓ Ice Cubes - optional



Method How do we complete the experiment?

- 1) Place the cup or mug in the middle of the bowl
- 2) Fill the bowl with hot water about 2/3 of the way up. Add a little water inside the cup.
- 3) Cover the bowl with the plastic wrap. Use the elastic or the string to secure the plastic to the top of the bowl
- 4) Place a few ice cubes on the plastic wrap above the cup
- 5) If you used cold water, put the bowl in the sun for a couple of hours.
- 6) If you used hot water, you should see condensation clinging to the plastic wrap
- 7) Label the diagram on the back of the page

Diagram

Label the diagram using the word bank

Precipitation

Condensation

Collection

Evaporation



Results

Label the stages of the water cycle below

The water that is in the cup	
When the water went up to the top of the bowl	
When the water stuck to the plastic wrap	
When the water fell from the plastic wrap	

Coding - Supercomputers Predicting Weather

A **meteorologist** is someone who studies the air to predict the weather. Meteorologists use the temperatures of the air as well as the air movement to predict if it will rain, snow, or storm.

Meteorologists need data to make their predictions. They get their data from satellites in the sky. These satellites move around the Earth, taking pictures and tracking the movement of air.



On large supercomputers used by meteorologists can process quadrillions of calculations per second. The data from the satellites is automatically sent to these computers through special sets of code. The supercomputers make models of what the weather will look like so that meteorologists can study them. All of this is possible because of computer codes that tell the technology what to do.

Fill in the Blanks Use the words to fill in the blanks

models	coding	data	weather
--------	--------	------	---------

- 1) A meteorologist is someone who studies _____.
- 2) Meteorologists can predict the _____.
- 3) Satellites collect _____ from the in the sky.
- 4) Supercomputers make _____ of what the weather will look like.
- 5) We wouldn't be able to predict the weather without _____.

Directions Read the if statement and come up with your own then statement

1)	If it is cold outside	then	
2)	If it is going to rain today	then	
3)	If it is going to snow today	then	
4)	If there is lightning today	then	

Investigate - Local Weather

Weather Reports

A weather report is a prediction of what the skies will bring to an area. The weather report uses tools and data to measure the air pressure, wind speed, and movement of weather fronts.

The data from these tools give meteorologists the ability to make strong predictions of the upcoming weather. The weather report predicts the short-term forecast (usually 36 hours) with a higher accuracy than the 14-day forecast.

Weather Use the information about your local weather

Weather Conditions	Information
Temperature	
Relative Humidity	
Wind Speed and Direction	
Probability of Precipitation (%)	
Type of Precipitation	
Sunny/Cloudy?	



Questions

Answer the questions below

1) How does the weather look for the next couple of days?

2) Is there any extreme weather coming in the next 14 days – snowstorms or lightning?

Investigate - Weather Report

Pretend you are a weather network meteorologist. Write what you will tell your audience about the weather over the next 14 days. Use some of the ideas below.

- Should they plan for surfing or skiing?
- Should they be staying inside?
- Should they be golfing?
- Should they be finding shelter in the case of lightning?
- Should they rent some movies this week?
- Should they water their gardens because there isn't rain forecast?



Writing

Write a report on the weather in your area in the next 14 days

Writing Code - Weather Reports

When data is collected from supercomputers, codes are used to display predictions about the weather. Check out the example below.

Input
dark clouds full of rain are coming
winds are strong, over 100 kph
the temperature is 2° C

Output
It will rain today
It will be windy and a tornado is possible
The temperature is cool, almost freezing

Coding Write a code that goes with the inputted data



Input	Outputs
There are no clouds in the sky	
The wind is 0kph	
The temperature is 25° C	

Input	Outputs
Lightning clouds are on the way	
The wind is weak at 5kph	
The temperature is 20° C	

Input	Outputs
Clouds full of water are coming	
The wind is 15kph	
The temperature is -30° C	

Coding: Storing Data - Weather Forecast

When we write code, we sometimes need to store data to be used later. We can store the data and name it a variable. A **variable** is a quantity that changes. We can use letters or words to represent the changing quantity.

Example - A program that collects data from a supercomputer

Fetch rainfall percentage as the variable rain

Display rain on the screen

If rain is more than 50%

Then display "Probably rain today"



Fetch means to find data

Coding

Write your code that collects wind, rain, and temperature data and displays it as a message on the screen

1)

2)

3)

If/Else Statements - Predicting Weather

When precipitation is expected, the precipitation can take the form of rain, snow, sleet or freezing rain. An if statement could be used to display which type of precipitation will fall.

Reminder:

- **Rain** - starts as snow and melts in warm air and stays melted (liquid)
- **Freezing rain** - starts as snow and then melts in warm air and refreezes on the ground because it is frozen
- **Sleet** - starts as snow and melts in warm air and then refreezes before reaches the ground
- **Snow** - stays as snow and stays frozen



Directions: The app displays which type of weather is coming. Write the then statements that would follow the If statements.

1) IF the snow melts on the ground

THEN display, "

2) IF the snow melts and stays melted

3) IF the snow stays frozen

4) IF the snow melts and then refreezes before reaching the ground

Directions Draw one screen of the app displaying one of the then statements above



Unit Test - Matter**Multiple Choice**

Circle the best answer. Only choose 1 answer!

1. Which state of matter below takes the shape of its container?

- a) Liquids
- b) Solids
- c) Rock
- d) All of

2. Which of the following is an example of a liquid?

- a) Table
- b) Peanut Butter
- c) Wood
- d) Rock

3. Everything that has mass and takes up space is...

- a) Particles
- b) Sublimation
- c) Matter
- d) Energy

4. When a solid turns to a liquid...

- a) Freezing
- b) Sublimation
- c) Melting (Fusion)
- d) Evaporation

5. When a liquid turns into a solid...

- a) Freezing
- b) Sublimation
- c) Melting (Fusion)
- d) Evaporation

6. When a liquid turns to a gas...

- a) Condensation
- b) Sublimation
- c) Melting (Fusion)
- d) Evaporation

7. When a gas turns into a liquid...

- a) Condensation
- b) Sublimation
- c) Melting (Fusion)
- d) Evaporation

8. Condensation happens when...

- a) water vapour suddenly becomes a solid
- b) water droplets form a liquid
- c) water freezes into ice
- d) water heats up into a vapour

9. When a solid turns directly into a gas...

- a) Condensation
- b) Sublimation
- c) Melting (Fusion)
- d) Evaporation

10. When snow turns to rain, it is an example of...

- a) Solid staying a solid
- b) A liquid turning into a solid
- c) A solid turning into a liquid
- d) A liquid staying a liquid

Matter – Yes or No?

Is the example matter – yes or no?

Dream



Yes

No

Cereal



Yes

No

Human



Yes

No

Time



Yes

No

Idea



Yes

No

Label the Water Cycle diagram

Evaporation

Precipitation

Condensation

Collection



Definitions

What does each term mean? (1 mark each)

Term	Definition (what does it mean)
Freezing Point	
Melting Point	

Short Answer

Answer the following questions - Each question is worth 2 marks

1) What happens to the particles in a solid when it is heated?

2) Write two examples of evaporation.

3) Explain how water goes through the 3 phases of matter?



Workbook Preview



Grade 3 – Science Unit

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

Guiding Question: How do plants and animals interact?

	Learning Outcome - Students analyze and describe how plants and animals interact with each other and within environments.	Pages
LS.1	A food chain shows the order in which plants and animals depend on each other for food. A food chain can be represented in many ways, such as illustrations, diagrams, stories, words A food chain represents one possible way that plants and animals interact.	17-32
LS.2		16
LS.3		69
	other plants and animals.	
LS.4	Plants and animals in local environments can be protected by actions such as ▪ respectfully interacting with nature ▪ minimizing disturbance to plants and animals ▪ being aware of animal crossings ▪ following fishing and hunting regulations ▪ counting and tracking populations Plants and animals may depend on each other and their environments for survival, such as for food and habitat. First Nations, Métis, and Inuit knowledge of plants and animals within environments includes animal behaviour, sources of food, migration, patterns, seasonal patterns	70-81, 86-108, 111-118
Computer Science:		
CS.1	Students apply creativity when designing instructions to achieve a desired outcome.	82-85, 109-110

Preview of 90 pages from
this product that contains
191 pages total.

NAME: _____

PLANTS AND ANIMALS

PREVIEW



Ecosystem - Living and Non-Living Things

An ecosystem is an area where living and non-living things are together. The living things, like plants and animals need the non-living things to survive in the ecosystem.

**Living Things in the Environment****Non-Living Things in the Environment**

Living Things are things that grow (plants, animals, humans, bacteria)

Non-Living Things are things that do not grow (rocks, wind, air, sunlight, water)

Directions Circle whether the thing is living or non-living



Living

Non-Living



Living

Non-Living



Living

Non-Living



Living

Non-Living



Living

Non-Living



Living

Non-Living



Living

Non-Living



Living

Non-Living



Living

Non-Living

Herbivores, Carnivores, Omnivores

Herbivores

Consumers that are **herbivores** eat only plants. Examples of herbivores are cows, deer, goats, gorillas, butterflies, camels, horses, rabbits, rhinos, and sheep.



Carnivores

Consumers that are **carnivores** eat only other animals for energy. Examples of carnivores include tigers, lions, sharks, walrus, platypus, penguins, wolves, owls, alligator, and snakes.

Omnivores

Consumers that are **omnivores** eat both plants and animals. They eat whatever they can find. Examples of omnivores include dogs, cats, pigs, chickens, squirrels, rats, bears, raccoons, and humans.

Questions

Answer the questions below.

1) Circle the animals that are herbivores.



2) Circle the animals that are carnivores.



3) Circle the animals that are omnivores.



Name: _____

8

Curriculum Connection
L5.2

Directions Is the organism a carnivore, herbivore or omnivore?

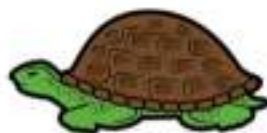
Elephant



Bird



Turtle



Cobra



Skunk



Chipmunk



Frog



Fish



Spider



Alligator



Camel



Beaver



Name: _____

Classifying Organisms

Research

Fill in the table about the animal in the first column

Animals	Producer, Consumer, Decomposer	Herbivore, Omnivore, Carnivore	Primary Producer or Primary, Secondary, Tertiary, Quaternary Consumer
			
 Grass			
 Rabbit			
 Bear			
 Fox			
 Deer			

Research

Fill in the table about any animal that you want to learn more about

Animals	Producer, Consumer, Decomposer	Herbivore, Omnivore, Carnivore	Primary Producer or Primary, Secondary, Tertiary, Quaternary Consumer

PREVIEW

Experiment - Animal Scat

Research Question

What's the difference between carnivores, omnivores, and herbivores

Animal **scat** is the poop that animals produce as waste from the food they eat. Depending on their diet, animals will have differently sized, coloured, and shaped scat.

Materials

What do you need?

- ✓ Brown playdough
- ✓ Plastic toy insects or small animals
- ✓ Grass clippings and/or leaves
- ✓ Raisins or other dried fruits



Method

How do we complete the experiment?

- 1) Mold the brown playdough into scat. You can think of an animal and research their size of scat or model something like the one in the picture.
- 2) If it is an herbivore, add plants to the scat.
- 3) If it is an omnivore, add plants and animals to the scat.
- 4) If it is a carnivore, add just animals to the scat.



Herbivore Scat

Observations**What happened?**

1) What size of scat did you make? What animal might have scat that looks like this?

2) Describe the scat for each of the consumers below.

Herbivore

Carnivore

Omnivore

Research**Answer the questions below**

1) Can hunters track animals based on their scat? Explain.

2) Draw the animal's scat below.

Rabbit - Herbivore

Fox - Carnivore

Raccoon - Omnivore

--	--	--

Food Chain - Producers and Consumers

Food Chain

All living things need energy to survive. We get energy from food. When we run, jump, or play, we use this energy.

Plants get their energy from sunlight, water, and things in the soil. This process is called photosynthesis.

Animals get energy by eating plants or other animals. This is how nutrients move from one living thing to another.

Producers

Plants are like little factories. They make their own food using sunlight, air, and water. They are called producers because they can produce their own food through photosynthesis.

Consumers

Animals, including humans, can't make their own food. They eat plants or other

animals to get energy. Some animals only eat meat, and they're called **carnivores**. Animals that only eat plants are **herbivores**. **Omnivores** eat both plants and animals.

Decomposers

Decomposers like bacteria and fungi eat dead plants and animals. They help break these down into soil for plants to grow. This makes the soil very good for plants because it's full of nutrients.



Define

What do the terms below mean?

Producer	
Consumer	
Carnivore	
Herbivore	
Omnivore	

True or False

Circle whether the statement is true or false.

1. Most humans are carnivores	True	False
2. Examples of producers are humans and dogs	True	False
3. Producers are plants who can make their own food	True	False
4. Consumers are animals who cannot produce their own food	True	False
5. An omnivore is always at the top of the food chain	True	False
6. Decomposers provide nutrients for soil	True	False
7. Plants produce their own food via a process called photosynthesis	True	False

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Match each item in Column A to B.

Column A	Column B
1) Plants make their own food.	A) Herbivores
2) Animals that eat only meat	B) Photosynthesis
3) Plants use sunlight and water.	C) Producers
4) Animals that eat only plants.	D) Decomposers
5) Fungi that help break down dead animals.	E) Carnivores

Name: _____

Mark

Match each item in Column A to B.

Column A	Column B
1) Plants make their own food.	A) Herbivores
2) Animals that eat only meat	B) Photosynthesis
3) Plants use sunlight and water.	C) Producers
4) Animals that eat only plants.	D) Decomposers
5) Fungi that help break down dead animals.	E) Carnivores

Name: _____

Mark

Match each item in Column A to B.

Column A	Column B
1) Plants make their own food.	A) Herbivores
2) Animals that eat only meat	B) Photosynthesis
3) Plants use sunlight and water.	C) Producers
4) Animals that eat only plants.	D) Decomposers
5) Fungi that help break down dead animals.	E) Carnivores

Name: _____

Mark

Match each item in Column A to B.

Column A	Column B
1) Plants make their own food.	A) Herbivores
2) Animals that eat only meat	B) Photosynthesis
3) Plants use sunlight and water.	C) Producers
4) Animals that eat only plants.	D) Decomposers
5) Fungi that help break down dead animals.	E) Carnivores

My Food Chain

Research

Create your own food chain by writing or drawing plants and animals in their appropriate step on the food chain

**Question**

Answer the question below

What is a quaternary consumer? Who did you choose in your food chain and why?

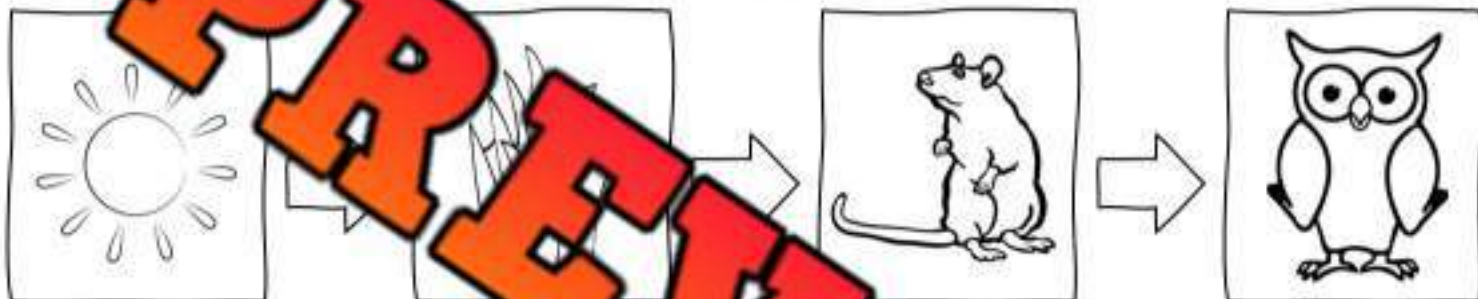
Food Chain

A food chain starts with the sun. The sun gives energy to producers so they can grow. The consumers herbivores and omnivores eat the plants. This gives these animals energy from the sun. Carnivores and omnivores eat other animals, which gives them energy from the sun as well. Some food chains are long, and some are short.

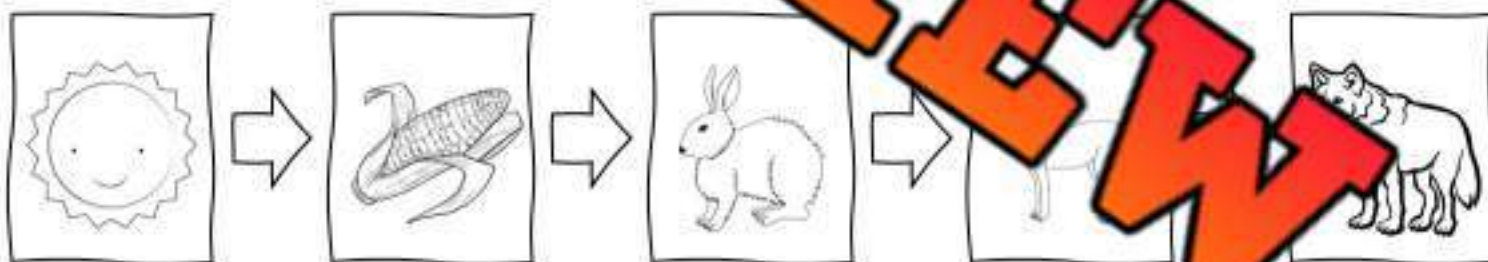
Food Chain

Colour the food chains and label each link as a producer or consumer

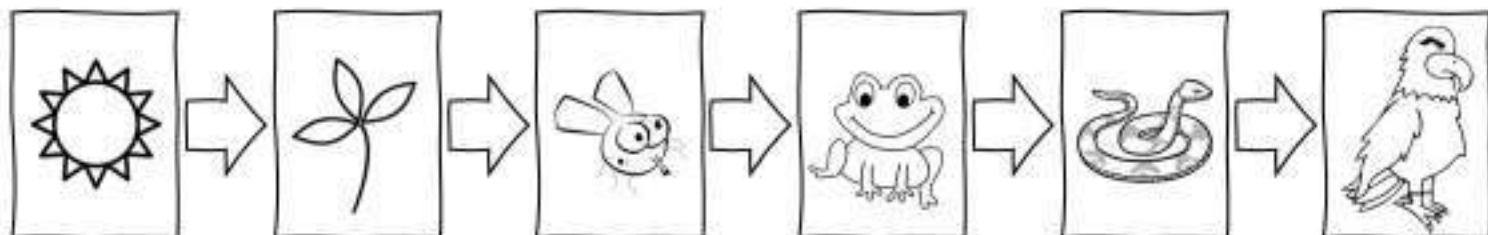
4-Link Food Chain



5-Link Food Chain



6-Link Food Chain



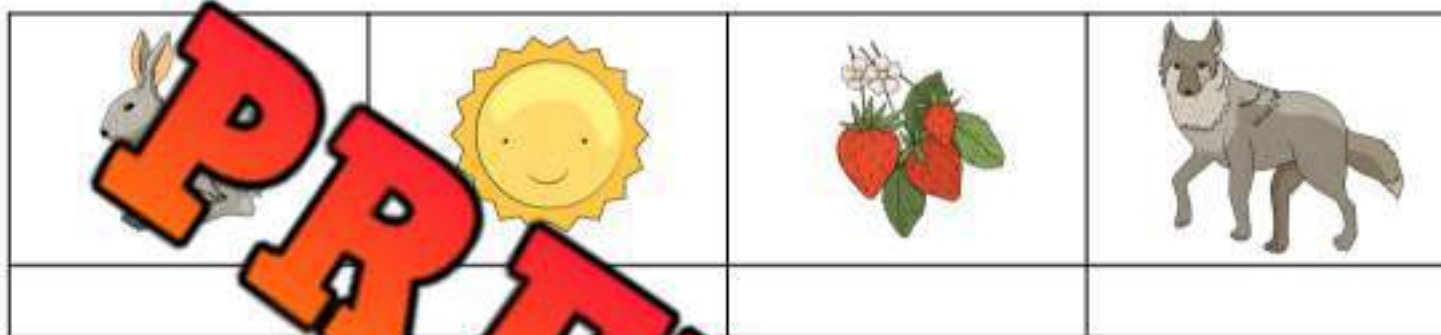
Ordering Food Chains

Energy Chain

Order the plants and animals by numbering them

4-Link Food Chain

Number the plants/animals 1-4



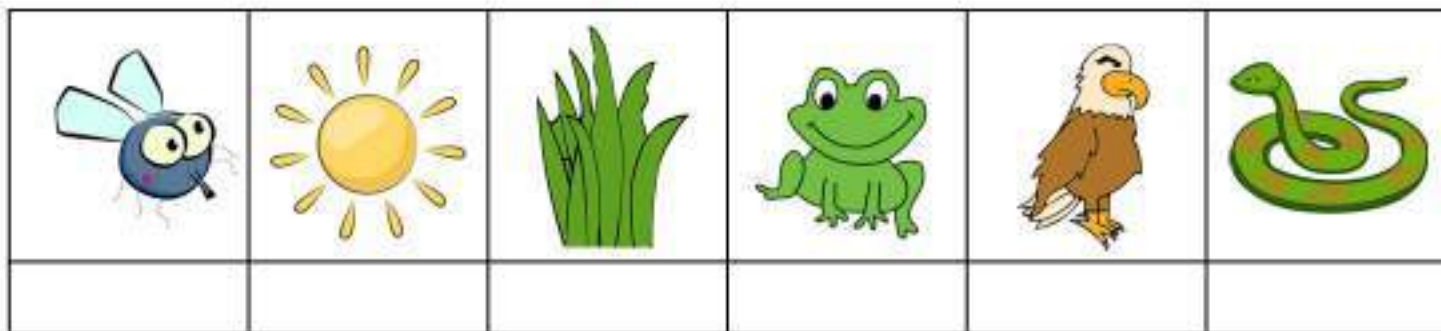
5-Link Food Chain

Number the plants/animals 1-5



6-Link Food Chain

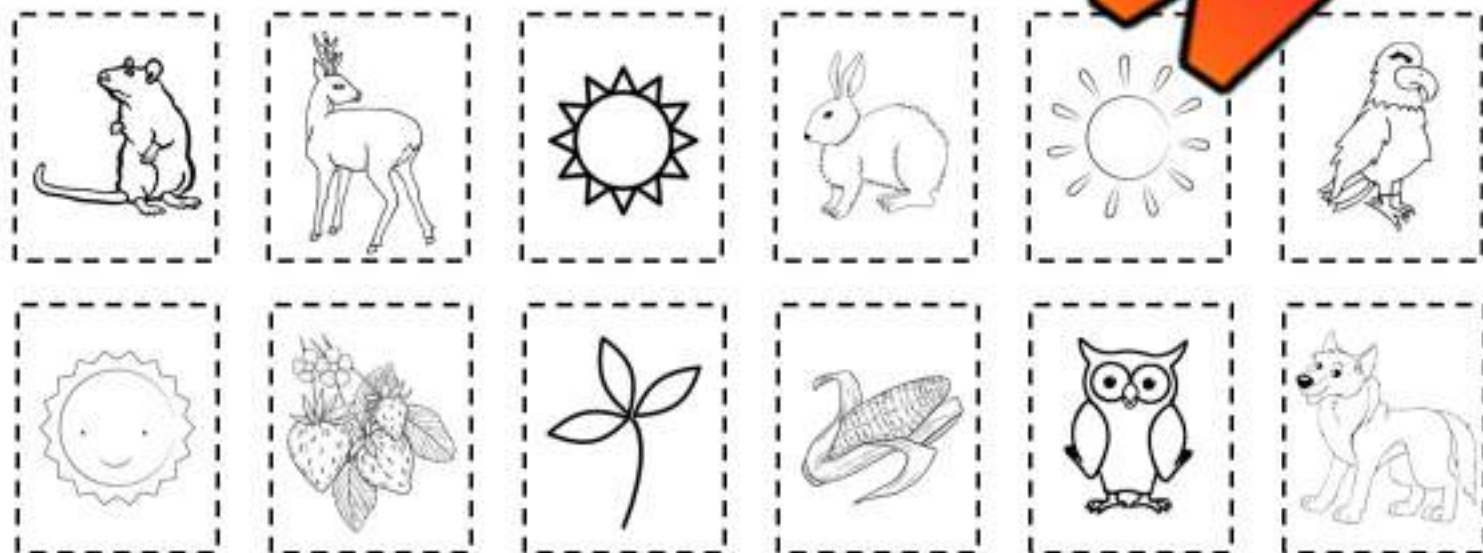
Number the plants/animals 1-6



Food Chains

Cut and paste the plants and animals into the food chains

	→		→		→	
			→		→	
	→		→		→	

PREVIEW

Name: _____

My Energy Chains

Food Chains

Draw your own food chains below

5-Link Food Chain

Food Chain

Food Chain - Wetland

Diagram

Interpret the diagram of the food chain in a pond



Sea



Shrimp



Frog



Snake

What is happening in the food chain?

Diagram

Draw two food chains. Make sure the animals belong to the same habitat

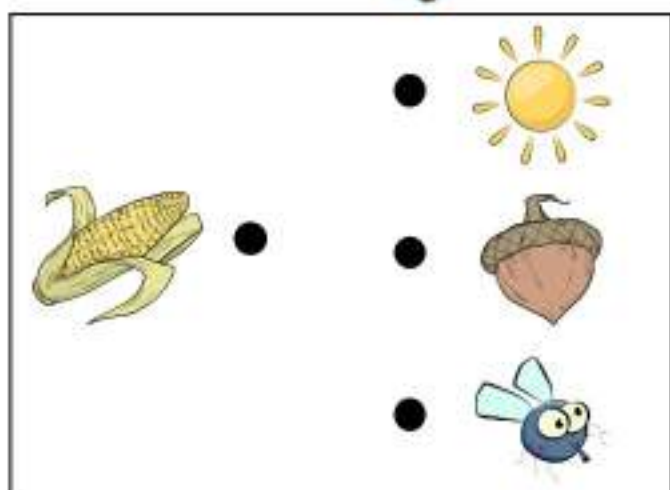
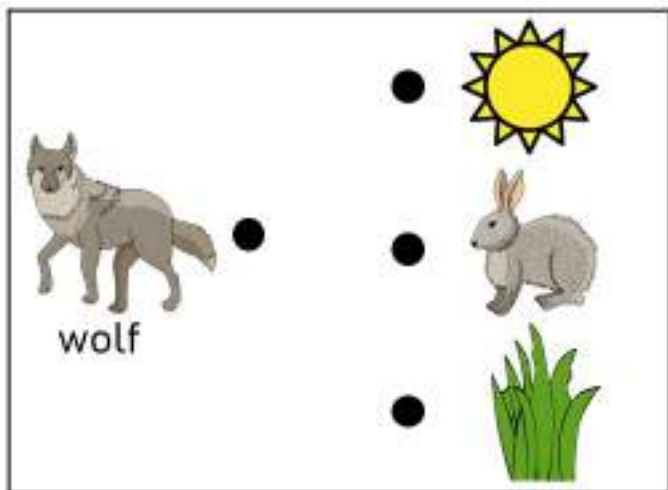
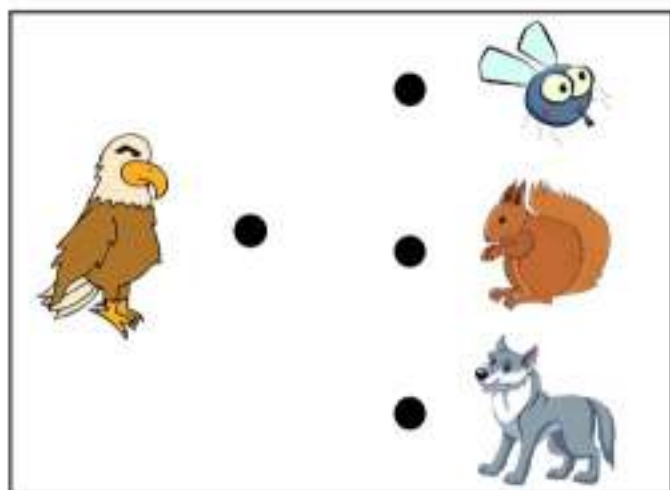
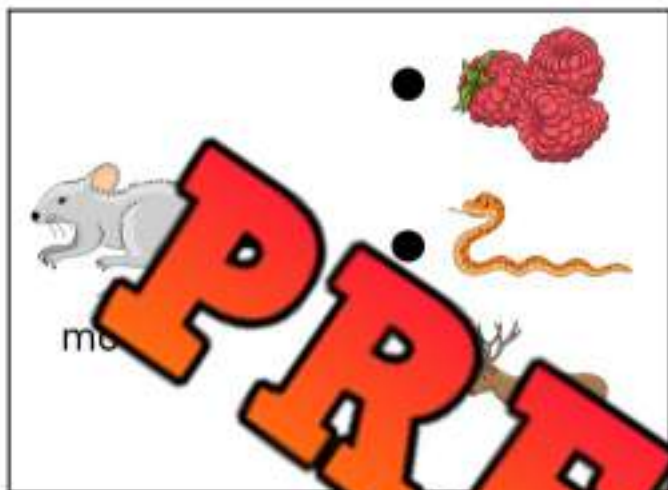
What is happening in the food chain?

What is happening in the food chain?

Food Chain - Animal's Food

Matching

Draw a line from the animal to what it eats for energy



Altering the Food Chain

IMPORTANCE OF THE FOOD CHAIN



When We Change the Food Chain

Sometimes when we make changes to places where animals and plants live, it can also change the food chain. If we do something like getting rid of all the grasshoppers, the leaves will start to grow because nothing is eating them. But the mice, who eat grasshoppers, will have less food and there will be less mice. Owls, who eat mice, will then also have less food and there will be fewer owls.

A Real-Life Story: Changing the Food Chain in Borneo

A long time ago in a place called Borneo, people used a bug called DDT to get rid of mosquitoes that spread a sickness called malaria.

But using DDT didn't just kill mosquitoes. It killed a lot of other insects like cockroaches. Lizards, who loved to eat cockroaches, now had less food and the lizards went hungry. Cats, who loved to eat lizards, now had less food and went hungry as well. But with less cats around, the number of rats grew a lot because cats weren't there to catch them.

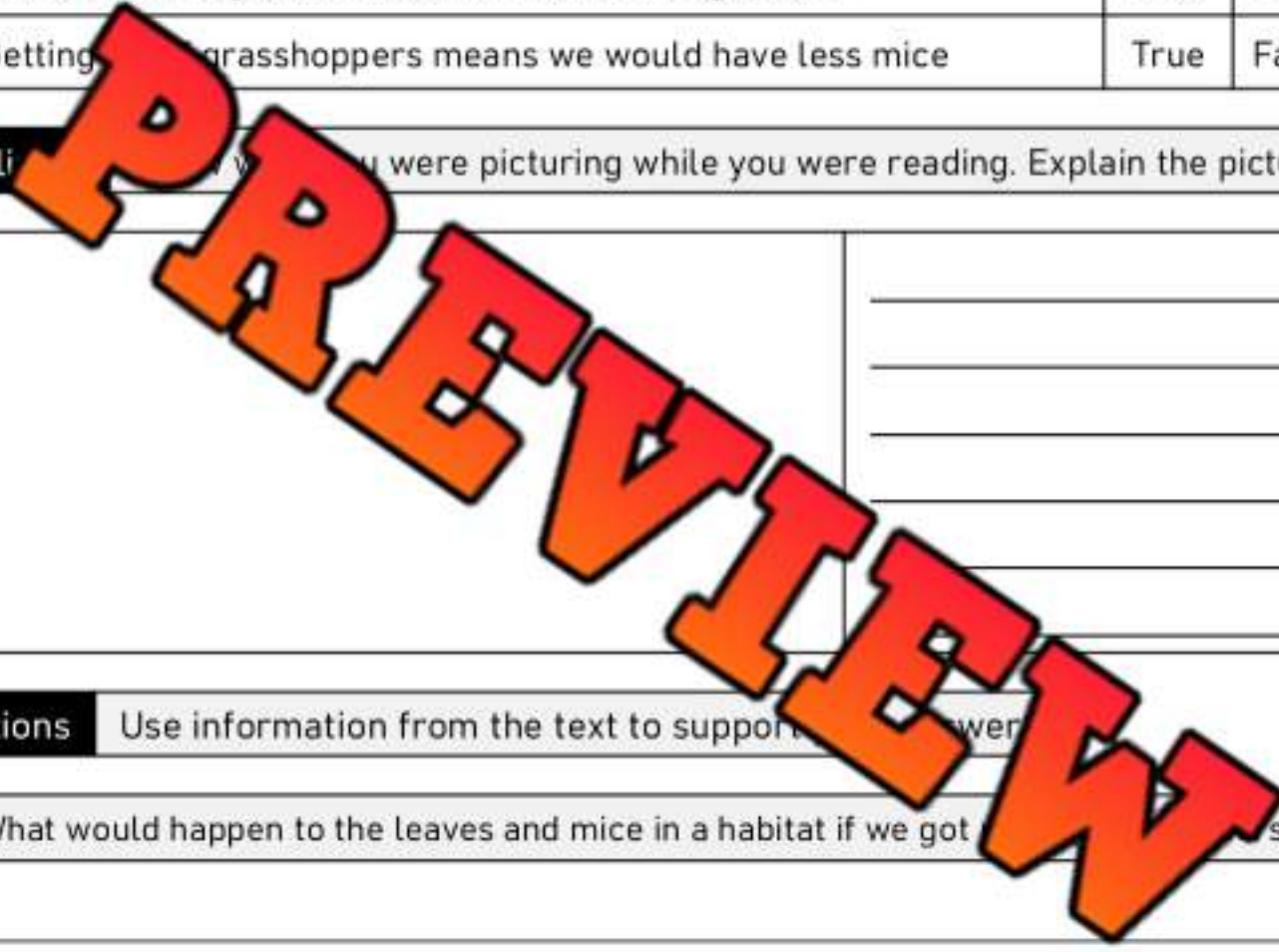
The rats caused a lot of problems in Borneo. In fact, they made more people sick than the mosquitoes did. So, to solve the rat problem, people brought lots of cats from other places to Borneo to catch the rats. This was called "Operation Cat Drop" and it worked!

This story teaches us a big lesson. When we change the food chain, it can cause problems we didn't expect.

True or False Circle whether the statement is true or false

1) When humans change the food chain, it can affect other animals	True	False
2) In Borneo, humans used DDT properly	True	False
3) Getting rid of mosquitos is a good thing	True	False
4) One small change to a food chain can have big effects	True	False
5) Getting rid of grasshoppers means we would have less mice	True	False

Visual Draw a picture you were picturing while you were reading. Explain the picture

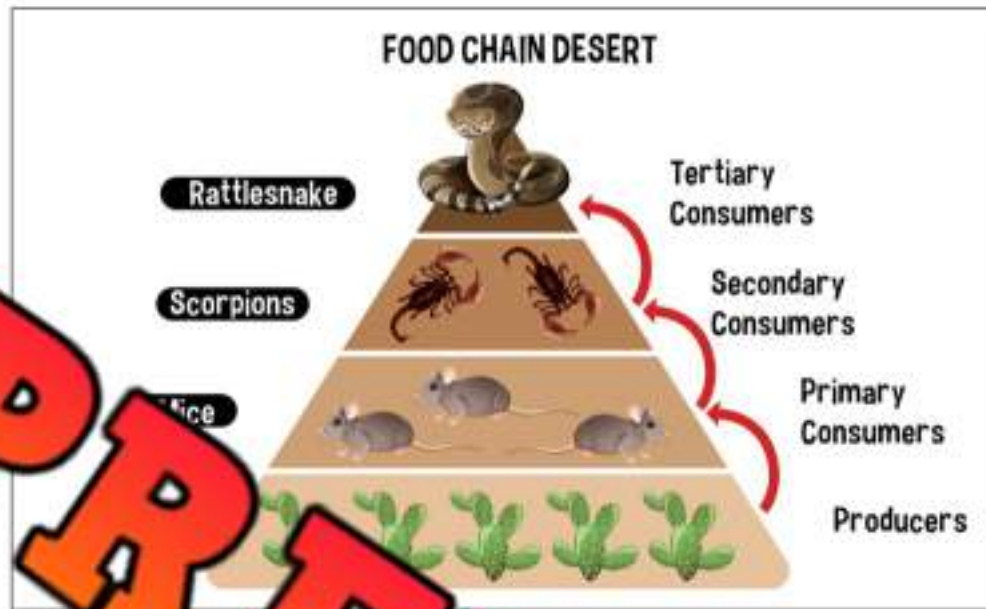
	_____

Questions Use information from the text to support your answer

1) What would happen to the leaves and mice in a habitat if we got rid of grasshoppers?

2) What happened to the cats in Borneo?

Food Chain - Desert



Questions

Answer the questions below

1) Describe the food chain in the desert.

2) What would happen if plants (cacti) stopped growing in the desert?

3) Why do you think rattlesnakes are at the top? Why aren't there larger animals or birds living in the desert?

Food Chain - African Savanna



Level	Examples
Primary Producers	Grass, Acacia Trees, Baobab Tree, Wild Fig, Star Grass
Primary Consumers	Zebras, Elephants, Antelopes, Gazelles, Giraffes
Secondary Consumers	Warthogs, Baboons, Mongooses
Tertiary Consumers	Hyenas, African Wild Dogs, Cheetahs, Jackals
Top Predators	Leopards, Spotted Hyenas, Crocodiles, Leopards

Questions Answer the questions below.

1) Create your own food chain like the one above using different animals.

2) Are the biggest animals always higher on the food chain? Explain.

3) Do animals only eat the animals below them on the food chain? Explain.

Story - Alberta Food Chain

The Adventure of the Alberta Food Chain

Once upon a time in the beautiful land of Alberta, Canada, there was a tiny seed named Sam. Sam lived in the rich soil and with the help of the sun, water, and nutrients from the soil, he grew into a tall and strong wheat plant.

As Sam grew up, he used the sun's energy to turn water and air into food, a process called photosynthesis. Sam was a producer, an important part of Alberta's ecosystem.



Now, in the same Alberta forest, a rabbit named Herb lived. Herb was a consumer. He lived by munching on plants. When he discovered Sam, he was happy! Herb, a consumer, got his energy from eating plants like Sam.

Now, in the same Alberta forest, there lived a cunning fox named Fergus. Fergus was a carnivore, an animal that eats other animals. Herb, the rabbit, was often part of Fergus's meals. Fergus was also a consumer, but he got his energy from animals, not plants.



Then, there were the decomposers, like Dan, the friendly earthworm, and Fungi, the mushroom. When plants like Sam shed leaves, or animals like Herb and Fergus passed away, Dan and Fungi helped break them down. They turned these into nutrients that went back into the soil, helping new seeds like Sam to grow.



In this way, the cycle of life, the food chain, continued in the beautiful land of Alberta. From the small seeds to the big foxes, every creature had a role to play. And even when their time was over, they helped to give life to new plants and animals, keeping the cycle going forever.

Question

Answer the question below

What do the animals in the story eat?

Sam

Herb

Fergus

Dan

Fungi

True or False

Is the statement true or false?

1) Sam is a tiny animal

True

False

2) Sam became a tall Wheat plant

True

False

3) Herb, the rabbit, eats other animals

True

False

4) Fergus, the fox, eats plants like Sam

True

False

5) Dan, the earthworm, is a decomposer

True

False

6) The sun helps Sam make food

True

False

7) Fergus is a herbivore

True

False

8) Fungi, the mushroom, is a producer

True

False

9) The food chain in Alberta never ends

True

False

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.

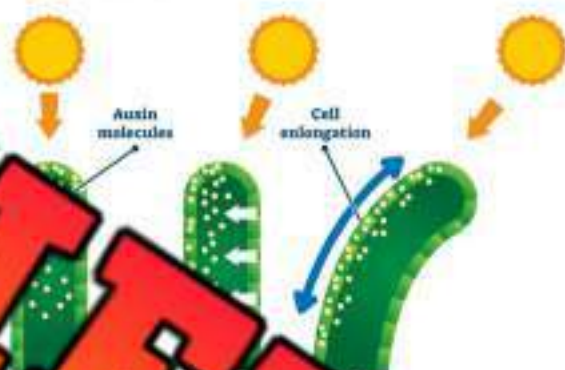
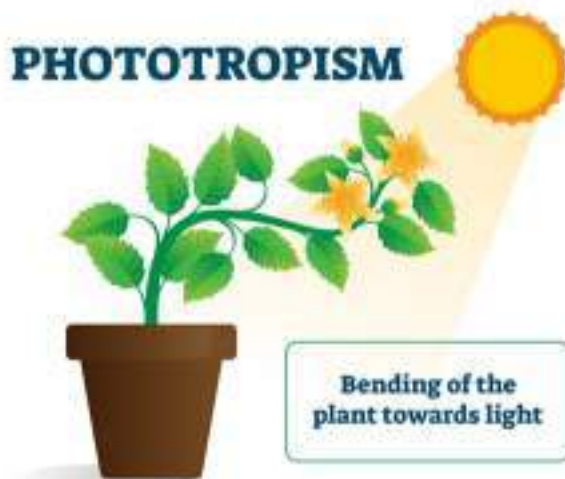
What is Phototropism?

Phototropism is when a plant grows towards light. Just like how you turn your head to look at something that interests you, plants have a way of knowing where the light is, and they grow towards it. This helps them get the energy they need from the sun to survive.

The hormone auxin, is found on the shaded side of a plant. It makes the plant longer on that side, so it can stretch further. This causes the plant to bend towards the light.

So, the next time you see a plant growing towards a window, you know why, because of phototropism!

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.

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 will bend and grow towards light	True	False
5) Plants need light as water is more important	True	False

Visual How were you picturing while you were reading. Explain the picture

Questions

Answer the questions below using evidence from the text

1) What is phototropism? Why does it happen?

2) If plants didn't grow towards light, would they grow as well?

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?

- ✓ 1 potted plant
- ✓ Cardboard box
- ✓ Scissors
- ✓ Tape



Method How do we complete the experiment?

- 1) Cut a small hole (around 2 inches in diameter) on one 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: _____

36

Curriculum Connection
L5.3

Observations

What changes have happened to the plant each day

Time	Description of the Plant
Day 1	
Day 2	
Day 3	
Day 4	
Day 5	

Results

What happened? Describe the changes to the plant

Plants Responding to Touch

How Do Plants Respond To Touch

Plants can't feel like us, but they do react to touch. They have special cells that let them know when they're being touched. When you touch a plant, it might close or fold its leaves, or even grow differently.

Remember, plants are living things. Even though they can't talk to us, they can communicate with us. Check out the examples below.

Examples of Plant Responses to Touch

- Thigmonasty: Some plants react to touch. For example, the Venus flytrap quickly shuts its leaves when touched.
- Sensitive Plant: The touch-me-not plant protects itself by folding its leaves when touched.
- Turgor Pressure Change: A plant can move towards the touch. This happens because the cells of the plant near the touch get more water and those far away lose water.
- Fresh-Cut Grass: When grass is cut, it reacts by releasing chemicals. These chemicals warn nearby creatures to help them stay safe.



Sensitive Plant



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 are not living things	True	False
5) Sensitive plants will droop or fold up when touched	True	False

Questions

What questions do you have about the reading?

1)	
2)	

Questions

Answer the questions below using evidence from the text.

1) Why do plants respond to being touched?

2) How do some plants respond to being touched? Give examples.

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Is the statement true or false?

1) The Venus flytrap closes when touched.	True
	False
2) Plants have special cells to sense touch.	True
	False
3) Thigmonasty happens very slowly over time.	True
	False
4) Sensitive plants fold their leaves to protect.	True
	False
5) Grass releases smells that warn other plants.	True
	False

Name: _____

Mark

Is the statement true or false?

1) The Venus flytrap closes when touched.	True
	False
2) Plants have special cells to sense touch.	True
	False
3) Thigmonasty happens very slowly over time.	True
	False
4) Sensitive plants fold their leaves to protect.	True
	False
5) Grass releases smells that warn other plants.	True
	False

Name: _____

Mark

Is the statement true or false?

1) The Venus flytrap closes when touched.	True
	False
2) Plants have special cells to sense touch.	True
	False
3) Thigmonasty happens very slowly over time.	True
	False
4) Sensitive plants fold their leaves to protect.	True
	False
5) Grass releases smells that warn other plants.	True
	False

Name: _____

Mark

Is the statement true or false?

1) The Venus flytrap closes when touched.	True
	False
2) Plants have special cells to sense touch.	True
	False
3) Thigmonasty happens very slowly over time.	True
	False
4) Sensitive plants fold their leaves to protect.	True
	False
5) Grass releases smells that warn other plants.	True
	False

Plants Responding to Water and Gravity

Responding to Water

Plants need water to grow and create food through a process called photosynthesis. They interact with water in several ways:

Hydrotropism: Some plants, like cacti, have roots that grow towards water. This helps them survive.

Transpiration: Water moves up the stem and out of the leaves through small openings. This helps plants cool down and release excess water.

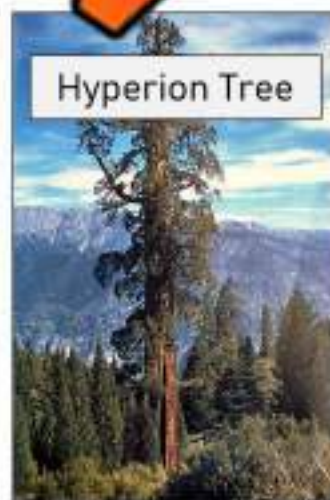
Germination: When a seed soaks up water, it begins to sprout, starting the growth of a new plant.



Responding to Gravity

Plants also respond to gravity. If they grow too tall, they might lean over. Some plants need support structures to keep growing tall. These plants develop bigger roots and a thicker base.

For example, the Hyperion tree, the tallest tree in the world found in California, is 115 metres tall and weighs over 1.6 million pounds. It has a diameter of 4.8 metres, which means the distance from one side of the tree to the other is 4.8 metres. This thick base allows the Hyperion tree to stand tall.



Hyperion Tree

True or False

Is the statement true or false?

1) Plants will respond to gravity by growing larger roots and trunks	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 you water a seed, it will germinate and sprout	True	False
5) Water moves up plants through transpiration	True	False

Visual How were you picturing while you were reading. Explain the picture

Questions

Answer the questions below using evidence from the text.

1) How do plants respond to water?

2) How do plants respond to gravity?

Experiment - Tasty Leaves

Research Question What are we learning about?

If we soak the shoots of lettuce leaves in sugar and/or salt water, will the lettuce taste different?

Hypothesis Will the lettuce taste different?

Treatment	Will it Taste Different?	
	Yes	No
Sugar Soak		
Salt Soak		



Materials What do we need for the experiment?

- ✓ 2 cups with 1/3 cup of water – clear cups work well
- ✓ Two lettuce leaves with their shoots intact
- ✓ 3 tablespoons of sugar
- ✓ 3 tablespoons of salt



Method How do we complete the experiment?

- 1) Add the 3 tablespoons of salt to the water and stir well
- 2) Add the 3 tablespoons of sugar to the water and stir well
- 3) Put one or two lettuce leaves in each solution. Only the shoots (bottom of the leaf) should be in the water solution.
- 4) Wait at least 5-6 hours.
- 5) Taste the leaves, not the shoots. Do they taste different?

Observations

What happened?

Type of Water	Did it Taste Different?	
Sugar Soaked	Yes	No
Salt Soaked	Yes	No

**Results**

Answer questions below

1) Why would the plants taste different after sitting in salt or sugar water? Explain.

2) Why is it important that we keep our soil clean and not polluted?

3) What happens to our soil when we use chemicals (pesticides and fertilizers)? How could that impact the taste and healthiness of the plant.

Nocturnal and Diurnal Animals

Diurnal Animals

Diurnal animals love the sun! These animals wake up when the sun rises. They play, eat, and work during the day. When the night comes, they sleep.

Diurnal Animals

- Human
- Dog
- Eagle
- Butterflies



Nocturnal Animals

Nocturnal animals love the dark. They wake up when the sun sets and the moon shines. They play, eat, and work during the night. When the day comes, they sleep.

Nocturnal Animals

- Bats
- Owls
- Raccoons



Why Are Some Animals Nocturnal?

Nocturnal animals like the dark. It keeps them safe from other animals that might want to hurt them. The cool night air also helps some animals, like the desert mouse, stay cool.

Why Are Some Animals Diurnal?

Diurnal animals love the sunlight. It helps them see clearly. Some diurnal animals, like butterflies, need the sun's heat to fly.

Nocturnal animals sleep during the day and move around at night. They do this to stay out of the heat during the day. It is cooler at night when the sun has gone down.

Which Type? Is the animal nocturnal or diurnal?



Nocturnal

Diurnal



Nocturnal

Diurnal



Nocturnal

Diurnal



Nocturnal

Diurnal



Nocturnal

Diurnal



Nocturnal

Diurnal



Nocturnal

Diurnal



Nocturnal

Diurnal



Nocturnal

Diurnal



Coyote

Nocturnal

Diurnal



Nocturnal

Diurnal



Fox

Nocturnal

Diurnal

Animals Responding To Temperature - Migration

What is Migration?

Migration is like a big journey that animals take. They travel from one place to another when the seasons change. It's like going on a long holiday! Animals migrate, or move, because the weather is getting too hot or too cold. They go to places where the weather is just right for them.

Why Do Animals Migrate?

In Alberta, many animals can't find food in the winter. This is because plants can't grow when it's cold. So, many animals, they migrate south to warmer places. They find food growing in these warmer new places.



Animals That Migrate from Alberta

- 1) **Birds:** Many birds like the Canada Goose and the Sharp-shinned Hawk fly south for the winter. They go to warmer places like Mexico.
- 2) **Bats:** Some bats in Alberta, like the Silver-haired Bat, migrate to warmer places too! They fly to the United States when it's too cold in Alberta.
- 3) **Butterflies:** The Painted Lady butterfly is amazing. It flies all the way to the United States, too. That's a long trip for such a little creature!
- 4) **Caribou:** Caribou move long distances between seasons. In winter, they move to forest areas with less snow to find food. In summer, they migrate to cooler, northern areas.

True or False

Is the statement true or false?

1) Migration is a big journey animals take.	True	False
2) Animals migrate because of weather changes.	True	False
3) In winter, animals in Alberta can easily find food.	True	False
4) Canada Geese fly south for the winter.	True	False
5) Caribou stay in the same place all year.	True	False

Draw _____ Draw an animal that migrate below

**Question**

Write 3 animals that migrate and explain where they go

Experiment - Animal Adaptation: Flight

Research Question What are we learning more about?

Animals will migrate during the winter to escape the cold weather. To **migrate**, animals need to travel far distances. Birds migrate far distances because they can fly.

The Arctic Tern migrates 70,000 kilometres to warmer weather. The Sooty Shearwater migrates 50,000 kilometres. These birds have to be able to fly efficiently so they can travel far without using too much energy.

Materials What do we need for this activity?

- Sheet of paper
- Tape measure - optional
- Tape
- Scissors
- Paper Clips

Method How do we complete the experiment?

1. Make a standard dart paper airplane. Make your folds as shown.
2. Throw your plane 5 times from a spot you've marked with tape on the ground.
3. Once you have a good idea of how far it can fly, try adjusting your plane. You could cut slits in the plane and make new folds.
4. Retest your plane with the new changes. Record your observations on the back of the page.
5. Add paper clips to the planes to see if that makes them fly better. Put them on different parts of the plane. Record your results on the back of the page.



Paper Airplane - Drag Experiment

Observations

What happened?

Plane	Distance (if you have a tape measure)	Rank the Planes 1 = best, 3 = worst
First Plane		
Second Plane		
Plane with Weights		

Results

Answer the questions.

1) Why do birds migrate?

2) How far does the Arctic Tern migrate?

3) Why should birds be good at flying if they migrate?

4) Was your plane good at flying? Would it be good at migrating?

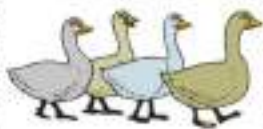
Animals That Migrate

Questions

Cut and paste the animals putting them in the right category

Migrate**Do Not Migrate**

PREVIEW



Animals That Hibernate

Why do Animals Hibernate?

When it gets really cold in winter, it can be hard for animals to find food. Plants stop growing and some insects go away.

To save energy, some animals go into a deep sleep called hibernation.



What happens during hibernation?

When animals hibernate, they find a safe spot like a cave or a hole in the ground. They stay there and sleep all through the winter. During this time, their bodies slow down. Their heart beats slower, they breathe slower, and they don't need to drink water.

Animals That Hibernate in Alberta

- **Bears:** Did you know that black bears in Alberta hibernate? They find a cozy den and sleep all winter. In the spring, they wake up and are ready to find food.
- **Bats:** Bats like the Little Brown Bat hibernate too. They find a cool, dark spot and sleep until spring.
- **Ground Squirrels:** These small animals find a hole in the ground and hibernate. When spring comes, they wake up and start looking for food again.
- **Frogs:** Even some frogs hibernate! The Wood Frog in Alberta freezes in winter and thaws in spring.

Name: _____

60

Curriculum Connection
L5.3

True or False Is the statement true or false?

1) Hibernation is a short sleep	True	False
2) During hibernation, animals eat a lot	True	False
3) Animals hibernate because of cold weather	True	False
4) Bats do not hibernate	True	False
5) All animals hibernate in winter	True	False

Draw _____ hibernate below

Question Why do animals hibernate?

Questions

Which animals below hibernate? Circle yes or no

1)



Yes

2)



Yes

No

3)



Yes

No

4)



Yes

No

5)



Yes

No

7)



Yes

No

8)



Yes

No

9)



Yes

No

10)



Yes

No

11)



Yes

No

12)



Yes

No

13)



Yes

No

14)



Yes

No

15)



Yes

No

16)



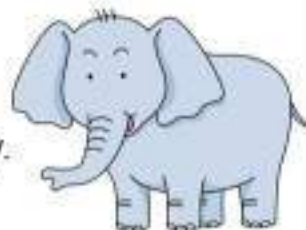
Yes

No

Animal Hearing and Smelling

Super Smellers:

- Bears: Bears are super smellers. They can smell food from miles away. This helps them find berries or honey hidden in the forest.
- Dogs: Dogs are great smellers too. They can smell things that are buried underground. That's how some dogs find bones even when they are hidden.
- Elephants: Elephants use their big long trunks to smell water far away. This helps them find water when it is very dry.
- Moose: A moose can smell plants from far away. This helps them find food in snowy lands.



Hearing Heroes:

- Rabbits: Rabbits have large ears. They can hear a rustling leaf from far away. If a fox is sneaking up, they hear it and hop away fast.
- Owls: Owls are night-time hearing heroes. They can hear tiny sounds in the dark. This helps them catch mice moving in the grass at night.
- Whales: Even underwater, whales can hear sounds from very far away. This helps them find their family or food in the big, wide ocean.
- Deer: A deer can turn its large ears in different direction without moving its head. This helps them hear if a wolf or other predator is coming close.



True or False Is the statement true or false?

1) Dogs can find bones underground	True	False
2) Elephants can smell water when it's dry	True	False
3) Rabbits have small ears	True	False
4) Owls can't hear sounds in the dark.	True	False
5) Rabbits use their ears to hear predators	True	False

Explain. Write how an animal uses its hearing or smelling to survive

Bear	
Dog	
Elephant	
Rabbit	
Whale	
Deer	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Check only the true statements.

Statement	✓
Elephants smell water with trunks.	
Moose smell plants from far.	
Owls catch mice using smell.	
Rabbits can't hear quiet sounds.	
Whales hear sounds in oceans.	
Deer can't move their ears.	
Bears can smell far away.	
Dogs can smell things underwater.	
Bears use hearing to find honey.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Elephants smell water with trunks.	
Moose smell plants from far.	
Owls catch mice using smell.	
Rabbits can't hear quiet sounds.	
Whales hear sounds in oceans.	
Deer can't move their ears.	
Bears can smell far away.	
Dogs can smell things underwater.	
Bears use hearing to find honey.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Elephants smell water with trunks.	
Moose smell plants from far.	
Owls catch mice using smell.	
Rabbits can't hear quiet sounds.	
Whales hear sounds in oceans.	
Deer can't move their ears.	
Bears can smell far away.	
Dogs can smell things underwater.	
Bears use hearing to find honey.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Elephants smell water with trunks.	
Moose smell plants from far.	
Owls catch mice using smell.	
Rabbits can't hear quiet sounds.	
Whales hear sounds in oceans.	
Deer can't move their ears.	
Bears can smell far away.	
Dogs can smell things underwater.	
Bears use hearing to find honey.	

Animal Tasting and Seeing

Taste Champions

- Goats: Goats have more taste buds than us! They like to taste all sorts of things to find out what's yummy and what's not. They even taste wood and paper.
- Pigs: Pigs are also good at tasting. They can taste sweet, salty, sour, and bitter things like we can! They use their snouts to find tasty food in the ground.
- Cats: Cats are meat eaters because they have a strong sense of taste. They don't like sweet things, but they love meat!
- Fish: Some fish, like catfish, have taste buds all over their bodies! They can taste their food even before it gets to their mouth.



Vision Victors

- Eagles: Eagles have eyes that are better than ours! They can spot a small mouse on the ground even when they're flying up in the sky.
- Cats: Cats can see very well in the dark. They can't see all the colours we can, but their eyes are perfect for seeing movement at night.
- Dragonflies: Dragonflies have amazing eyesight. They can see all around them at the same time! This helps them to find food and stay safe.
- Bees: Bees can see colours we can't! They can see ultraviolet light, which helps them find flowers with the sweetest nectar.



True or False Is the statement true or false?

1) Goats have more taste buds than people	True	False
2) Pigs cannot taste sweet things	True	False
3) Cats like sweet food	True	False
4) Catfish have taste buds on their bodies	True	False
5) Cats can see all the colours humans can	True	False

Match. Write the letter from the ability beside the matching animal

Answer		Tasting or Seeing Ability
	Goats	A) They do not taste sweet things, but they love meat.
	Pigs	B) They are very good at seeing in the dark, especially movement.
	Cats	C) They have lots of taste buds for tasting different things.
	Catfish	D) They can spot a small mouse from a long way in the sky.
	Eagles	E) They can taste sweet, salty, sour, and bitter things.
	Cats	F) They can see ultraviolet light, which helps them find sweet flowers.
	Dragonflies	G) They can see all around them at the same time.
	Bees	H) They have taste buds all over their bodies.

Indigenous Use of Plants

Who Are The Indigenous?

The indigenous groups in Canada are the people who lived here first. The three indigenous groups used plants in many ways to survive. These groups are the Métis, Inuit and First Nations. Some indigenous groups still live off the land, making plants very important.

Food

The indigenous people of Canada ate plants that were available to them. They didn't eat bananas because bananas didn't grow well in Canada. Instead, many indigenous groups grew what they called the 3 Sisters, which were beans, corn, and squash. They made soups out of these 3 plants.



Medicine

The indigenous people of Canada have been using plants to cure illness for thousands of years. They use plants to make herbal teas that fight germs from the vitamins in the plants. An example of this was when the Haudenosaunee made tea out of pine trees to treat scurvy. Pine needles have a lot of vitamin C, which can cure scurvy quickly.

Shelter

The indigenous people of Canada used plants in many ways than we do today. They built shelters like wigwams and Teepees out of bark, wood poles, straw, and vines. They also built longhouses, which were larger shelters made of cedar wood and bark.



Clothing

The indigenous used stems, roots, bark, and leaves to make clothing. Bark was easy to find, so it was used a lot to make clothes. Bark would be shredded and weaved to make skirts, aprons, shirts, belts, hats, capes, and even raincoats.



Questions

Answer the questions below

1) What medicine did the indigenous make to cure scurvy? How did they make it?

2) How did indigenous groups make clothing?

Visualizing

Draw what you pictured while you were reading. Explain the picture

True or False

Circle whether the statement is true or false

1) The 3 sisters were corn, beans, and bananas	True	False
2) The indigenous made clothing out of bark	True	False
3) Bark was hard to find for the indigenous	True	False
4) A longhouse is made of bamboo trees	True	False
5) Pine needles can be used to make tea that is rich in vitamin C	True	False

Indigenous Use of Tobacco Plant

Indigenous Use of Tobacco

Tobacco is a special plant. It is very important to many First Nations and Métis people. Let's learn why.

Tobacco for Giving

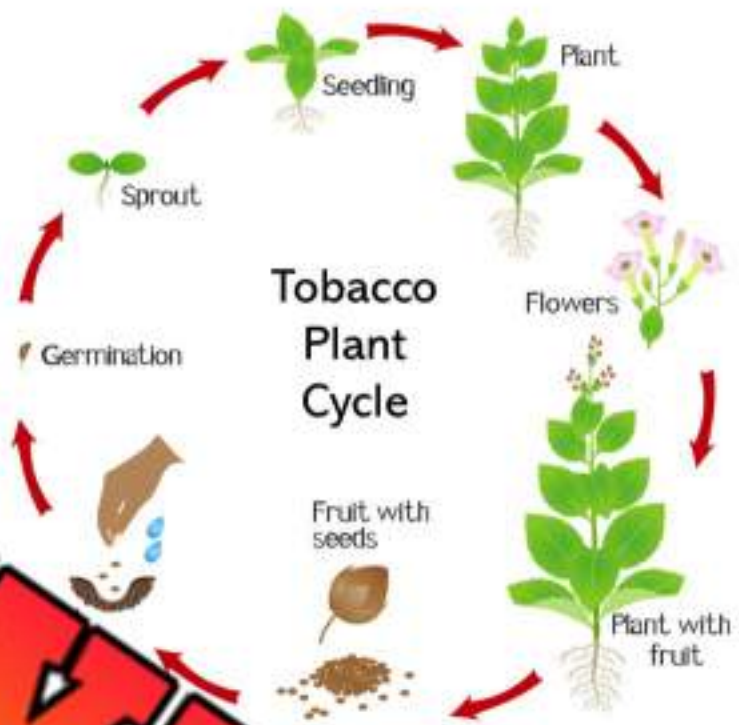
Harvesting tobacco is a special way to give food from the Earth to the Earth. Before the First Nations and Métis people start harvesting food, they give tobacco to the Earth. They say "thank you" to the Earth. The Earth gives them food and things they need to live.

Giving tobacco is a way to show respect. When the Earth is helping them and they appreciate it. They might put tobacco on the ground. Or they might burn it. When they burn it, the smoke goes up to the Earth.

First Nations and Métis people use tobacco in other ways. They might give it as a gift to someone they respect, or to ask for help or advice. It's also used in special ceremonies, like weddings or naming ceremonies.

Tobacco for Smoking

Some people smoke tobacco. But this is different from giving tobacco to the Earth. People might smoke tobacco because they like the taste or how it makes them feel. But smoking tobacco can hurt our health. It can make us sick, like giving us lung cancer or heart disease. So, it's best not to start smoking.



Questions

Answer the questions below

1) Why do First Nations and Métis people give tobacco to the Earth?

2) How do they give tobacco to the Earth?

Visualizing

Draw what you see in your mind as you were reading. Explain the picture

**True or False**

Circle whether the statement is true or false

1) The First Nations and Métis only smoke tobacco	True	False
2) They give tobacco as a sign of respect	True	False
3) They burn tobacco to let the smoke go up in the air	True	False
4) Smoking tobacco is good for us	True	False
5) Tobacco is an important plant to the First Nations and Métis people	True	False

Plants Need Animals

Plants and Animals Need Each Other

Plants would not be able to survive without animals and animals would not be able to survive without plants. We need each other! Plants do not eat animals, which means we need each other in different ways.



Why Plants Need Animals

Plants need animals in order to survive. Below are three main

1) Animals spread pollen

Some animals help plants make new plants. They carry pollen from flower to flower. Without pollen, the plant cannot make seeds. Seeds are needed for new plants to grow.

Animals that carry pollen are called pollinators. Pollinators are very important animals that help plants a lot. Bees are the best insect pollinators, but bees are the best at pollinating. Without bees, we wouldn't have many plants, and we wouldn't have animals!

2) Animals spread seeds

Animals are also good at spreading seeds around. This happens when they eat fruit with seeds in it and compost it. Animals in the wild that eat fruit also spread seeds. They take the seeds to new places where the seeds grow into new plants.

Horses roll around on the ground, collecting seeds on their backs. When they gallop away, seeds blow in all directions.

3) Animals make manure

Animals also help plants by providing manure that fertilizes the soil. Manure is a fancy word for poop. Animal poop has a lot of nutrients in it and it is used to make soil even better. Soil with manure in it allows plants to grow healthier and stronger.

Questions

Answer the questions below

What are three ways why plants need animals?

1)

2)

3)

Word Search

words

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

Plants

Spread

Bees

Animals

Seeds

Fertilizer

Manure

True or False

Circle whether the statement is true or false

1) Plants need animals to spread their pollen

True

False

2) Plants need animals to spread their seeds

True

False

3) Plants need animals to plant seeds deep in the soil

True

False

4) Plants need animals to give them sunlight

True

False

5) Plants grow better in manure from animals

True

False



Questions

What is happening in the picture? How is the animal helping the plant?







Experiment - Pollination

Research Question What are we learning about?

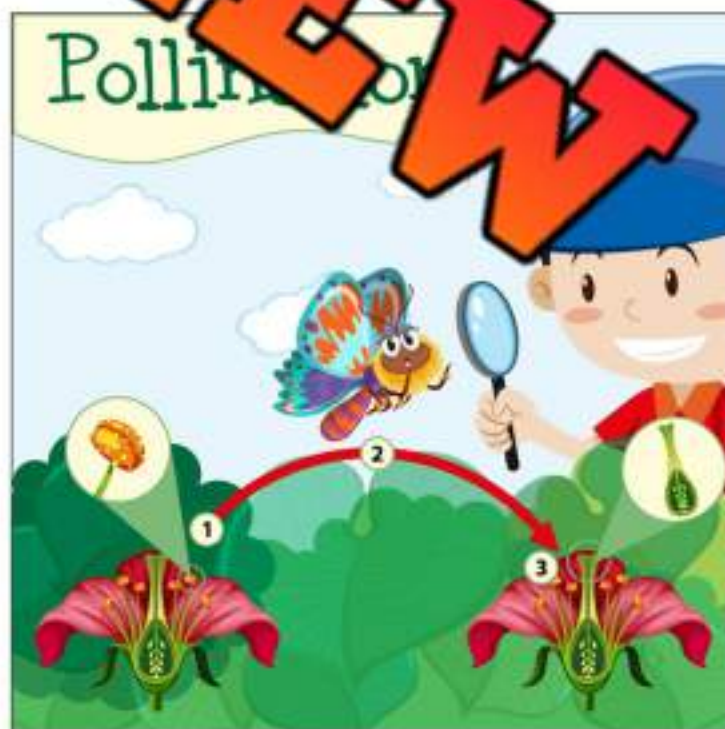
How do insects and other animals pollinate plants?

Materials What do we need for our experiment?

- ✓ 1 bag of cheese corn chips or a bag of cheese popcorn
- ✓ White tissue paper enough for each student to get one

Method How do we conduct the experiment?

- 1) Hand out a small amount of chips/popcorn to each student
- 2) Have them enjoy their food but tell them not to lick their fingers!
- 3) When everyone is done, hand out one piece of tissue paper to each student
- 4) Tell the students to touch the tissue paper with their sticky fingers
- 5) Did any of the cheese flavouring get on the paper?
- 6) Answer the questions on the back of the page



Observations

What happened?

Did any of the flavouring land on the tissue paper? How did that happen?

Results

Answer the questions below

1) What happens in the diagram? How is pollen being spread?



2) If you touched your cheesy fingers to the door handle, what would happen?

3) Why do insects and animals touch plants in the first place?

Writing Code - Robotic Bees

Honeybees pollinate about 80% of plants worldwide. The problem is that since 1947, we have lost 60% of our honeybees. Robotic scientists are working to solve this problem by designing robotic bees that can pollinate plants.



Direction

Use the arrows to move the bee to each of the flower so it can pollinate them. Use as few moves as you can.



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

Directions

The code below was written to send the bee to the plant(s) and then back to the hive. Are there errors in the code? Can you fix them?

Is this Correct?

Yes

No

Your Code

run program

fly right 4

fly down 4

fly right 2

fly down 1

run program

**Is this Correct?**

Yes

No

Your Code

run program

fly up 3

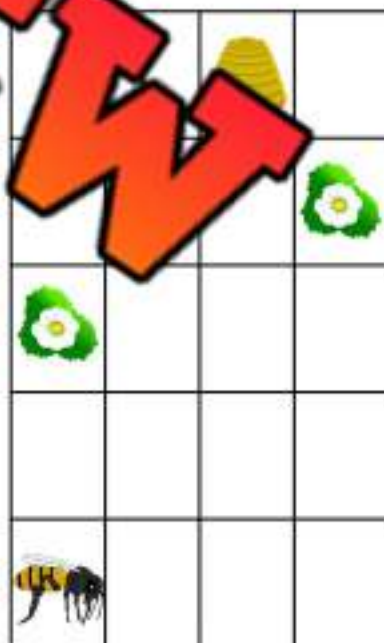
fly right 3

fly up 1

fly left 1

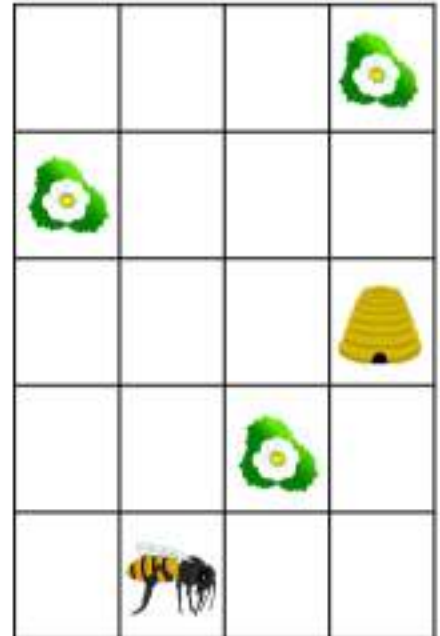
fly up 1

run program

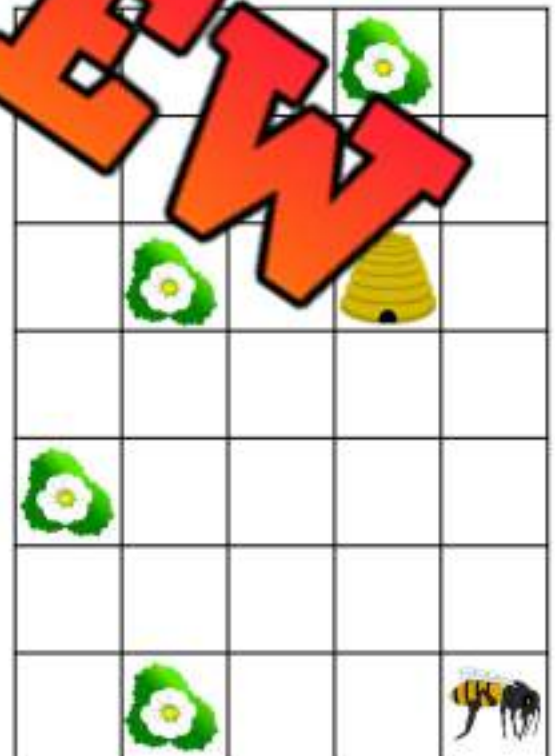


Directions Write your own code to get the bee to the flowers and to the hive

run program



run program



Animals Need Plants

Animals Need Plants

Without plants, animals would not be able to survive. Animals need plants for many reasons, including the three below.



1) For Food

The biggest reason we need plants is for food. We eat plants! They are yummy, especially if you don't forget, even breads, cereals, and pastas are made from plants.

Without plants, animals would not have energy to survive. You may think animals could survive on other animals, but with no plants, many animals would die. With plants, we would run out of animals to eat.



2) For Oxygen

We also need plants because they release oxygen into the air. Animals need oxygen to breathe! Plants and animals work together to keep the air in our atmosphere. Plants need the carbon dioxide that animals breathe out in order to make their own food and we need the oxygen that plants release. Plants and animals are a great team!

3) For Shelter

Plants are a source of shelter for animals as well. Some animals burrow into trees and live inside of them. They use trees to hide inside from predators. Trees also provide shade from the sun so they can cool down. Birds use plants to make their nests. They use twigs, grass clippings, and soil to make their nests where they can protect their eggs.



Questions

Answer the questions below

What are three ways why animals need plants?

1)

2)

3)

Making Connections Draw 3 ways animals use plants. Explain your drawings

True or False

Circle whether the statement is true or false

1) Animals need plants to eat for energy	True	False
2) Animals need plants to make oxygen for us to breathe	True	False
3) Animals need plants to make shelters	True	False
4) Animals need plants for carbon dioxide	True	False
5) Animals use plants to make cars	True	False

Questions

What is happening in the picture? How is the animal using the plant?







Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Mark

There are the reasons animals
need plants below. Can you
circle them?

Shade	Food	Cars
Food	Oxygen	Nests
Houses	Water	Shelter

Name: _____

Mark

There are the reasons animals
need plants below. Can you
circle them?

Shade	Toys	Cars
Food	Oxygen	Nests
Houses	Water	Shelter

Name: _____

Mark

There are the reasons animals
need plants below. Can you
circle them?

Shade	Toys	Cars
Food	Oxygen	Nests
Houses	Water	Shelter

Name: _____

Mark

There are the reasons animals
need plants below. Can you
circle them?

Shade	Toys	Cars
Food	Oxygen	Nests
Houses	Water	Shelter

How Food is Grown

Different Ways of Growing Food

Food is grown in many different ways around the world. We get food from farms, greenhouses, and home gardens.

Farms

A **farm** is a lot of land that is used for growing plants and food. A lot of plant foods for many people living all over the world. Farmers grow on **arable land**. **Arable land** is land that has good soil. A beach would not be arable land, so you wouldn't see a farm on a beach!

Farmers plant crops that grow in the weather conditions they have. In Canada, our weather does not grow some food. Bananas, mangoes, and pineapples need a longer growing season.

Greenhouses

A **Greenhouse** is a glass building where plants are grown. Greenhouses are used a lot in Canada because you can control the environment in a greenhouse. You can add heat to a greenhouse in the winter, or use lights to act like the sun where the sun sets early.

In Canada, there are almost one thousand big greenhouses. These greenhouses are used to grow almost 1 million metric tons of vegetables! Most of the big greenhouses are in Ontario.

Home Gardens

Home gardens are smaller areas where people plant seeds and crops outside of their houses. Home gardens are like smaller farms and usually only provide food for one family.



Fill in the Blanks What word is missing?

1. Arable land has good _____.
2. A greenhouse is a _____ building.
3. The province with the most greenhouses is _____.
4. Farms in Canada cannot grow mangoes, bananas, and _____.
5. Over half the people in _____ grew at least one fruit or vegetable.

**Questioning** Write questions you have about the reading

1)	
2)	
3)	

Multiple Choice Circle the best answer

1) Canada has a long/short growing season	Long	Short
2) In a greenhouse, you can add	Heat	Oxygen
3) Home gardens are like smaller	Greenhouses	Farms
4) Good land for growing plants is called	Arable land	Rich land
5) Most fruits and vegetables are grown in	Home gardens	Farms

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Mark

Circle the correct answer.

1) Which land has good soil?

Arable

Greenhouse

2) Where do families grow food?

Home gardens

Greenhouse

3) Where are vegetables grown indoors?

Greenhouse

Arable land

4) Where can you add heat?

Home gardens

Greenhouse

Name: _____

Mark

Circle the correct answer.

1) Which land has good soil?

Arable land

Greenhouse

2) Where do families grow food?

Home gardens

Greenhouse

3) Where are vegetables grown indoors?

Greenhouse

Arable land

4) Where can you add heat?

Home gardens

Greenhouse

Name: _____

Mark

Circle the correct answer.

1) Which land has good soil?

Arable land

Greenhouse

2) Where do families grow food?

Home gardens

Greenhouse

3) Where are vegetables grown indoors?

Greenhouse

Arable land

4) Where can you add heat?

Home gardens

Greenhouse

Name: _____

Mark

Circle the correct answer.

1) Which land has good soil?

Arable land

Greenhouse

2) Where do families grow food?

Home gardens

Greenhouse

3) Where are vegetables grown indoors?

Greenhouse

Arable land

4) Where can you add heat?

Home gardens

Greenhouse

Locally Grown Food

Locally Grown Food

Food that is grown locally means the food has been grown nearby. Local food could have been grown down the street from where you live. The best way to buy local food is to go to a farmers' market. At a farmers' market, local farmers bring their crops and sell them.



When you shop at a grocery store, almost all of the food is not grown locally. Fruits and vegetables come from Mexico, where the growing season is longer.

Some foods are not grown locally. For example, bananas, pineapples, and mangoes do not grow in Canada. During the winter months, nothing grows in Canada. This means we cannot buy fresh fruits and vegetables from local farmers.

Benefits of Buying Local Food

There are 3 main benefits of buying locally grown food. Check them out below.

1) Fresh fruits and vegetables

When we buy locally, we know the fruits and vegetables have not had to travel a long distance. This means the fruits or vegetables could have been picked recently!

2) Supporting local families

If you buy locally grown food, the money you are spending on the food stays in your community. This extra money in your community can help to pay for community buildings like parks and hockey rinks. You are also helping people you might know!

3) Better for the environment

When you buy locally, the food does not have to travel as far. This is better for the environment because it means less transports or airplanes travelling to send food other places. Airplanes and transports release gases into our environment that make it sick.



Questions

Use information from the text to support your answer

1) Why is it hard to always buy fruits and vegetables locally?

2) When is it hard to buy fruits and vegetables locally?

3) What are the reasons why you should buy fruits and vegetables locally?

Visualizing

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

Rules and Counts: Caring for Alberta's Animals

Fishing and Hunting Rules

In Alberta, we have special rules for fishing and hunting. These rules tell us how many fish or animals we can catch or hunt and when we can do these activities. For example, we can only catch certain types of fish during specific months.

Wardens help make sure everyone follows these rules. They might ask to see your fishing or hunting license, or they might see what you've caught. If someone breaks the rules, they can get into trouble.



Counting Animals and Fish

Besides these rules, scientists and park rangers also keep track of how many animals and fish there are in an area. This is to make sure there are healthy populations. They might count how many deer are in a forest or how many fish are in a lake.

They do this by observing animals, using cameras, or sometimes by tagging and releasing animals to keep track of them.

Why Counting is Important

Counting animals and fish is very important. The number they find helps to decide the rules for fishing and hunting.

If there are a lot of fish in a lake, people might be able to fish more. But if there aren't many fish, people might need to fish less. This way, we can make sure there are always plenty of animals and fish in Alberta's beautiful outdoors.



Questions

Answer the questions below

1) Why do we count and track animals?

2) What can be done if animal populations are getting smaller?

Visualizing

Draw what you see in the picture you were reading. Explain the picture

True or False

Circle whether the statement is true or false

1) Fishing rules tell us when to fish	True	False
2) Game Wardens check fishing licenses	True	False
3) We don't need to count fish in a lake	True	False
4) Counting animals helps us decide hunting rules	True	False
5) You can fish for any fish in any month	True	False

Replenishing Plants

What Does Replenishing Plants Mean?

Humans need wood in order to build many of the things we use everyday. Trees provide us with the wood we need, which means trees need to be cut down in order to manufacture wood.

Lumberjacks are workers who cut down trees.

Developers create fields full of plants so they can build houses and stores. **Replenishing Plants** means we plant new trees or plants that have been cut down or removed.



Why Replenish Plants

We need to replenish plants for many reasons:

1. Plants are needed for animals to survive. We eat plants in the form of fruits and vegetables and most of the animals eat, also, plants.
2. If we cut down trees and forests without replanting, we will run out of wood. We use wood to build structures.
3. Plants are needed to absorb carbon dioxide. If we have too much carbon dioxide, our planet gets sick!
4. Plants release oxygen for us to breathe. We need oxygen to survive!
5. We get medicine from plants. Plants help cure diseases and injuries that people suffer from.

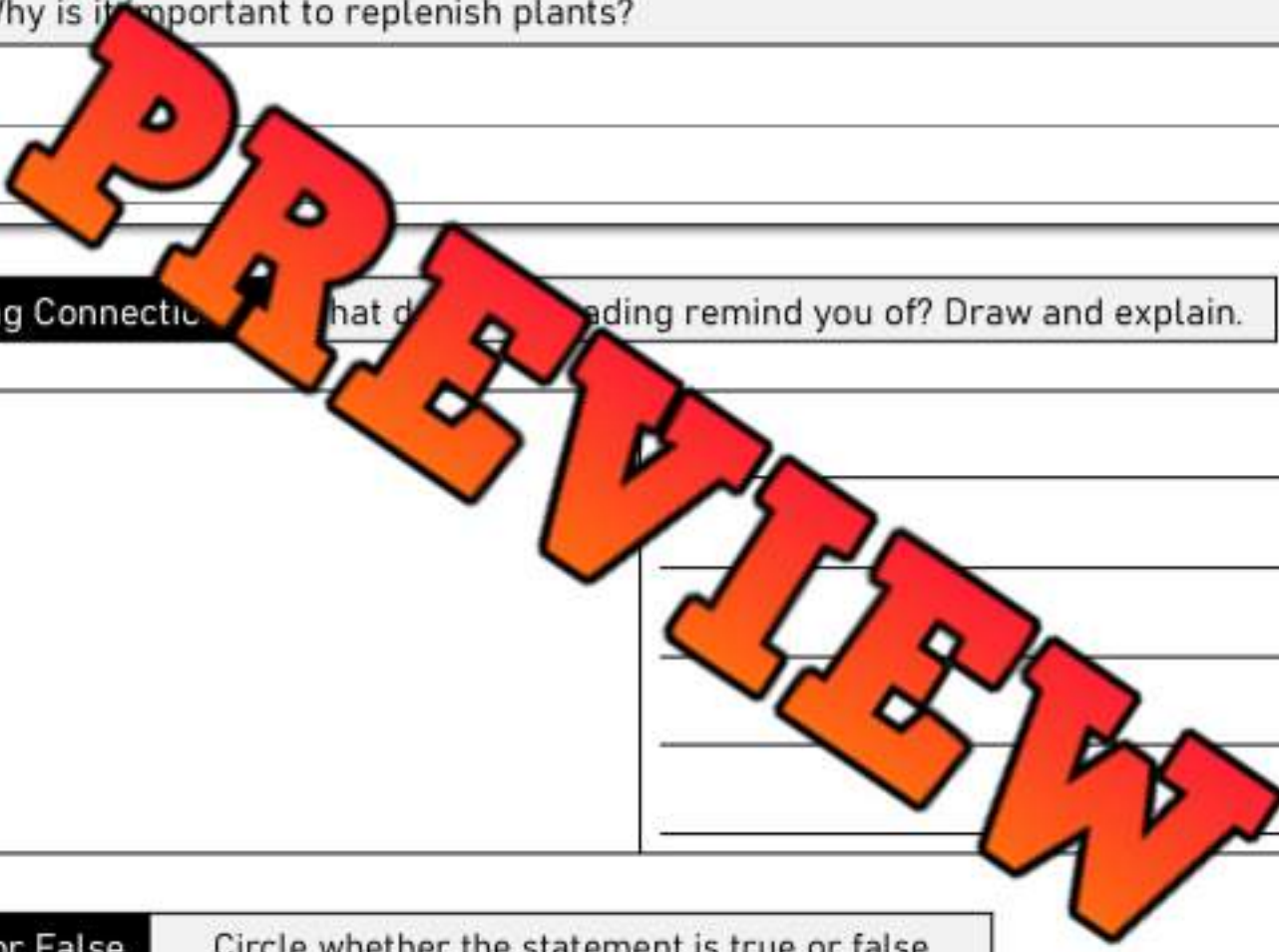


Questions

Use information from the text to support your answer

1) Why are trees cut down?

2) Why is it important to replenish plants?

Making Connections What does this reading remind you of? Draw and explain.

True or False

Circle whether the statement is true or false

1) We need to cut down trees to get wood to build structures	True	False
2) We need to plant new trees to keep us healthy	True	False
3) We need trees to absorb carbon dioxide	True	False
4) We need wood more than we need growing trees	True	False
5) We can cut down as many trees as we want and stay healthy	True	False

Two Billion Trees

Two Billion Trees

In the year 2020, the Canadian government made a plan to plant two billion trees. They hope to have the two billion trees planted by 2030. As of 2022, they have planted 30 million trees.

Why Two Billion Trees?

- **Climate Change** - Trees collect carbon which will help stop climate change
- **Save Animals** - Trees are homes to many animals. Planting new trees will save animals
- **For People** - More green spaces and parks for people to enjoy

How Can You Help?

If you want to help plant trees, you could join a team that plants trees. Check out the Canadian government's website for a form to join. The government gives money to teams so they can plant trees in good places.



Questions

Answer the questions below.

Why is the Canadian government planting two-billion trees?

1)

2)

3)

True or False

Circle whether the statement is true or false

1) The Canadian government by 2022 had planted 1 billion trees	True	False
2) They are planting trees to fix climate change	True	False
3) You can join a team to help Canada plant 2 billion trees	True	False
4) Trees are only needed to make us oxygen to breathe	True	False
5) Trees save animals by giving them a home	True	False

Coding - Drawing Plants

Directions Follow the code from Nora to draw a plant

Hi, Nora here. Can you follow my code to draw a plant?

run program

draw horizontal line for the ground

draw a stem for the ground line

draw a stem for the ground line

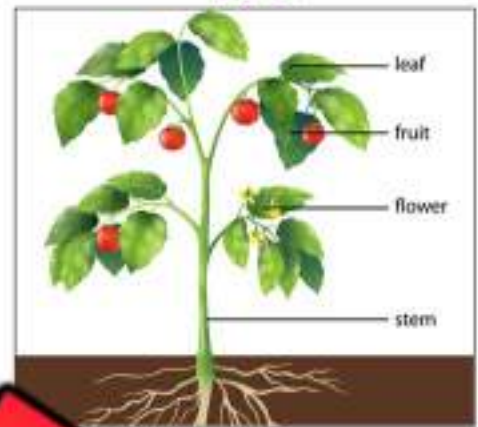
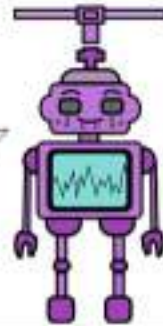
draw a stem for the ground line

draw black for the ground line

draw strawberry for the ground line

some of the petioles

draw a flower coming on the

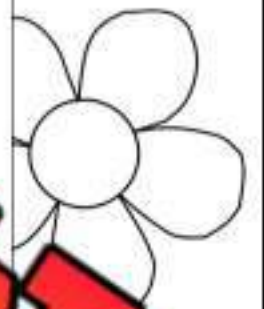


Writing Code - Drawing a Flower**Directions**

Can you write code that will make a flower?

Write codes that a classmate can follow to draw a flower. Remember, your classmate will only draw what you code.

run program

**Output**

Indigenous Understanding of Animals

Indigenous Understanding of Animals

First Nations, Métis, and Inuit people have a deep knowledge about animals and how they behave. They also understand when animals move from one place to another. This knowledge helps them in many special ways.

Understanding Animal Behaviour

- Read the Signs: They can watch birds and predict when a storm is coming. Birds will stop flying and hide in their nests when a storm is coming.
- Know Seasons: Squirrels start collecting nuts when winter is near. This tells them when the seasons are changing.
- Stay Safe: If a bear stands on its hind legs, it might be worried and it's time to step back.
- Learn Skills: By watching beavers build dams, they learn how to build strong homes.



Understanding Migration Patterns

- Mark Seasons: When geese fly south, they know winter is coming. When robins come back, they know spring is here.
- Plan Hunting: They only hunt caribou when they know they are migrating through their lands.
- Find Food: They follow the herds of bison during their migrations to ensure they have food.

Think

Answer the questions below

1) What is one way the Indigenous know when a storm is coming?

2) How do Indigenous know the seasons are changing?

Visualizing

Draw what you see in your mind when you were reading. Explain the picture

Word Search

Find the words!

Season	Safe
Storm	Animal
Bear	Stand
Bird	Nest

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

Indigenous Understanding of Life Cycle

Indigenous Understanding of Life Cycles

Indigenous groups in Alberta have fished successfully for thousands of years. They understand the life cycles of fish. Even though there were no rules in place as to how many fish you could catch, they did not overfish. Overfishing has led to the problems we have today.



Problems Today

As of now, there are many lakes and rivers in Alberta that have low amounts of fish. This is because of overfishing of salmon and trout. The government has put in rules to stop people from catching certain fish. These rules are in place because we need fish to lay eggs so that new fish can be born.



Even with the rules, many anglers (people who fish for fun) do not follow them. This has led to the fish population to decline.

The Indigenous groups in Alberta did things differently.

- ✓ They would catch fish downstream, after they laid eggs
- ✓ Their fishing nets had a large hole, letting some of the fish escape. This was out of respect for the fish. They now had a chance to survive.
- ✓ They didn't have rules, but they all followed the unwritten rules of conservation. Conservation means only using what you need.

True or False

Circle whether the statement is true or false

1) Overfishing isn't a problem because there will always be more fish	True	False
2) Many Indigenous groups overfish	True	False
3) Many Canadian anglers overfish	True	False
4) The amount of salmon in Alberta rivers and lakes is healthy	True	False
5) The Indigenous wouldn't catch fish before they lay eggs	True	False

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

Questions

Use information from the text to support your answer

1) Why did the government put in rules as to how many salmon can

2) Why were the Indigenous able to fish for thousands of years without affecting the salmon population?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Indigenous groups in Alberta didn't have rules, but they all followed the unwritten rules of conservation.
	The Indigenous groups in Alberta would catch fish downstream, after they laid eggs.
	Conservation means using all you want.

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Indigenous groups in Alberta didn't have rules, but they all followed the unwritten rules of conservation.
	The Indigenous groups in Alberta would catch fish downstream, after they laid eggs.
	Conservation means using all you want.

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Indigenous groups in Alberta didn't have rules, but they all followed the unwritten rules of conservation.
	The Indigenous groups in Alberta would catch fish downstream, after they laid eggs.
	Conservation means using all you want.

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Indigenous groups in Alberta didn't have rules, but they all followed the unwritten rules of conservation.
	The Indigenous groups in Alberta would catch fish downstream, after they laid eggs.
	Conservation means using all you want.

Métis Seasonal Rounds

Living on a seasonal cycle means you live differently in different seasons. The Métis traditionally did the following in each season.

Spring

- Hunt buffalo, ducks, geese, swans, moose, deer, and elk
- Trap otters, beavers, rabbits, and wolves
- Collect driftwood for canoes and household items
- Trim and plant trees
- Plant wheat and other grains



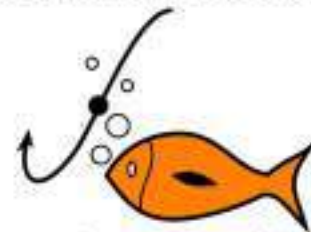
Summer

- Hunt buffalo, wolves, coyotes, rabbits, and moose
- Trap bears
- Gather Seneca root, blueberries, raspberries, and currants
- Fish with nets
- Plant and harvest barley
- Shear sheep for their wool



Fall

- Hunt buffalo to save food for the winter
- Hunt moose, deer, chickens, ducks, geese, and swans
- Fish for whitefish and salmon
- Trap and hunt bears, wolves, coyotes, mink, otters and beavers
- Harvest wheat
- Slaughter livestock



Winter

- Trap skunks, weasels, mink, otters, beavers, muskrats, and bears
- Hunt buffalo, bears, wolves, coyotes, chickens, rabbits, and moose
- Ice fish with nets

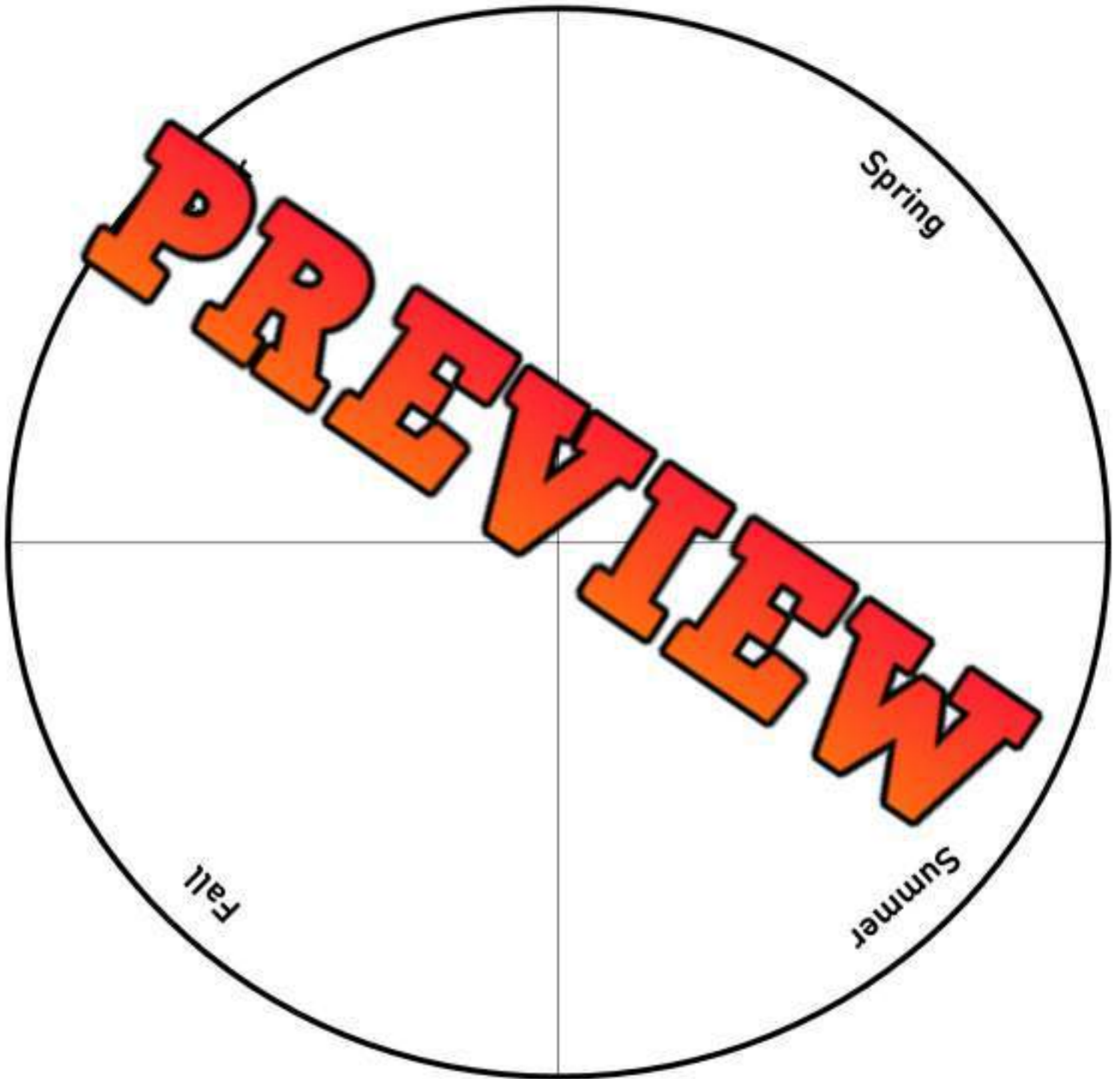
Name: _____

117

Curriculum Connection
LS.4

Instructions

Use the information from the previous page to fill in the seasonal round below for the Métis Indigenous group



Your Own Seasonal Round

You will likely have different things happening in your life from season to season. Do you celebrate certain holidays in a season? Do you play different sports or do different activities in different seasons?

Instructions

Draw or write the things you do from season to season



Name: _____

Date: _____

Unit Test - Plants and Animals

Multiple Choice

/10

1) Who is highest on the food chain? a) Wheat plant b) Fox c) Rabbit d) Mouse	2) An animal that eats both plants and animals is a... a) Carnivore b) Herbivore c) Omnivore d) Multivore
3) Plants that make their own food are... a) Consumers b) Decomposers c) Producers d) All of the above	4) Animals that do not have any predators are... a) Tertiary Consumers b) Primary Consumers c) Quaternary Consumers d) Secondary Consumers
5) What gives grass energy? a) Rabbits b) Snakes c) Bugs d) Sunlight	6) Which of the following is a decomposer? a) Snake b) Bat c) Fungi d) Dragonfly
7) What gives snakes energy? a) Mice b) Sunlight c) Wolves d) Grass	8) Which animal is a carnivore? a) Raccoon b) Bat c) Dog d) Owl
9) Which animal does not hibernate? a) Bears b) Bats c) Squirrels d) Birds	10) Which animal is an omnivore? a) Deer b) Bear c) Penguin d) Horse

Define

What do the terms below mean?

Mark

/

Term	Definition (what does it mean)
Carnivores	
Herbivore	
Omnivore	

Short Answer

Answer the questions below

Mark

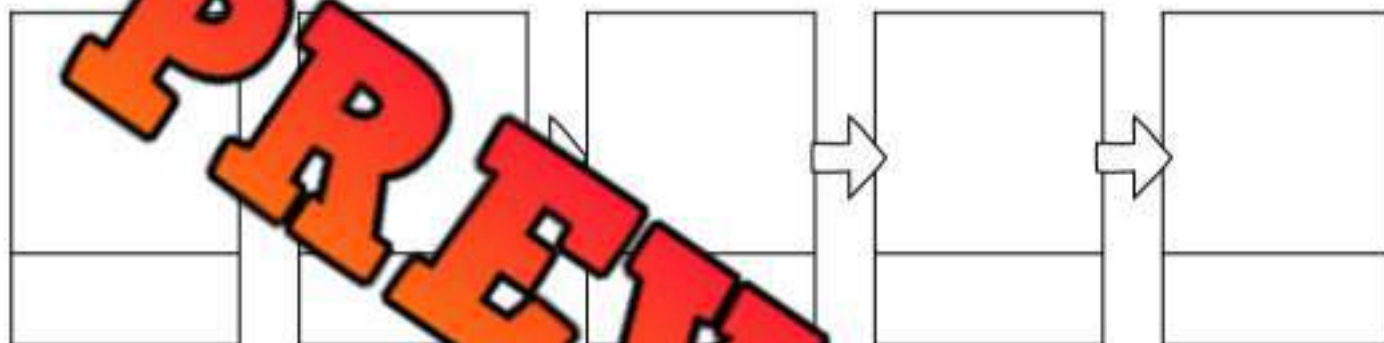
/

1) Do plants need light? How do they respond to it?

2) Why do humans track animal populations?

3) Why do animals migrate and hibernate?

1) What is a food chain? Draw a food chain with 5 different parts.



2) Why do plants need animals and why do animals need plants?



Workbook Preview



Grade 3 – Science Unit

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

Guiding Question: How can forces relate to changes in movement?

	Learning Outcome - Students investigate and explain how forces affect the movement of objects.	Pages
E3.1	A force is a push or pull on an object resulting from an interaction with another object.	6-9
E3.2	An object that is not moving will stay still until a force makes it move, and an object that is moving will keep moving until a force stops it. (Newton's First Law)	27-35
E3.3	Contact forces occur between objects that touch each other. Contact forces include	26
	pulling, squeezing, pushing	
E3.4	The strength of forces applied to objects can be described as strong, weak, large, small	46-51
E3.5	The direction of forces applied to objects can be described as upward, downward, from the left, from the right, from both sides, from all directions Changes to an object's movement when a force is applied include changing speed, starting stopping, changing direction	36-45
E3.6	The effort needed to move objects is reduced by simple machines, such as levers, wheels, inclined planes	54-87
E3.7	Many First Nations, Métis, and Inuit designed, tested, and continue to use simple machines, such as an antler wedge, a paddle, Inuit scraping tools; e.g., ulu	88-97
Computer Science:		
CS.1	Students apply creativity when designing instructions to achieve a desired outcome.	52-53, 93-102

Preview of 80 pages from
this product that contains
166 pages total.

NAME: _____

Forces



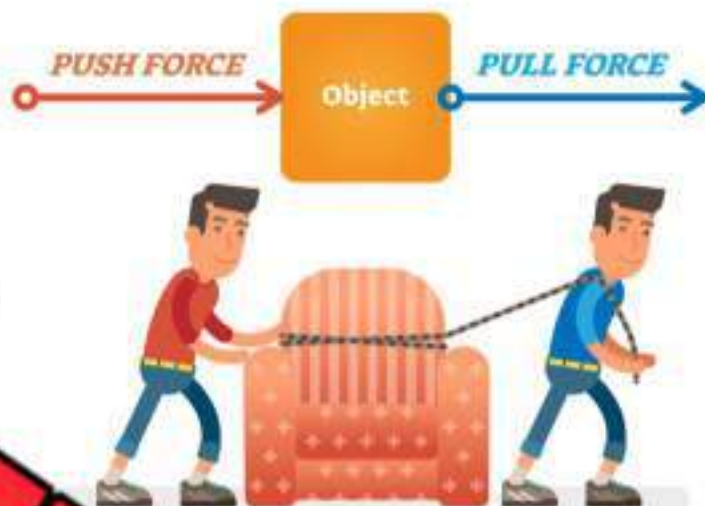
Forces - Push and Pull

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.

At home, you have pushed a book across the desk to see how far it goes, or maybe they pulled a string on your hands. These are two examples of forces. Push and pull forces that caused objects to move.

PUSH & PULL



Pushing Force

A **push** is when we move an object away from us. The child on this swing is the object being pushed. A man is pushing the child using a pushing force. If the man can't apply enough pushing force, the child won't have enough energy to 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: _____

7

Curriculum Connection
E3.1

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 ball	Push	Pull
5) Climbing	Push	Pull

Think

Give an example of a push and a pull force

Push	
Pull	

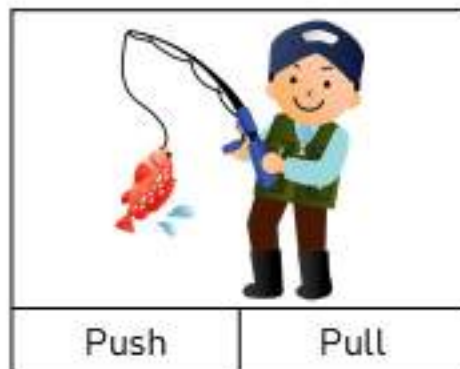
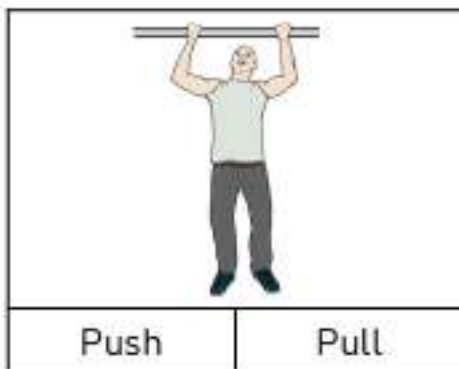
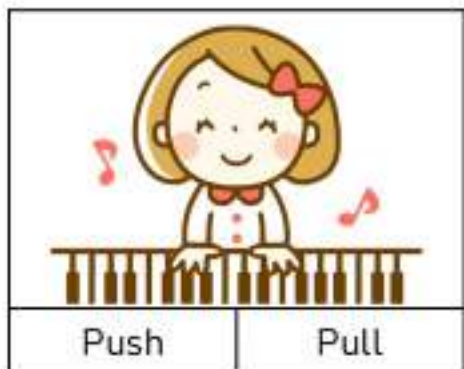
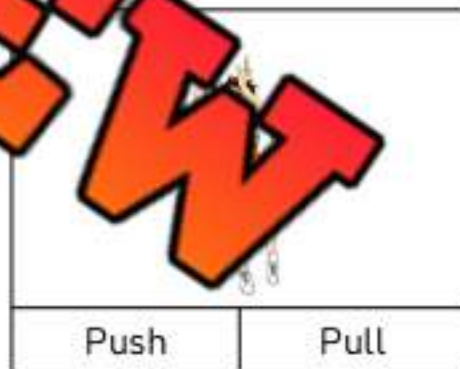
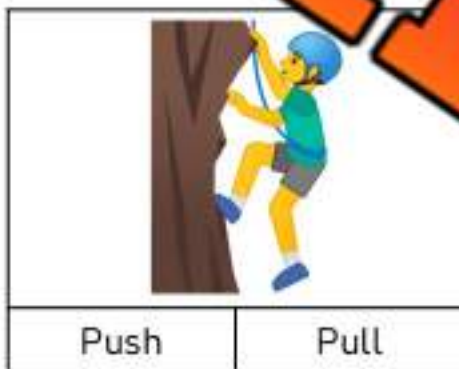
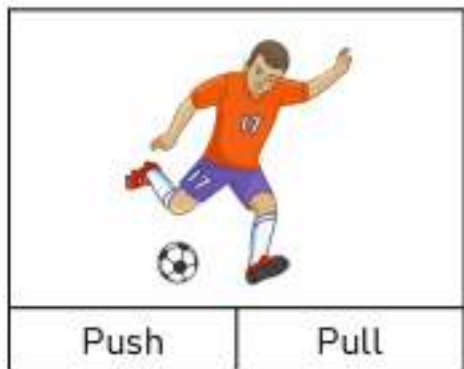
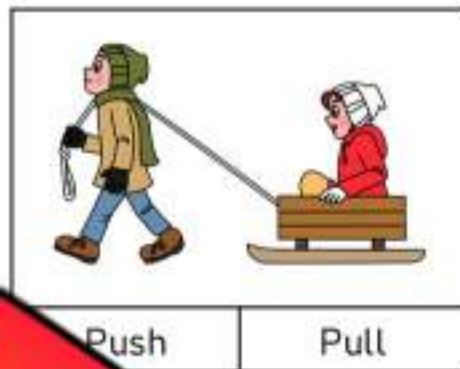
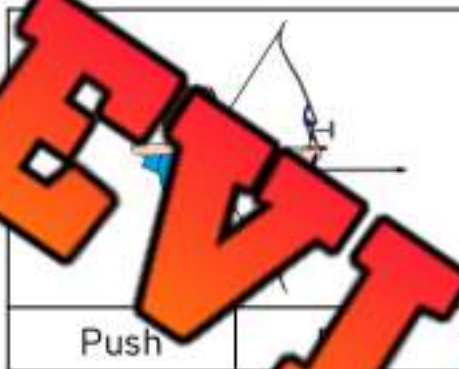
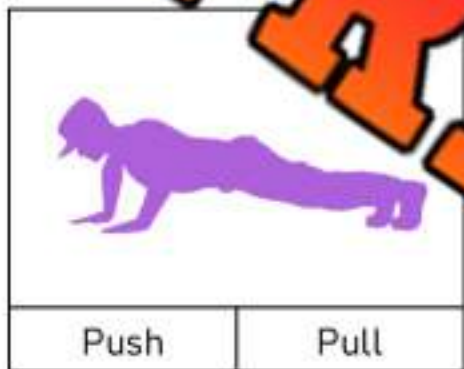
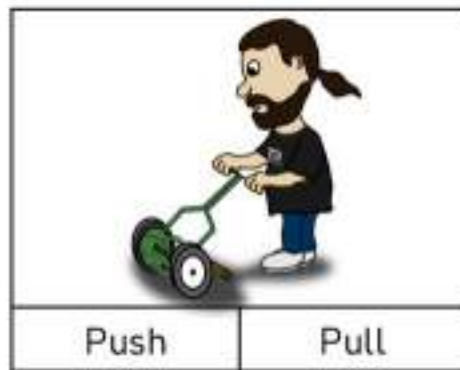
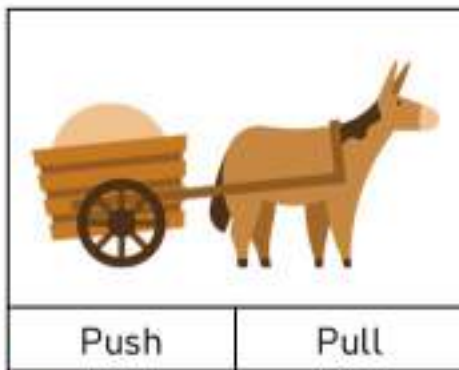
Visualizing

Draw what you were picturing while you were reading the picture

Push or Pull?

Directions

Is the picture a push or pull?



Contact Force - Applied Force

What is a Contact Force?

Contact forces are the pushes or pulls that happen when two things touch each other. Imagine you are pushing a toy car. Your hand is applying a force to the car.

This is a **contact force**.



Applied Forces

Applied force is a type of contact force. This happens when a person or an object pushes or pulls on another object. For example, when you kick a ball, you're using an applied force. If a book is on a table, the table is using an applied force to keep the book from falling through it.

Examples of Contact Forces

- ☒ **Playing Tug of War:** When you pull on the rope in a game of tug of war, you're using a contact force. Your hands have to touch the rope to pull it.
- ☒ **Pushing a Swing:** When you push someone on a swing, you're using a contact force. Your hands push the swing to make it move.
- ☒ **Pulling a Wagon:** If you pull a wagon full of toys, you're using a contact force. Your hand pulls the handle of the wagon to make it move.



So remember, a contact force happens when two things touch each other and one pushes or pulls on the other.

True or False

Is the statement true or false?

1) Throwing a ball is an applied force	True	False
2) A ball rolling down a hill with no one touching it is an applied force	True	False
3) Pulling a wagon is an applied force	True	False
4) An apple falls from a tree because of an applied force	True	False
5) Pushing _____ is an applied force	True	False

Making a Connection

What applied forces have you used today?

PREVIEW

Questions

Answer the questions below

1) What is a contact force?

2) What is an applied force?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Is this a contact force? Yes or No?

Swing moves by pushing	Yes	No
Pulling rope in tug war	Yes	No
Wind blowing a leaf	Yes	No
Pushing door open	Yes	No
Pulling a Wagon	Yes	No
Book stays on table	Yes	No
Magnet pulling an object	Yes	No
Balloon floating in air	No	Yes
Kicking a ball	Yes	No
Sitting on a chair	Yes	No

Name: _____

Mark

Is this a contact force? Yes or No?

Swing moves by pushing	Yes	No
Pulling rope in tug war	Yes	No
Wind blowing a leaf	Yes	No
Pushing door open	Yes	No
Pulling a Wagon	Yes	No
Book stays on table	Yes	No
Magnet pulling an object	Yes	No
Balloon floating in air	Yes	No
Kicking a ball	Yes	No
Sitting on a chair	Yes	No

Name: _____

Mark

Is this a contact force? Yes or No?

Swing moves by pushing	Yes	No
Pulling rope in tug war	Yes	No
Wind blowing a leaf	Yes	No
Pushing door open	Yes	No
Pulling a Wagon	Yes	No
Book stays on table	Yes	No
Magnet pulling an object	Yes	No
Balloon floating in air	Yes	No
Kicking a ball	Yes	No
Sitting on a chair	Yes	No

Name: _____

Mark

Is this a contact force? Yes or No?

Swing moves by pushing	Yes	No
Pulling rope in tug war	Yes	No
Wind blowing a leaf	Yes	No
Pushing door open	Yes	No
Pulling a Wagon	Yes	No
Book stays on table	Yes	No
Magnet pulling an object	Yes	No
Balloon floating in air	Yes	No
Kicking a ball	Yes	No
Sitting on a chair	Yes	No

Experiment - Applied Force

Research Question What are we learning more about?

How much applied force can I make?

Materials What do we need?

- ✓ 1 ball
- ✓ 1 city ball
- ✓ 1 tennis ball
- ✓ 1 golf ball
- ✓ 1 hula-hoop

Method How do we complete the experiment?

- 1) Which ball do you think you will be able to throw the furthest? Which ball will you throw the least far? Write your hypothesis on the back of the page.
- 2) Stand in the hula-hoop
- 3) Throw one ball at a time as far as you can. Leave the balls where they land so you can compare how far you threw them
- 4) Fill in your observation page
- 5) Answer the questions on the back of the page



Hypothesis

Rank how far you think you will be able to throw the ball

Furthest	←	→	Shortest

Observation

What happened?

1) Which ball could you throw the furthest? Explain.

2) Could you throw a heavier or a lighter ball?

Heavier

Lighter

3) Could you throw a smaller ball further or a bigger ball?

Smaller

Bigger

4) Which force are you using to move the ball?

Friction

Gravity

Magnetism

Applied

5) What muscles do you think you are using to move the ball with the applied force? Where are the muscles in your body?

Contact Force - Frictional Force

Frictional Force

Friction is a force that makes it harder to slide objects across each other. For example, if you tried to slide a box on ice, there isn't much friction to slow the box down. But, if you slide the same box on pavement, there is a lot of friction to slow down the box. Friction is that force that makes objects stick together.



Friction is important because it allows us to walk on the ground without slipping. Some materials have surfaces that create more friction, like rubber, which is why we have rubber soles on the bottom of our shoes.

Questions

Use information from the text to support your answer.

1) What is friction?

2) Why is it better to wear basketball shoes while playing basketball than wearing socks?

Explain

Why is friction making it hard to move the stone?



Experiment - Friction Car Ramp

Research Question

Does more friction slow down a moving car?

If we roll a car down a smooth ramp, will it go further than a bumpy ramp?

Materials

What do we need?

- ✓ Cardboard to make the ramps
- ✓ Toy car to rest on
- ✓ One of the textured materials
- ✓ Glue
- ✓ Textured materials
 - Bubble wrap
 - Bread tabs
 - Rubber bands
 - Rice
 - Staples



Method

How do we complete the experiment?

- 1) Each group will make one ramp. The teacher can be a control group with a smooth ramp that is smooth
- 2) Groups will need cardboard cut into a rectangle that will act as a ramp
- 3) Students can use some of the textured materials listed above to make a textured ramp. They can glue rice to the ramp, put staples in it, glue bubble wrap down, or wrap rubber bands around the ramp. Be creative!
- 4) Have each group test their ramps with their toy car
- 5) When all groups are finished, they can demonstrate their car going down the smooth ramp versus the textured ramp.
- 6) Mark how far the toy car travelled on the smooth ramp versus the textured ramp. Record your results on the back of the page.

Observations**What happened?**

1) How did you make your textured ramp? Which materials did you use?

2) Did the car travel further on the smooth or textured ramp?

Smooth Ramp Textured Ramp

Results

Answer the questions below

1) Which ramp did the car travel further on it travelled down it?

Smooth Ramp

Textured Ramp

2) Why did the car travel further on the smooth ramp?

3) If the car raced on ice, would the ice give more or less friction?

More

Less

4) Would the car travel further if it travelled on ice? What do you think?

Experiment - Friction Force Power

Research Question What are we learning about?

Can we make a model that uses friction to lift an object?

Materials What do we need?

- ✓
- ✓ Water bottle - medium sized
- ✓ Paintbrush or pencil
- ✓ Optional - Funnel

Method How do we complete the experiment?

- 1) Fill the water bottle with rice using the funnel
- 2) Bang the bottle gently on the table to settle the rice
- 3) Ensure the bottle is mostly full
- 4) Place the pencil in the bottle
- 5) Bang the bottle on the table while you push the pencil to the bottom. This will ensure the rice settles around the pencil
- 6) Try to lift the bottle by pulling up on the pencil
- 7) Record your observations on the back of this page



Observations**What happened?**

Were you able to lift the bottle using the pencil? Explain what happened.

Results**Answer questions below**

1) What force allowed you to lift the bottle?

2) How did friction allow the pencil to hold the bottle?

3) Draw a picture of the experiment.

PREVIEW

Contact Force - Tension

What is Tension?

Tension is a type of contact force. It happens when you pull on a string, a rope, or anything else that's stretchy. When you pull on a string or rope, the force that is called tension.

Tension is what keeps objects. A tow truck can use a wire under tension to pull a car. If the wire is pulled tight, the tow truck will pull the car. But if the wire is loose, the car will not move.

Tension in Action

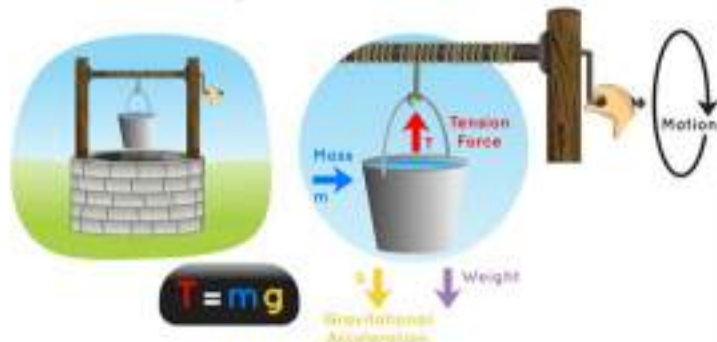
Imagine you are playing with a toy on a string. When you pull the string, the toy comes towards you. That's tension working! The force you used to pull the string made the toy move.

Examples of Tension

- ☑ Flying a Kite: When you fly a kite, you hold onto the string and pull. The tension in the string helps the kite to fly high in the sky.
- ☑ Playing Tug of War: In a game of tug of war, when you pull on the rope, you create tension. This tension helps you to try and pull the other team over the line.

Tension Force

Pulling a Bucket of Water from Well



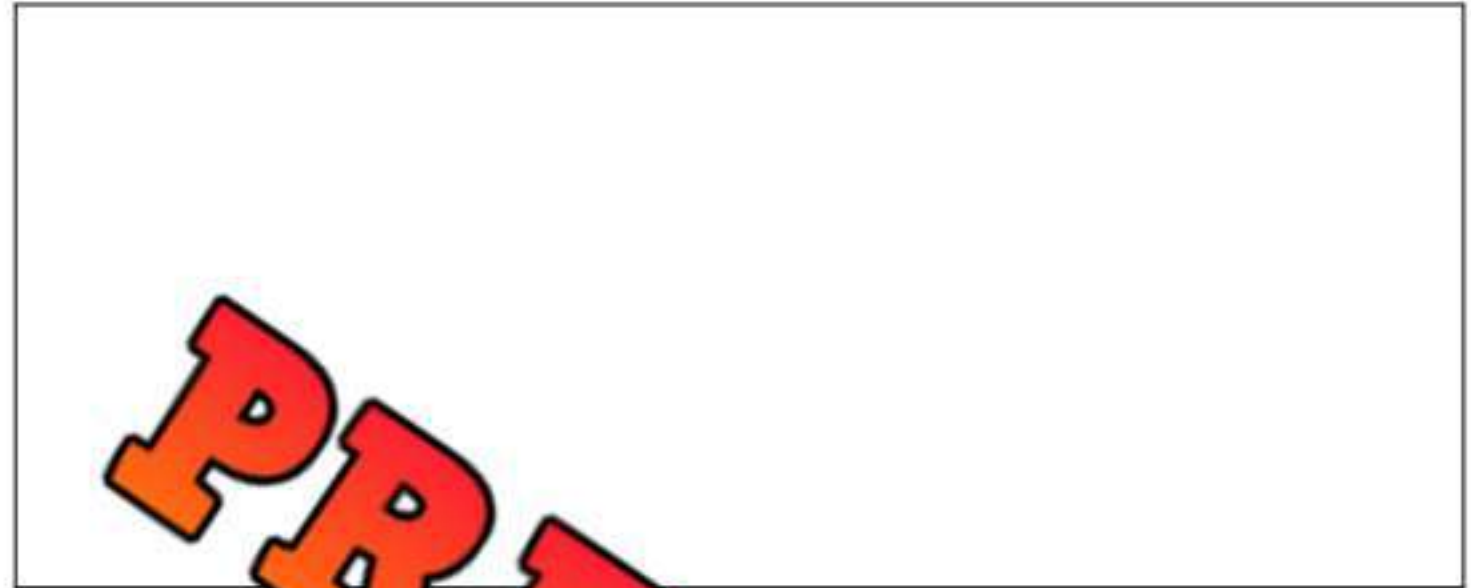
$$T = mg$$

Towing Car



Draw

Draw a tow truck using tension to pull a car

**Questions**

Answer in _____

1) What is tension force?

2) Write 3 examples of tension force in action.

1

2

3

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Check only the facts that describe tension.

- ☐ Tension happens when you pull on a string, rope, or anything stretchy.
- ☐ Tension can help move objects, like when a tow truck pulls a car.
- ☐ Tension works only when the rope or string is loose.
- ☐ When you pull on a string and it moves toward you, that is tension.
- ☐ Tension is a force that pushes objects apart.
- ☐ In tug of war, pulling the rope creates tension.

Name: _____

Mark

Check only the facts that describe tension.

- ☐ Tension happens when you pull on a string, rope, or anything stretchy.
- ☐ Tension can help move objects, like when a tow truck pulls a car.
- ☐ Tension works only when the rope or string is loose.
- ☐ When you pull a toy on a string and it moves toward you, that is tension.
- ☐ Tension is a force that pushes objects apart.
- ☐ In tug of war, pulling the rope creates tension.

Name: _____

Mark

Check only the facts that describe tension.

- ☐ Tension happens when you pull on a string, rope, or anything stretchy.
- ☐ Tension can help move objects, like when a tow truck pulls a car.
- ☐ Tension works only when the rope or string is loose.
- ☐ When you pull a toy on a string and it moves toward you, that is tension.
- ☐ Tension is a force that pushes objects apart.
- ☐ In tug of war, pulling the rope creates tension.

Name: _____

Mark

Check only the facts that describe tension.

- ☐ Tension happens when you pull on a string, rope, or anything stretchy.
- ☐ Tension can help move objects, like when a tow truck pulls a car.
- ☐ Tension works only when the rope or string is loose.
- ☐ When you pull a toy on a string and it moves toward you, that is tension.
- ☐ Tension is a force that pushes objects apart.
- ☐ In tug of war, pulling the rope creates tension.

Newton's First Law of Motion

What is Newton's First Law of Motion?

Newton's first law of motion, also called the "law of inertia," tells us about how things move or stay still. It says that if an object is not moving, it will stay that way until something makes it move.

On the other hand, if an object is already moving, it will keep moving in a straight line at the same speed, unless something makes it stop. Here on Earth, there are many things that change the motion of objects.

- **Friction** is a force that slows down the movement of objects sliding past each other.
- **Air resistance** happens when an object moves through air. The air pushes back on the object, slowing it down.
- **Gravity** is the force that pulls everything toward the Earth's center.

Examples of Newton's First Law

- ✓ If you roll a ball on a smooth floor, it will keep rolling until something or until the floor's roughness, or friction, stops it.
- ✓ When you throw a ball in the air, gravity pulls it back down. As it moves up, it pushes through the air, so air resistance slows it down. Once it hits the ground, friction makes it stop rolling.
- ✓ But if you were in outer space, where there is no gravity or air, and you threw a ball, it would keep moving in the same direction and speed until it hit something.



An object at rest stays at rest



An object acted upon by an unbalanced force changes speed and direction



An object in motion stays in motion



An object acted upon by an unbalanced force changes speed and direction

Questions

Answer the questions below using evidence from the text

1) What is Newton's First Law of Motion?

2) Provide your own example of the First Law of Motion. Explain a force that might stop the object from

True or False

Is the statement true or false?

1) In space, there is no air or gravity to stop motion	True	False
2) Gravity is the only force that stops motion on Earth	True	False
3) When you throw a ball into the air, gravity and air resistance stop it from moving	True	False
4) When you roll a ball, air resistance is the strongest force that stops it from moving	True	False
5) Friction is the force that slows down objects that slide against each other	True	False

Making Connections

What does this remind you of in your life?

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Circle the correct force.

1) Which force pulls things to Earth?	Friction
	Gravity
2) Which force slows objects moving through air?	Air resistance
	Friction
3) Which force keeps a ball from rolling forever?	Gravity
	Friction
4) Which force slows objects sliding on floor?	Air resistance
	Friction
5) Which force keeps us from floating into space?	Gravity
	Friction

Name: _____

Circle the correct force.

1) Which force pulls things to Earth?	Friction
	Gravity
2) Which force slows objects moving through air?	Air resistance
	Friction
3) Which force keeps a ball from rolling forever?	Gravity
	Friction
4) Which force slows objects sliding on floor?	Air resistance
	Friction
5) Which force keeps us from floating into space?	Gravity
	Friction

Name: _____

Circle the correct force.

1) Which force pulls things to Earth?	Friction
	Gravity
2) Which force slows objects moving through air?	Air resistance
	Friction
3) Which force keeps a ball from rolling forever?	Gravity
	Friction
4) Which force slows objects sliding on floor?	Air resistance
	Friction
5) Which force keeps us from floating into space?	Gravity
	Friction

Name: _____

Circle the correct force.

1) Which force pulls things to Earth?	Friction
	Gravity
2) Which force slows objects moving through air?	Air resistance
	Friction
3) Which force keeps a ball from rolling forever?	Gravity
	Friction
4) Which force slows objects sliding on floor?	Air resistance
	Friction
5) Which force keeps us from floating into space?	Gravity
	Friction

Experiment - First Law of Motion

Research Question

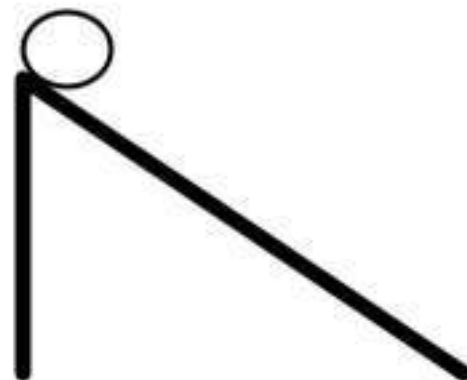
What are we learning about?

Will a marble or ball travel at the same speed down a ramp if you perform the experiment 5 times?

Materials

What do we need?

- ✓ A marble or ball that will fit the ramp.
- ✓ A ramp on a flat surface. You could use a slide out of a board or a stack of books.
- ✓ A stopwatch



Method

How do we conduct the experiment?

- 1) Place the ramp on a flat surface. Measure the distance from the top of the ramp to the bottom.
- 2) Place the marble or ball at the top of the ramp. Make sure not to push the ball down the ramp. Instead, let it go at the exact same spot each time.
- 3) Use the stopwatch or timer to measure the time it takes for the marble or ball to reach the bottom of the ramp.
- 4) Measure the distance from the top of the ramp to the bottom.
- 5) Repeat the experiment several times to ensure accuracy and to average out any minor differences.

Hypothesis

Will it take the same amount of time for the object to roll to the end of the ramp? Explain your opinion.

Observations What happened?

Trial	Time	Speed = Distance/Time	Speed = Distance/Second
1			
2			
3			
4			
5			

Results Answer the question below

1) Explain your results. Are the times similar or very different?

2) Why would the results be the same or very similar? Explain the function in your answer.

3) What forces acted on your rolling object?

Inertia - First Law of Motion

What is Inertia?

Inertia means an object wants to keep doing what it's already doing. For example, if a toy car is rolling on the floor, it wants to keep rolling. If it's sitting still, it wants to stay still. If it's moving in a circle, it wants to keep moving in a circle.

Imagine you're sitting in a car and the car suddenly stops. You will feel like you're being pushed forward. This is because your body wants to keep moving forward, because of inertia.

It's like a toy train that is moving on a track. It will keep moving until something makes it stop. Like a wall or a barrier, or a person who picks it up and takes it off the tracks.

INERTIA

The Tendency of an Object to stay at Rest or preserve its State of Motion



More Examples of Inertia

- ☒ A roller coaster at a theme park uses inertia to keep the cars moving along the tracks. The cars have a lot of inertia, so they can keep moving even when they go over hills and through loops.
- ☒ A person trying to stop a bike that is moving at high speed, they have to overcome the inertia of the bike to stop it.
- ☒ A person trying to push a heavy object, they have to overcome the inertia of the object to make it move.

Questions

Answer the questions below using evidence from the text

1) What is inertia?

2) Give an example of how inertia keeps objects still and how it keeps objects moving.

Objects Stay At Rest

Objects Keep Moving

Visualizing

Draw what you were picturing while you were reading the picture

Inertia - Experiment

Research Question What are we learning about?

This experiment demonstrates the concept of inertia, where objects at rest resist motion.

Materials What do we need?

- ✓ Cup
- ✓ Coin
- ✓ Card

Method How do we complete the experiment?



- 1) Put the cup right side up on a flat surface
- 2) Place the card on top of the cup
- 3) Place the coin flat on top of the card
- 4) Flick the card using a strong force in a horizontal direction. Be careful not to flick upwards. Do multiple trials.
- 5) Did the coin move with the card? Record what happened to the coin on the back of the page
- 6) Answer the questions

Observations

What happened when you completed the experiment? Did the coin move or did it fall straight down?

Result Answer the questions below

1) Why would the coin fall straight down?

2) Explain why this experiment demonstrates inertia.

3) What does friction have to do with this experiment? If the card was rubber, what would happen? How is this a force that changes the outcome?

Balanced and Unbalanced Forces

Balanced Forces

A **balanced force** happens when 2 equal forces act on an object in opposite directions. An example would be a book resting on a table.

There are two forces acting on the book. One force is the Earth's gravitational pull downward on the book. The second force is the push of the table on the book which pushes upward on the book. The forces on the book are balanced, so the book will not move.



Unbalanced Force

An **unbalanced force** is a force that changes an object's position, speed, or direction of an object. When the same book is pushed from right to left across the table, the forces are unbalanced, and it moves.

The upward and downward forces are balanced, but the side forces are unbalanced. The force on the right side of the book is greater than the force on the left side because no one or nothing is blocking the left side.



Try This!

Stand across from your partner with your arms straight ahead of you. Put your palms facing them and line them up with your partner's palms. Now with both partners pushing equally, take a step back (so that you would fall without your partner's force). How does this represent balanced and unbalanced forces?

Questions

Answer the questions below using evidence from the text

1) What is a balanced force?

2) What is an unbalanced force?

True or False

Is the statement true or false?

1. A balanced force will cause movement.	True	False
2. An unbalanced force means the object has no forces acting on it.	True	False
3. A balanced force is when there is a tie in tug-of-war.	True	False
4. Your pencil resting on your desk has balanced forces acting on it.	True	False
5. Shooting a basketball means it has unbalanced forces acting on it.	True	False

Word Search

Find the words in the wordsearch

Balanced	Unbalanced
Force	Object
Acceleration	Equilibrium
Movement	Direction
Push	Pull

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

Forces From Different Directions

Forces From Different Directions

Forces can come from all different directions. Just like when we hit a ball with a bat, we can swing up, down, to the left, or to the right.



Up and Down

When you throw a ball in the air, you are applying an upward force. The ball goes up because of the force you used. But there is also a force that pulls the ball down. That's called gravity. Gravity is a force that pulls things down.

Left and Right Forces

Think about playing tug-of-war. You pull the rope to your side and your friend pulls to the other side. You're applying a force to the right, and your friend is applying a force to the left.

BALANCED FORCES



From Both Sides

Imagine you have a squishy ball and you squeeze it in your hand. You're applying force from both sides. The ball squishes because of the force from your hand.

From All Directions

Now think about being in a pool. When you're underwater, you can feel the water pushing on you from all directions. This is because the water is applying a force from all around you.

Direction of Force

Which direction is the force moving?

A ball being thrown upwards	Up/Down	Left/Right	Both Ends	All Directions
A book falling off a table	Up/Down	Left/Right	Both Ends	All Directions
A car moving forward	Up/Down	Left/Right	Both Ends	All Directions
Pulling a sled to the left	Up/Down	Left/Right	Both Ends	All Directions
Squeezing a ball	Up/Down	Left/Right	Both Ends	All Directions
Water pushing a diver	Up/Down	Left/Right	Both Ends	All Directions
Pushing a door open	Up/Down	Left/Right	Both Ends	All Directions
Pulling open a bag of chips	Up/Down	Left/Right	Both Ends	All Directions
A game of tug of war	Up/Down	Left/Right	Both Ends	All Directions
The air all around you	Up/Down	Left/Right	Both Ends	All Directions

Questions

Answer the questions below

1) When you throw a ball into the air, how do forces act on the ball?

2) Write about a force you used today. Describe the direction of the force or forces.

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Check only the true statements.

Statement	✓
Squeezing a toy ball is using force.	
Water only pushes your legs when you swim.	
Gravity is the force that pushes up.	
Upward force makes a ball rise into the air.	
A ball rolls without needing any push at all.	
Balanced forces can keep an object still.	
A bat can swing in many directions.	
Tug-of-war is a game of pushing.	
Gravity works even when you are underwater.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Squeezing a toy ball is using force.	
Water only pushes your legs when you swim.	
Gravity is the force that pushes up.	
Upward force makes a ball rise into the air.	
A ball rolls without needing any push at all.	
Balanced forces can keep an object still.	
A bat can swing in many directions.	
Tug-of-war is a game of pushing.	
Gravity works even when you are underwater.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Squeezing a toy ball is using force.	
Water only pushes your legs when you swim.	
Gravity is the force that pushes up.	
Upward force makes a ball rise into the air.	
A ball rolls without needing any push at all.	
Balanced forces can keep an object still.	
A bat can swing in many directions.	
Tug-of-war is a game of pushing.	
Gravity works even when you are underwater.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Squeezing a toy ball is using force.	
Water only pushes your legs when you swim.	
Gravity is the force that pushes up.	
Upward force makes a ball rise into the air.	
A ball rolls without needing any push at all.	
Balanced forces can keep an object still.	
A bat can swing in many directions.	
Tug-of-war is a game of pushing.	
Gravity works even when you are underwater.	

Objects Changing Direction

Changing Directions

When an object is in motion, it is travelling in one direction. We can change the direction of the object in motion by applying a force to it.

In sports, this is common using applied forces.

Examples in Sports

Hockey – In hockey is an example of the puck changing direction. A one-timer is when a team passes the puck one direction to a teammate who then passes directly into the net. They don't slow the pass down, they change the direction of the pass by aiming it towards the net.



Baseball – When a pitcher throws the ball towards the batter, the ball is changing direction. The pitcher uses muscular force to throw the ball as fast as they can towards the batter.

The batter swings the bat as hard as they can to change the direction of the ball towards the outfield and hopefully over the fence. Homerun!

Tennis – In tennis, the ball starts with the server hitting it to the returning player. The returning player hits the ball back by changing the direction of the ball. They swing their arm while holding a racquet to strike the ball.



Tennis players use muscular force to swing the racquet. The stronger the player, the more muscular force they can make.

Questions Answer the questions below using evidence from the text

1) How does an object change directions?

2) What is an example of an object changing direction?

DrawDraw a picture of a situation where an object changes direction.
Label the object using arrows to show the forces acting on the object.**Making Connections** What does this remind you of in your life?

Force Diagram - Changing Directions

Force Diagram

A **force diagram** can be drawn to show the forces acting on objects. If the object has unbalanced forces acting on it, the object will move. In a game of tug of war, the rope will move towards the stronger pulling force.

Questions

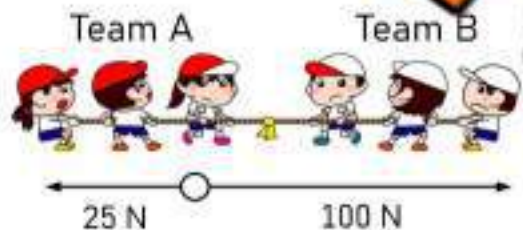
Examine the force diagrams and answer the questions

1)



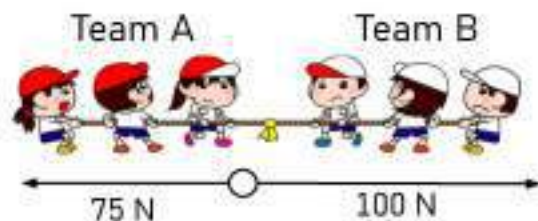
Who will win? Will it be a long/short match?

2)



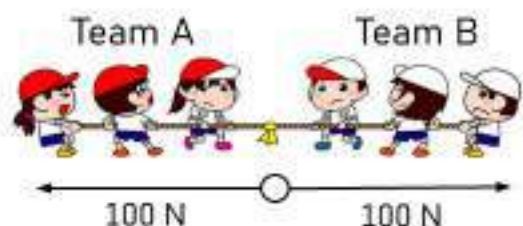
Who will win? Will it be a long/short match?

3)



Who will win? Will it be a long/short match?

4)



Who will win? Will it be a long/short match?

Questions

Examine the force diagrams and answer the questions

1)



50 N



200 N

Is the ball moving? What will happen when the cleat hits it?

2)



400 N

Is the ball moving? What will happen when the cleat hits it?

3)



20 N



100 N

Is the puck moving? What will happen when the stick hits it?

4)



250 N



0 N

Is the puck moving? What will happen when the stick hits it?

5)



30 N



90 N

Is the ball moving? What will happen when the racquet hits it?

Introduction to If/Then Statements

An if/then statement is a conditional that is an action that could occur if something specific happens.

For example – If the bell goes at school, then the students go to class.



Questions

Circle which then statement makes the most sense

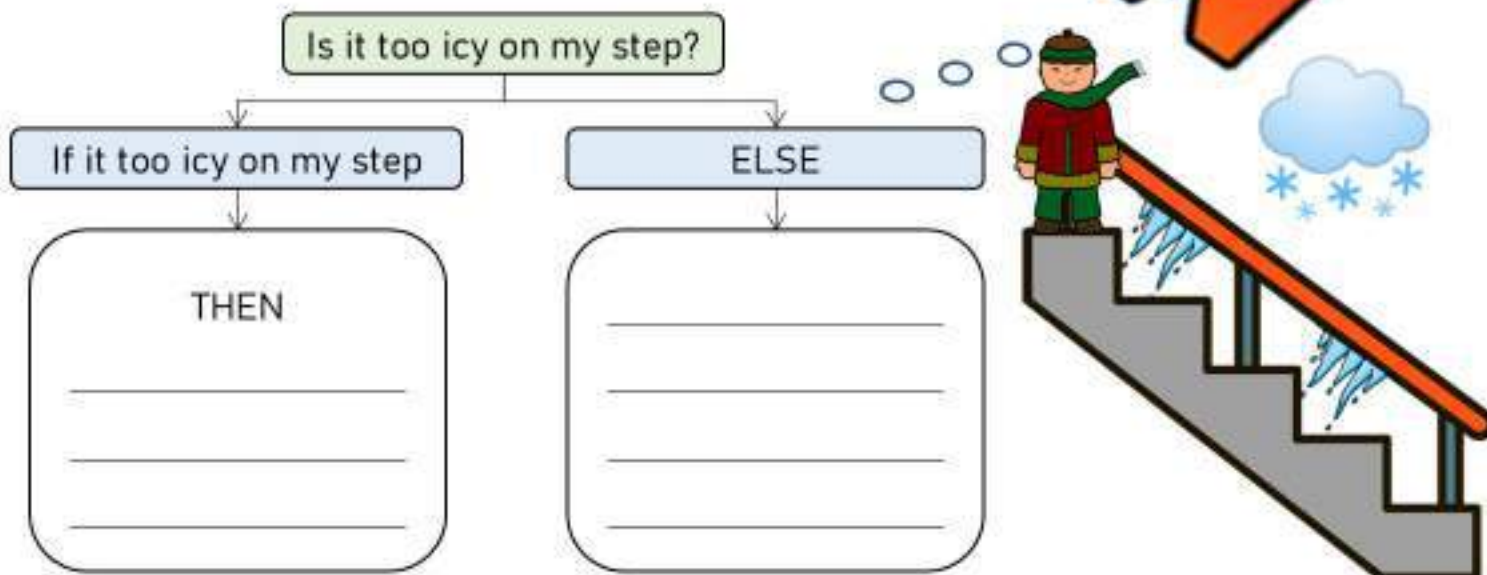
1)	If the bike is pushed	then	The bike stops	The bike goes faster
2)	If the ball is kicked	then	Team gets a goal	Team loses a goal
3)	If the force is strong	then	The object won't move much	The object will move a lot
4)	If you pull an object	then	It moves closer	It moves further away
5)	If you push an object	then	It moves closer	It moves further away
6)	If the ball is thrown in the air	then	It will keep going up forever	It will come back down
7)	If you wear safety equipment	then	You'll get hurt less	You'll get hurt more
8)	If an object is not moving and no force acts on it	then	It will not move	It will start moving
9)	If a ball rolls on the ground	then	It will never stop	It will stop because of friction and air resistance
10)	If a strong force squeezes a ball	then	The ball will move inward	The ball will move outward

Coding - Else Statements

An **else** statement works like an if statement. When an if statement is false, we can have another command, instead of nothing happening.



Directions Fill in the commands below with your own ideas



Directions

Fill in the ELSE commands below with your own ideas

Is the other team pulling harder than us?

IF the other team pulling harder than us?

THEN

_____ELSE

_____

Is the baseball in the strike zone?

IF the baseball in the strike zone?

THEN

Could I get hit on the head in this game?

IF I get hit on the head in this game?

THEN

_____ELSE

_____

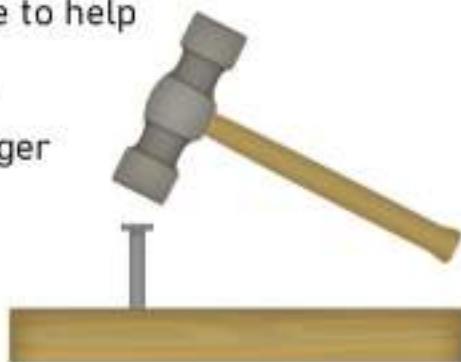
Machines

What is a Machine?

To move an object, we need to use a pulling or pushing force. This means when we lift a box, push a car, stand up out of bed, or jump up in the air, we are using force.

Sometimes our muscles cannot make enough force to push or pull something. When this is the case, we can use a machine to help us. A machine is anything that makes a force stronger.

A hammer is a machine because it makes a stronger force on a nail. Your arms and legs are also machines because they make force so we can eat our food.



For example, if you try to lift a heavy object with your hands, you would struggle. If you use a knife, the force you make with the knife is stronger on the steak. When we hit a nail with a hammer, the handle of the hammer increases the force you apply. The longer the hammer, the stronger the force. Wedge hammers have long handles.

Simple Machines

Simple machines are the basic machines that allow us to make more force. There are 6 types of simple machines:

- 1) Levers
- 2) Wheels and axles
- 3) Pulleys
- 4) Wedges
- 5) Screws
- 6) Inclined planes.



Pulley



Lever



Wheel and Axle



Wedge



Inclined Plane



Screw

True or False Is the statement true or false?



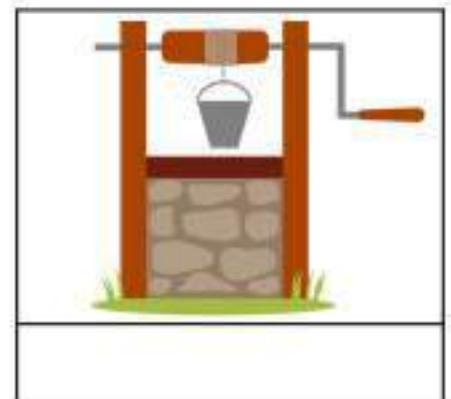
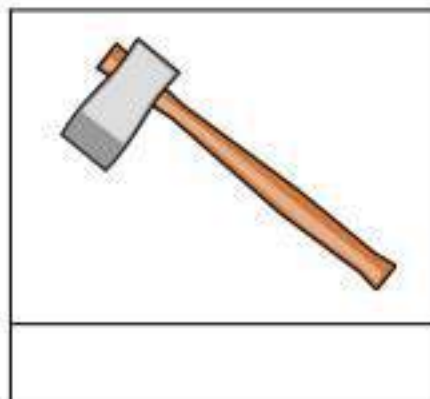
1) A machine allows us to make more force	True	False
2) There are 6 basic simple machines	True	False
3) An axe uses a wedge	True	False
4) A ramp is an example of a pulley	True	False
5) A bicycle is a wheel and axle	True	False

Question Answer Questions below

1) What is a machine? Why do we use them?

2) When have you used a simple machine?

Label Which simple machine is in the picture?



Wheel and Axle

Wheel and Axle

The wheel and axle is a simple machine that was invented around 5,500 years ago. It changed the world by making it easier to move objects. Wagons use wheels and axles to pull people and things. It uses a wheel with a rod attached through the middle that can spin if it is pushed or pulled. This machine can help move loads and also lift.

Here are some examples of machines that use a wheel and axle to move objects. A pulley uses a wheel and axle to lift objects. A winch is an example of a wheel and axle that can lift a heavy object.

Example – A Well

A well often uses a wheel and axle to lift things from the ground. In this example, turning the wheel winds the rope around the rod which lifts the bucket. This is a good example of how the movement to the crank which lifts the load straight up.



Stronger Force

If we dragged a cart across the ground, the friction would make it difficult to move anything heavy. **Friction** is a force that makes it hard to slide an object by another material.

Wheels make the friction force weaker. This is because only a small part of the wheel is touching the ground. That is why wheels roll well.

Sliding a cart without wheels would be hard. Pushing a cart on wheels is much easier. This is because there is less friction. A cart with wheels is called a wagon.



True or False

Is the statement true or false?

1) Rolling is easier than sliding	True	False
2) Friction is a force that makes sliding easier	True	False
3) Using a wheel makes less friction	True	False
4) A bicycle uses wheels and axles	True	False
5) The invention of the wheel didn't change much	True	False

Questions

Answer the questions below

1) What is a wheel and axle?

2) When have you used a wheel and axle?

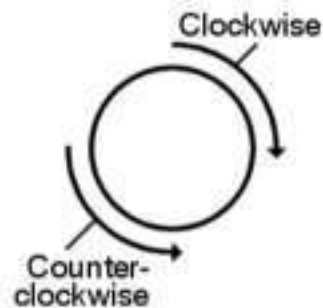
Visualizing

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

Wheel and Axle - Clockwise/Counter-Clockwise

Clockwise and Counter-Clockwise Turns

When something moves in a circle, it can move either clockwise or counter-clockwise. **Clockwise** means the object moves in the same direction as the hands on a clock. **Counterclockwise** means the object moves in the opposite direction of a clock.



When a car turns, it moves either clockwise or counter-clockwise. If you are in the right side of a car when looking at the front, the wheels will move counter-clockwise. If the car moves backwards, these wheels will move counter-clockwise.

Questions

Which direction will the wheels turn?



1) If the car moves forwards

2) If the car moves backwards



3) If the car moves forwards

4) If the car moves backwards

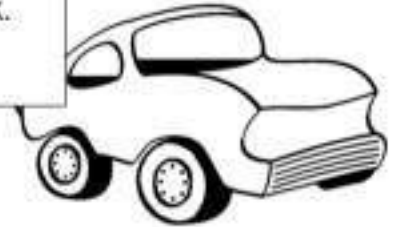


5) If the car moves forwards

6) If the car moves backwards

Wheel and Axle - My Car

Bring a toy car from home or borrow one to take a closer look.
Answer the questions below about the car.



Questions

Answer the questions below

1) Draw a picture of the car from the bottom.

2) Can each wheel spin on its axle? Yes No

3) What materials are the wheel and axle made of?

Wheels

Axles

4) Draw a picture of the car from the side view.

5) Point the car so it is facing you and you are seeing the front. Then turn the car so you are looking at the left side of the car.

If the car moves forwards, the wheels will spin which direction?

Clockwise

Counter-Clockwise

If the car moves backwards, the wheels will spin which direction?

Clockwise

Counter-Clockwise

Activity - Balloon Car

Research Question What are we learning about?

We will be creating a car that is able to move without us pushing it. To do this, we will use the force of moving air. Our car's wheels will attach to a rotating axle.

Materials What you will need for the experiment

- ☐ Plastic bottle
- ☐ Two straws with holes punched through them that are large enough for the wooden skewers to fit through
- ☐ 2 wooden skewers long enough to span over the width of the bottle
- ☐ Balloon
- ☐ Two straws
- ☐ Tape
- ☐ Scissors



Method How you will complete the experiment

- 1) Cut one of the straws in half
- 2) Tape both pieces of the straw to one side of the water bottle
- 3) Put the wooden skewers through the straws
- 4) Press each bottle cap onto the ends of the wooden skewers. These will be the wheels and axles
- 5) Give your car a push to see if it will roll properly. If it gets stuck or if the wheels don't roll, make sure your axles are parallel to each other.
- 6) Tape the neck of the balloon around one end of the other straw. Wrap the tape very tightly so the connection is airtight.
- 7) Cut a small hole in the top of the water bottle so that it is just big enough to push a straw through. Ask your teacher for help on this step!
- 8) Push the free end of the straw through the hole and out the mouth of the bottle
- 9) Tape the straw to the bottle so it is secured to the bottle
- 10) Blow up the balloon by blowing air into the straw. Keep your finger over the end of the straw until you are ready for the car to move!

Diagram

Draw a picture of your balloon car. Label the wheels, axles, and power source. Use arrows to show which way the wind is blowing

**Results**

What happened with your car? Answer the questions below.

1) How did your car move? Explain.

2) How could you improve the design of your car so it can travel further? Think about the following in your answer: weight, straw size, size of balloon.

3) Newton's third law of motion states that for every action, there is an equal and opposite reaction. Why is this experiment an example of this law?

Inclined Plane

Inclined Plane

An inclined plane is a simple machine with no moving parts. It is just a ramp with one end higher than the other. Using an inclined plane allows gravity to pull objects down. It also helps us lift objects up high.

When we need to lift an object upwards, we can carry it or slide it along a ramp. This is easier than picking up big objects. The Egyptians used inclined planes to move heavy stones when they built the pyramids.

Tradeoff

An inclined plane has a horizontal length and a vertical height. **Horizontal** means side to side.

Vertical means up and down.

If we make a shorter horizontal length, the inclined plane will be steeper. This will make the distance we need to push shorter but we need more force to move the object.

If we make the horizontal length longer, we are creating a longer ramp. This means it needs less force to push. The problem is that we need to push the object further.

Example

You are standing at the edge of a moving truck that is 2 m tall. You want to move a box up to the opening of the truck. You would only need to lift it 2 m if you lifted it straight up.

If the box is too heavy to lift, you could use an inclined plane.

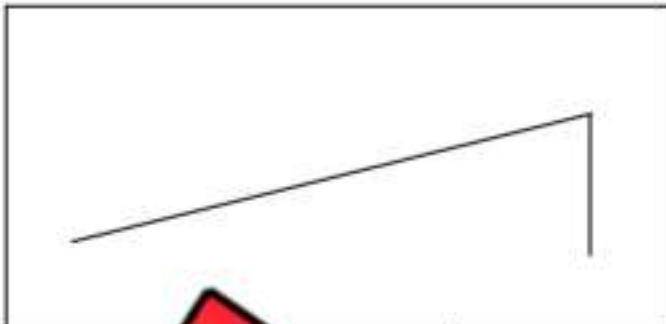
If you make the ramp 4 m long (twice as long as the height), you have made the object twice as light. But, you will need to move twice as far!

INCLINED PLANE

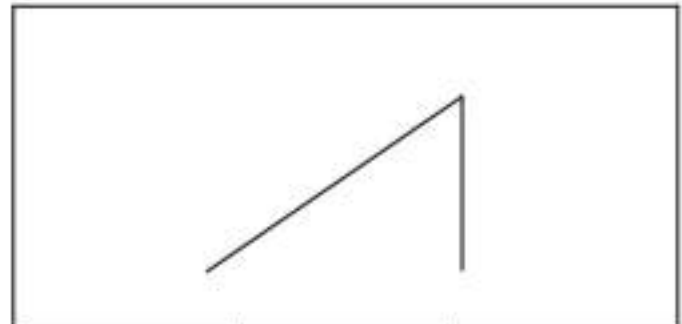


Describe

Circle the descriptions of the inclined planes below



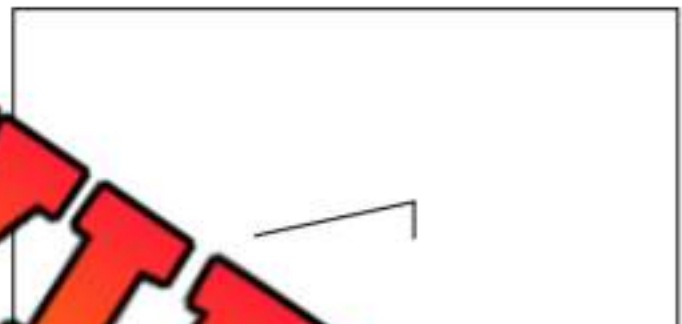
Slope	Steep	Gentle
Effort	Light	Heavy
Distance	Far	Short



Slope	Steep	Gentle
Effort	Light	Heavy
Distance	Far	Short



Slope	Steep	Gentle
Effort	Light	Heavy
Distance	Far	Short



Slope	Steep	Gentle
Effort	Light	Heavy
Distance	Far	Short

Multiple Choice

Circle the best answer

1) Horizontal means...	Side-to-side	Up-and-Down
2) Vertical means...	Side-to-side	Up-and-Down
3) A _____ ramp makes the load feel lighter	Longer	Shorter
4) Using a longer ramp makes the distance	Closer	Further
5) Using a shorter ramp makes the load feel	Lighter	Heavier

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Is the statement true or false?

1) An inclined plane is a ramp with one end higher.

True

False

2) Egyptians used inclined planes to lift heavy stones.

True

False

3) An inclined plane helps us lift objects up high.

True

False

4) A longer horizontal length needs less force to push.

True

False

5) Vertical means side-to-side.

True

False

Name: _____

Mark

Is the statement true or false?

1) An inclined plane is a ramp with one end higher.

True

False

2) Egyptians used inclined planes to lift heavy stones.

True

False

3) An inclined plane helps us lift objects up high.

True

False

4) A longer horizontal length needs less force to push.

True

False

5) Vertical means side-to-side.

True

False

Name: _____

Mark

Is the statement true or false?

1) An inclined plane is a ramp with one end higher.

True

False

2) Egyptians used inclined planes to lift heavy stones.

True

False

3) An inclined plane helps us lift objects up high.

True

False

4) A longer horizontal length needs less force to push.

True

False

5) Vertical means side-to-side.

True

False

Name: _____

Mark

Is the statement true or false?

1) An inclined plane is a ramp with one end higher.

True

False

2) Egyptians used inclined planes to lift heavy stones.

True

False

3) An inclined plane helps us lift objects up high.

True

False

4) A longer horizontal length needs less force to push.

True

False

5) Vertical means side-to-side.

True

False

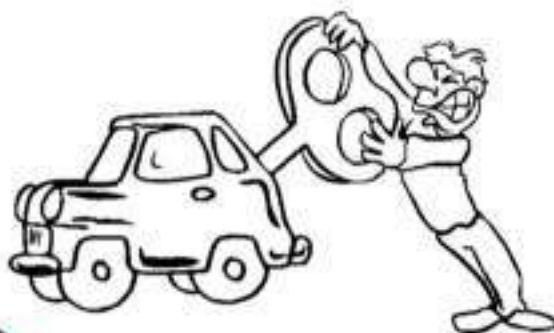
Experiment - Inclined Plane

Research Question What are we learning about?

How does the height and angle of an inclined plane affect the movement of an object at the top coming down?

Materials What you will need for the experiment

1. Toy car
2. Cardboard
3. Books
4. Meter stick
5. Tape



Method How you will complete the experiment

1. Stack three books on top of each other. Tape one end of the cardboard to the edge of the top book. Tape the bottom edge of the cardboard to the floor. You should now have an inclined plane that looks like a ramp.
2. Place the car at the top of the inclined plane and let go.
3. Measure how far the car travels using the meter stick. Record your measurements on this paper.
4. Change the height of the inclined plane by adding a 4th, 5th, and 6th book.
5. Repeat steps 2 and 3 with the different heights of inclined planes.

Observations How far did your car do?

Height in Books	Distance in CM
3 Books	
4 Books	
5 Books	
6 Books	

Results Answer the questions below

1) What happened to the force you applied as you made the inclined plane steeper?

2) Does it get easier or harder to move something up an inclined plane as you make it steeper?

3) Is it easier to move things downhill or uphill?

4) Do you need more or less force to push an object down a hill that is steeper?

Levers

What is a lever?

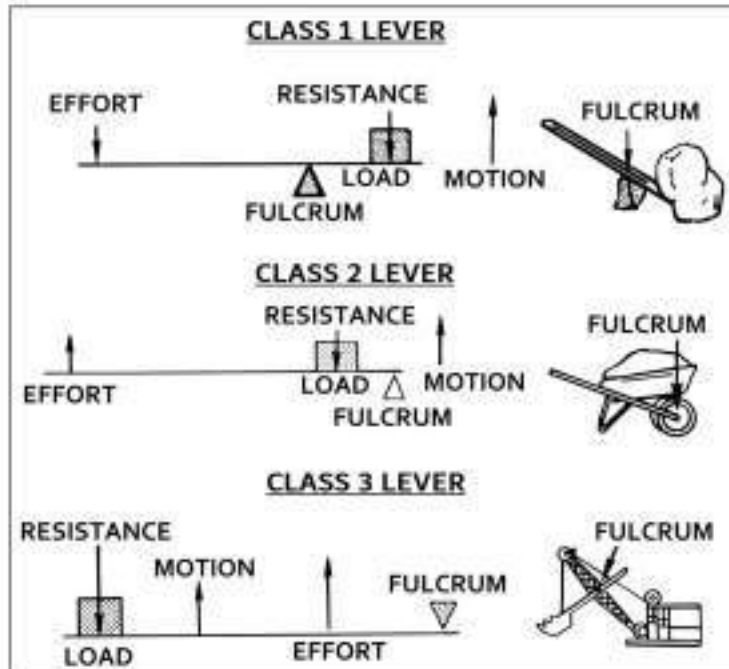
A lever is a simple machine that is used to make work easier by using leverage which multiplies the force.

Let's say you needed to move a box of heavy treats up to the top floor of your treehouse. You could carry it, but that would be difficult. You could make it easier by using a lever.

To make a lever, you need a long flat board, a fulcrum, and someone to apply a force. You could use a large flat rock as a fulcrum and rest the long board over top of it so that the rock is in the middle. You could place the box of treats on one end and push down on the other end. This would push the box into the air.

This is an example of a type 1 lever. The fulcrum is in the middle of the load and the force. Levers not only multiply force, but they can also change the direction of a force.

Types of Levers



Class 1 Lever	The fulcrum is in the middle of the load and where the effort is being applied
Class 2 Lever	The load is between the fulcrum and the effort
Class 3 Lever	The effort is between the fulcrum and the load

LEVER (SIMPLE MACHINE)



Questions

Answer the questions below using evidence from the text

1) What is a lever?

2) When has _____ used a lever? What class of lever was it?

Examples

What type of lever is the following?



Class of Lever



Class of Lever



Class of



Class of Lever



Class of Lever



Class of Lever

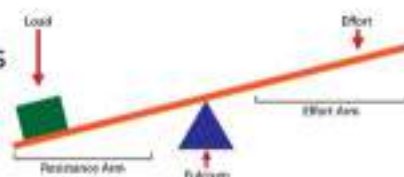
Calculating Mechanical Advantage - Lever

Calculating Mechanical Advantage Using a Lever

To calculate the MA of a lever, you will need to know the lengths of the effort arm and the load arm. The formula is:

$$\frac{\text{Effort Arm (length)}}{\text{Resistance Arm (length)}}$$

This will give you the MA, which you can use to find how much force will be made by the lever.

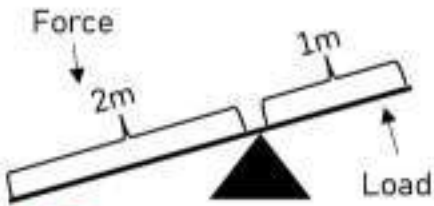


Calculate the MA and output force in the examples below

	Effort Arm	Load Arm Length	MA	Input Force	Output Force
1)	10 cm	5 cm	2	10 N	
2)	4 m	2 m		5 N	
3)	2 m	1 m	2	10 N	
4)	3 m	3 m	1	10 N	
5)	10 cm	2 cm	5	10 N	
6)	30 cm	10 cm		10 N	
7)	6 m	2 m		25 N	
8)	12 m	3 m		100 N	
9)	15 cm	5 cm		20 N	
10)	12 m	6 m		50 N	

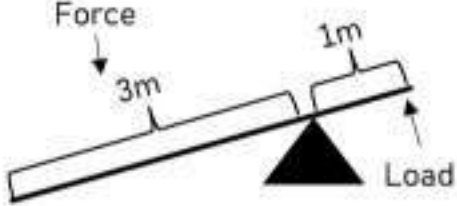
Calculate Calculate the MA and output force in the examples below

1)



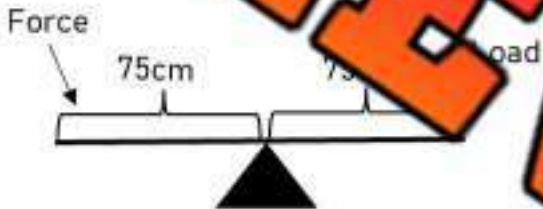
MA	
Input Force	100 N
Output Force	

2)



MA	
Input Force	25 N
Output Force	

3)



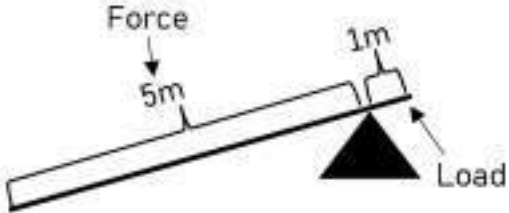
MA	
Input Force	200 N
Output Force	

4)



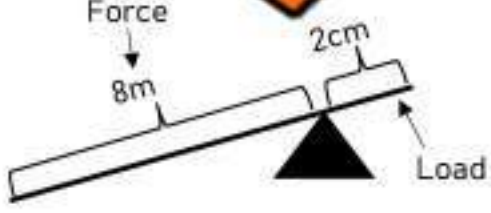
MA	
Input Force	50 N
Output Force	

5)



MA	
Input Force	10 N
Output Force	

6)



MA	
Input Force	20 N
Output Force	

Experiment - Testing Different Levers

Research Question

What will you be testing?

How does moving the fulcrum affect the force needed to lift a load?

Materials

What you will need for the experiment

- ☐ Ruler
- ☐ Tapes
- ☐ Tape
- ☐ Weights - objects that all have the same weight (marbles, paper clips, etc.)
- ☐ Fulcrum - metal bin or pencil held together, eraser

Procedure

How you will complete the experiment

- 1) Tape the cups to the ends of the ruler.
- 2) Decide which side will be the load. Put a reasonable amount of weight into the cup that will be the load.
- 3) Put the fulcrum in the centre of the ruler. Add weights into the cup on the effort side of the lever until the lever is balanced. Record the weight you added (number of marbles/weights).
- 4) Empty the effort cup but leave the same weight in the resistance cup. Put the fulcrum closer to the effort side of the ruler. Complete the same steps as above and record how much effort was needed to balance the lever.
- 5) Lastly, empty the effort cup again and repeat the same steps as above, but move the fulcrum closer to the resistance cup. Record your results.
- 6) Answer the questions on the backside of the page.



Observations

What did you notice as you completed the experiment

Fulcrum Position	Fulcrum Position on Ruler - cm or mm	Weight in Load Cup	Weight in Effort Cup
In the Middle			
Close to Effort Cup			
Close to Resistance Cup			

Diagram

Diagram of the 3 levers you made

In the Middle	
Close to Effort Cup	
Close to Resistance Cup	

Results

Answer the questions below

What position allowed the least amount of force to move the load? Explain why this was the case.

Wedge

Wedge

A wedge is a triangular tool that is often made from metal, wood, plastic, or stone. It is thick on one end and narrow on the other to form a sharp edge.

A wedge is a type of an inclined plane (or two inclined planes) that is often attached to a handle. Wedges have been used for millions of years to hunt wild animals, strip trees, and much more.

How do they work?

When we apply a force to the wide side of a wedge, the sharp edge goes further into the object. In the diagram above, we can see how a wedge is used to split a piece of wood to split the wood.

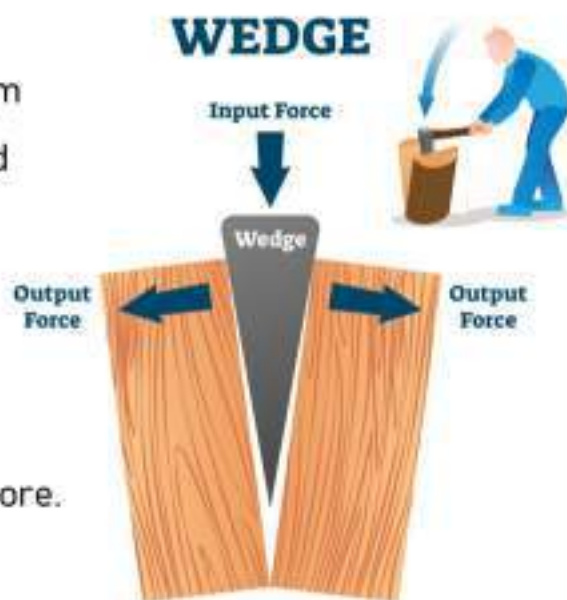
When we apply a downward pushing force to the wide side of a wedge, the wedge creates a side to side force into the object it is used to split. An example of a **single wedge** is a chisel, while an example of a **double wedge** is an axe.

Tradeoff

When we use a longer and thinner wedge, it is easier to force it into the object. The only issue is that this may not cause enough side to side force. If the wedge is shorter and has a wider angle at the tip (not as sharp), we will need to apply more force to do the work.

Examples of wedges

A wedge can be used in the following different ways: to cut (knife), to split (axe), to tighten, to hold back (door stop), to scrape (blades), and to hold together (nail).



True or False

Circle whether the statement is true or false

1) A chisel is a single wedge	True	False
2) A double sided axe is a single wedge	True	False
3) A downward input force makes outward forces	True	False
4) Longer and thinner wedges are not as sharp	True	False
5) Longer and thinner wedges are sharper allowing it to travel further	True	False

Questions

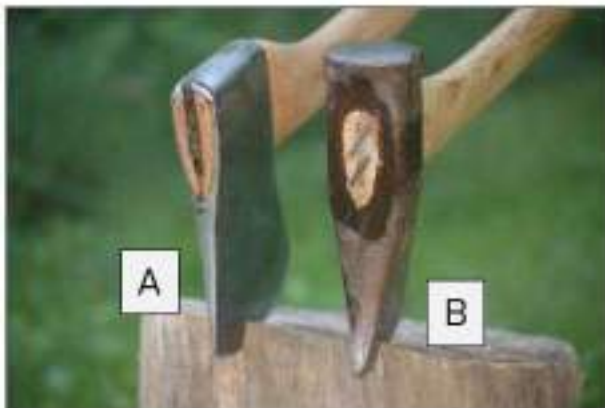
Answer the questions below using evidence from the text

1) What is a wedge and how do the

2) When have you ever used a wedge?

Explain

Which axe is a wood splitting axe and which is used to cut down trees. Explain



Experiment - Wedges

Research Question How does a wedge work?

A **wedge** has two inclined planes put together. A wedge is used for many reasons. One of them is to cut things in half. How well does a wedge cut playdough?



Materials What do you need for the experiment?

- ☐ Playdough
- ☐ Wedge (triangular wooden block)
- ☐ Plastic knives (optional)



Procedure How you will complete the experiment

- 1) Take out a ball of playdough
- 2) First have students try to cut the playdough in half with the palm of their hand
- 3) Next have the students use the side of their hand to cut the playdough in half
- 4) Next have the students use the wedge to cut the playdough in half
- 5) Lastly, have the students use a plastic knife to cut the playdough in half.
- 6) Record your observations on the back of the page.

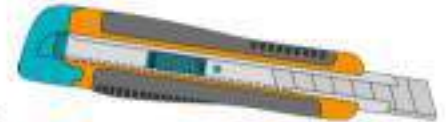
Observations

What happened when you cut the playdough

Cutting Tool	What Happened? Did It Cut It Well? Did It Cut It Clean?
Palm	
Side of Hand	
Knife	

Results

Answer the questions



1) What is a wedge good at doing?

2) Name 2 wedges that are good at cutting. Draw them.

3) What would life be like without wedges?

Indigenous Groups Using Simple Machines

Indigenous Groups Using Simple Machines

First Nations, Métis, and Inuit people have been clever and imaginative for a long time. They have used simple machines, like an antler wedge and a paddle, to help them with their work.

Antler Wedge

An antler wedge is a simple machine that comes from the antler of a caribou or reindeer. It has a 'V' shape and is very strong. First Nations, Métis, and Inuit people used it to split things like wood or bone. They would push or hit it into something they wanted to split into smaller pieces. It helped them to make homes, tools, and food.



Paddle

A paddle is another simple machine used by the First Nations, Métis, and Inuit people. They used it to move their boats through the water. By pushing the paddle against the water, they could make their boat move forward. The paddle made it easier to travel across rivers and lakes.



Using Them Today

These simple machines, the antler wedge and the paddle, are still in use today. They are perfect examples of how simple machines can make work easier. The First Nations, Métis, and Inuit people continue to use these tools, showing us their cleverness and skill.

True or False

Is the statement true or false?

1) Antlers are made from plastic	True	False
2) A paddle is used to move a boat	True	False
3) Using a paddle makes it easier to move a boat	True	False
4) Antlers have a W shape	True	False
5) Antler wedges are used to cut things	True	False

Questions Answer the questions below

1) How is a paddle used in a boat?

2) How is an antler wedge used?

Draw

Draw a paddle and an antler wedge

--	--

Inuit Scraping Tools: The Ulu

Inuit Scraping Tools: The Ulu

The Inuit people, who live in the cold, snowy regions of Canada, are very smart. They have been using a special tool, called an ulu, for thousands of years.

What is an ulu?

An ulu is a scraping tool. It looks like a knife but has a curved blade. The handle is usually made of bone or antler. The blade can be made of bone, antler, or even stone.



Making an Ulu

- 1) Find Materials: You need a strong handle. You need a strong, flat piece for the blade. Bone or antler can work too.
- 2) Shape the Blade: Cut the blade into a half-circle shape, like half of a pizza!
- 3) Make the Handle: Cut the bone or antler into a shape that fits your hand. It should be easy to hold.
- 4) Connect the Blade and Handle: Make a hole in the handle and the blade. Then, tie them together with strong string or leather.
- 5) Sharpen the Blade: Use a stone to rub the edge of the blade until it's sharp.

Using an Ulu

The Inuit people use ulus for many things. It's like their super-tool! They use it to scrape animal skins to clean them. This makes the skins soft so they can be used to make clothes and tents. Ulus are also used to cut food like meat and fish.

Name: _____

91

Curriculum Connection
E3.7

Questions

Answer the questions below

1) What is an ulu?

2) How is _____ made?

Draw

Draw an ulu below



Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Inuit people use ulus to scrape animal skins to clean them.
	An ulu is a scraping tool. It looks like a knife but has a curved blade.
	An ulu is used mostly to help Inuit people mark important places.

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Inuit people use ulus to scrape animal skins to clean them.
	An ulu is a scraping tool. It looks like a knife but has a curved blade.
	An ulu is used mostly to help Inuit people mark important places.

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Inuit people use ulus to scrape animal skins to clean them.
	An ulu is a scraping tool. It looks like a knife but has a curved blade.
	An ulu is used mostly to help Inuit people mark important places.

Name: _____

Mark

2 Truths and a Lie – Can you find the one that's not true?

	The Inuit people use ulus to scrape animal skins to clean them.
	An ulu is a scraping tool. It looks like a knife but has a curved blade.
	An ulu is used mostly to help Inuit people mark important places.

Coding - Making Compound Machines

Directions

Follow the code to design an excavator

run program

cut out all the shapes

paste the tracks on the bottom

paste the window on the front of the tracks

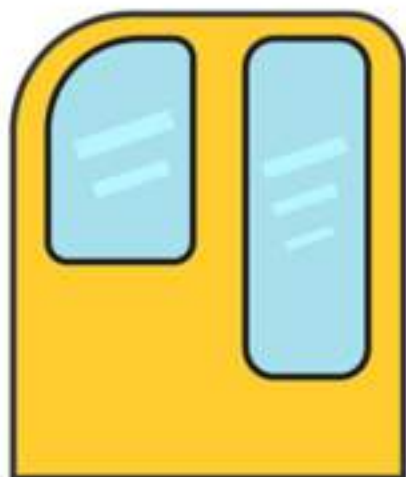
paste the side panel behind the window

paste the arm in the front of the window

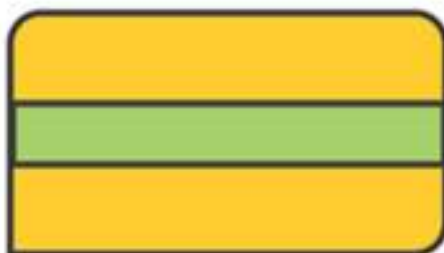
paste the bucket on the arm



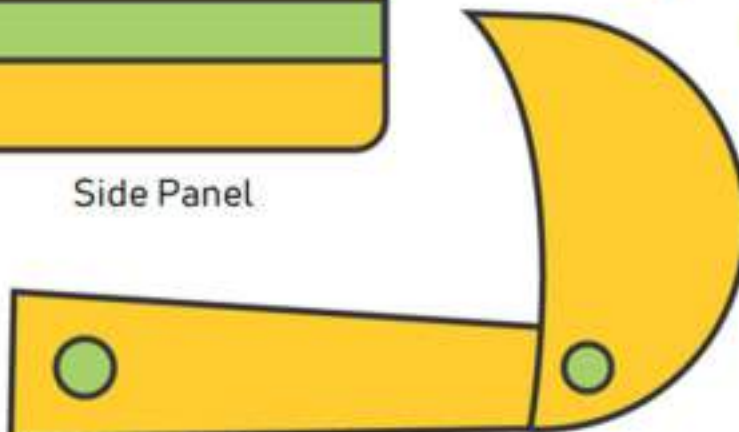
Tracks



Window



Side Panel



Bucket



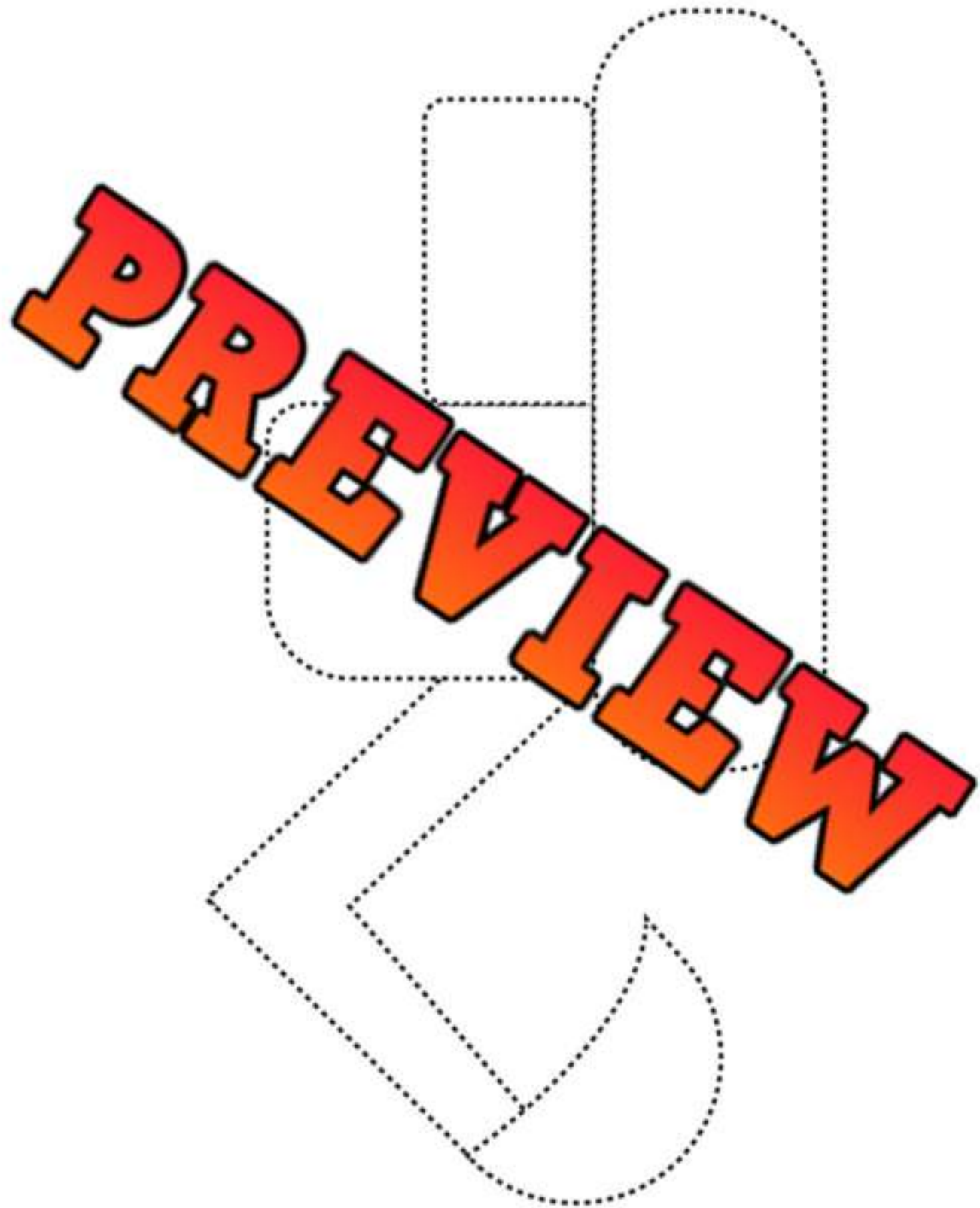
Arm

Name: _____

94

Curriculum Connection
CS.1

Directions Follow the code and paste the parts to make the excavator



Directions Follow the code to design a crane truck

run program

cut out all the shapes

paste the underbody on the bottom of the body

paste the wheels on the bottom of the body

paste the lights on the front and back of the body

paste the window on the front of the body

paste the back of the back of the body

paste the hook on the end of the cage

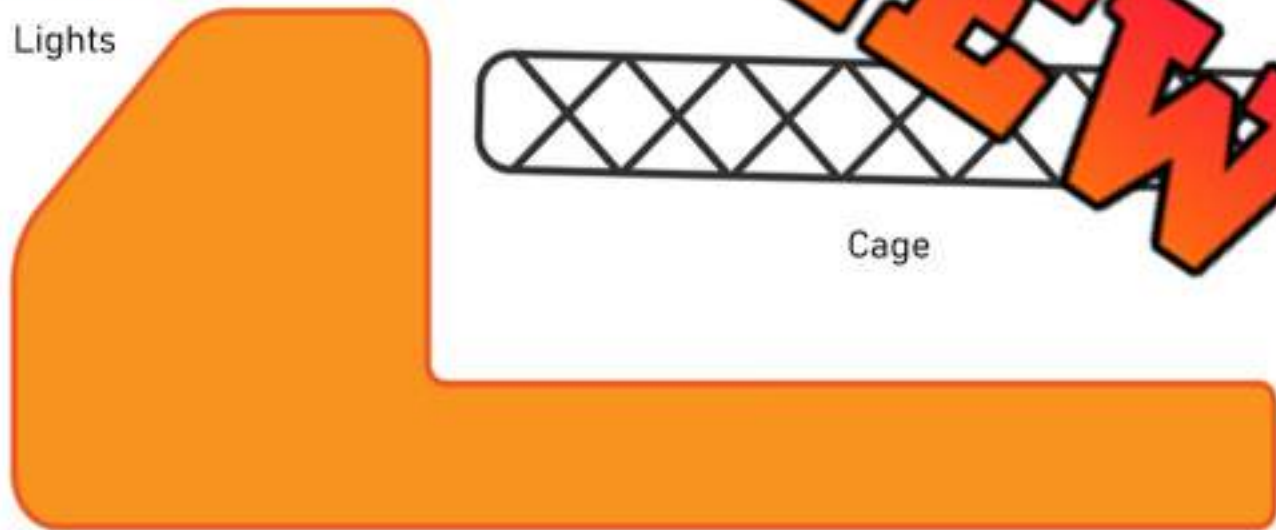
paste the cage on the box



Wheels



Lights



Body



Cage



Window



Hook



Under Body

If Then Conditional Statements - Activity

Directions

Follow the if/then statements to move the backhoe to the job site

1)	If a lever has a fulcrum	then	Move ↓ 3 spots
2)	If a wedge is an inclined plane	then	Move → 4 spots
3)	If a ladder is a lever	then	Move ↓ 3 spots
4)	If a jar is a screw	then	Move → 4 spots
5)	If a wedge	then	Move ↓ 3 spots
6)	If a pulley might feel lighter	then	Move ← 5 spots
7)	If a slide is a lever	then	Move → 4 spots
8)	If a wheelbarrow	then	Move ↓ 1 spots
9)	If a gravity is a pushing force	then	Move ↑ 3 spots
10)	If throwing a ball is a pushing		Move → 5 spots



Coding - Robot Lawn Mower

This is a self-driving lawn mower



It under
co

Right makes it
turn right



Right

Left makes it turn
right



Left

Forward makes the car move forward by the number shown



Forward 2

Directions

to the lawn mower to cut the field of grass

Codes – Forward, F, P, C, R, L, B, H, T

Line 1

Line 2

Line 3

Line 4

Line 5

Line 6

Line 7

Line 8

Line 9



Directions

Write code to get the lawn mower to cut the field of grass

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

Line 17

Line 18

Line 19

Line 20

Line 21



PREVIEW

Coding - Robot Assembly Lines

Today, code is used to program robots to do work. Assembly lines use robots to do boring, unskilled work. Robots are good at:

- ✓ Working hard – they do not get tired
- ✓ Lifting heavy
- ✓ Working all day and night
- ✓ Doing dangerous work



We send people to fix the robots. When a robot breaks, a human fixes the robot. People check the robots to make sure they are working.

Fill in the Blanks

Use the words to fill in the blanks

night	hurt	code	robot	hard	heavy
-------	------	------	-------	------	-------

- 1) _____ is written so robots know what to do.
- 2) Robots are good at working _____.
- 3) Robots can work all day and all _____.
- 4) Robots don't get _____ so they can do dangerous work.
- 5) Robots can lift _____ things.
- 6) We need humans to fix _____.



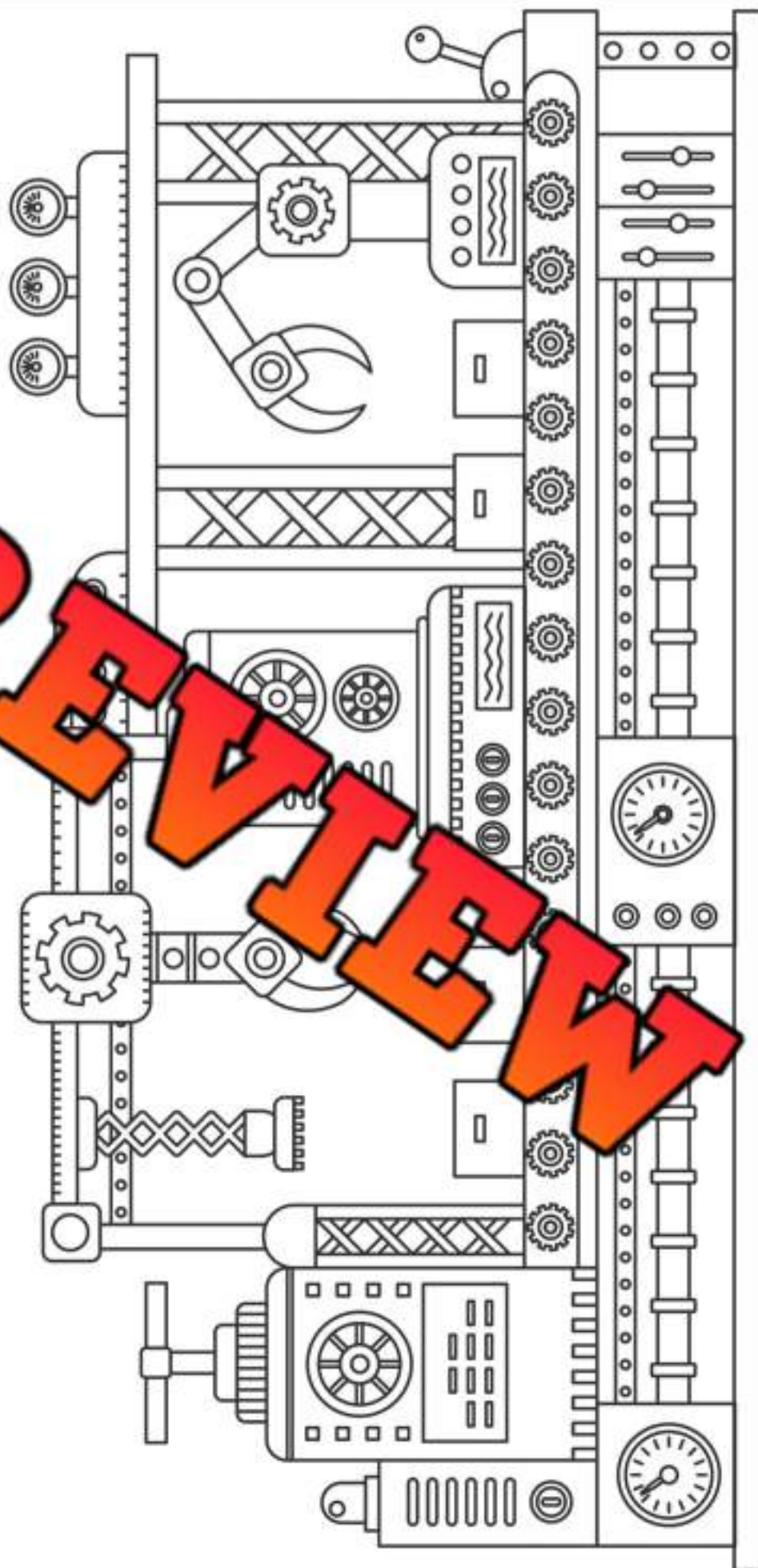
Question

What would life be like without coding or robots?

Name: _____

Colour the picture of the assembly line

Colour





Questions

Answer the questions below

1) What are the robots making?

2) Do you think the robots make cars faster or slower than people?

Faster

Slower

3) What are the humans doing in the diagram? Circle the answers.

Building

Carrying

Selling

Driving

Inspecting

Buying

Painting

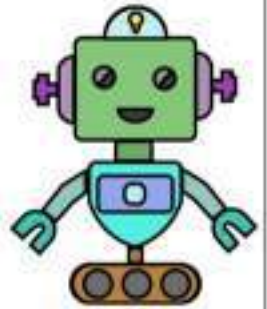
Lifting

Robots - Simple Machines

Robots are helping the world in many ways. They are used in factories to make the things we use everyday. Without robots, humans would need to assemble the parts needed to make these things.

Robots use simple machines to get work done. Check out the simple machines used by robots on assembly lines.

- ✓ Wheel and axles for wheels that allow robots to move around
- ✓ Levers that work as arms for the robot to move things
- ✓ Robots use tools that are wedges or screws used to do work



Draw _____ Draw a robot with wheels, levers for arms, and tools for hands

Which simple machines does your robot have?

Name: _____

Date: _____

Units Test - Forces

Multiple Choice

/10

1) A ladder is an example of a... a) Wheel and Axle b) Inclined Plane c) Wedge d) None of the above	2) An example of a pulling force is... a) Kicking a ball b) Punching a punching bag c) Playing tug of war d) Pushing someone on a swing
3) When a car's wheels squeeze a bike tire to move it forward, what force is in action... a) Electromagnetic Force b) Gravity c) Friction d) Muscular Force	4) A seesaw is an example of which type of simple machine? a) Wedge b) Lever c) Inclined Plane d) Wheel and Axle
5) A knife is an example of which type of simple machine? a) Wedge b) Lever c) Inclined Plane d) Wheel and Axle	6) A ramp is an example of a... a) Wheel and Axle b) Inclined Plane c) Wedge d) None of the above
7) When skating on a rink, it is slippery because there isn't much... a) Friction b) Gravity c) Pulling force d) Pushing force	8) Which material makes shoes that don't slip on the ground? a) Plastic b) Wood c) Rubber d) Glass
9) A slide on a playground is an... a) Wheel and Axle b) Inclined Plane c) Wedge d) None of the above	10) Using inclined planes makes our life... a) Harder b) Easier

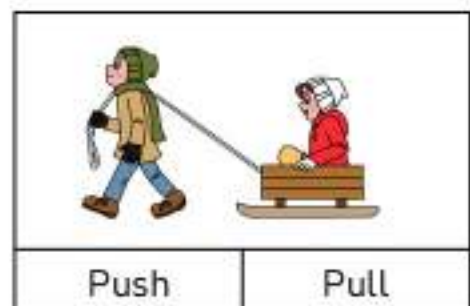
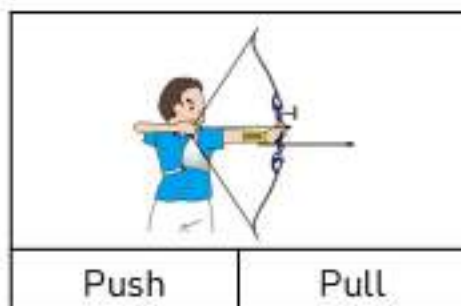
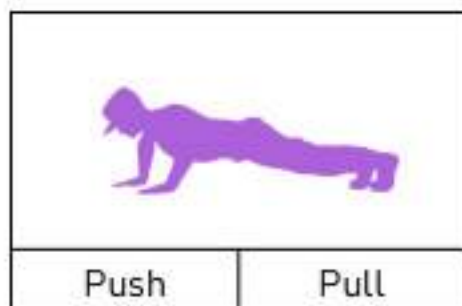
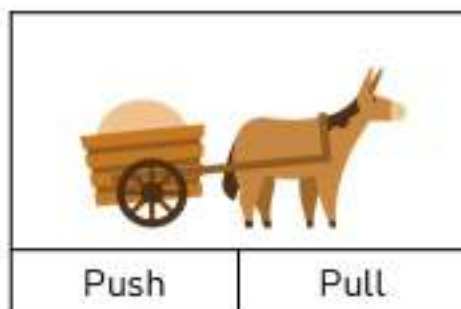
Fill in the Blanks

Circle the correct word for the blank

1)	1) A force is always a push or _____ (throw, pull)
2)	2) Gravity is a _____ force. (pushing, pulling)
3)	3) When sitting on a chair, the chair has a(n) _____ force. (balanced, unbalanced)
4)	4) When kicking a soccer ball, the ball has a(n) _____ force. (balanced, unbalanced)
5)	5) If an object has balanced forces acting on it, it will _____.
6)	6) A bulldozer is a _____ force. (strong, weak)
7)	7) A wheelbarrow is a _____. (lever, inclined plane)
8)	8) A ladder is a _____. (lever, inclined plane)
9)	9) An ulu is a _____. (wedge, lever)
10)	10) An antler can be used as a _____. (wedge, lever)

Directions

Is the picture a push or pull?



True or False

Is the statement true or false?

1) Friction on ice is strong	True	False
2) Tension is when we push a rope together	True	False
3) Tension is when we pull a rope apart	True	False
4) Elastic force happens when we stretch an object	True	False
5) When we throw a ball, we use applied force	True	False
6) In some of the simple machines, pulling forces are used	True	False
7) A wheelbarrow is an inclined plane	True	False
8) You can't change the direction of a simple machine	True	False
9) Force can be applied in all directions	True	False
10) A bulldozer uses a weak force	True	False

Label

Which simple machine is in the picture?

Lever

Wedge

Inclined Plane

Wheel and Axle

1)



2)



3)



4)





Workbook Preview



Grade 3 – Science Unit

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

Guiding Question: What visible changes can be identified by examining Earth's surface?

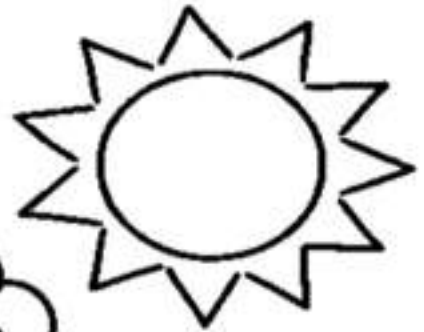
	Learning Outcome – Students analyze changes in Earth's surface and explain how its layers hold stories of the past.	Pages
ES.1	Changes that can occur to Earth's surface over a long period of time include mountains wearing down, rivers changing course, lakes and seas drying out and refilling, glaciers moving, advancing, and receding Natural events that can change Earth's surface in a short period of	7-31, 37-47, 63
ES.2	all of Canada. Melting glacier ice creates runoff that forms and maintains many of the major rivers in Alberta. Earth is warming up from natural and human causes, which is accelerating the melting of glaciers. Interactions with wind and water have shaped Earth's surface, including Alberta's badlands and the Grand Canyon in the United States.	24-36, 48-57, 64-65
ES.3	Human activities that can change Earth's surface include - living on the land, building towns and cities, getting and using resources, growing crops and farming (agriculture), polluting, stewardship Plant and animal activities can change Earth's surface, such as - overpopulation, using resources, parasite infestation; e.g., mountain pine beetle, animals burrowing	66-71

**Preview of 90 pages from
this product that contains
187 pages total.**

	Learning Outcome - Students analyze changes in Earth's surface and explain how its layers hold stories of the past.	Pages
ES.4	Earth's surface contains layers that have been deposited over long periods of time. Fossilized dinosaur bones found in many locations around the world show that dinosaurs lived on Earth millions of years ago. Millions of years ago, Earth's surface in Alberta included lush tropical forests and an inland sea that supported dinosaur life and the preservation of dinosaur bones. Fossilized dinosaur bones can be collected from the surfaces of Earth or by digging up (excavating) its layers. Fossilized dinosaur bones have been found in several locations in Alberta, such as • Alberta's badlands, the Grande Cache area, the Fort McMurray area Dinosaur Provincial Park, located in Alberta's badlands, has been classified as a UNESCO World Heritage Site. Many dinosaurs lived in Alberta, such as • Albertosaurus, Edmontosaurus, Nodosaurus, Tyrannosaurus Displays of fossilized dinosaur bones can be viewed in museums in Alberta such as the • Royal Tyrrell Museum in Drumheller, Philip J. Currie Dinosaur Museum in Wembley A scientist who studies fossilized dinosaur bones is called a paleontologist.	72-94
ES.5	Soil includes • living plants and animals, decaying plants and animals, rock particles, air, water Soil provides a habitat for many animals. Habitats are environments where plants or animals establish a home. Soil can change due to the influence of plants and animals, such as • plants and crops growing, worms tunneling and eating matter	95-119
	Computer Science - Learning Outcome	
CS.1	Students investigate creativity and its relationship to computational thinking	N/A

NAME: _____

CHANGING EARTH



PREVIEW



Sudden vs Gradual Changes to Earth

Changes to Earth: Sudden (Fast) and Gradual (Slow)

The Earth is always changing. Some changes happen very quickly because of strong forces like earthquakes, landslides, and volcanoes. Other changes happen slowly over a lot of time, like when wind and water shape the land.

Fast Changes to Earth

Earthquakes

Sometimes, powerful forces change our Earth very quickly. In 2015, an earthquake changed Mount Kinabalu in Malaysia. The mountain had a part called Pinnacle's Peak, and the earthquake damaged it.



Volcanoes

A volcano is a hole in the Earth's ground that can erupt lava, ash, and steam. When a volcano erupts, its lava can cool down and turn into rock. This can change parts of the Earth. Volcanoes in Hawaii have even made new islands.

Slow Changes to Earth

Wind, water, and ice can change the Earth slowly. This can happen through processes called erosion and weathering. Erosion is when parts of the Earth are worn away or moved. An example of erosion is when wind moves soil, glaciers scrape the ground, or water changes our coastlines. Weathering is when rocks break down into smaller pieces, but don't move. Both erosion and weathering shape the Earth slowly over time.

Questions

Answer the questions below using evidence from the text

1) What is the difference between sudden and gradual changes to Earth?

2) Write examples of sudden and gradual changes to Earth.

Sudden**Gradual****Visualizing**

Draw what you would picture if you were reading. Explain the picture

Sudden or Gradual

Is the example a gradual or sudden change?

1) A landslide destroys a forest

2) A waterfall is formed after years of water erosion

3) A glacier carved out the Cape Cod River

4) An earthquake created fissures in the ground

Research - Sudden and Gradual Changes to Earth

CHANGES TO THE EARTH

Definitions

What do the terms below mean?



From ICE

From WATER

From WIND

SLOW CHANGES



Weathering

Deposition



Volcanic Eruptions

Earth Quakes

Landslides

Term	Definition
Erosion	
Weathering	
Deposition	

Term	Definition
Glacier Erosion	
Water Erosion	
Wind Erosion	

Research

Research your own examples of sudden and gradual changes to the Earth

Sudden	
Gradual	

Layers of Earth

Layers of the Earth

The Earth is made up of several layers, which are composed of different materials and have different properties.

From the surface of the Earth outwards, the layers are:

The Inner Core

The inner core is the innermost part of the Earth. It is made up of solid iron and nickel. It is the hottest part of the Earth, with temperatures reaching up to 5,000 degrees Celsius. The inner core is thought to be about the same size as the Moon.

The Outer Core

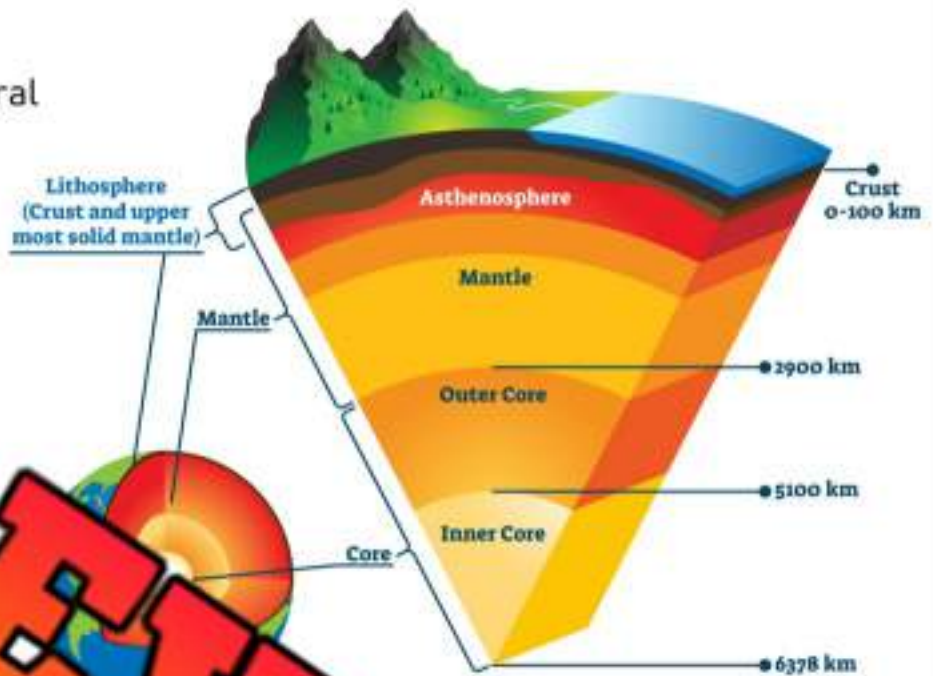
The outer core is made up of molten iron and nickel. It is a liquid. The outer core is a liquid.

The Mantle

The mantle is made of hot, molten rock. It is the largest layer of the Earth. The mantle is hot liquid rock that is always moving.

The Crust

The crust is the outermost layer of the Earth and is made up of solid rock. The crust is thin, but it is still about 35 kilometers thick. The crust is made of seven major plates, like jigsaw pieces.



Name: _____

11

Curriculum Connection
ES.1

True or False

Circle whether the statement is true or false

1) The Earth's mantle is solid	True	False
2) The crust is made of 7 big plates	True	False
3) The inner core is about the same size of the moon	True	False
4) The crust is the hottest layer of the Earth	True	False
5) The crust is the thinnest layer of Earth	True	False

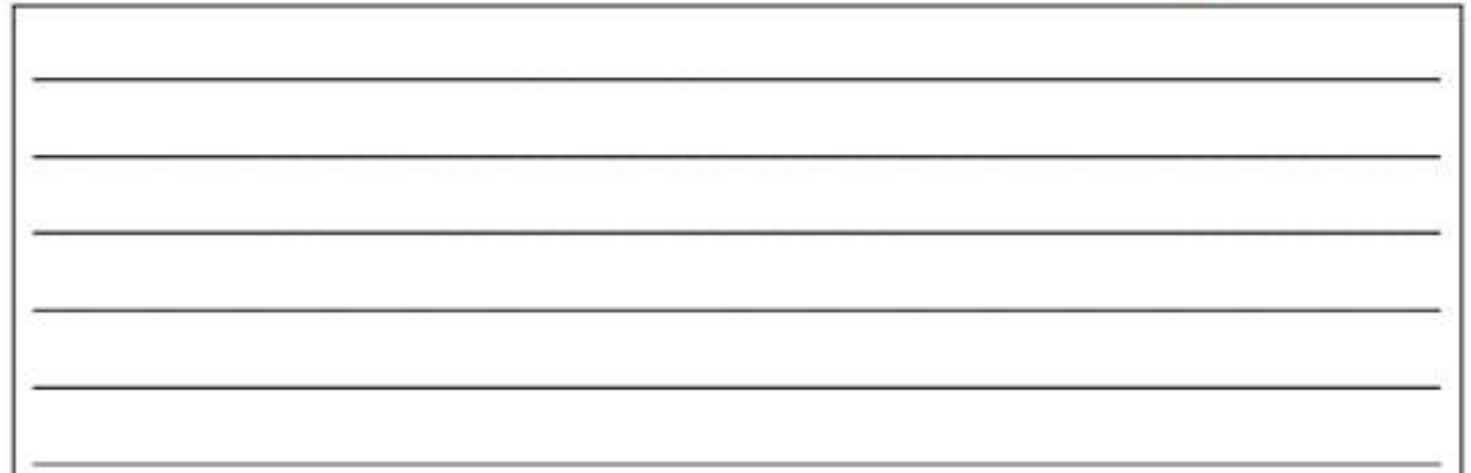
Draw

Diagram of the Earth and label each layer



Question

Describe the layers of the Earth so someone who didn't know the names of the layers



Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Is the statement true or false?

1) The crust is made of hard rock.	True
	False
2) The inner core is cooler than the crust.	True
	False
3) The outer core is cooler than the inner core.	True
	False
4) The mantle never moves inside the Earth.	True
	False
5) The crust is the thickest layer.	True
	False

Name: _____

Mark

Is the statement true or false?

1) The crust is made of hard rock.	True
	False
2) The inner core is cooler than the crust.	True
	False
3) The outer core is cooler than the inner core.	True
	False
4) The mantle never moves inside the Earth.	True
	False
5) The crust is the thickest layer.	True
	False

Name: _____

Mark

Is the statement true or false?

1) The crust is made of hard rock.	True
	False
2) The inner core is cooler than the crust.	True
	False
3) The outer core is cooler than the inner core.	True
	False
4) The mantle never moves inside the Earth.	True
	False
5) The crust is the thickest layer.	True
	False

Name: _____

Mark

Is the statement true or false?

1) The crust is made of hard rock.	True
	False
2) The inner core is cooler than the crust.	True
	False
3) The outer core is cooler than the inner core.	True
	False
4) The mantle never moves inside the Earth.	True
	False
5) The crust is the thickest layer.	True
	False

Mountains

Mountain Landform

A **mountain** is a landform that rises high above the surrounding ground. Mountains are usually higher than 300 metres above the ground, otherwise they are called hills. Mountains are made from rocks and earth.

Features of a Mountain

Mountains have two main features – a sloped side of the mountain, and the summit, which is the top of the mountain. Mountains usually form together in a line that we call a mountain range. On a mountain range, there is one summit that is the top of all mountains. The mountain range has several peaks, which are the tops of the other mountains in the range.

Types of Mountains

How Do Mountains Form?

There are four types of mountains.

- 1) Folded – form when two plates crash into each other.
- 2) Fault Block – Form when the Earth's crust cracks because of plates moving. When it cracks, one side of the crack can be higher than the other.
- 3) Upwarped – form when magma underground pushes the crust up.
- 4) Volcanic – form when a crack in the Earth's crust gets bigger and magma rises and spills out of the crack. Over time, the magma cools and a volcano grows.



Folded Mountains



Fault-Block Mountains



Volcanic Mountains

True or False

Circle whether the statement is true or false

1. Mountains have to be at least 50 metres tall	True	False
2. Folded mountains happen when plates crash into each other	True	False
3. Magma is only found above the ground	True	False
4. Volcanos form when magma rises out of a crack	True	False
5. Mountains are formed because of the Earth's plates	True	False

Questions What questions do you have after reading the information?

1)	
2)	

Questions

Use information from the text to support your answers

1) What is a mountain?
2) How are mountains made?

Plate Boundaries

Plate Boundaries

A **plate boundary** is where two plates meet. There are three types of plate boundaries – divergent, convergent, and transform.

Divergent (Spreading) – Happens when two plates move away from each other. A divergent plate boundary.

Volcanic mountains form at divergent plate boundaries because the magma rises to the ground and then it cools.

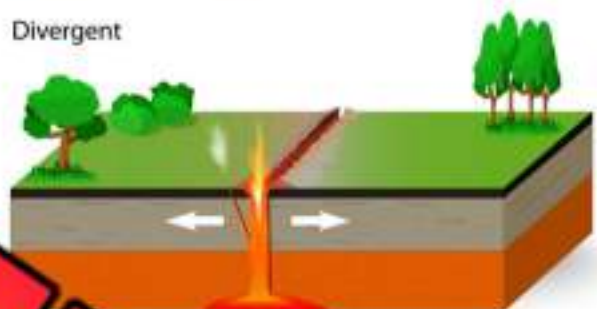
Convergent (Colliding) – Happens when plates move towards each other and hit. Fold mountains happen at convergent plate boundaries. They happen because when the plates hit, one plate moves under the other. The plate that is denser or heavier, will often slide under the other plate. This pushes up the other plate, which makes a fold mountain.

Transform – Happens when plates slide past each other. Earthquakes can happen at these plate boundaries because the plates rub on each other. This friction makes a strong force that can shake the ground. The San Andreas fault zone in California is an example of a transform plate boundary.

Transform



Divergent



Convergent



True or False

Circle whether the statement is true or false

1) Plate boundaries are where plates meet each other	True	False
2) Convergent boundaries are where plates move away from each other	True	False
3) Mountains are formed at transform plate boundaries	True	False
4) Divergent boundaries are where plates move away from each other	True	False
5) Heavier plates move under lighter plates	True	False

Define

Define each of the plate boundaries?

Divergent Plate Boundary	
Convergent Plate Boundary	
Transform Plate Boundary	

Diagram

Draw a diagram of each type of plate boundary

Divergent Plate Boundary	Convergent Plate Boundary	Transform Plate Boundary

Experiment - Types of Plate Boundaries

Background

What is the lab about?

The plates that make up part of our Earth's crust are constantly moving, shifting, and interacting with each other. As they float on the mantle, the plate boundaries can be convergent, divergent, or transform.

Materials

You will need to complete the experiment

- A paper plate
- A thick substance to be used as the mantle but icing/frosting will work
- Two crackers - any type of cracker will also work



Procedure

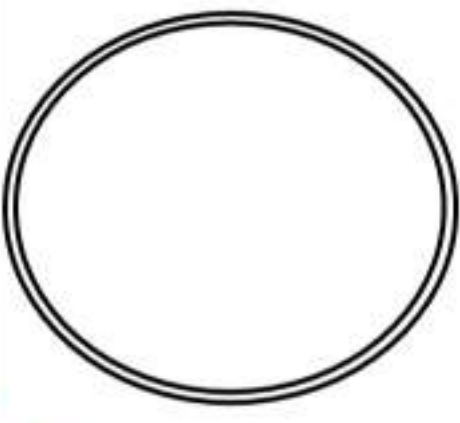
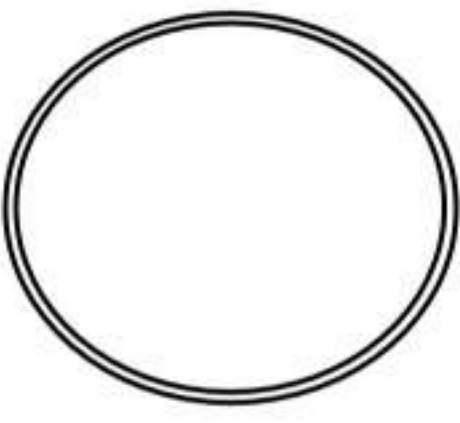
How you will complete the experiment

- 1) Spread the thick substance on the paper plate. This will be the mantle
- 2) Put two crackers on the mantle. The crackers represent the plates.
- 3) First perform the transform plate boundary by sliding the crackers by each other. They should rub against each other, as the friction causes earthquakes.
- 4) Next, perform a divergent plate boundary by pulling the crackers apart.
- 5) Lastly, perform a convergent plate boundary by pushing the crackers into each other. You may need to lift one cracker up to slide it past the other cracker. Make a folded mountain by cracking the cracker that went over top the other cracker.
- 6) Draw diagrams of your demonstrations on the back of this page.



Observations

Draw a diagram on the paper plates below. Use arrows to show the movement of the crackers (plates)

		
Transform	Divergent Boundary	Convergent Boundary

Results

Answer the questions below

1) What is a plate boundary? What do they do?

2) How do plate boundaries make folded mountains?

3) What can form at a divergent plate boundary?

The Rocky Mountains

How did the Rocky Mountains Form?

The Rocky Mountains are a mountain range that runs through the United States and Canada. They were formed because of the movement of the Earth's plates.

The Rocky Mountains formed because of the collision of the North American plate. About 80 million years ago, the North American plate started to hit the Pacific plate.

The Pacific Plate is an oceanic plate that is thin but heavy. When the plate hit the North American Plate, the Pacific Plate went under the land plate. This made the North American Plate move over top.

Now the line pushing on the edge of a rug is likely cause the rug to fold and push up over the floor. It does the same when where you touch the rug. If it happens further in, towards the centre of the rug.

When the Rocky Mountains formed, the plates hit near the Pacific Ocean. But the same thing happened as above. The mountains formed

about 1000 km inland. That is why the mountains are not right at the plate boundaries.



Questions

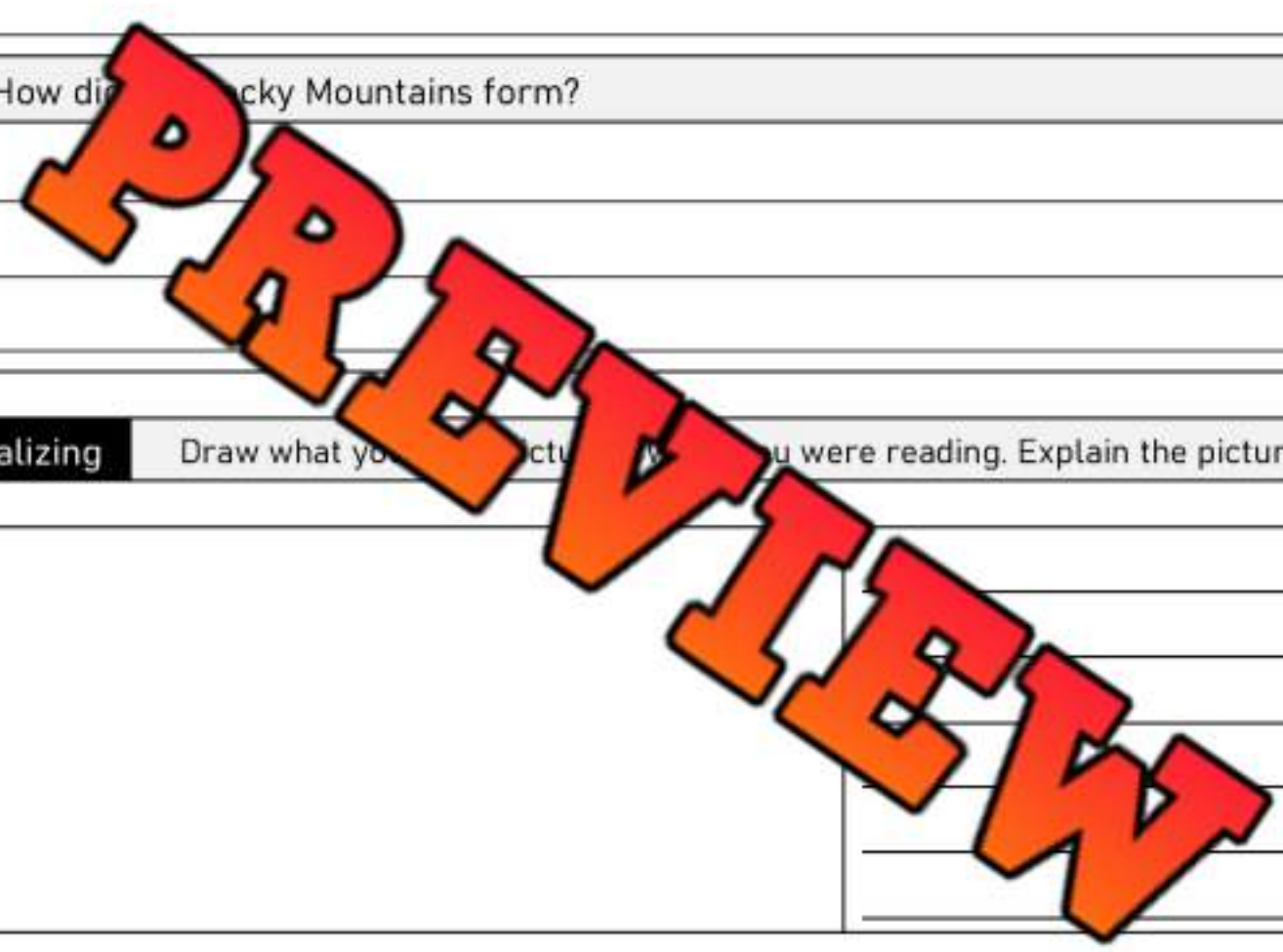
Answer the questions below using evidence from the text

1) Where are the Rocky Mountains?

2) How did the Rocky Mountains form?

Visualizing

Draw what you pictured while you were reading. Explain the picture



True or False

Circle whether the statement is true or false

1) The Rocky Mountains were formed by plate movement	True	False
2) Mountains always form where the plate boundaries are	True	False
3) The Rocky Mountains are only in Alberta	True	False
4) There are no plates in our oceans	True	False
5) The Rocky Mountains formed about 80 million years ago	True	False

Landform - Glaciers

What is a Glacier?

A **glacier** is a huge mass of ice that moves very slowly over land. The largest glacier in the world is Lambert Glacier, which is in Antarctica.

It is 400km wide and 600km long, and 2.5km thick.

It is 40,000 kilometres squared. It is 48 times bigger than the city of Calgary and 58 times bigger than Edmonton.



How Glaciers Form

Glaciers are huge pieces of ice that stay frozen for many years. In colder regions, not all the snow and ice melts during the spring and summer months. This means more snow and ice pile on top of the old snow and ice each year.

Over time, massive chunks of snow and ice form, and these are called glaciers. Most of the glaciers are in the Antarctic and Greenland, but glaciers are found on nearly every continent, even Africa.

Glacial Erosion

As glaciers move slowly, they scrape and grind over the ground. This scraping and grinding can change the land around them. It can make valleys deeper, create lakes, and even make new mountains. This process is called glacial erosion.

Just like how we use tools to shape things, like when we use a hammer to make a sculpture, the glacier uses its weight and movement to shape the land. So, over thousands of years, glaciers can change the way our planet looks.

Questions

Answer the questions below using evidence from the text

1) What is a glacier?

2) How do glaciers change our land?

Draw

Draw mountains and how glaciers slide in valleys between the mountains

True or False

Circle whether the statement is true or false

1) Glaciers move fast	True	False
2) Glaciers are any piece of ice	True	False
3) Glaciers scrape the land, changing it	True	False
4) Glaciers can carve out valleys, making them bigger	True	False
5) Most glaciers are found in Africa	True	False

Landform - Valleys

What is a Valley?

Valleys are long and deep areas of land that are found between hills and mountains. They look like large ditches. They are formed between two mountains or large hills that face each other. A valley is the space between these mountains.



How are Valleys Formed?

Most valleys are formed by erosion. Erosion is the process that wears down the soil and rocks. Imagine making a large mound of sand. If you poured a lot of water over the middle of the mound, the water will find its way to the bottom of the hill.

The result will be a valley that looks just like a ditch. This is how valleys are formed. The only difference is that valleys take thousands of years to form.

Erosion

As river water flows towards a larger body of water, the speed of the water will break away the soil and land from the sides of the water. This is called erosion. Erosion will make a valley bigger and bigger.

Glaciers

Not all valleys are formed by rivers. Some valleys are formed by large, slowly moving bodies of ice called glaciers. As the glaciers slid across our land, they scraped and molded valleys.

Questions

Answer the questions below using evidence from the text

1) What is a valley? Where do they form?

2) How are valleys formed? Explain two ways.

Draw

Draw a picture of 2 peaks with a valley in between. Label the peaks and valley

**True or False**

Circle whether the statement is true or false

1) Valleys form when people dig with shovels	True	False
2) Glaciers made valleys when they slid across the land	True	False
3) Rivers can erode valleys, making them bigger	True	False
4) Valleys are long and deep areas of land	True	False
5) Peaks are at the bottom of mountains	True	False

Experiment - Making a Valley

Research Question What are we learning about?

What is a valley? How do valleys change over time with the movement of water and sediment?

Materials What you will need for the experiment

- 1) Large tray or container
- 2) Clay
- 3) Cylinder or thick battery
- 4) Water
- 5) Sand



Method How you will complete the experiment

- 1) Fill a large tray or container with clay to make a flat surface.
- 2) Slide the cylinder down the clay, making a river. The cylinder acts as a glacier that is scraping the land, digging a valley.
- 3) Add some sand to it to the trench, simulating the bottom of the river.
- 4) Pour a small amount of water on one side of the trench. Then rest one side of the container on something to tip it up. This should make the water run down the riverbed.
- 5) Observe how the water erodes the sand and the clay. Make notes on the back of the page.
- 6) Change the experiment by adding more water or tipping the container more, changing the flow of the water. Does this change the erosion?

Observations**What happened?**

1) What happened when you poured the water into the container?

2) Did the water erode the sand or clay more? Explain why that happened.

Results**What happened? Answer the questions**

1) How was the valley made? What did the clay represent?

2) How did the valley change? What caused the change?

3) How do valleys form in real life? How do they change over time?

From Ice to Ocean: The Great Journey of Water

1) Starting from the Freezing Cold

Our little water drop's journey begins at a big, icy place called the Columbia Icefield in the Rocky Mountains. This place is full of glaciers. When the sun comes out and warms up the ice, it starts to melt into water. Our little water drop is one of those that melts and starts its journey.

2) Down the Mountain

After melting, our little water drop flows down the mountain, joining other water to become a small stream. It then becomes a river known as the Athabasca River. Now, our water drop is part of this big river flowing downhill.



3) A Quick Stop at Lake Athabasca

The Athabasca River flows and flows until it reaches Lake Athabasca. Our water drop, along with many others, rests for a while in Lake Athabasca.

4) Onward to the Slave River and Great Slave Lake

After its break, our water drop leaves Lake Athabasca and moves along with the water of the Slave River. This river takes our little friend to an even bigger lake, the Great Slave Lake.

5) The Final Stretch: Mackenzie River to the Arctic Ocean

After Great Slave Lake, our brave little water drop enters the Mackenzie River. This is the last river on its journey. It flows and flows until finally, it reaches its destination, the Arctic Ocean.

Diagram

Draw and label the landforms on the map, showing the journey water takes from a glacier to the ocean

Landforms☐ Columbia Icefield☐ Athabasca River☐ Lake Athabasca☐ Slave River☐ Great Slave Lake☐ Mackenzie River☐ Arctic Ocean

Activity: Glacier Coding Journey

Objective What are we learning about?

Through this activity, students can gain a basic understanding of coding concepts like sequences and algorithms. They also get to move around and act out the slow, but impactful, journey of a glacier.

Coding Legend What do the coding actions mean?

- | | | |
|--------------------------|--------------------|---------------------|
| 1) Move forward (steps) | 4) Turn Right | 7) Float (lay down) |
| 2) Move backward (steps) | 5) Melt (sit down) | |
| 3) Turn left | 6) Grow (stand up) | |

Instructions How you will complete the activity

- 1) Go over the coding actions with students
- 2) Have each student write a "program" using the coding actions. They will write down the sequence of actions they want their partner to perform.
- 3) Split the class into pairs
- 4) Have them move into an area where they can move around freely
- 5) Have one partner start as the coder and the other as the glacier
- 6) The coder will read the program to the glacier and the glacier will perform the coding actions. Where will the glacier end up on its journey?
- 7) Have the students switch roles



Name: _____

38

Curriculum Connection
ES.1

Program

Coding Instructions

run glacier program

PREVIEW

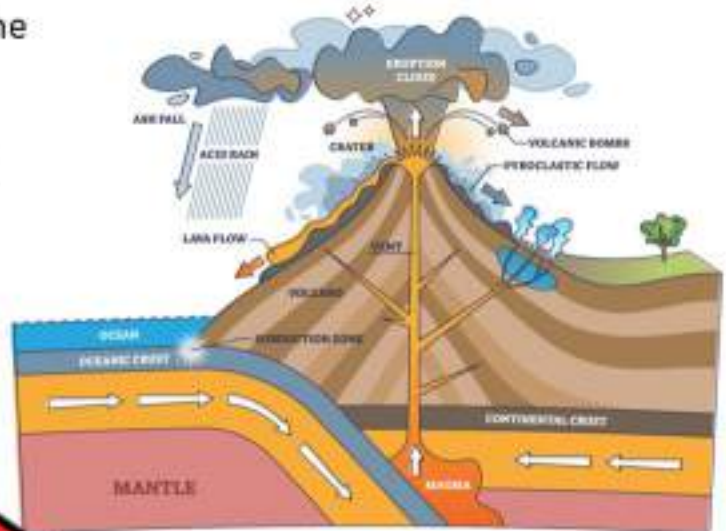
Volcanoes

What is a Volcano?

A volcano is a mountain with a hole at the top called a crater. Inside the volcano, there is hot, melted rock called magma. Sometimes pressure builds up inside the volcano and the magma shoots out of the top in an explosion. This is called an eruption.

When the lava lands on the ground, it is called lava. When the lava cools, it turns into rock and builds up the volcano to make it bigger.

VOLCANIC ERUPTION



Types of Volcanoes

There are different types of volcanoes, like shield volcanoes, which are made mostly of lava flows and have gently sloping sides. Another type is cinder cone volcanoes, which are made mostly of volcanic ash and have steep sides.

Are Volcanoes Dangerous?

When a volcano erupts, it can be dangerous for people and animals living nearby. The eruption can shoot out hot ash, rocks, and lava, and can also cause landslides and floods. But on the other hand, volcanoes also help create new land and can make the land around them more fertile for plants to grow.



True or False Circle whether the statement is true or false

1) Volcanoes are always exploding	True	False
2) Volcanoes all look the same	True	False
3) A shield volcano is wider and a composite volcano is taller	True	False
4) The crater is the hole at the top of a volcano	True	False
5) Magma is inside a volcano	True	False

Question Write a question from the text to support your answer

1) What is a volcano?

2) Are volcanoes dangerous?

Draw Draw a diagram of a volcano. Label the vent, ash, crater, lava, magma, and volcanic bombs

Experiment - Making a Volcano

Research Question

What are we learning about?

Can you make your favourite type of volcano? Can you make it erupt?

Materials

What you will need for the experiment

- 1) A small plastic bottle (such as a water bottle)
- 2) Play dough or clay
- 3) Baking soda
- 4) Vinegar
- 5) Food coloring (optional)
- 6) A tray, large plate, or bedsheet to catch any overflow



Method

How you will complete the experiment

- 1) Place the small plastic bottle on the middle of the plate. Remove the top of the bottle to make the volcano shorter.
- 2) Using the play dough or clay, make a volcano around the bottle. The bottle will be the inside of the volcano and the top of the bottle will be the crater.
- 3) Mix a small amount of baking soda and a few drops of food coloring (if desired) in a separate container.
- 4) Slowly pour the baking soda mixture into the volcano's crater.
- 5) Slowly pour vinegar into the volcano. The mixture of baking soda and vinegar will create a chemical reaction that will cause the volcano to "erupt."

Observations**What happened?**

What happened to the volcano? Explain using the terms: magma, erupt, and lava

Results**What did you find? Answer the questions below.**

1) What type of volcano did you find? Explain how you know.

2) What happened to the overflowing lava?

3) When lava overflows, what happens to it in real life?

4) Draw your volcano below.

Weathering

Weathering

The term **weathering** means that rocks are broken down into smaller rocks. The weathering process is very slow and is a result of temperature changes, abrasion, and chemical reactions.

Temperature Changes - As the temperature changes from warm to freezing cold, rocks break apart. This happens because water seeps into the cracks in rocks. When the water freezes, it gets bigger as it changes into ice. As it gets bigger, it causes the rock to crack.

Abrasion - Abrasion happens when rocks collide against each other and break down. This happens a lot to rocks at the bottom of a stream or river. The water moves the rocks so they bump into other rocks. This makes the rocks smoother as the corners of rocks are chipped off.

Abrasion can also happen when wind and water carry small pieces of rock that hit against bigger rocks. The bigger rocks can be broken down into small pieces called sediment. Sediment is like rock dust. Sediment can get compacted together to form a sedimentary rock.

Chemical Reactions - Rocks will breakdown when they react with water, air, or other chemicals. Acids from rain or chemicals humans add to water can also weather rocks.



True or False Circle whether the statement is true or false

1) Temperature changes can cause rocks to break	True	False
2) Weathering means rocks break apart	True	False
3) Sediments are large pieces of rock	True	False
4) When rocks hit each other, they can break apart	True	False
5) Rocks at the bottom of a stream are rough	True	False

Questions Answer the questions below using evidence from the text

1) How do rocks weather?

2) Inference: What do you think happens to rock or soil that has weathered?

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

	_____

Erosion - Wind, Water, Ice

Erosion

Weathering is the breaking down of rocks. **Erosion** is when the weathered rock gets moved to a new place. Erosion happens because of wind, water, and ice. Over a long time, these forces change our landscape by eroding them.

Water Erosion

Water is one cause of erosion. Below is a list of the most significant forms of water erosion.

- Rainfall – when it falls on the Earth's surface, it is called **splash erosion**. The raindrops actually hit the ground and move soil and destroy its structure.
- Rivers – at the bottom of a river, the water breaks up particles and carries them downstream. These particles are called **sediments**. The flow of a river is often strong, which will break down rocks, soil and the edges of the river.
- Waves – the movement of water as waves is powerful enough to polish rocks on the shorelines.

Wind Erosion

Wind is a major type of erosion, especially in dry areas. The soil in dry climates is lighter, which allows the wind to move this soil easier.

Wind shapes sand dunes, which are hills of sand near oceans or in deserts.

Ice Erosion

Glaciers are so powerful that when they move, they carve out valleys and shape mountains. Glaciers erode the underlying rock by abrasion. In addition to glaciers, when water gets into rock and freezes, the ice can cause rocks to split.



True or False Circle whether the statement is true or false

1) Wind is the biggest cause of erosion	True	False
2) Rivers can cause erosion on the shorelines	True	False
3) When waves crash into the shore, they erode it	True	False
4) Erosion is only the breaking down of rocks	True	False
5) Erosion is the movement of broken down rocks	True	False

Questions Answer the questions below using evidence from the text

1) What is erosion?

2) How does wind cause erosion?

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

Meandering Streams

What is a Meandering Stream?

A **meandering stream** has a single channel that winds like a snake through a valley.

Meandering streams start as straight

streams in the

valley, it

often begins to

erode its way to

the easiest path. For example,

if the path has softer rock

on one side of the stream,

it will begin to erode that side of the stream. The sharp bend, or what scientists called the meander.

MEANDERING STREAM



What Causes Meandering Streams?

As water flows through the stream, it pushes with a stronger force on the outside of the bend than on the inside of the bend. This erodes the outside of the bend more, making bigger bends.

To make the bends even curvier, the inside of the stream has a slower flow. This makes the eroded sediment more likely to deposit on the inside, creating even larger bends! This is because if the sediment is moving slow, it is more likely to stop moving. If it is moving fast, it will keep moving and cause more erosion.

Notice this is represented on the diagram - deposition on the inside and erosion on the outside.

True or False

Circle whether the statement is true or false

1) Erosion happens on the inside of a curve more than the outside	True	False
2) Deposition happens on the inside of a curve more than the outside	True	False
3) Bendy streams start as straight streams	True	False
4) If water moves fast, the sediment will likely stop moving	True	False
5) Water moves faster on the outside of a curve	True	False

Questions

Answer the questions below using evidence from the text

1) How do meandering streams form? Why are they so bendy?

2) How does water in a stream cause erosion?

Diagram

Draw a diagram of a meandering stream



Lakes in Alberta: Drying and Refilling

Lakes in Alberta: Drying and Refilling

In Alberta, we have lots of beautiful lakes. Sometimes, these lakes can dry up, but don't worry! They can refill too.



When Lakes Dry Up

Lakes can dry up for different reasons. Sometimes, it is because of less rain or snow. In summer, the sun can make the water in the lakes go up into the sky. This is called evaporation. So, if it's very hot and there is not much rain, the lake can dry up.

A Special Lake: Medicine Lake

One special lake in Alberta is called Medicine Lake. It's really amazing! Sometimes, it looks like a lake, but at other times, it looks almost empty. This is because Medicine Lake has special underground holes, almost like drains in a bathtub.



When there is a lot of water, like in the spring, the lake fills up. But in other seasons, the water drains away underground, making the lake look empty. But don't worry, it always fills up again!

When Lakes Refill

Lakes can refill too! In the winter, the snow falls and when it melts, it goes into the lake. When it rains, the water also goes into the lake. So, even if a lake dries up in the summer, it can refill when it rains or when the snow melts.

True or False

Circle whether the statement is true or false

1) Lakes always have the same amount of water	True	False
2) Water can evaporate when it is hot	True	False
3) Medicine Lake drains like a bathtub	True	False
4) Lakes can never refill	True	False
5) Heavy snow melting can refill lakes	True	False

Question

Use information from the text to support your answer

1) Why do lakes _____

_____2) How do lakes refill?

_____**Questioning**

Write 2 questions you have about the reading

1) _____
_____2) _____

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Name: _____

Mark

Check only the true statements.

Statement	✓
Snow melting helps refill lakes.	
Lakes never fill up again.	
The sun causes evaporation.	
Medicine Lake is in Alberta.	
Rain makes lakes look empty.	
Medicine Lake never looks empty.	
Lakes dry up in winter.	
Snow melting fills the lakes.	

Wind/Water Shaping The Badlands

Wind and Water Work Together

In the Alberta Badlands, wind and water have worked together to make the land look very special. They help create the big cliffs and deep gullies we see today.

The Land in the Badlands

The Badlands are made of soft rock and dirt. The soil is made of dense clay that doesn't hold many trees or grass. It is a dry place because it doesn't rain much. This is why you don't see many trees or grass. There are some plants growing in the Badlands.

Making the Badlands Look Special

When it rains a lot, the water runs down the hills and takes some of the dirt with it. When it's windy, the wind can also carry away bits of rock and dirt. What is left is only the hard rock.

Over a lot of years, this has made the land in the Badlands look like it does now.



Creating the Hoodoos

One of the cool things you can see in the Badlands are the "hoodoos". Hoodoos are like tall, thin towers of rock that stick up from the ground. They are made when a hard rock on top protects the softer rocks below from the wind and rain.

So, when you see a hoodoo, you are seeing how wind and water can change the shape of the land!

Questions

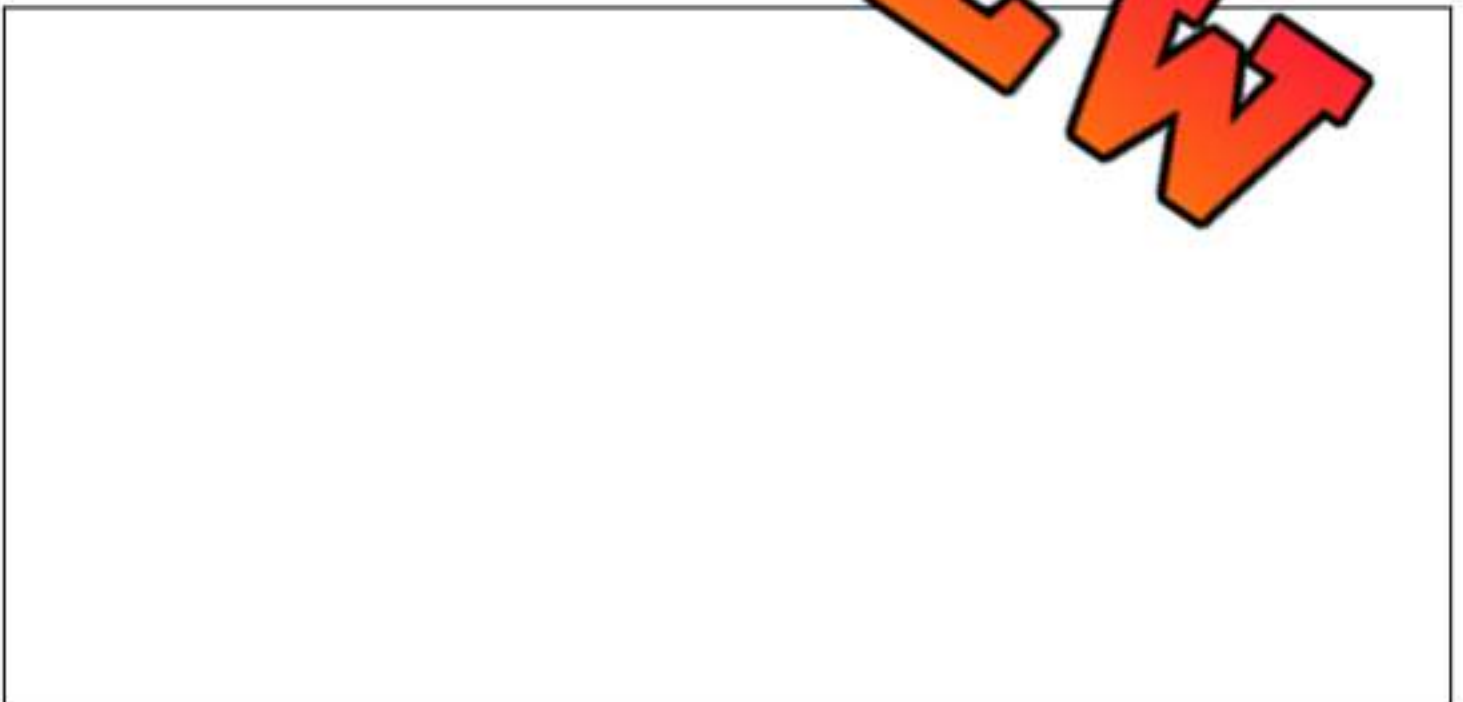
Answer the questions below using evidence from the text

1) What do the Badlands look like?

2) How could water change the Badlands?

Draw

Draw a hoodoo in the Badlands



How Humans Change Earth's Surface

Living on the Land

Making Our Homes: When we decide to live in a place, we need to prepare the land for our homes. We might have to clear a space, which could mean cutting down trees or moving rocks. This changes the land.

Planting Gardens: Sometimes, we plant gardens in our yards. We might plant flowers or vegetables. This means we change the types of plants that grow in that place.

Creating Paths: Even when we play in a park, we can make paths that weren't there before. Even when we walk the same way, we leave a mark. Over time, these marks can become paths.

Building Towns and Cities

Clearing Land: When we build towns and cities, we clear large areas to make space for buildings, roads, and parks. This is a big change to the land.

Building Infrastructure: We also dig into the Earth to put down pipes for water and cables for electricity. These changes are hidden under the ground, but they're still important.

Paving Roads and Building Bridges: When we build roads and bridges, we change the land too. Roads cover the ground with hard materials, and bridges allow us to cross rivers and valleys.



Questions

Use information from the text to support your answer.

1) How do humans change the Earth's surface by living on the land?

2) How do cities and towns change the Earth's surface?

Draw

Draw four ways humans change the Earth's surface.

The Impact of Plants/Animals on Earth's Surface

Overpopulation: Too Many Animals or Plants

Sometimes, there can be too many animals or plants living in one area. This is called overpopulation. Overpopulation can really change how the land looks and feels.

For example, if there are too many deer in a forest, they might eat all the leaves and grass. This can make the forest look bare and less green. It also means less food for other animals that also eat those plants.

Another example would be if there are too many plants of one kind. They might take all the nutrients from the soil. This can stop other plants from growing there. When the land in this way, it affects all the living things in that area.

Pests and Parasites: The Mountain Pine Beetle's Impact

One example of a little creature causing big changes is the mountain pine beetle. This tiny bug makes its home inside pine trees, and it's a real pest!

It harms the trees until they can't live anymore. When many trees die, it changes the look of the land. Whole forests can turn from green to brown.

Burrowing Animals: Changing the Earth from Underground

Some animals, like rabbits, moles, and groundhogs, love to dig holes in the ground. This digging is called burrowing.

When animals burrow, they change the surface of the Earth by creating new tunnels and holes. If you've ever tripped over a rabbit hole, you know just how much this can change a patch of land!



Questions

Use information from the text to support your answer

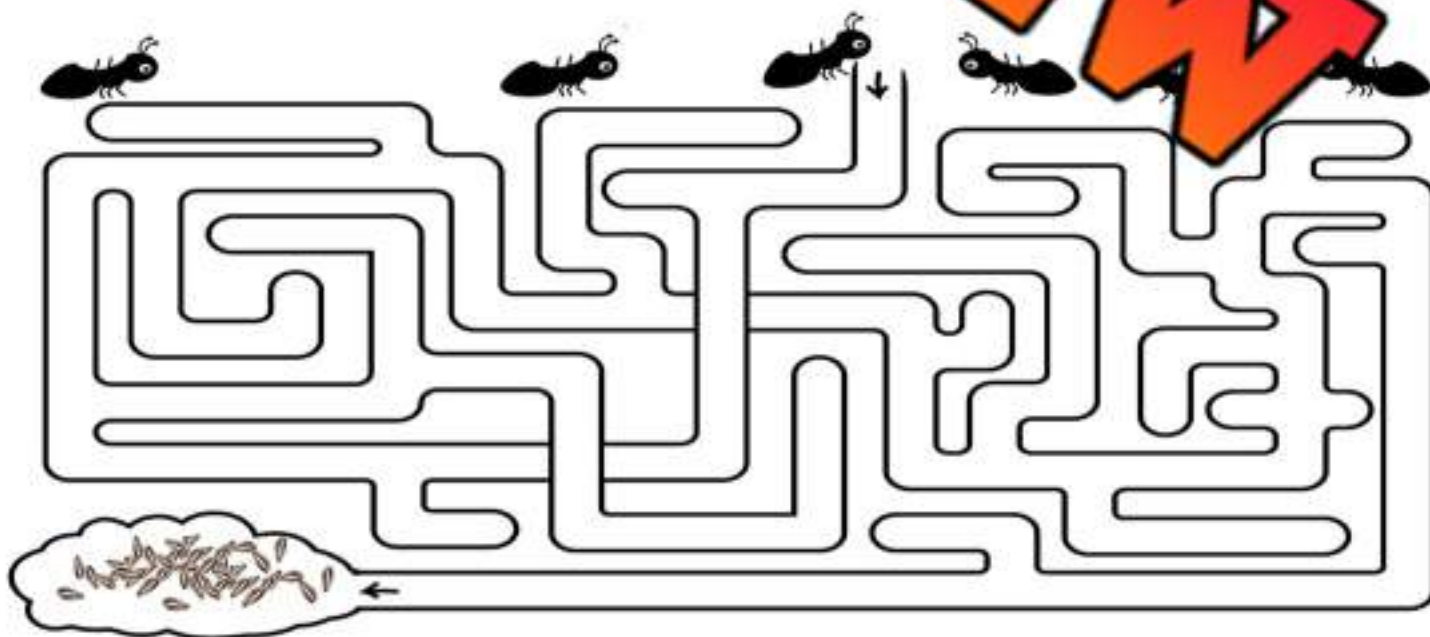
1) How does overpopulation affect the Earth's surface?

2) How do Mountain Pine Beetles affect the Earth's surface?

3) How do burrowing animals affect the Earth's surface?

Maze

Draw the path the ants need to take to get to their food



Earth's Layers and Fossils

Earth's Layers: Like a Giant Sandwich

Our Earth is like a giant sandwich, but instead of bread and cheese, it has layers of rocks and soil. These layers were made over a long, long time. As time goes on, new layers are added on top. The older layers get squished down and become hard rocks.

Dinosaurs Long Ago

A long time ago, before your grandparents or great-great-grandparents were born, dinosaurs lived on Earth. They roamed the lands, flew in the sky, and swam in the waters.

How Dinosaurs Turn into Fossils

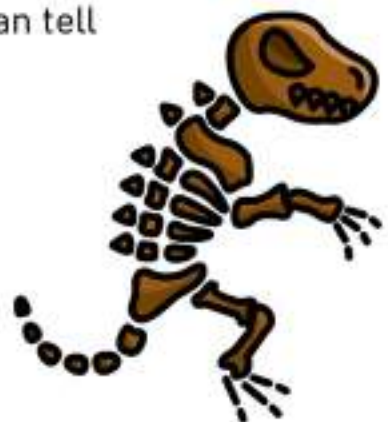
Sometimes, a dinosaur would die near a river or in a swamp. Its body would sink into the mud. Over time, more and more mud and sand covered the dinosaur. Many, many years later, the dinosaur's bones turned into rock. We call these rock fossils.

Digging for Fossils

Today, scientists called paleontologists dig into the Earth's layers to find these fossils. By looking at which layer a fossil is found in, they can tell how old it is. The deeper the layer, the older the fossil!

Finding Dinosaurs in Fossils

Fossils are like a secret message from the past. They tell us what kinds of dinosaurs lived long ago. When we find a fossil, it's like finding a puzzle piece of history.



True or False

Circle whether the statement is true or false

1) The Earth has just one layer	True	False
2) Rocks and soil never move	True	False
3) New layers of rock and soil are on top of older layers	True	False
4) The deeper we find a fossil, the older it is	True	False
5) We know dinosaurs lived because we've found dinosaur fossils	True	False

Questions Answer the questions below using evidence from the text

1) What is a fossil?

2) Is the Earth made of layers? Explain.

Draw

Draw fossils below



Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Circle the word that fits on the blank.

1) _____ are bones turned into rock.	Shells Fossils
2) A _____ digs to find fossils.	Paleontologist Astronaut
3) Dinosaur bones turned into _____ over time.	Fossils Rock
4) The _____ the layer, the older the fossil.	Deeper Higher
5) Fossils are found by digging into _____.	Earth's layers History

Name: _____

Circle the word that fits on the blank.

1) _____ are bones turned into rock.	Shells Fossils
2) A _____ digs to find fossils.	Paleontologist Astronaut
3) Dinosaur bones turned into _____ over time.	Fossils Rock
4) The _____ the layer, the older the fossil.	Deeper Higher
5) Fossils are found by digging into _____.	Earth's layers History

Name: _____

Circle the word that fits on the blank.

1) _____ are bones turned into rock.	Shells Fossils
2) A _____ digs to find fossils.	Paleontologist Astronaut
3) Dinosaur bones turned into _____ over time.	Fossils Rock
4) The _____ the layer, the older the fossil.	Deeper Higher
5) Fossils are found by digging into _____.	Earth's layers History

Name: _____

Circle the word that fits on the blank.

1) _____ are bones turned into rock.	Shells Fossils
2) A _____ digs to find fossils.	Paleontologist Astronaut
3) Dinosaur bones turned into _____ over time.	Fossils Rock
4) The _____ the layer, the older the fossil.	Deeper Higher
5) Fossils are found by digging into _____.	Earth's layers History

Experiment - Fossils

Research Question What are we learning about?

How are fossils formed? What needs to happen for an animal to become a fossil?

Materials What you will need for the experiment

- ☐ 7 pieces of bread - we used 7 but if you're doing this with a larger group, you could use 3 pieces for each person
- ☐ Gummy bears - better if they have a bumpy texture on them that can be seen when they are pressed into the bread
- ☐ Gummy worms - they have a smoother texture
- ☐ Plastic wrap

Method How you will complete the experiment

- 1) Put 3 or 4 candies on each slice of bread.
- 2) Layer the bread and keep adding candies between the layers
- 3) Wrap the layers of bread in plastic wrap
- 4) Put something heavy on top and let it compress the bread for at least 8 hours - we used books
- 5) Unwrap the plastic and carefully pull apart the layers. What do you see?



Observations

What happened?

Results

the questions below

1) What do the weights and gummy bears represent?

2) What did the weights on the bread represent?

3) Why was this experiment an example of how fossils are made?

4) Since the bread is soft, which type of rock did it represent? Explain.

Dating Fossils - Relative Dating

Learning from Fossils

Fossils are remains of old plants and animals that help us understand life long ago.

Scientists use different methods to find out how old fossils are, and one way is relative dating.

Understanding Relative Dating

Relative dating is a way of determining the order of when things happened without knowing exact years. It involves looking at where fossils are found and comparing their positions.



For instance, if a scientist finds a fossil of a trilobite in one rock layer and a dinosaur fossil in a layer above it, they know the trilobite lived before the dinosaur. This is based on a rule called the law of superposition, which says older rocks and fossils are found deeper in the ground.

Another way of relative dating is biostratigraphy, where scientists compare fossils from different rock layers. If one layer has a simple fish fossil and another layer has a more developed fish fossil, they know the layer with the simpler fish is older.

But remember, relative dating only tells us the order of events, not the exact age of fossils or rocks. For that, scientists use other methods, like carbon dating.

True or False

Circle whether the statement is true or false

1) Relative dating tells us the exact age of a fossil	True	False
2) The Paleozoic Era is older than the Cenozoic Era	True	False
3) Superposition means older fossils are not as deep	True	False
4) Relative dating gives us less information than carbon dating	True	False
5) Relative dating is complex and couldn't be done by a non-scientist	True	False

Question How do we know how old fossils are?

PREVIEW

Draw

Draw the dinosaurs from the different eras below

Triassic Period

Coelophysis

Jurassic Period

Stegosaurus

Cretaceous Period

Tyrannosaurus Rex

Triassic Period
(230 – 200 MYA)**Jurassic Period**
(200 – 145 MYA)**Cretaceous Period**
(145 – 65 MYA)

A Long, Long Time Ago in Alberta

When Dinosaurs Roamed

Can you believe that a long, long time ago, millions of years ago, Alberta looked very different? It wasn't snowy or cold. Instead, Alberta was filled with lush, green forests. It was so warm and like a tropical rainforest! Imagine, palm trees everywhere and big leaves rustling.

In these forests, there were dinosaurs! Big dinosaurs, small dinosaurs, dinosaurs that ate plants, and dinosaurs that ate meat. They roamed around, eating, playing, and living their lives.



Alberta's Inland Sea

But forests were not the only thing in Alberta back then. There was also a big sea, right in the middle of the land! This is called an "inland sea." Just as we have today, this sea had lots of water and lots of animals living in it.

Preserving Dinosaur Bones

When dinosaurs died, their bodies sank into the soft mud at the bottom of the sea. Over time, more and more layers of mud, leaves, and sand covered them up. This is how the dinosaurs' bones became fossils.

The mud, leaves, and sand slowly turned into rock, but the dinosaur bones inside stayed the same. They turned into fossils, a kind of rock that keeps the shape of the dinosaur bones. That's why we can find dinosaur fossils in Alberta!

True or False

Circle whether the statement is true or false

1) Alberta used to have a sea running through it	True	False
2) Alberta has always been cold	True	False
3) Alberta had rainforests with tall trees	True	False
4) Alberta has always looked the way it does today	True	False
5) Alberta had a sea in it 500 years ago	True	False

Question What was different about Alberta when dinosaurs roamed?

PREVIEW

Draw

Draw a picture of a rainforest, like the ones found in Alberta 500 years ago

PREVIEW

Finding Fossils in Alberta's Badlands

Finding Fossils in Alberta's Badlands

The Badlands in Alberta are not like most places. They're a bit like a desert, with lots of hills and not many trees. But what makes them truly special are the treasures hidden inside them – dinosaur fossils!



Long ago, dinosaurs lived in this area. When they died, their bodies got covered by dirt. Over millions of years, these layers turned into rock, and the dinosaur bones were preserved. The Badlands were once full of water and plants, which helped preserve the dinosaur bones really well.

Dinosaur Provincial Park: A Special Place

Among the Badlands, there's an extra special place – Dinosaur Provincial Park. This park is a World Heritage Site because it has one of the best dinosaur fossil fields in the world. That means we've found more kinds of dinosaur fossils here than almost anywhere else!

Why Here and Not Other Places?

You might wonder why we find so many fossils in the Badlands and not in other places. That's because of the special conditions that existed here long ago. The area was once a big, flat floodplain. When a dinosaur died, its body was quickly covered by sediment brought in by water, which helped save the bones.

Today, wind and water slowly wear away the rocks in the Badlands. This helps to expose the hidden fossils. In many other places, the fossils might still be buried deep under the ground, or the conditions weren't right for fossils to form.

True or False

Circle whether the statement is true or false

1) More dinosaurs have been found in the Badlands than other places	True	False
2) The Badlands have always been dry	True	False
3) Wind and water slowly wear away rocks in the Badlands	True	False
4) There are no more fossils on Earth	True	False
5) There are more fossils in the Badlands	True	False

Question Why are many dinosaur fossils found in the Alberta Badlands?

Wordsearch

Find the words from the word bank

Word Bank	
Fossil	Badlands
Alberta	Desert
Hills	Trees
Dinosaur	Dirt
Buried	Deep

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

Exit Cards

Cut Out

Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Draw a line to match each question on the left with the correct answer on the right.

Why are the Badlands special? ☐☐ Wind and water erosionWhat turned dinosaur bones into fossils? ☐☐ Dirt and mud layersWhy are fossils found easily in the Badlands? ☐☐ Hidden fossils

Name: _____

Mark

Draw a line to match each question on the left with the correct answer on the right.

Why are the Badlands special? ☐☐ Wind and water erosionWhat turned dinosaur bones into fossils? ☐☐ Dirt and mud layersWhy are fossils found easily in the Badlands? ☐☐ Hidden fossils

Name: _____

Mark

Draw a line to match each question on the left with the correct answer on the right.

Why are the Badlands special? ☐☐ Wind and water erosionWhat turned dinosaur bones into fossils? ☐☐ Dirt and mud layersWhy are fossils found easily in the Badlands? ☐☐ Hidden fossils

Name: _____

Mark

Draw a line to match each question on the left with the correct answer on the right.

Why are the Badlands special? ☐☐ Wind and water erosionWhat turned dinosaur bones into fossils? ☐☐ Dirt and mud layersWhy are fossils found easily in the Badlands? ☐☐ Hidden fossils

The Dinosaurs of Alberta

The Dinosaurs of Alberta

Albertosaurus

One of the dinosaurs that used to live right here in Alberta was the Albertosaurus. Albertosaurus was a large dinosaur, kind of like a T-Rex, but a bit smaller. It was a meat-eater with sharp teeth. The name Albertosaurus means "Alberta lizard", and it's named after our province!



Edmontosaurus

Another dinosaur that lived in Alberta was the Edmontosaurus. This dinosaur was a big plant-eater. It was taller than a school bus is long! Edmontosaurus had a flat, duck-like head, which it used to eat plants.

EDMONTOSAURUS



Nodosaurus

The Nodosaurus also lived in Alberta. This dinosaur was a plant eater too, but it was small and stayed safe from meat eaters. Nodosaurus had a bumpy back and spikes on its sides. It was like a living fortress!

Tyrannosaurus

You probably know the last dinosaur on our list – the Tyrannosaurus! Even though we usually think of T-Rex living in other places, some Tyrannosaurus also lived in Alberta. They were one of the biggest meat-eating dinosaurs, with huge teeth and powerful jaws.



Name: _____

85

Curriculum Connection
ES.4

Draw

Draw and describe each of the dinosaurs found in Alberta below

Albertosaurus

Edmontosaurus

Nodosaurus

Sauropod

PREVIEW

Name: _____

Look up "dinosaurs found in Alberta" so you can learn more about the dinosaurs that lived in Alberta millions of years ago. Write anything you learned about them and draw a picture of them as well.

Research

Learn more about the dinosaurs that lived in Alberta

PREVIEW

Name: _____

87

Curriculum Connection
ES.4

Research

Learn more about the dinosaurs that lived in Alberta

PREVIEW

The Dinosaurs of Alberta

The Dinosaurs of Alberta

Long, long ago, dinosaurs roamed the place we now call Alberta. They were big and small, fast and slow, meat-eaters and plant-eaters.



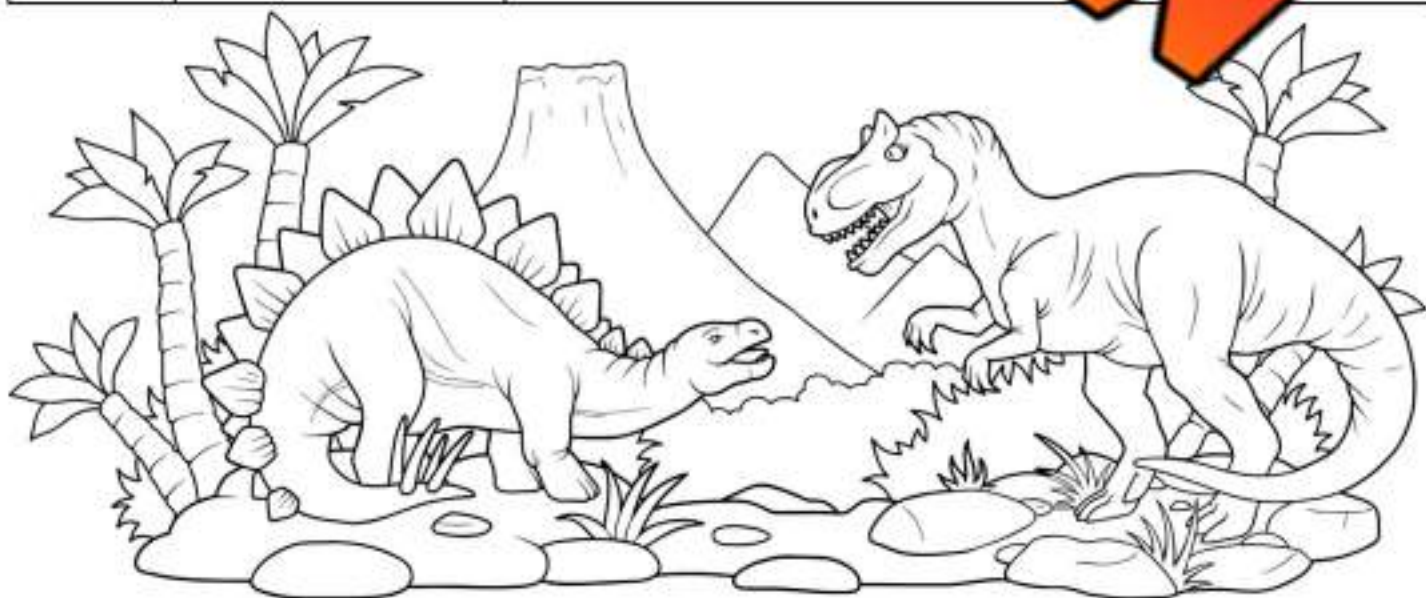
Here are some of the special dinosaurs that lived in Alberta:

Name	Description
Albertosaurus	Albertosaurus was a meat-eater, a little smaller than T-Rex. It was fierce. It is named after Alberta.
Triceratops	Triceratops was a plant-eater with three horns and a frill that shielded its head. It was as big as a truck!
Tyrannosaurus Rex (T-Rex)	The T-Rex is one of the most famous dinosaurs. It was a powerful meat-eater with sharp teeth.
Edmontosaurus	Edmontosaurus was a plant-eater that walked both on two legs and four. It was as big as a school bus!
Stegosaurus	A dinosaur with bony plates and spikes on its back. It was a slow-moving plant-eater.
Pterodactyl	The Pterodactyl was not really a dinosaur, but a reptile that lived at the same time.
Brachiosaurus	The Brachiosaurus was one of the biggest dinosaurs. It had a long neck and ate plants from the tops of trees.
Velociraptor	Velociraptors were small but fast and clever hunters. They had sharp claws and worked together to catch their food.
Pachyrhinosaurus	Pachyrhinosaurus was a plant-eater like Triceratops, but it had a big bump on its nose instead of a horn.
Ankylosaurus	The Ankylosaurus was like a living tank, with a tough, armored back and a big club on its tail for protection.

Matching

Write the letter from the description beside the correct dinosaur

Answer	Dinosaur	Description
	Albertosaurus	A) Was one of the most famous dinosaurs. It was a powerful meat-eater with giant teeth.
	Triceratops	B) Was not really a dinosaur, but a flying reptile that lived at the same time.
	Tyrannosaurus (T-Rex)	C) Was a meat-eater, a little smaller than T-Rex but still fierce. It is named after Alberta.
	Coelophysis	D) Was a small but fast hunter. They had sharp claws and worked together to catch their food.
	Spinosaurus	E) A dinosaur with bony plates and spikes on its back. It was a slow-moving plant-eater.
	Pterodactyl	F) Was a living tank, with a tough, armored back and a big club tail for protection.
	Brachiosaurus	G) Was a plant-eater with three horns and a large shield around its head. It was as big as a truck!
	Velociraptor	H) Was a meat-eater like the T-Rex, but it had a big bump on its nose and a head of feathers.
	Pachyrhinosaurus	I) Was one of the biggest dinosaurs. It had a long neck and ate plants from the ground and trees.
	Ankylosaurus	J) Was a big plant-eater that walked on two and four. It was as tall as a school bus!



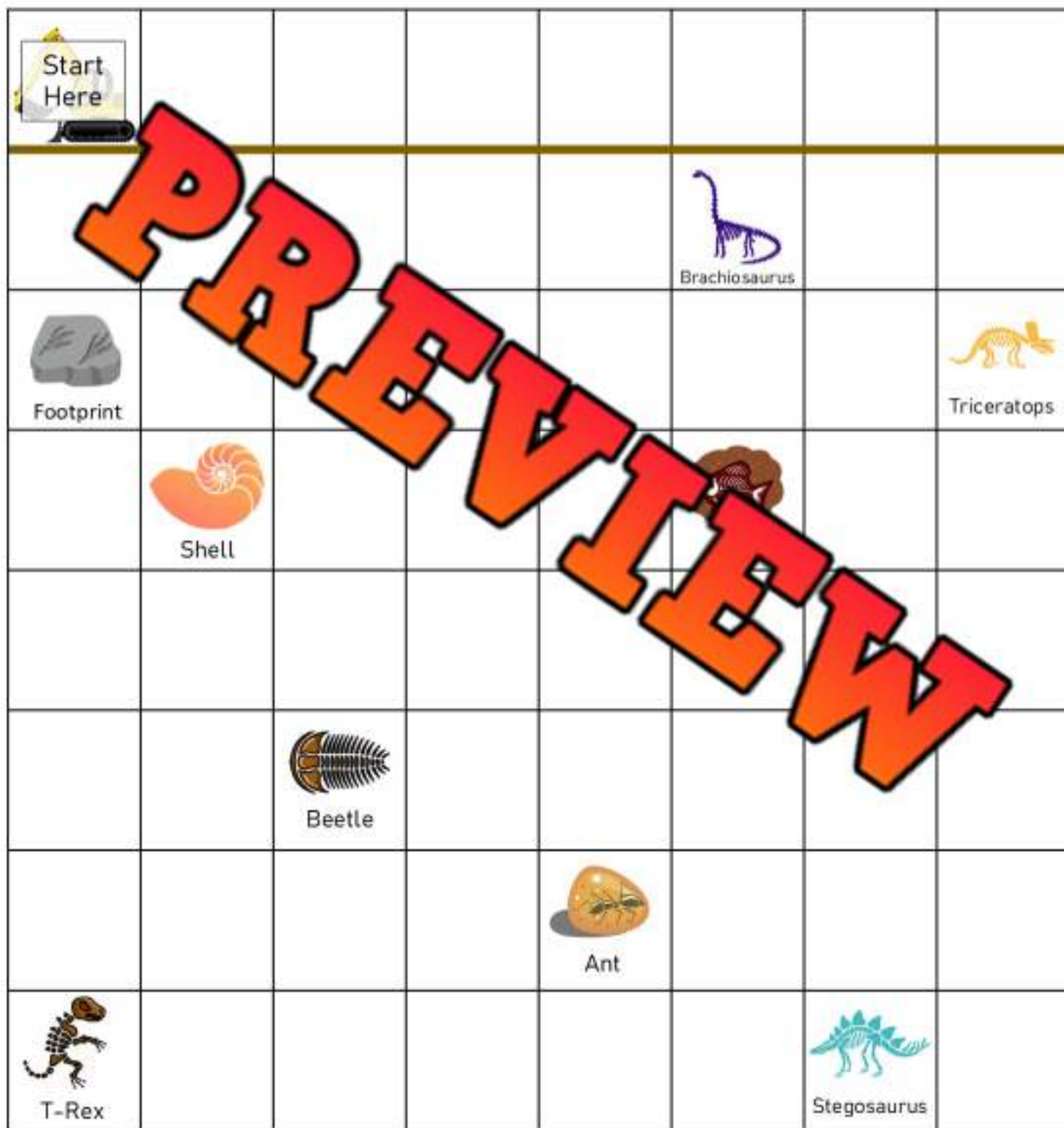
Label From the list of dinosaurs from the other reading, label the dinosaurs below



Coding Activity - Fossils

Digging

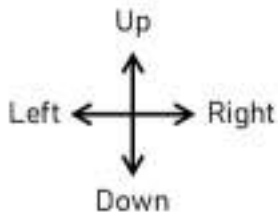
Use the map to write code on the back of the page



Name: _____

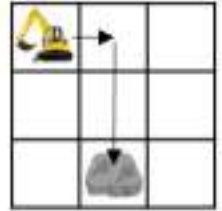
92

Curriculum Connection
ES.4



Commands – Use the example below to learn the code

Move 1 right
Move 2 down



Digging

Tell the excavator where to dig to find the fossils

1) Find the footprint and triceratops

2) Find the shell and the triceratops

3) Find the beetle, fish, and the triceratops

Digging

Tell the excavator where to dig to find the fossils. Use as few lines of code as possible. You can find them in any order.

4) Find the T-Rex, shell, ant, and fish

5) Find the fish, footprint, shell, beetle, and footprint

PREVIEW

IF/THEN Statements - Fossils

Directions Follow the if/then statements to move the excavator to the fossil

1)	If Albertosaurus is a dinosaur found in Alberta.	then	Move down 3 spots
2)	If Dinosaur Provincial Park is in Alberta.	then	Move right 5 spots
3)	If the Edmontosaurus was found in Toronto.	then	Move left 4 spots
4)	If dinosaurs didn't live with humans	then	Move down 2 spots
5)	If Alberta used to be a tropical forest.	then	Move right 3 spots
6)	If an excavator found a dinosaur fossil in Alberta.	then	Move down 1 spot
7)	If dinosaurs were found everywhere in Alberta.	then	Move left 3 spots
8)	If dinosaurs like a T-Rex lived, they were	then	Move left 7 spots
9)	If dinosaur fossils are just rock	then	Move right 2 spots
10)	If Alberta was once covered by an ocean sea.	then	Move down 1 spot

All About Soil

All About Soil

Soil is like a cake that is made from a lot of different ingredients. Soil has little bits of rock or sand, clay, dead plant and animal remains, fungi, and even manure – animal poop!

Soil contains lots of little creatures!

Earthworms are important for soil because they turn plant and animal remains into nutrients. They also dig through the soil. This helps loosen the soil so plants can grow better.



Importance of Soil

We need soil to provide plants with the water and nutrients they need to grow. This means that without soil, plants could not grow and without plants, humans could not survive. Soil is very important!



Interesting Facts About Soil

- Soil is alive! There are more microorganisms in a handful of soil than there are people on Earth
- Soil prevents floods because it soaks up and stores water
- Soil acts as a water filter as it filters out pollutants in our groundwater
- Without soil, humans could not survive because we need soil to grow plants
- Not all soil is the same. There are six main types of soil
- Sand is a type of soil that can grow some types of plants
- Darker soil is better for growing plants because it has more nutrients in it
- Erosion is the movement of soil from one place to another

Questions

Answer the questions below using evidence from the text

1) What is soil? What is in it?

2) Why is _____ important to humans and animals?

Questioning

Write 3 questions you have about soil

1)

2)

3)

True or False

Is the statement true or false?

1) Soil is alive because it has living things in it

True

False

2) Soil is not very important to humans

True

False

3) Nothing grows in sand

True

False

4) The darker the soil, the better it is for growing plants

True

False

5) Worms make soil better for plants

True

False

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class.

Name: _____

Mark

Check only the true statements.

Statement	✓
There are fewer organisms in soil than people.	
Humans can live without soil easily.	
Sand is not a type of soil.	
Soil helps filter water from pollution.	
Darker soil has more nutrients in it.	
There are six main soil types.	
Soil is alive and full of life.	
All soil has the same nutrients.	
Soil can soak up rainwater.	

Name: _____

Mark

Check only the true statements.

Statement	✓
There are fewer organisms in soil than people.	
Humans can live without soil easily.	
Sand is not a type of soil.	
Soil helps filter water from pollution.	
Darker soil has more nutrients in it.	
There are six main soil types.	
Soil is alive and full of life.	
All soil has the same nutrients.	
Soil can soak up rainwater.	

Name: _____

Mark

Check only the true statements.

Statement	✓
There are fewer organisms in soil than people.	
Humans can live without soil easily.	
Sand is not a type of soil.	
Soil helps filter water from pollution.	
Darker soil has more nutrients in it.	
There are six main soil types.	
Soil is alive and full of life.	
All soil has the same nutrients.	
Soil can soak up rainwater.	

Name: _____

Mark

Check only the true statements.

Statement	✓
There are fewer organisms in soil than people.	
Humans can live without soil easily.	
Sand is not a type of soil.	
Soil helps filter water from pollution.	
Darker soil has more nutrients in it.	
There are six main soil types.	
Soil is alive and full of life.	
All soil has the same nutrients.	
Soil can soak up rainwater.	

What Is In Our Soil?

What Is Soil Made Of?

Soil is made up of rocks, organic material, living organisms, and water. These four ingredients make one of the Earth's most important natural resources.



Rocks

We have all seen rocks in our schoolyard or in our backyard. Rocks are slowly weathered, meaning they break into small pieces of rock that form soil.

Weathering means as rocks have to deal with rain and snow as well as heat and freezing temperatures. These forces break rocks into tiny grains of soil. Soil is made up of different sized rocks, broken pieces of rocks, and organic material.

Organic Material

Soil also has organic material in it. **Organic material** is any material that was alive and is now dead. So the leaves that fell in the Fall season are organic material because they are now dead. Sticks, twigs, and even dead plants are also organic material. Organic material is found on the top layer of soil.

Living Organisms

The soil also has many living organisms in it. Worms, moles, grubs, centipedes, slugs, mushrooms and many others all live in the soil. Most living things are found in the topsoil, which is the layer of soil close to the surface.

Water

Depending on the types of rocks in the soil, water could make up over 60% of the soil. Clay soils have a lot of water in them, making them fun to mould them!



Questions

Answer the questions below using evidence from the text

1) What four things are in soil?

2) How are each of the things below in soil?

Rocks	
Organic Material	
Living Organism	
Water	

Questions

Answer the questions below using evidence from the text

--	-------------------------------------

Experiment - Soil Composition Test

Research Questions What are we learning about?

Soil is usually made up of different types and textures of rocks. Soil could be mostly clay, silt, sand, or it could be a combination of all three. Today we will test soil from our environment to learn more about what is in it.

Materials What do we need for our experiment?

- Mason jar
- Water
- Shovel or trowel
- Dish soap



Method How do we complete the experiment?

1. Find an area with soil that you can see – perhaps a garden or a ditch
2. Use the shovel to dig down about 20 cm
3. Fill the mason jar half full of soil
4. Add water to the mason jar so that it is three-quarters full
5. Add a teaspoon of liquid dish soap
6. Shake the jar for at least three minutes
7. Leave the jar for at least 24 hours and if the soil has heavy clay, leave it for 48 hours
8. Observe the different layers in your soil.

Observations

Common results you may see

Soil Types	Common Results
Sandy Soil	Sandy particles will appear on the bottom of the jar. The water will be fairly clear.
Clay	The water will still look cloudy. There will be a thin layer of dirt particles on the bottom. The water stays cloudy because it takes longer for the clay particles to settle.
Peaty Soil	There will be a layer of floating pieces on the surface with a small amount of dirt on the bottom. The water will be a bit cloudy.
Chalky Soil	There will be a layer of white sediment on the bottom of the jar and the water will be a grayish color.
Loamy Soil	The water will be clear and there will be a thin layer of soil on the bottom with the smallest particles on top.

Observations

What did you notice?

Which type of soil is in your jar? Explain how you know.

Diagram

Draw the mason jar with the soils in it. Colour and label the layers



Layers of Soil

Layers of Soil

Soil has many layers below what we see from the surface. Each layer has different types of soil in it.

Organic Layer (0 - 5 cm)

- Made from dead leaves, twigs, dead animals, leaves, and grass.
- The organic layer has not yet decomposed yet so you can still see the original material.

Topsoil (5 - 15 cm)

- Fairly thin layer where seeds begin to grow into sprouts
- Made from organic matter like broken down plants and animals as well as tiny rock particles

Subsoil (15 - 75 cm)

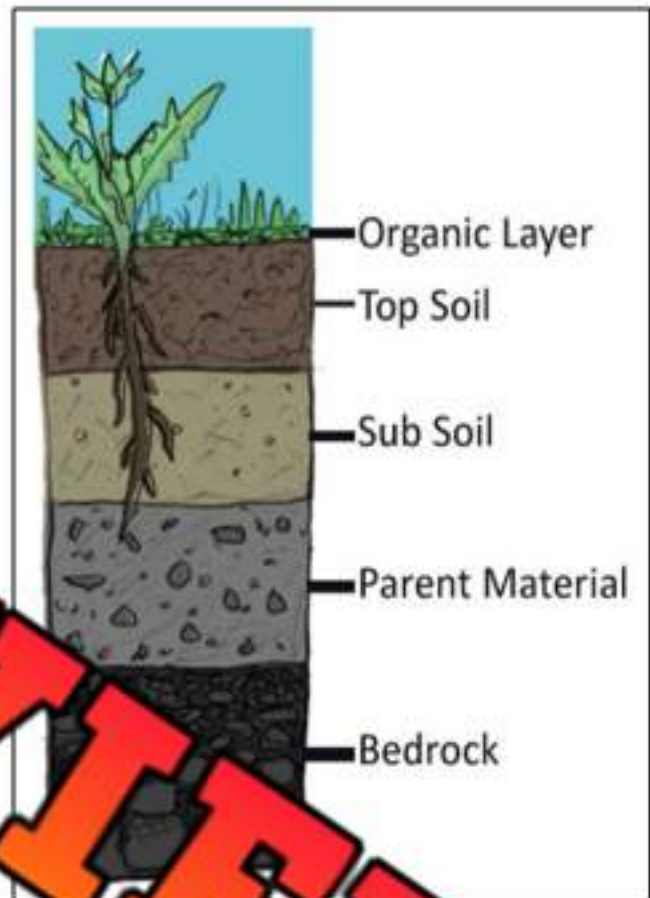
- Made from clay, iron, and organic materials

Parent Material (75 - 200 cm)

- Made of mostly large rocks. Very difficult to dig beyond this layer!

Bedrock (2 m - 1000+ m)

- Bottom layer that is made up of a large solid rock. This layer cannot be dug using a shovel. Instead, a drill is needed to dig through, like when a well is dug.



Questions

Answer the questions below using evidence from the text

1) What are the different layers of soil made from?

2) What colors would you have if you were digging a pool in your yard?

Draw

Draw the things you see in each layer

Organic Layer	
Topsoil	
Subsoil	
Parent Material	
Bedrock	

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Mark

Circle the correct answer.

1) Which layer has clay and iron in it?	Organic layer
	Subsoil
2) Which layer cannot be dug using a shovel.	Bedrock
	Topsoil
3) Which layer is made of large rocks?	Parent material
	Bedrock
4) Which layer is made up of dead plants?	Organic layer
	Topsoil
5) Which layer has tiny rock particles?	Subsoil
	Topsoil

Name: _____

Mark

Circle the correct answer.

1) Which layer has clay and iron in it?	Organic layer
	Subsoil
2) Which layer cannot be dug using a shovel.	Bedrock
	Topsoil
3) Which layer is made of large rocks?	Parent material
	Bedrock
4) Which layer is made up of dead plants?	Organic layer
	Topsoil
5) Which layer has tiny rock particles?	Subsoil
	Topsoil

Name: _____

Mark

Circle the correct answer.

1) Which layer has clay and iron in it?	Organic layer
	Subsoil
2) Which layer cannot be dug using a shovel.	Bedrock
	Topsoil
3) Which layer is made of large rocks?	Parent material
	Bedrock
4) Which layer is made up of dead plants?	Organic layer
	Topsoil
5) Which layer has tiny rock particles?	Subsoil
	Topsoil

Name: _____

Mark

Circle the correct answer.

1) Which layer has clay and iron in it?	Organic layer
	Subsoil
2) Which layer cannot be dug using a shovel.	Bedrock
	Topsoil
3) Which layer is made of large rocks?	Parent material
	Bedrock
4) Which layer is made up of dead plants?	Organic layer
	Topsoil
5) Which layer has tiny rock particles?	Subsoil
	Topsoil

Questions

Label the layers of soil below



Subsoil	Topsoil	Bedrock
Parent Material	Organic Material	

Matching

Write the letter from the description beside the matching layer

	Subsoil	a) Made up of large solid rock
	Topsoil	b) Made up of twigs, leaves and other organic matter
	Organic Layer	c) Made of mostly large rocks
	Bedrock	d) Made from clay, iron, and other organic material
	Parent Material	e) Made of organic matter – decomposed plants and animals as well as some small rocks

Experiment - Layers of Soil Model

Background

Label the layers of soil below

Soil is much more than just the dirt under our grass. Each layer is made-up of different particles and serves a specific purpose. Today we will be making a model representation of the layers of soil using yummy ingredients!

Materials

What will you need for this experiment?

- Chocolate and butterscotch chips mixed
- Chocolate pudding
- Whole Oreos and Oreo crumbs
- Gummy worms
- Shredded coconut mixed with green food coloring
- Clear cups or glasses to hold the layers of soil
- Spoons
- Tape, sticky-notes or labels



Method

How you will complete the experiment

1. Drop an Oreo into the bottom to represent the bedrock
2. Put in a small handful of chocolate/butterscotch chips to represent the parent material
3. Spoon in the chocolate pudding to represent the subsoil
4. Toss in the crushed-up Oreos to portray the topsoil. Stick the gummy worms out of the topsoil
5. Sprinkle your coloured coconut on top, allowing the gummy worms to poke out.
6. Use tape, labels or sticky-notes to label each of the layers on the side of the cup.

Diagram

Draw a diagram of your cup with each layer of soil. Label the diagram

**Results**

Answer the questions below

1) What did you learn about the different layers of soil?

2) If you were digging in your yard, which layer of soil would you struggle to dig through? Why?

Different Uses of Earth's Materials

How Different Cultures Use Earth Materials

Earth materials are used to make many different things around the world. In some cultures, clay is still used to make houses. In other cultures, houses are made from sod. Read below to learn more about the different uses of Earth's materials around the world.

Adobe

When a mix of mud and straw is pressed together, it will dry and become a brick-like material that is called **adobe**. Adobe is used to build houses in dry places in North America such as Texas, Mexico, and Arizona.



Sod Houses

Soddies are houses that are made of blocks of sod. To make a sod, you would take a shovel and dig up a block of sod. The sods are then held together by the grass's roots. Sod houses were built in the Prairies in the 1800's because the settlers did not have access to other building materials.

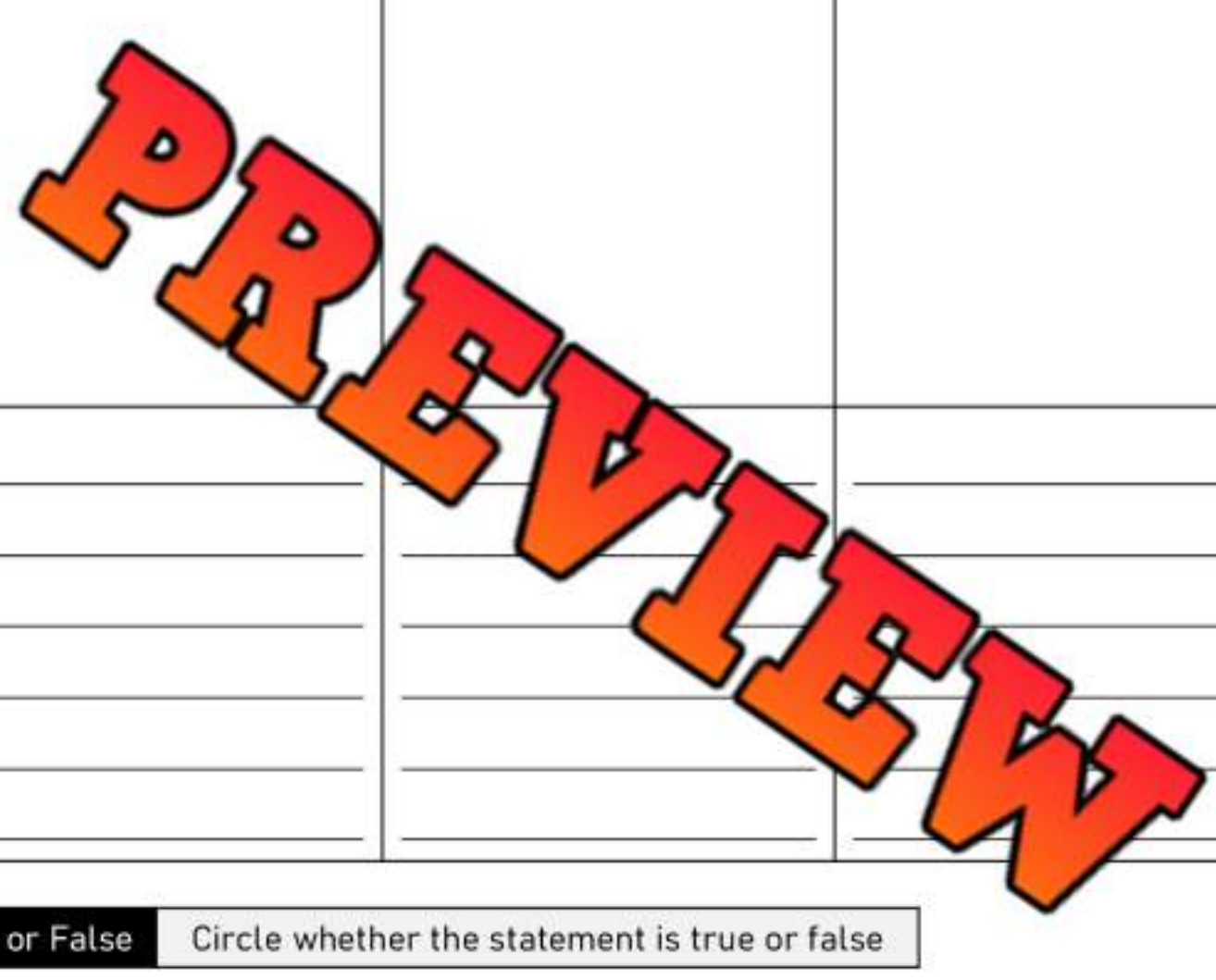


Clay Pots

Clay is used for pottery and construction projects around the world. When clay dries, it becomes hard like cement. This means it can be molded and shaped into pots or bricks that will become hard when dried. Pottery has been around for over 20,000 years!



Draw and Write Draw the structures and write which Earth materials you would use

Adobe House	Soddie - Sod House	Clay Pot
		

True or False Circle whether the statement is true or false

1. Adobe houses are made from clay	True	False
2. Clay pots have been around for over 20,000 years	True	False
3. Sod houses are made from grass and soil	True	False
4. Clay can be used for pottery or bricks	True	False
5. Sod houses are still used often in Canada	True	False

Exit Cards

Cut Out Cut out the exit cards below and have students complete them at the end of class

Name: _____

Mark

Circle the correct answer.

1) Which house is made of mud?

Sod houses

Adobe houses

2) Which is used for pottery work?

Adobe

Clay

3) Which becomes hard when dried?

Clay

Sod

4) Pottery has been around for ____.

20 000 years

30 000 years

5) Mixing straw and mud makes...

Sod

Adobe

Name: _____

Mark

Circle the correct answer.

1) Which house is made of mud?

Sod houses

Adobe houses

2) Which is used for pottery work?

Adobe

Clay

3) Which becomes hard when dried?

Clay

Sod

4) Pottery has been around for ____.

20 000 years

30 000 years

5) Mixing straw and mud makes...

Sod

Adobe

Name: _____

Mark

Circle the correct answer.

1) Which house is made of mud?

Sod houses

Adobe houses

2) Which is used for pottery work?

Adobe

Clay

3) Which becomes hard when dried?

Clay

Sod

4) Pottery has been around for ____.

20 000 years

30 000 years

5) Mixing straw and mud makes...

Sod

Adobe

Name: _____

Mark

Circle the correct answer.

1) Which house is made of mud?

Sod houses

Adobe houses

2) Which is used for pottery work?

Adobe

Clay

3) Which becomes hard when dried?

Clay

Sod

4) Pottery has been around for ____.

20 000 years

30 000 years

5) Mixing straw and mud makes...

Sod

Adobe

Name: _____

Date: _____

Unit Test - Changing Earth

Multiple Choice

/10

1) What is able to make a valley? a) Water b) Wind c) Glacier d) Air	2) Where does the Columbia Icefield drain into? a) Pacific Ocean b) Arctic Ocean c) Atlantic Ocean d) Indian Ocean
3) What is called when it lands on Earth? a) Lava b) Magma c) Fire d) Ash	4) What are the 3 forms of erosion? a) Wind, water, fire b) Wind, fire, ice c) Fire, ice, water d) Wind, water, ice
5) Which type of erosion polishes a coastline? a) Wind b) Water c) Ice d) Fire	6) Where are the oldest fossils found? a) Top of a cliff b) In layers of rock c) In the middle of a cliff d) In the bottom of a cliff
7) Where are most fossils found in Alberta? a) Lake Athabasca b) Badlands c) Rocky Mountains d) Fort McMurray	8) When sediment stops moving, it is called _____. a) Weathering b) Sediment c) Erosion d) Deposition
9) Why do many mountains form? a) When humans pile up dirt b) When we pile up garbage c) When the Earth's plates hit each other d) When the plates move away from each other	10) Millions of years ago, Alberta was... a) A warm rainforest b) A cold arctic c) A dry desert d) A frozen glacier

Definitions

What do each of the words mean?

Term	Definition (what does it mean)
Glacier	
Land	

Label

Name each

Triceratops	Brachiosaurus	Stegosaurus
Brachiosaurus	T-Rex	













Long Answer

Answer the long answer questions. Each question is 5 marks

1) Do glaciers move? How do they change the Earth's surface?

2) What is a fossil? Where are they found? Why are some fossils found in the Badlands?
