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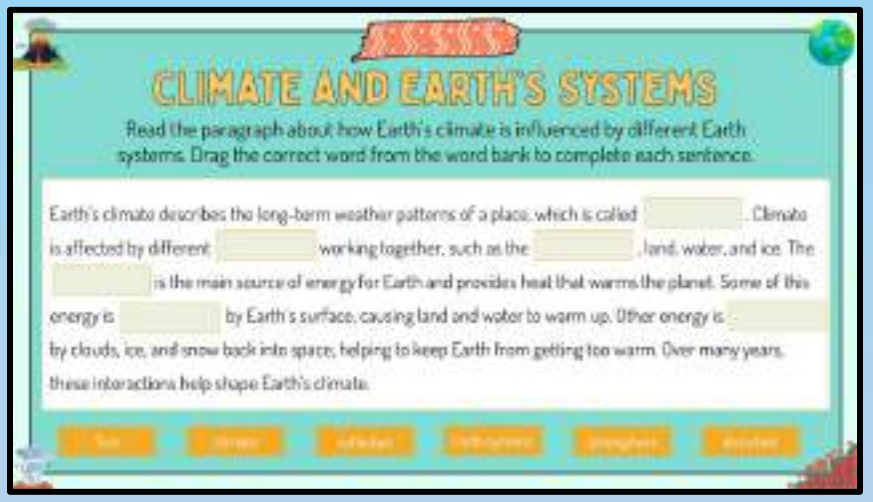
Google Slides Lessons Preview

Alberta Science Curriculum
Earth Systems Unit – Grade 6

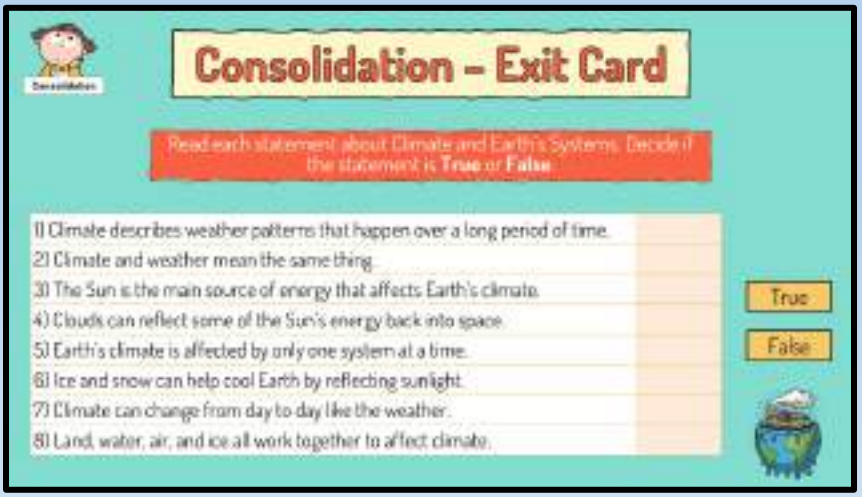
3-Part Lesson Format

Part 1 – Minds On!
- Learning Goals
- Discussion Questions
- Quotes
- And More!



Part 2 – Action!
- Writing
- Matching
- Drag and Drop
- Drawing
- And More!

Part 3 – Consolidation!
- Exit Cards
- Quizzes
- Reflection
- And More!



Alberta Science Curriculum
Earth Systems Unit – Grade 6

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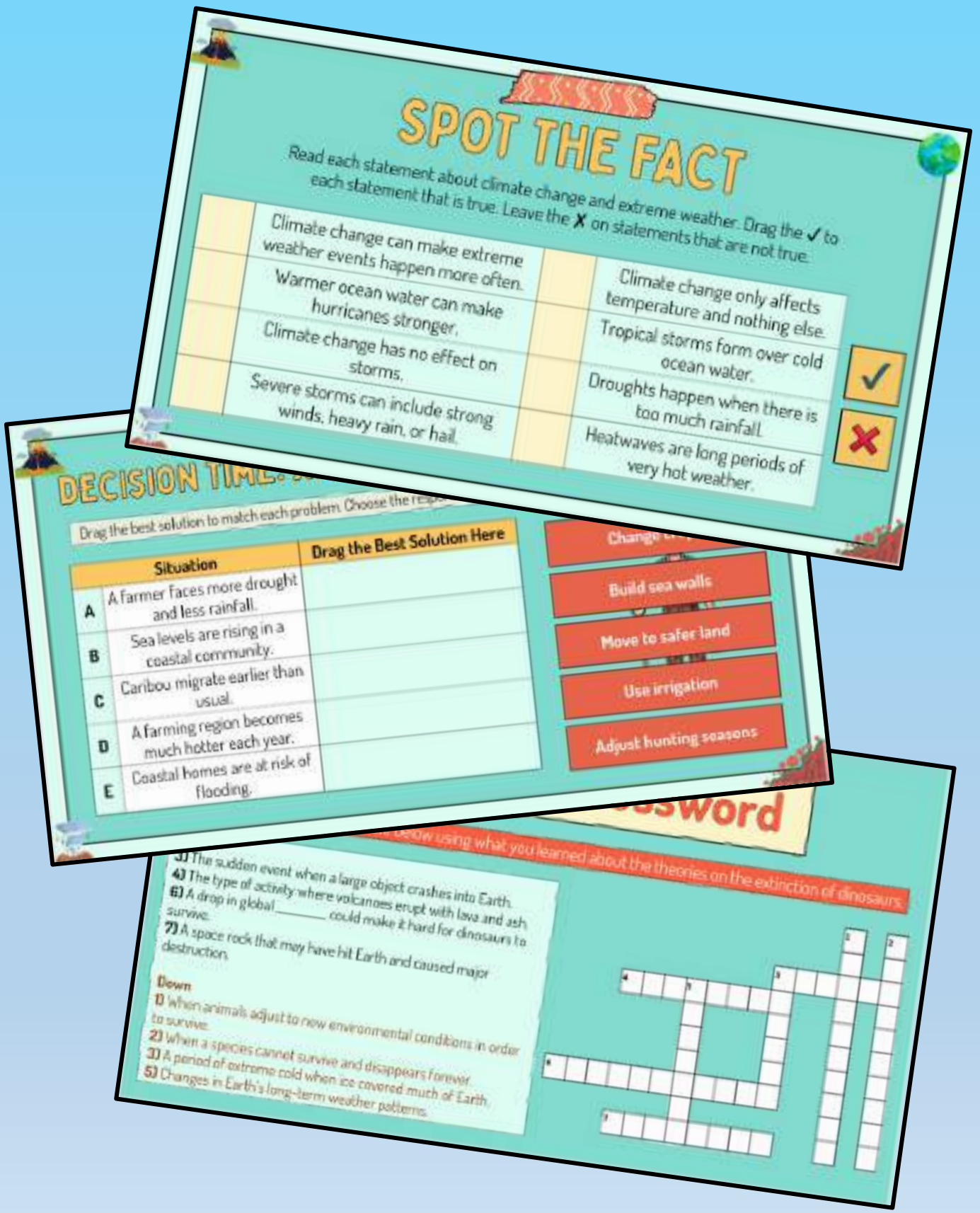
Earth Systems Unit – Grade 6



Workbook Preview

Grade 6 – Science Unit

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

Guiding Question: What relationships exist between climate and changes on Earth?

	Learning Outcome – Students investigate climate, changes in climate, and the impact of climate change on Earth	**Pages**
ES.1	Earth's systems interact with the Sun and each other to impact climate in various ways, including clouds reflecting sunlight into space, greenhouse gases trapping heat from the Sun, ice reflecting light from the Sun Humans rely on the Sun and Earth's systems for a habitable climate.	7 – 17
ES.2	Geographical location factors that affect climate include latitude, proximity to a large body of water, elevation, urban or rural setting	18 – 19
ES	Clean energy production has the potential to reduce net greenhouse gas production. Personal actions that can help address human causes of global climate change include reducing personal consumption and waste, planting a garden or buying local produce, using clean, affordable, and reliable energy sources responsibly	51
ES.4	Climate change can affect weather and extreme weather events, migration patterns, water resources, frequency of forest fires Climate change can impact agricultural practices, such as crop selection, crop production, harvesting periods and yields, irrigation, pest management	52 – 57, 60 – 63
ES.5	Traditional ways of living off the land, including hunting and gathering practices of First Nations, Métis, and Inuit communities, have been impacted by climate change in various ways, such as rising sea levels in coastal areas, changing migration patterns, access to hunting, harvesting, and fishing	64 – 69

Grade 6 – Science Unit

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

Guiding Question: What relationships exist between climate and changes on Earth?

	Learning Outcome - Students investigate climate, changes in climate, and the impact of climate change on Earth	**Pages**
ES.6	Theories about potential causes of the extinction of dinosaurs include wo climate change, a catastrophic meteoric event, or volcanic act	70 – 75
ES.7	be identified through long-term observation and er conditions, including amount of precipitation, te extreme weather events. Climate ch be id ough long-term observation and measurement vir ns, such as sea and ocean levels, thickness and dur ice, p t changes, number of forest fires Climate observations come from of so uch as recorded information, oral narratives, surf yers, in m different time periods on Earth	76 – 79
ES.8	Extreme weather events that occur on Ear ude hurricanes, monsoons Extreme weather events that occur in Canada include os blizzards, torrential rain, wildfires	80 – 85
ES.9	Technologies used to predict extreme weather events include radars weather satellites, and computer modelling	86 – 87
ES.10	Traditional knowledge and modern technologies both provide information on long-term climate changes. Local Elders, traditional Knowledge Keepers, and scientists can collaborate and share information about local climate and climate change.	97 - 98
CS.1	Students examine abstraction in relation to design and coding, and describe impacts of technologies.	58 – 59, 88 – 96

NAME: _____

CLIMATE CHANGE

PREVIEW

Name: _____ 7

Curriculum Connection
ES.1

What is Climate?

Understanding Climate: A Bigger Picture of Weather

Climate is about patterns of weather over a long time. It takes into account various factors like temperature, rainfall, wind speed, and humidity. For instance, if an area receives a lot of rain throughout the year, we'd say it has a wet climate. If it's often hot, we'd say it has a hot climate. We have terms like tropical, desert, and polar to describe different types of climates.

Weather vs. Climate: What's the Difference?

Many people confuse weather and climate, but they are not the same. Weather describes the conditions of the atmosphere over a short period of time, such as hours or days. For example, it could be sunny one day and rainy the next.

On the other hand, climate tells us what kind of weather is typical in a place over many years. If you live in a desert, for example, you expect it to be hot and dry most of the time - that's your climate.

Examples of Describing Climate vs. Weather

Describing Weather:

- "Today is rainy and cold."
- "The sun is shining brightly this afternoon."
- "It's windy outside, make sure to wear your hat."

Describing Climate:

- "Our city has a hot, dry climate. We hardly see rain."
- "We live in a tropical climate. It's usually hot and humid all year."
- "The climate here is mild with cool winters and warm summers."

Name: _____ 8

Curriculum Connection
ES.1

What is Climate?

True or False

Circle whether the statement is true or false

1) Climate is about patterns of weather over a short time.	True	False
2) We use words like tropical, desert, and polar to describe climates.	True	False
3) If a place is often hot, it has a hot climate.	True	False
4) "Today is r[illegible]y and cold" is describing climate.	True	False
5) "We live i[illegible]al climate" is describing weather.	True	False

Questi[illegible] the questions below

1) What does cli[illegible]

2) What is the difference between weathe[illegible]d climat[illegible]

3) Write 1 sentence that describes weather and 1 that describes clima[illegible]

Climate	
Weather	

Making Connections

Describe the climate where you live

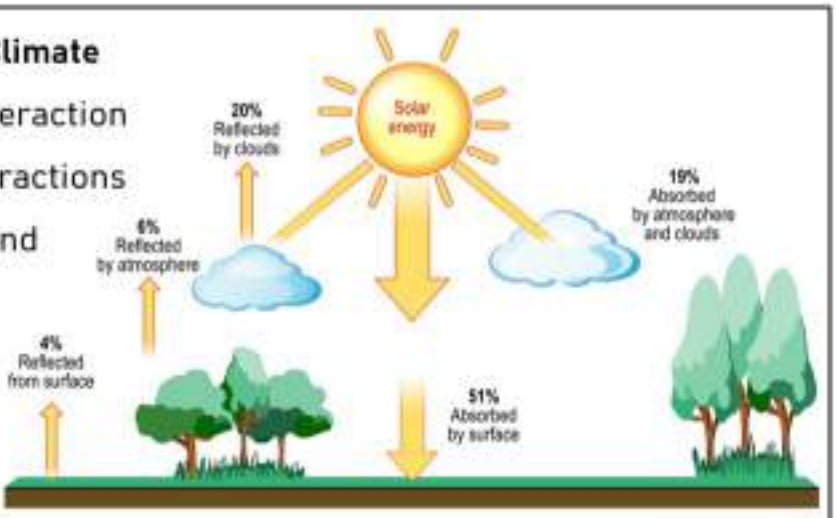
Name: _____ 9

Curriculum Connection
ES.1

Earth's Systems and Their Impact on Climate

Earth's Systems and Their Impact on Climate

Earth's climate is influenced by the interaction of its systems with the Sun. These interactions result in various climate phenomena and are crucial to understand the world's climate patt



The Ro

The Sun is e prim f E rth's heat. It influences our climate by providing the energy that drive patter cean currents. The Sun not only heats the Earth's surface, but it th move. This wind can cause storms.

Clouds and Climate

Clouds play a significant role in the Earth ct a portion of the Sun's light back into space, a phenomenon calle bedo. T lec an cool the Earth by reducing the amount of sunlight that reaches the e.

Greenhouse Gases and Climate

Greenhouse gases, such as carbon dioxide and methane, trap fro Earth's atmosphere, much like a greenhouse keeps heat inside. This p s the greenhouse effect, is vital for life as it keeps the Earth warm enough to sus e. However, an increase in greenhouse gases can lead to more heat being trapped, causing the planet to warm, a condition known as global warming.

Ice and Climate

Like clouds, ice also reflects sunlight back into space due to its white surface, another instance of the albedo effect. This reflection helps cool the Earth. However, as global temperatures rise and ice melts, less sunlight gets reflected back into space, and more is absorbed by the Earth, leading to further warming.

Name: _____ 10

Curriculum Connection
ES.1

Earth's Systems and Their Impact on Climate

True or False

Circle whether the statement is true or false

1) The Sun is the primary source of Earth's heat.	True	False
2) Clouds increase the Earth's temperature.	True	False
3) The greenhouse effect traps heat in the Earth's atmosphere.	True	False
4) Greenhouse gases cause the Earth to cool down.	True	False
5) The reflec[illegible]unlight by ice cools the Earth.	True	False

Questi[illegible]er the questions below

1) What is the ro[illegible]n E[illegible]climate?

2) Explain the greenhouse effect and hov[illegible]acts E[illegible]erature.

Sketch

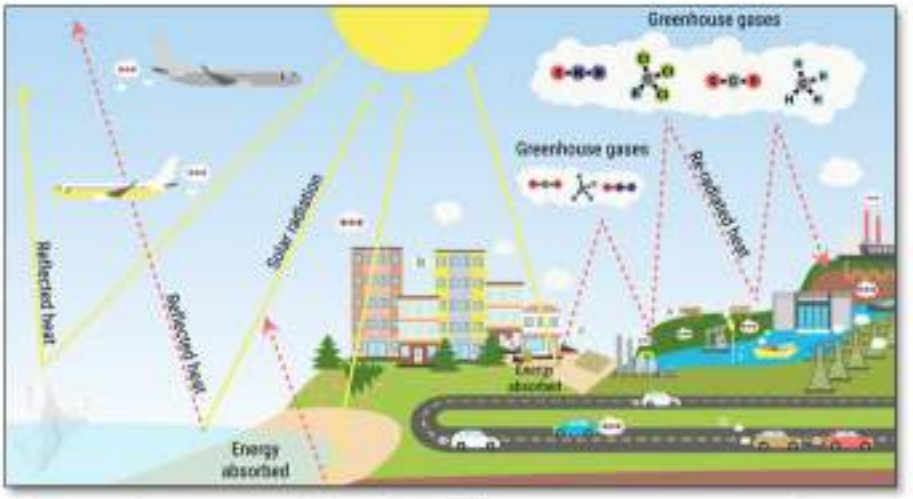
Sketch a picture showing how clouds and ice reflect sunlig[illegible]pace.

Name: _____ 13

Curriculum Connection
ES.1

Greenhouse Gas Effect

Understanding Our Air



The air we breathe is a mix of different gases! It is made up of 78% nitrogen, 21% oxygen, and 1% of other gases like carbon dioxi gon, helium, hydrogen, a Nitrogen is used ma protein, an we hum need oxygen to breathe. The oxygen we use up is replaced by the o nts pro aintaining a critical balance. If we cut down too many trees, we could t ting our air quality.

The Greenhouse Effect

Have you ever seen a greenhouse? It's a g ilding grow plants in cold weather. The Sun's heat can enter, but it can't escape, keepin reen warm. The same thing happens on Earth due to greenhouse gases.

What Are Greenhouse Gases?

The most known greenhouse gases are carbon dioxide, methane, and e gases work like the glass walls of a greenhouse, letting in sunlight and trap me heat to keep our planet warm. The more greenhouse gases in our atmosphere, the thicker the glass walls, which warms our planet.

What Can We Do?

But here's the problem: when we humans do things like burning fossil fuels (like when we drive cars or run factories), raising lots of cattle, or cutting down trees, we add more greenhouse gases to our atmosphere. This means more heat gets trapped, leading to global warming and climate change.

Name: _____ 14

Curriculum Connection
ES.1

Greenhouse Gas Effect - Questions

Questions

Answer the questions below using evidence from the text

1) Describe the balance between oxygen and carbon dioxide used by plants and animals.

2) What [illegible]gs you do that create greenhouse gases?

Visualizing

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

True or False

Circle whether the statement is true or false

1) The Earth's atmosphere contains equals parts oxygen and carbon dioxide	True	False
2) Some greenhouse gases occur naturally, and some are human made	True	False
3) Planting trees helps reduce greenhouse gases	True	False
4) Oxygen is an important greenhouse gas	True	False
5) Examples of greenhouse gases are carbon dioxide, methane, nitrous oxide	True	False

Name: _____ 15

Curriculum Connection
ES.1

Experiment - Carbon Dioxide Effects

Research Question — What are we learning about?

How does carbon dioxide affect the air temperature on Earth? If we add carbon dioxide to an environment, will it heat up faster than an undisturbed environment?

Materials — What you will need for the experiment

1) Tw[illegible]s
2) Two thermom[illegible]ca[illegible]t in the bottles. Glass thermometer[illegible]well [illegible]hermometer
3) Heat lamp, radiato[illegible]ay
4) 2-4 seltzer tablets

Method — How you will co[illegible] the [illegible]ent

1) Fill the two bottles about one-quarter full of wa[illegible]
2) Take the lids off the bottles and cover one of them wi[illegible]uct [illegible]
3) Make a hole in the duct tape using scissors. Put the thermome[illegible]h this hole
4) Drop the seltzer tablets into the second bottle. Cover it immediately using the duct tape. Cut a hole in this tape as well and stick the thermometer in.
5) Place the two bottles under a heat source, making sure they receive the same amount of heat. You could take them outside on a hot, sunny day or use a heat source.
6) Check the temperatures periodically over the next couple of hours. See if there is a difference in temperature

Name: _____ 16

Curriculum Connection
ES.1

Experiment - Carbon Dioxide Effects

Observations — What happened?

1) What was released when the seltzer tablets interacted with the water?

2) What effect did the extra carbon dioxide have on the temperature in the bottle?

Results — [illegible] the observations below

1) Why do you think the bottle with [illegible] temperature?

2) How are we releasing carbon dioxide into our environment?

3) Why is this dangerous for our environment and the living things in our environment?

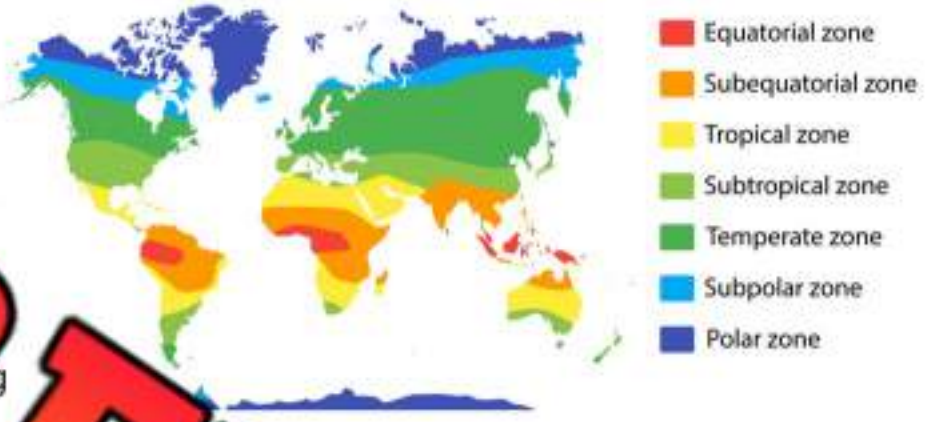
Name: _____ 18

Curriculum Connection
ES.2

How Geography Influences Climate

How Geography Influences Climate

Geography plays a significant role in determining the climate of an area. The geographical location of a place influences its climate in several ways. Check out the factors below.



1. Latitude

Latitude refers to how far north or south a place is from the equator. It is one of the most significant factors that influences climate. Places near the equator receive more direct sunlight, making them warmer. The farther away from the equator, the less direct sunlight it receives, making it colder.

2. Proximity to Large Bodies of Water

The closeness of a place to large bodies of water, such as seas and oceans, also affects its climate. Water heats up and cools more slowly than land. Therefore, coastal areas often have milder climates with less extreme temperature ranges compared to inland areas. In coastal areas, summers are usually cooler and winters warmer.

3. Elevation

Elevation, or how high a place is above sea level, impacts climate too. The higher the elevation, the colder the climate. This is because as we move higher, the air gets thinner and its ability to absorb and retain heat decreases.

4. Urban or Rural Setting

Whether a place is urban or rural can also impact its climate. Cities, with their many buildings and paved surfaces, tend to absorb and retain heat, a phenomenon known as the "urban heat island effect." This makes cities often warmer than rural areas. Plus, cities can also have higher pollution levels, which can influence local weather patterns and overall climate.

Name: _____ 19

Curriculum Connection
ES.2

How Geography Influences Climate

True or False

Circle whether the statement is true or false

1) Latitude refers to how far east or west a place is.	True	False
2) The equator receives the most direct sunlight.	True	False
3) Coastal areas have more extreme temperature ranges.	True	False
4) Elevation does not affect climate.	True	False
5) The "urba sland effect" makes cities cooler.	True	False

Questi r the questions below using evidence from the text

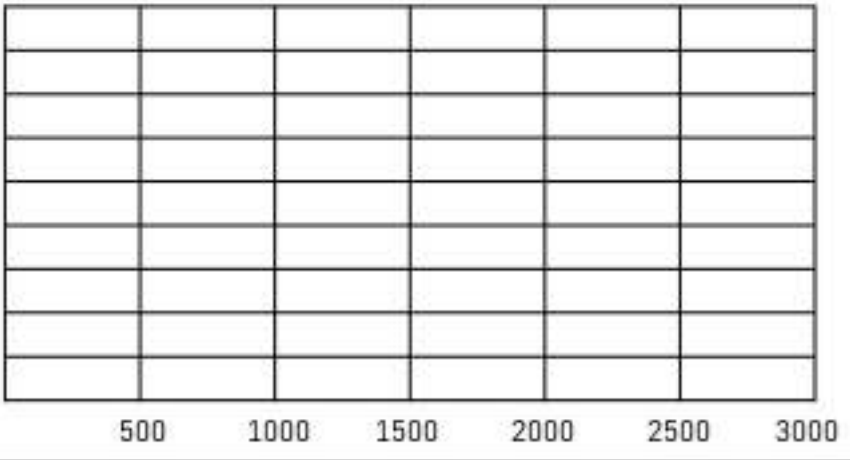
1) What is the "u d e ? Explain how it affects the climate of urban areas.

2) Explain how the proximity to large bodies of wa influ limate of an area.

Graph

Create a simple line graph by plotting the data points

Elevation (m)	Temperature (°C)
500	18
1000	16
1500	14
2000	12
2500	10
3000	8



Name: _____ 20

Curriculum Connection
ES.3

Natural Processes Causing Climate Changes

Natural Processes Causing Climate Changes

Climate change is not always human-induced. Many natural processes can cause significant changes in our planet's climate. Let's take a closer look at some of these natural causes.

Volcanic Eru[illegible]s

Volcanic er[illegible]e a powerful force of nature that can influence our climate. When a volcan[illegible] quantities of ash and gases into the atmosphere. The ash can block [illegible]light, l[illegible]temporary cooling effect. However, the emitted greenhouse gas[illegible]on di[illegible]n contribute to a long-term warming effect.

Meteors

Meteor impacts can also affect [illegible]. [illegible]e meteor strikes Earth, it releases a significant amount of energy, leading to [illegible]ead f[illegible] throwing dust and particles into the air. This can bloc[illegible]ligh[illegible] and cause a temporary drop in global temperatu[illegible]

Changes in the Sun's Output

Our Sun's energy output is not constant; it undergoes various cycles. Increased solar output can cause warming, while decreased output can lead to cooling. For instance, the 11-year solar cycle affects the intensity of solar radiation reaching Earth, influencing our climate.

Changes in Orbits

The Earth's orbit around the Sun is not a perfect circle; it changes over time in shape, tilt, and orientation, a phenomenon known as Milankovitch cycles. These changes can cause variations in the amount of sunlight our planet receives, leading to climate changes over thousands of years.

Name: _____ 21

Curriculum Connection
ES.3

Natural Processes Causing Climate Changes

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

1) Volcanic eruptions can cause climate change.	True	False
2) The Sun's energy output is always constant.	True	False
3) Changes in Earth's orbit around the Sun can cause climate change.	True	False
4) Greenhouse gases from volcanoes can cause warming.	True	False
5) Meteors c[illegible]e global temperatures to rise.	True	False

Questio[illegible] A[illegible] the questions below

1) How do volcan[illegible]mpa[illegible]r climate?

2) What happens when a large meteor strikes Eart[illegible]ow d[illegible]ct our climate?

Sketch — Draw a diagram showing how a volcanic eruption can influence [illegible]arth's climate. Label the important parts of your diagram.

Name: _____ 22

Curriculum Connection
ES3

Newspaper Article: Meteor Strikes Earth

"Massive Meteor Strikes Earth, Shifts Climate!"

Yesterday, an event took place that could only be compared to a plot from a science fiction movie. A giant meteor, roughly the size of a small city, collided with Earth, causing sig[illegible]t and potentially long-lasting cha[illegible]ur planet's climate.

The m[illegible] of the ocean, sending [illegible]ive wa[illegible]ng onto nearby coastlin[illegible]ng cloud of dust and [illegible]to the atmosphere. Scientis[illegible]ieve will impact Earth's climate [illegible]y.

"The dust cloud will block some [illegible]e Sun's rays from reaching Earth," explained Dr. Clara Jenkins, a prominent climatologist. "This means less sunlight will reach the surface, leading to a global drop in temperature."

This event, known as a 'nuclear winter,' can result in significant global cooling. The last time such a phenomenon occurred was about 65 million years ago, leading to the extinction of the dinosaurs.

"We could see colder temperatures worldwide, and possibly even snow in places where it's usually warm," said Dr. Jenkins. "However, this effect is expected to be temporary, lasting a few years to a decade."

The meteor event is also believed to have an impact on rainfall patterns, which might result in more intense and unpredictable weather conditions. Some regions could experience longer periods of drought, while others could face severe flooding.

Although the meteor's immediate impact is dangerous and unsettling, it is also a reminder of our planet's fragile place in the universe. As we learn more about this event, it will undoubtedly inform our understanding of climate change and how sudden, natural events can reshape our world.

[illegible]ists urge everyone to stay calm, [illegible]ir local news, and listen to the [illegible]ce o[illegible]l authorities. Meteor events like this [illegible]re, and researchers world[illegible] are [illegible] to understand and re[illegible]to thi[illegible]t event.

Stay tune[illegible] upd[illegible] this story as it develops[illegible]mb[illegible] this together, and toget[illegible] through this extraordi[illegible] Earth's history.

Name: _____ 23

Curriculum Connection
ES.3

Newspaper Article: Meteor Strikes Earth

True or False

Circle whether the statement is true or false

1) The meteor hit a city.	True	False
2) The meteor caused a large cloud of dust and debris.	True	False
3) Dr. Clara Jenkins is a climatologist.	True	False
4) The dust cloud will increase the Sun's rays reaching Earth.	True	False
5) The last 'n winter' event led to the extinction of dinosaurs.	True	False

Questio

the questions below

1) What is the 'nu phe non that Dr. Clara Jenkins referred to?

2) How does the dust cloud from the meteor impa s cli

Comic

Create a comic strip that explains the event. Include the role of the the dust cloud, and the changes in temperature and rainfall.

Name: _____ 24

Curriculum Connection
ES.3

Assignment - Newspaper Article: Volcanoes

In this assignment, you'll investigate the impact of volcanic eruptions on Earth's climate. You'll research the topic, then create a fictional scientist to source your information. Using your findings, you'll write a newspaper article, developing your research, critical thinking, and writing skills.

Research Research the effects of volcanic eruptions by answering the questions below

1) What ha[illegible] a volcanic eruption?

2) What effects do volcanic eruptions have on our cli[illegible]? Do [illegible]crease/decrease rainfall, temperature, wind, storms, etc.? Write 4 [illegible]s.

Name: _____ 25

Curriculum Connection
ES.3

Assignment - Newspaper Article: Volcanoes

3) Where will the volcano erupt? Find a volcano online and write its location.

4) When will the volcano erupt? Date, time of day, etc.

5) Write some details about the eruption. Was it a big eruption? Can you explain how many different gases were released and the quantity of gases?

6) Invent a fictional scientist who will be your source of information in your article. Give this scientist a name, title (e.g., Dr. of ...) and specific field of study (e.g., volcanologist, climatologist).

7) Write 3 quotes the scientist might say. Use the information in the previous page about the effects on climate and have the scientist say these things.

8) Write an attention-grabbing headline.

Name: _____ 27

Curriculum Connection
ES.3

Assignment - Newspaper Article: Volcanoes

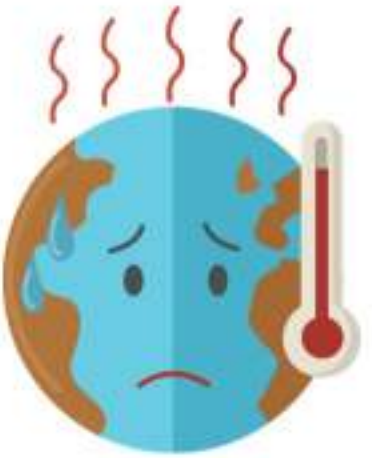
Name: _____ 28

Curriculum Connection
ES.3

Climate Change

Overview

Scientific evidence has shown that our climate has warmed over the last 100 years due to human activity. The everyday actions of our society are creating greenhouse gases that are wrapping a thick blanket around our planet. These actions have major effects that need a global response. Everyone needs to conserve the use of energy and resources!



Climate Change Evidence

The burning of fossil fuels to generate energy is the primary reason for climate change. When fossil fuels are burned, the result is carbon dioxide emissions that are called greenhouse gases. These emissions rise into the atmosphere and disrupt the carbon cycle.

A normal blanket of CO2 is normal as plants and animals decay and this blanket keeps some heat in the earth's atmosphere. The problem is the extra carbon dioxide we are producing from factories, and powerplants is thickening the blanket and keeping more heat on the earth's surface.

Global Effects

As the planet warms, the glaciers are melting and the sea is rising. The environment is unable to adapt to the unpredictable changes in temperature and this causes extreme weather such as hurricanes, tsunamis, droughts, floods and more!

Global Response – Paris Agreement

In 2015, all 195 countries in the world realized that climate change needs to be corrected. They agreed to meet in Paris to discuss ways to fix the climate change issue.

Each country has agreed that the climate cannot rise above a 2˚ increase from the normal temperature by the year 2100. Countries submitted carbon dioxide emissions targets that they would strive to achieve. If all countries can hit their targets, the amount of carbon dioxide would be significantly reduced.

Countries also needed to submit their action plan for how they will achieve their targets. Some plans included implementing a carbon tax on gasoline to deter people from using too much fuel.

Name: _____ 29

Curriculum Connection
ES.3

Climate Change

Questions

Answer the questions below using evidence from the text

1) What is climate change?

2) What ar… …ts of climate change?

Definitions

Explain what … fol… …ean

Greenhouse Gases	
Climate Change	
Paris Agreement	

True or False

Is the statement true or false?

1. A carbon tax will deter people from buying fuel.	True	False
2. Countries met in 2015 to sign the Paris Agreement to lower C02 emissions.	True	False
3. Zero carbon emissions would be better for the environment.	True	False
4. Climate change is a result of people burning too many fossil fuels.	True	False
5. The planet warming will make it more enjoyable for people in cold places.	True	False

Name: _____ 30

Curriculum Connection
E5.3

Climate Change - Biodiversity

What is Climate Change?

Climate change is the changes in the Earth's weather patterns for a long period of time. Having an unseasonably cool few days in the summer is not part of climate change as it is only a few days. But, when we notice changes in weather over the past year, we can chalk it up to climate change.

In fact, over the last 100 years, the Earth has warmed 1°C. This number is increasing by 0.2 degrees Celsius per decade. At this rate, you can see that we are warming the [illegible]at an unsustainable rate.

2020	[illegible]	[illegible]	2400	2500	2600	2700	2800	2900	3000
±0	[illegible]	[illegible]	7.6	9.6	11.6	13.6	15.6	17.6	19.6

Effects of Climate [illegible] on Biodiversity

Plants and animals are [illegible] their ecosystem. They have characteristics that allow them to thrive [illegible] in conditions. But, if we cause changes to their environment [illegible] conditions might not be suited for them to survive. Below are some [illegible] climate change affecting living things:

- ❑ More forest fires that destroy plant and animal habitat
- ❑ Melting glaciers and arctic ice, making it harder for [illegible] polar bears to hunt
- ❑ More extreme weather – droughts, floods, and severe storms
- ❑ Animals must adapt to new temperatures. Warm-blooded organisms regulate their temperature, but it has been discovered that animals like the possum cannot control its body temperature when it rises above 30°C. An extended heat wave could kill off many possums
- ❑ Warmer ocean temperatures are causing coral bleaching. **Coral bleaching** is the whitening of coral. When corals are stressed, they release algae, which gives them their colourful look. When they've released too much algae, they turn white. Bleached white corals are not dead but are at risk of starvation and disease. Without corals, scientists believe that more than one million species around the world will be homeless!

Name: _____ 31

Curriculum Connection
ES.3

Climate Change - Biodiversity

True or False

Circle whether the statement is true or false

1) Climate change is increasing temperatures by 2 degrees every decade	True	False
2) Droughts and floods are extreme weather that destroy habitats	True	False
3) Corals are home to over one million different species	True	False
4) Melting gl[illegible]s and sea ice reduces biodiversity	True	False
5) Extreme [illegible]will not affect biodiversity	True	False

Making [illegible]nect[illegible]

What does the reading remind you of in your life?

Questions

Use information from the [illegible]o s[illegible]swer

1) How much is the climate changing? What does this m[illegible]an[illegible]

2) Which effect of climate change do you think is the worst for organisms? Explain.

Name: _____ 32

Curriculum Connection
E5.3

Climate Change - Melting Glaciers

Melting Glaciers

As a result of human activities causing global warming, glaciers are melting. The **Muir Glacier** in Alaska has retreated and thinned since the 19th century. T images show state of the 1941, and 2004. The glacier has moved back about 11 kilometres and has dec more than 800 metres.

Th sheets nd and Antarctica are melting at a rapid rate. In Greenland, the ice shee mass age of 279 billion metric tons of ice per year. All of this ice is enterin ocea g sea level rises. In Antarctica, every 40 hours, one billion metric to e is m al, the Earth is now losing 1.2 trillion tons of ice each year.

The effects of melting on our ausing concern over rising see levels. If all glaciers were to melt, the vels whopping 70 metres! This would put every coastal city underwater. Fortuna that all glaciers would ever melt, but we are heading in the wrong dir

Evidence of Melting Glaciers

There are several pieces of evidence that suggest t acie round the world. Some of the most common pieces of evidence in

- Rising sea levels: As glaciers melt, they contribute to ris eve cier melts, the water flows into the ocean, causing the sea level ise. observed around the world, and it is one of the most significant im melting.
- Changes in snow cover: Glaciers form from snow that has accumulated over many years and has been compressed into ice. As glaciers melt, the amount of snow cover decreases, and this can be observed using satellite data.
- Changes in river flow: As glaciers melt, they contribute to changes in river flow. In areas where glaciers are an important source of water, melting glaciers can lead to increases in river flow, while in other areas, it can lead to decreases in river flow.
- Changes in vegetation: As the climate changes and glaciers melt, it can lead to changes in vegetation. For example, as glaciers retreat, they may expose new areas of land that were previously covered by ice. This can lead to changes in the types of plants that grow in these areas.

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Curriculum Connection
ES.3

Climate Change - Melting Glaciers

Questions
Answer the questions below using evidence from the text

1) What is happening with the glaciers on Earth? Describe the changes to the Muir Glacier.

2) What [illegible] glaciers are melting?

Reaction
What is your reaction to th[illegible]ng gla[illegible]? Explain what you're thinking

True or False
Circle whether the statement is true or false

1) As glaciers melt, the sea levels will lower significantly	True	False
2) The Muir Glacier has melted to the point it has retreated 11 kilometres	True	False
3) Each year, 1.2 trillion tons of glacier ice is melting	True	False
4) The ice caps in Antarctica and Greenland are melting rapidly	True	False
5) If all glaciers melt, the sea levels will rise 100 metres causing flooding	True	False

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Curriculum Connection
E5.3

Effects of Melting Glaciers

Background – Why Are Glaciers Melting?

Glaciers are melting for two main reasons. First, the increase in temperatures due to global warming are melting glaciers at a rate much faster than they were melting before the industrial revolution. This fact tells us that our human actions are causing glaciers to melt.

The second reason is due to warming ocean temperatures. With the temperatures rising, the ocean's temperatures are rising also. This is [illegible] melting of glaciers under the surface of the ocean. In addition, scientists are concerned that the global ocean currents are changing, causing warmer ocean waters to be pushed toward the north and south poles. This is melting the very important ice sheets in Antarctica and Greenland.

Effects of Melting

Rising Sea Levels

Since 1961, glacial melting has caused the sea levels to rise 2.7 centimetres.

Impact on the Climate

As glaciers are melting at the north and south poles, the oceanic currents are slowing, causing a changing global climate and creating more extreme weather events, like hurricanes and typhoons.

Disappearance of Species

Glacier melting is causing the extinction of many species. Glaciers provide a natural habitat to many animals, including penguins, seals, and polar bears. Almost all penguins are found in Antarctica, where they live on glaciers. Icebergs provide habitats for these animals to take a rest as they travel around their ecosystem. Without these glaciers, many of these animals will become extinct.

Less Freshwater

Melting glaciers help supply the river systems on our Earth. Scientist believe that by the year 2100, 85% to 100% of all arctic ice in Canada will be lost. This means the supply of freshwater into the rivers in Canada will be affected greatly. These regions that are currently being supplied with freshwater from melting glaciers will need to adapt to life with less freshwater available.

Name: _____ 35

Curriculum Connection
ES.3

Effects of Melting Glaciers

Questions

Use information from the text to support your answer

1) Why are glaciers melting?

2) Why will so[illegible]mals become extinct if glaciers continue to melt?

Summarize

Paraph[illegible]h h[illegible]w in one sentence

Rising Sea Levels	
Impact on Climate	
Disappearance of Species	
Less Freshwater	

Questioning

Write 2 questions you have about the reading

1)	
2)	

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Curriculum Connection
E5.3

Letter to the Editor: Reducing Emissions

205 Pearl Street, Calgary, Canada
T1X 0L3
April 25, 2023

Dear Editor,

I am writing as a concerned student about the significant impact of human activities on global climate change. I believe we can make personal changes that would help address this pressing issue, and I encourage my community members to do the same.

Firstly, we can reduce our personal consumption and waste. Overconsumption leads to unnecessary waste, which often ends up in landfills and contributes to greenhouse gas emissions. We can do simple things like turning off lights when leaving a room, using reusable bags, bottles, and containers, and recycling whenever possible.

Secondly, planting a garden or buying local produce can be very beneficial. Growing our own food reduces the need for long-distance transportation and the associated carbon emissions. Buying locally produced products supports our local farmers and also reduces the carbon footprint associated with transporting food from far distances.

Thirdly, using clean, affordable, and reliable energy sources can drastically cut down our carbon emissions. For example, we can install solar panels in our homes, use energy-efficient appliances, or switch to electric cars if possible.

Addressing climate change is not just the responsibility of governments and corporations. Each one of us can contribute to the solution. I am confident that if we all take these simple steps, we can make a big difference in our community and our planet.

Yours sincerely,
Tory Casey

Name: _____ 40

Curriculum Connection
E5.3

Letter to the Editor: Reducing Emissions

Questions Answer the questions below

1) What are three personal actions listed in the letter that you can do to reduce your emissions?

2) How [illegible]anting [illegible]r buying local produce help reduce carbon emissions?

Brainstorm List 5 more actions you could [illegible]reduc[illegible]nal consumption and waste

True or False Circle whether the statement is true or false

1) Overconsumption leads to less waste.	True	False
2) Growing our own food increases carbon emissions.	True	False
3) Transporting food long distances reduces carbon emissions.	True	False
4) Using clean energy sources can cut down carbon emissions.	True	False
5) Turning off lights when not in use can reduce consumption.	True	False

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Curriculum Connection
E5.3

Clean Energy and Reduction of Greenhouse Gases

Understanding Clean Energy

Clean energy, also known as renewable energy, is generated from sources that do not run out replenish naturally over time. These sources include sunlight, wind, rain, tides, and geothermal [illegible]. These energy sources are considered [illegible] because their extraction and use pr[illegible]ants or emissions, including g[illegible]enhou[illegible]

How Clean Energy Re[illegible] Gr[illegible]

- Solar Power: Solar pow[illegible]es th[illegible]f the sun, producing no greenhouse gases.
- Wind Power: Wind turbines convert w[illegible]inetic e[illegible]nt[illegible]electricity, without producing harmful emissions.
- Hydropower: By harnessing the energy of flowi[illegible]fal[illegible]electric power produces electricity with minimal greenhouse g[illegible]ions.
- Geothermal Energy: This form of energy taps into the Earth[illegible]inter[illegible]g clean power and limited emissions.

The Potential of Clean Energy

The shift towards clean energy has the potential to greatly reduce greenhouse gas production. As we decrease our dependence on fossil fuels—significant contributors to greenhouse gas emissions—we mitigate the damaging effects of climate change. This transition towards clean energy sources is a vital step towards a sustainable future. Clean energy technologies also hold economic potential, creating new industries and jobs.

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Curriculum Connection
ES.3

Clean Energy and Reduction of Greenhouse Gases

True or False

Circle whether the statement is true or false

1) Clean energy sources produce a lot of pollutants.	True	False
2) Hydropower requires flowing or falling water.	True	False
3) Geothermal energy taps into the Earth's internal heat.	True	False
4) Fossil fuels are significant contributors to greenhouse gas emissions.	True	False
5) Transition[illegible]lean energy can create new jobs.	True	False

Writ[illegible]

[illegible] friend who doesn't believe in clean energy. Try to persuade [illegible]em ab[illegible] should switch to clean energy sources.

Draw

Draw a picture of your favourite clean energy source. Label and explain it.

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Curriculum Connection
E5.3

Beyond the Three R's

Beyond the Three R's

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

Refuse

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

- Is this produ[illegible]e so[illegible]else with less packaging?
- Do I need this pr[illegible]?
- Is this product recycl[illegible]

Repair

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

Regift

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

Recover or Rot (Compost)

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

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Curriculum Connection
E5.3

Beyond the Three R's - Questions

Questions

Use information from the text to support your answer

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

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

Making Connections

What does [illegible] reading [illegible] in your life?

True or False

Circle whether the statement is true or false

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

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Curriculum Connection
E5.3

Reselling - Online Marketplace Assignment

Objective What are we learning more about?

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

Instructions How do we complete the activity?

1) As[illegible] stude[illegible]k of one item they have at home that th[illegible]r n[illegible]d or want. It should be something [illegible]t in go[illegible]dition and could be useful to some[illegible]se.
2) Discuss with student[illegible]oncept o[illegible]ting. Emphasize how this hel[illegible]e w[illegible]n also help other people.
3) Once they have chosen their item[illegible] them an online marketplace post. They should in[illegible]
   - A title for their listing (e.g., "Gently Bicycle for Sale")
   - A description of the item, including its condition, color, size, and any other important details.
   - A reason why someone else might want or need this item.
   - A 'pretend' price or, if they choose to give it away, they can list it as 'Free'.
   - They can also draw a picture of their item to go with their listing.
4) Once they've created their listings, have the students present their items and explain why someone else might want or need them.
5) Discuss how the activity can be applied in real life and the benefits of reusing, recycling, and regifting.

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Curriculum Connection
E5.3

Reselling - Online Marketplace Assignment

Plan	Plan your sale item posting

1) What will the title of your listing be? Example: "Gently Used Bicycle for Sale"

2) A description of the item, including its condition, colour, size, and any other important d

3) Why might someone want this or ne

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

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Curriculum Connection
E5.3

Reselling - Online Marketplace Assignment

Listing	Create your listing below

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

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Curriculum Connection
ES.4

Research Activity - Extreme Weather in Canada

The weather in Canada is different throughout because of how the physical geography differs from region to region. For example, coastal regions will have different weather than regions more inland. Also, regions in the mountains will have different weather than in the plains.

Research | Learn about the weather in different areas in Canada

1) Which cit nada's warmest city? (use average daily temperature)

2) What ha been t t recorded temperature in Canada? Where was it?

3) What has been the cold ded t ure in Canada? Where was it?

4) Which city in Canada receives the most rainfall yea

5) Which city in Canada receives the least rainfall each y

6) Which city in Canada is the windiest? What is the wind speed?

7) Which city in Canada gets the most snow? How much does it get a year?

8) Which city in Canada received the heaviest hailstone? How heavy was it?

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Curriculum Connection
ES.4

Research Activity - Extreme Weather on Earth

Research	Learn about the weather in different areas in Canada

1) Which city on Earth is the warmest city? (use average daily temperature)

2) What has been the warmest recorded temperature on Earth? Where was it?

3) What has been the coldest recorded temperature on Earth? Where was it?

4) Which city on Earth receives the most rainfall each year?

5) Which city on Earth receives the least rainfall each year?

6) Which city on Earth is the windiest? What is the wind speed?

7) Which city on Earth gets the most snow? How much does it get a year?

8) Which city on Earth received the heaviest hailstone? How heavy was it?

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Curriculum Connection
ES.4

Climate Change and Extreme Weather

Climate Change and Weather

Climate and weather are closely connected. Weather is what we experience in our day-to-day lives - like rain, sun, wind, and snow. Climate, on the other hand, is the long-term average of these weather conditions.

As our climate changes, our weather patterns change too. We might see more hot days in the s[illegible]r and fewer cold days in the winter. We might also see changes in rainfall pat[illegible] some places getting more rain and others getting less.

Extreme W[illegible]ther E[illegible]

One of the most [illegible] impa[illegible]mate change is the increase in extreme weather events. These can incl[illegible]

- Heatwaves: Extremely hot wea[illegible]r fo[illegible]
- Droughts: Long periods without enou[illegible]nfall.
- Heavy Rainfall: Very heavy rain leading to flo[illegible]
- Severe Storms: Storms with strong winds, heav[illegible]
- Wildfires: Fires that spread over large areas.

Frequency of Extreme Weather Events

Climate change can intensify and increase the frequency of extreme weath[illegible]ents. Rising temperatures can lead to more severe heatwaves and increase the chance of droughts.

The additional heat also speeds up evaporation, causing more rain to fall during storms, making them more severe. Also, with warmer climates, winters could become milder, leading to less snow but more rain. This can change the habitats of animals who rely on cold winters. Additionally, warmer ocean waters can intensify hurricanes, posing risks to coastal communities.

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Curriculum Connection
ES.4

Climate Change and Extreme Weather

True or False

Circle whether the statement is true or false

1) Weather is the long-term average of climate conditions.	True	False
2) Climate change can lead to more hot days in the summer.	True	False
3) Droughts are caused by heavy rainfall.	True	False
4) Wildfires can be a result of extreme weather events.	True	False
5) More hea[illegible]o more evaporation and heavier rainfall.	True	False

Questio[illegible]

[illegible]the questions below

1) How can clima[illegible]d t[illegible]severe storms?

2) What are some examples of extreme weather e[illegible]

Visualizing

Draw what you were picturing while you were reading. Exp[illegible] the picture

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Curriculum Connection
C5.1

Reading Code - Tsunami Buoys

A **tsunami buoy** is a floating sensor that is put along coastal regions that experience tsunamis. The buoy measures the wave height of the waves around it. It collects data that is sent to the mainland where scientists can read the data.

Most tsunamis are under 3 metres tall. These tsunamis do not cause much damage on land. When tsunamis are over 3 metres, a tsunami warning is issued.

Coding

the data provided about the shoreline height and the tsunami
arning would you send to people living on shore?

Shoreline Height	T… G…	…arning – Then display, "_____"
2 m	2	
1.5 m	2.5 m	
2.2 m	5 m	
1 m	20 m	
3 m	1.5 m	
1.8 m	50 m	

If/Then Statements

Write your own IF/THEN statements with data rec… tsunami buoy. Make up the data.

If the shoreline height is 1.2 m and the tsunami is 8 m tall

THEN

If the shoreline height is _____ m and the tsunami is _____ m tall

THEN

If the shoreline height is _____ m and the tsunami is _____ m tall

THEN

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Curriculum Connection
CS.1

Storing Code - Tsunami Buoys

We can store data that we want to use later to help with our computer program. We could store preset display messages that are sent based on the height of the waves.

Example

If wave height is greater than 7 m
THEN display warning level 3

Storing Data
warning level 3 = elderly should evacuate

Storing Data Write display messages for your computer screen for each warning level

Warning L	Warning Display Message
1	
2	
3	
4	
5	

If/Then Statements Write your own IF/THEN statements ... receiv... the tsunami buoy. Make up the data.

If the shoreline height is _____ m and the tsunami is _____

THEN display warning level _____ (number)

If the shoreline height is _____ m and the tsunami is _____ m tall

THEN

If the shoreline height is _____ m and the tsunami is _____ m tall

THEN

If the shoreline height is _____ m and the tsunami is _____ m tall

THEN

Name: _____ 60

Curriculum Connection
ES.4

Tropical Storms

What is a Tropical Storm

A **tropical storm** is a change in atmospheric conditions that create strong winds, heavy rain or snow and sometimes thunder and lightning. Tropical storms form in the large oceans and then move towards land, often causing massive destruction.

Tropical storms often bring massive external forces that destroy structures.

Types of Tropical Storms

There are three main types of coastal or tropical storms – hurricanes, cyclones, and typhoons. The storms are all the same, as they all form over warm ocean waters, rotate around an area of low air pressure, and have wind speeds of over 119 km per hour. We have different names based on where the storm happens.

Hurricane

A hurricane will form over the North Atlantic Ocean and Northeast Pacific.

Cyclone

A cyclone will form over the Indian Ocean.

Typhoon

A typhoon is formed over the Northwest Pacific Ocean.

How Coastal Storms Form

A coastal or tropical storm will form in the following steps:

1) The water needs to be warm, at least 26.5 degrees Celsius. This is why tropical storms begin in warmer areas near the equator.
2) When wind blows across the warm ocean water, the warm, moist air rises rapidly
3) As it rises, the moist air cools and the water in it condenses, forming large storm clouds
4) The cooling water also releases a lot of heat. This heat transfer creates enough energy to cause strong winds
5) The strong winds push even more air up from the ocean's surface causing more clouds and even more wind
6) The rapidly moving air creates an area of low air pressure in the centre. This middle part of the storm is called the eye of the storm. It is calm, but around the eye has the strongest, most devastating winds.

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Curriculum Connection
ES.4

Tropical Storms

Questions

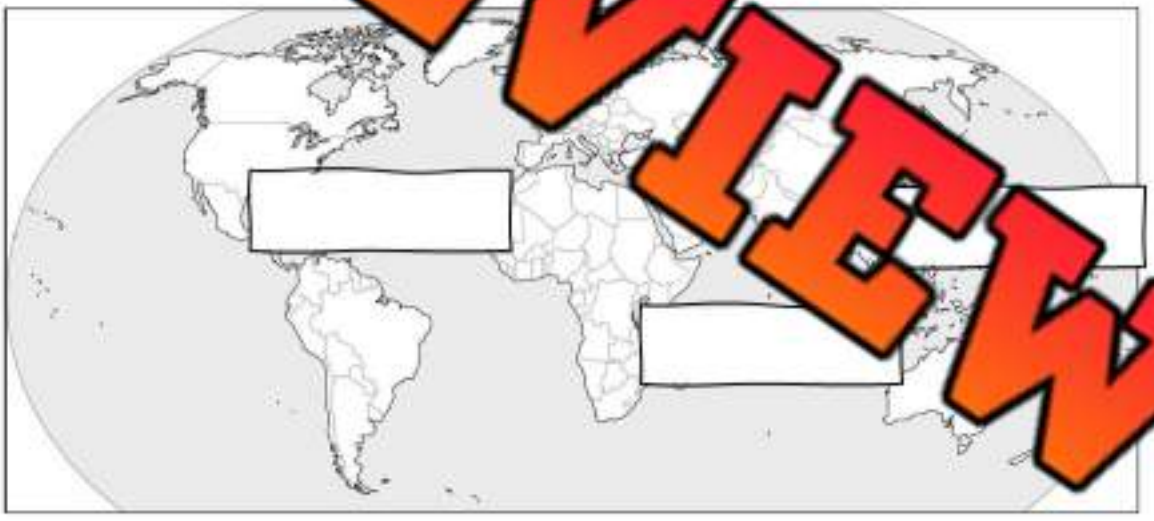
Use information from the text to support your answer

1) What is a coastal storm? What wind speeds need to be exceeded to be considered a coastal or tropical storm?

2) What is th[illegible]ce between a hurricane, cyclone, and typhoon?

Label

Fill in the b[illegible]re eac[illegible]types of coastal storms form



Ordering

Order the steps from first to last in the development of a coastal storm

	The eye of the storm is formed
	The moist air cools, creating large storm clouds
	Water is warmed to a minimum of 26.5 degrees Celsius
	Strong winds are created by warm and cool air moving causing changes in air pressure
	Wind blows across the warm ocean water causing the moist air to rise

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Curriculum Connection
ES.4

Natural Phenomenon - Evacuation

Natural Phenomenon Causing Evacuation

When a natural disaster is predicted to strike a region, the goal is to lessen the effects of the massive forces. One way to ensure human life is not lost is to enforce an evacuation order. **Evacuation** means to move people from a dangerous place to somewhere safe.

Evacuation

In many [illegible] told to evacuation will not be happy to do so. They often do not believe [illegible] will have a strong enough force to cause them danger. In this case, an eva[illegible] can [illegible] by the government. An evacuation order can be mandatory or vol[illegible] A **m[illegible]uation order** means the government tells people they have to leave [illegible]ses. If [illegible]ot, law enforcement will force them to leave.

A **voluntary evacuation order** mean[illegible]ficers tell each resident the risk and try to get them to eva[illegible], but the homeowner can stay if they choose to.

Evacuation Orders in Alberta – Wildfires

Wildfires are a significant concern annually in Alberta. Indeed, t[illegible]e h[illegible] wildfires each year for the last decade in Alberta.

In 2021, there were evacuation orders for 15,000 homes in Alberta as [illegible] wildfires escalated and approached urban regions. This evacuation was not mandatory, meaning many residents chose to stay put. When people decide against evacuation, it hampers the efficiency of firefighters, as they need to protect individuals and their properties instead of focusing solely on extinguishing the fires.

Many people who decided to stay were in danger of not only burning up in a fire, but also smoke inhalation and running out of food and water. The evacuation orders are meant to help people and limit the effect of natural disasters on human life.

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Curriculum Connection
ES.4

Natural Phenomenon - Evacuation

Definition

What do the terms below mean?

Evacuation	
Mandatory Evacuation	
Voluntary Evacuation	

Questions

Use information from the text to support your answer

1) How do evacuations help reduce the effects of natural disasters on people?

2) Did people leave during the evacuation orders in Alberta? Why was this a problem?

Your Turn

Would you want to leave your house in a voluntary evacuation? Explain.

Name: _____ 64

Curriculum Connection
ES.5

Climate Change - Impact on Farming

Climate Change and Its Impact on Agricultural Practices
Climate change is a worldwide phenomenon that is having a profound impact on our environment and daily lives. One of the areas where its effects are clearly visible is in agriculture. Climate change can alter crop selection, crop production, harvesting periods, yields, irrigation practices, and pest management strategies.

Crop Selecti
Climate cha affect the types of crops farmers choose to grow. Rising temperatu anges in precipitation patterns can make it more difficult to grow certain might thrive in the new conditions. For example, in warmer climat mers m owards heat-tolerant crops.

Crop Production
Crop production can gnifi d by climate change. Increases in temperature and carbon d boos owth of some crops, but this effect is often offset by extreme weat s a in rainfall patterns. Droughts can harm crops, while excess rainfa ca and crop disease.

Harvesting Periods and Yields
Climate change can alter the timing of crop har nd th f produce (yield) harvested. Warmer temperatures can accelerate t ro ling to earlier harvests. However, extreme weather events ca crops educe yields.

Irrigation
Climate change can impact irrigation needs and practices. Warmer temperatures and changing rainfall patterns can increase the demand for irrigation. However, in some regions, water resources may become scarcer due to climate change, challenging irrigation practices.

Pest Management
Climate change can affect the types and number of pests that farmers have to deal with. Warmer temperatures can allow pests to survive and reproduce more quickly, and changes in precipitation can create more favourable conditions for certain pests. This means that farmers may need to change their pest management strategies.

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Curriculum Connection
ES.5

Climate Change - Impact on Farming

True or False

Circle whether the statement is true or false

1) Higher temperatures always harm crop growth.	True	False
2) Climate change can lead to earlier harvests.	True	False
3) Irrigation needs are decreasing due to climate change.	True	False
4) Pests cannot survive in warmer temperatures.	True	False
5) Farmers may shift towards heat-tolerant crops due to climate change.	True	False

Questions

Answer the questions below

1) How can climate change impact crop selection?

2) How can climate change impact pest management strategies?

3) Why might climate change lead to earlier harvests?

Questioning

Write 2 questions you have about the reading

1)	
2)	

Name: _____ 66

Curriculum Connection
ES.5

Climate Change Affecting Indigenous Ways of Life

How Climate Change Affects Indigenous Ways of Life
Climate change is changing our world in big ways. It's also changing the way some people live, especially for First Nations, Métis, and Inuit communities. These communities have a special relationship with the land and use it in many traditional ways.

Rising Sea Levels in Coastal Areas
Due to climate change, sea levels are rising. This change impacts coastal communities in multiple ways:

- Land lo sea levels can result in the erosion of coastal lands eas where people live. For instance, an ca due to flooding.
- Less food: In ev negatively impact marine life, affecting nt and f seafood these communities can st. F tain fish species may disappear from traditional fishing gro

Changing Animal Migration Patte
With the earth's temperature rising, anim ion p are changing. This can:

- Move the hunting grounds: The areas where co ties t lly hunt can change, as animals migrate to cooler areas o ent h
- Change the timing: The times of year when communit ight o change to fit with the new patterns of animal migration. For instanc ou earlier in the year.

Harder Access to Hunting, Harvesting, and Fishing Areas
Climate change also poses challenges to access traditional hunting, gathering, and fishing areas:

- Less safe ice: In regions where people use ice for travel, warmer winters make the ice less stable and safe. This impacts ice-fishing practices, for example, as the ice may form later or break up earlier.
- Fewer plants and animals: Warmer weather and changing precipitation patterns can affect the abundance and distribution of the plants and animals that communities depend on, such as certain berries not fruiting at the usual time.

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Curriculum Connection
ES.5

Climate Change Affecting Indigenous Ways of Life

True or False Circle whether the statement is true or false

1) Climate change affects animal migration patterns.	True	False
2) Indigenous communities are not affected by climate change.	True	False
3) Warmer weather can affect the timing of caribou migration.	True	False
4) Some Indigenous communities travel on ice.	True	False
5) Higher temperatures can negatively impact traditional fishing grounds.	True	False

Questic he questions below

1) How does clim affect itional hunting times for indigenous communities?

2) Why are rising sea levels a problem for genous living in coastal areas?

Visualizing Draw what you were picturing while you were reading. Exp e picture

Name: _____ 70

Curriculum Connection
ES.6

Climate Changes in History

History of Climate Change on Earth

The climate of the Earth has changed significantly throughout its history, and these changes have had a major impact on the evolution and development of life on the planet. Some of the most significant climate changes throughout Earth's history include:

- The formation of the Earth: When the Earth was first formed about 4.5 billion years ago, it was a hot, molten ball of rock. As it cooled, the surface solidified, and an atmosphere formed. The early atmosphere was very different from the atmosphere we have today, and the climate was much hotter than it is now.
- The "Snowball Earth": About 700 million years ago, the Earth experienced a period of extreme cold known as the "Snowball Earth" period. During this time, much of the planet was covered in ice, and the climate was much colder than it is today.
- The Paleozoic Era: The Paleozoic Era, which lasted from about 541 million years ago to about 252 million years ago, was a time of great climate change. The climate during this time was much warmer than it is today, and there were no polar ice caps.
- The last ice age: The last ice age, which ended about 11,000 years ago, was a period of extreme cold and global glaciation. During this time, much of the planet was covered in ice, and the climate was much colder than it is today.
- The modern era: The modern era, which began about 11,000 years ago, has seen a number of significant climate changes. In the past few hundred years, the Earth has become warmer, and this trend is expected to continue in the future.

Climate Changes Impact on Biodiversity

Climate changes throughout Earth's history have had a major impact on biodiversity, or the variety of different species of plants and animals on the planet. Some of the ways in which climate change has affected biodiversity include:

- Extinction: Climate change can lead to the extinction of certain species that can't adapt to the changing conditions. For example, during the last ice age, many species of plants and animals became extinct because they couldn't survive the colder climate.
- Migration: Climate change can also lead to the migration of species to new areas. As the climate changes, some species move to new areas where the conditions are better for them. This can lead to changes in the distribution of species around the planet.

Name: _____ 71

Curriculum Connection
ES.6

Climate Changes in History

True or False

Circle whether the statement is true or false

1) The climate has never changed drastically in the history of the Earth	True	False
2) Ice ages have caused extinction events	True	False
3) When the Earth formed, it was much hotter than it is now	True	False
4) During the "Snowball Earth" event, the planet was mostly covered in ice	True	False
5) The last ic[illegible]s 10 million years ago	True	False

Summ[illegible]

[illegible]ize one of the periods of climate change in history

Questions

Use information from the [illegible]swer

1) How would you describe how much the Earth's climate ha[illegible]ed [illegible]

2) Which events were too cold for us to live? Which events were too hot?

Name: _____ 72

Curriculum Connection
ES.6

Theories on the Extinction of Dinosaurs

Theories on the Extinction of Dinosaurs
The extinction of dinosaurs is a significant mystery that has fascinated scientists for decades. Many theories have been proposed to explain why dinosaurs became extinct about 65 million years ago. Here are three of the most popular theories:

Worldwide Climate Change
Climate change could have played a role in the extinction of dinosaurs. The Earth's climate can change naturally over time due to factors like changes in the Earth's orbit or the amount of sun radiation reaching the Earth. During the time of the dinosaurs' extinction, a significant shift in the Earth's climate could have led to changes in habitat, food sources, making survival difficult for these large species.

Catastrophic Meteorite Impact
One of the most widely accepted theories is that a huge meteor or asteroid struck Earth, leading to the extinction of dinosaurs. The impact could have caused massive fires, tsunamis, and so much dust into the atmosphere that it blocked sunlight for several months. This event could have caused a dramatic drop in temperature, leading to what's known as a "nuclear winter", making it impossible for many dinosaur species to survive.

Volcanic Activity
Another theory suggests that intense volcanic activity could have caused the dinosaurs' extinction. Massive volcanic eruptions would have released a huge amount of dust and gases like sulfur and carbon dioxide into the atmosphere. These particles would have blocked sunlight, causing a drop in temperature and altering the Earth's climate. Also, the acid rain resulting from these gases could have made the environment inhospitable for the dinosaurs.

Each of these theories presents a different way that the Earth's environment could have become too hostile for dinosaurs. Scientists are still studying these theories to understand better what caused the extinction of these fascinating creatures.

Name: _____ 73

Curriculum Connection
ES.6

Theories on the Extinction of Dinosaurs

True or False

Circle whether the statement is true or false

1) Dinosaurs became extinct about 65 million years ago.	True	False
2) Climate change could not have affected dinosaurs.	True	False
3) A big meteor hitting Earth is a theory for dinosaur extinction.	True	False
4) The meteor impact could have caused a "nuclear summer".	True	False
5) Acid rain c[illegible]ave been a result of intense volcanic activity.	True	False

Sketch

[illegible]and around it, draw symbols or pictures representing each [illegible]he thr[illegible]s for their extinction.

Questions

Use information from the text to [illegible]you[illegible]er

1) How could volcanic activity lead to the extinction of dinosaurs?

2) How might worldwide climate change have led to the extinction of dinosaurs?

Name: _____ 74

Curriculum Connection
ES.6

Activity: Meteor Impact: The Extinction Event

Background

What is this activity all about?

The aim of this activity is to help students understand the potential effects of a meteor impact on Earth and its role in causing mass extinction events.

Materials

What will you need for this activity?

- Large c tic tub
- Differ oloured sand/soil (red, blue, green, yellow)
- Sm present meteorites)
- M ck or ta e
- Safety goggle
- Water
- Camera or sma e (for he impact)
- Plastic dinosaurs (

Method

How you com vity

1) Begin by explaining the concept of a teor im nd ential effects on Earth's environment.
2) Have the students fill the plastic tub with diffe ta o d/soil, representing different geological layers of Earth.
3) Place a few plastic dinosaurs around the "Earth" to give al life before the impact (optional).
4) From a predetermined height, have students drop the "meteorite" (sm ed rock) into the "Earth" (plastic tub). Make sure they are wearing safety g gles to protect their eyes from any sand that may splash.
5) Let the students observe the "impact". They should notice a "crater" forming, sand layers displacing and possibly "tsunami" waves if water is added. Record the event to analyze later.
6) Measure the size of the "crater" formed and the extent of displacement of the sand layers.
7) Have a discussion about the observations and what they could mean on a global scale - such as changes to the climate, the blocking out of sunlight, effect on plant and animal life, and ultimately leading to mass extinction.

Name: _____ 75

Curriculum Connection
ES.6

Activity: Meteor Impact: The Extinction Event

Observations	What happened?

1) What happened?

2) How lar crater made?

Discussion	be questions below.

1) How does the size of the te f the meteor? What might be the effect of a larger meteor hitting

2) How did the impact affect the different layers of "Earth"? ev t this disrupt ecosystems or the climate?

3) What might be the long-term effects after the initial impact of a meteor? Consider the blocking out of sunlight and temperature changes.

Name: _____ 76

Curriculum Connection
E5.7

Comparing Historical Weather in Calgary

Comparing Historical Weather Conditions in Calgary

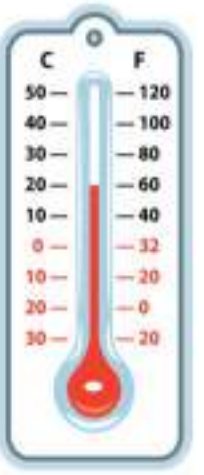
Weather and environmental conditions are critical aspects of our world. Comparing historical observations and measurements of weather to current data can help us understand these changes.

Temperature Changes Over Time in Calgary

Table 1 provides a comparative overview of average annual temperatures in Calgary over various decades.

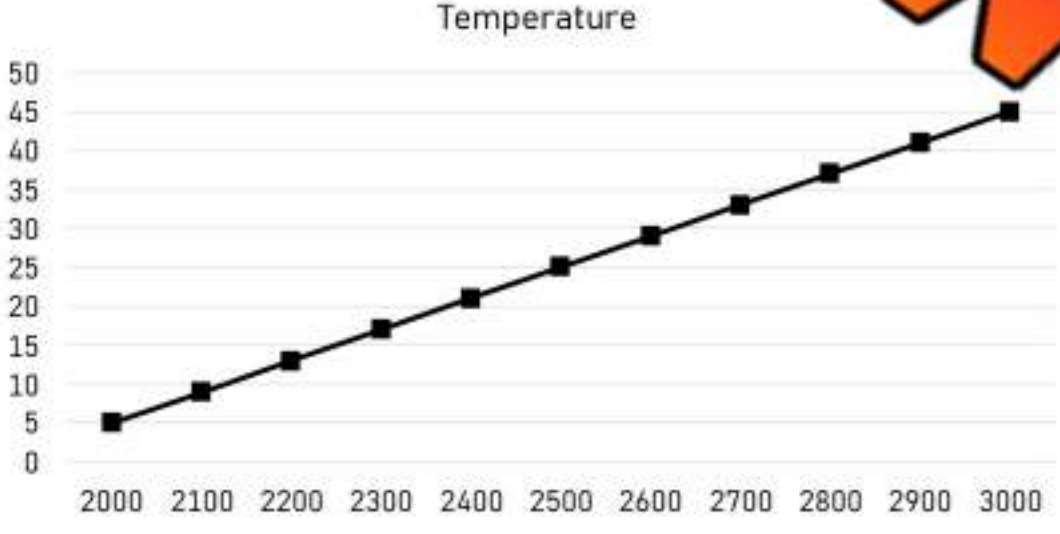
Table 1: Ave ual Temperatures in Calgary (in degrees Celsius)

Y	Average Temperature
	3.1
19	4.0
19	4.5
2000	
2010	
2020	5.0



As shown, the average annual temperature in C has g creased from the 1970s to the 2020s. This increase might not seem mu s, temperatures have increased almost 2 degrees Celsiu ate, i ears, global temperatures could be 8 degrees higher.

The graph below represents how the climate could wa ver millennium.



Name: _____ 77

Curriculum Connection
E5.7

Comparing Historical Weather in Calgary

True or False

Circle whether the statement is true or false

1) Temperatures in Calgary have gone up every decade.	True	False
2) In the year 2000, temperatures were the highest they have been	True	False
3) In 2020, the average annual temperature was 5 degrees Celsius	True	False
4) By the year 3000, Calgary's annual temperature could reach 45°C	True	False
5) If we don't [illegible] our way of life, nothing bad will happen	True	False

Ques[illegible] information from the text to support your answer

1) Describe how [illegible] different in 1970 than in 2020. What other severe weather could we [illegible] average [illegible] tures continue to rise?

2) Why do you think this data is important? How [illegible] help [illegible] ision making?

Reflect

How does this data make you feel?

Name: _____ 78

Curriculum Connection
ES.7

Sea Ice, Sea Levels, Permafrost

Observing Climate Change Over Time

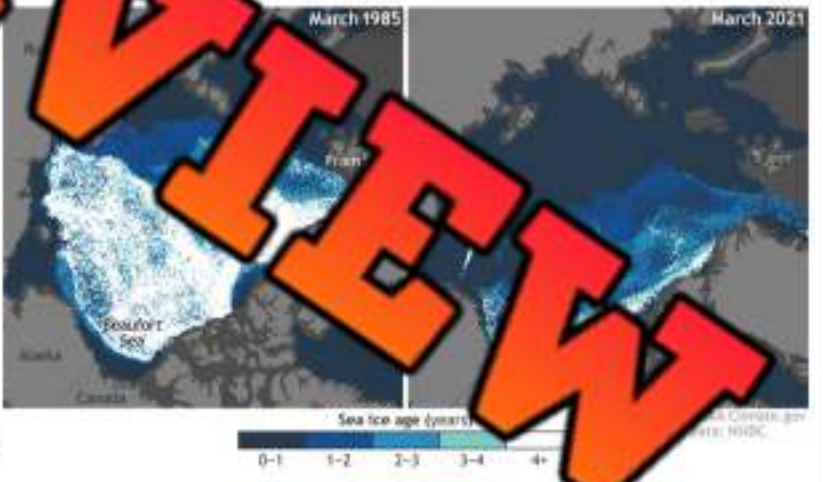
Climate change is a big shift in our planet's weather and temperature. Scientists can see these changes by watching different things over a long time, like many years or even decades. Three ways they do this is by looking at sea and ocean levels, how thick sea ice is and how long it lasts, and changes in something called permafrost.

Changes in S Ocean Levels

Sea and o how much water is in the oceans. When the Earth gets hotter, the wat e oce s and some ice melts, which makes the oceans rise. Scientists have b g h h the ocean is for a long time. In 1950, the sea level was about 0.25 etre e the average. But by 2020, the sea level was about 8.6 centimetres high avera t's a big change!

Changes in Sea Ice

Sea ice is another important thing to watch. It's ice that forms from sea water and covers our polar oceans. In the 1950s, the Arctic ice was thick and lasted all year. But by 2020, the ice was much thinner and didn't last as long. Sometimes, it even melted entirely in the summer. That shows us that the Earth is getting warmer.



Changes in Permafrost

Permafrost is a layer of soil or rock that stays frozen all the time. It's found in really cold places like the Arctic. Since 1950, scientists have noticed that the permafrost isn't as cold as it used to be. In some places, it's even starting to thaw. This can be a problem because it releases a gas called methane that can make climate change even worse.

Name: _____ 79

Curriculum Connection
ES.7

Sea Ice, Sea Levels, Permafrost

True or False

Circle whether the statement is true or false

1) Sea levels were lower in 1950 than in 2020.	True	False
2) Permafrost is a layer of soil or rock that stays frozen.	True	False
3) Methane gas is released when permafrost thaws.	True	False
4) The thickness of sea ice has increased over time.	True	False
5) The sea a levels have remained the same since 1950.	True	False

Ques

formation from the text to support your answer

1) What is perm is ortant to climate change?

2) Why is the decrease in the thickness and durati ea ice nt in understanding climate change?

Think

What effects do you think these changes are having on wildlife?

Name: _____ 80

Curriculum Connection
E5.8

Changes in Extreme Weather Events in Canada

Changes in the Frequency of Extreme Weather Events in Canada
In recent years, there's been a marked increase in the frequency and intensity of extreme weather events in Canada, largely attributed to climate change. Notably, events like wildfires, droughts, and heatwaves have surged in frequency.

Wildfires
In Canada, particularly in regions like British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, and Quebec, wildfires have posed a significant c ge. Over the last half-century, there has been an ble increase in wildfire activity.

I 00 nd the 1950s and 1960s, the country s n ave 0 fires per year, burning an average of 2 mil H r, by the early 2000s, the average num s incr over 13,000 per year, and the total ar ned ed to more than 2.5 million hectares.

Heatwaves
Heatwaves, defined as extended p ods ot weather, are becoming more frequent in Canada. Let's look at s to g arer picture. In the 1950s, heatwaves, characterized by temperatu xceedin relatively rare events. However, fast forward to 2020, and the scenario ange ally.

For instance, in Toronto, the average numbe mperatures exceeding 30°C was around five in the 1950s. But by 20 umbe limbed to almost 20 days per year, marking a four-fold increase. This in f intensity of heatwaves is primarily due to climate change and poses risks, particularly for vulnerable populations like the elderly and ch

Droughts
Similar to heatwaves, the frequency and severity of droughts in Canada have escalated in the past few decades. Droughts are characterized as prolonged periods of unusually dry weather, leading to severe water shortages affecting humans, animals, and plant life.

For a more concrete understanding, let's compare the drought data of the 1950s to that of 2020. In the 1950s, the Prairie provinces of Alberta, Saskatchewan, and Manitoba experienced mild to moderate drought conditions, affecting approximately 10% of the land area. By contrast, in 2020, severe drought conditions were reported to affect close to 40% of the Prairie land area, signifying a four-fold increase.

Name: _____ 81

Curriculum Connection
E5.8

Changes in Extreme Weather Events in Canada

True or False

Circle whether the statement is true or false

1) Wildfires have decreased in Canada over the years.	True	False
2) In the 1950s, Toronto had about 20 days per year over 30°C.	True	False
3) The frequency and severity of droughts have escalated in Canada.	True	False
4) Heatwaves in the 1950s were more frequent than in 2020.	True	False
5) The area a[illegible]d by wildfires in Canada increased to over 2.5 million hectares in [illegible]	True	False

Ques[illegible]

[illegible]ormation from the text to support your answer

1) How has the f[illegible]ildfir[illegible]ada changed from the mid-1900s to the early 2000s? Use the data [illegible]he re[illegible]

2) What changes have been observed in the severity [illegible] provinces from the 1950s to 2020?

3) Describe how the frequency of heatwaves in Toronto has changed from the 1950s to 2020.

Name: _____ 82

Curriculum Connection
ES.8

Extreme Weather Events Around the Earth

Extreme Weather Events in Specific Locations Around the Earth
Extreme weather events can have powerful impacts on the regions they strike, often causing significant damage to property and ecosystems and posing risks to human life. These events tend to be influenced by regional climate and geographical features.

Wildfires in British Columbia, Canada
Wildfires are a type of extreme weather event that often occurs in areas with hot, dry climates. In Canada, British Columbia is notably susceptible to wildfires due to its forests and summers. For example, the wildfire season of 2017 was the worst in British Columbia history, with wildfires burning over 1.2 million hectares of land.

Blizzards in Newfoundland and Labrador, Canada
Newfoundland and often experience severe blizzards, characterized by heavy snowfall and strong winds. The cold winters and geographical location make it a prime spot for these events. A notable example was the January 2020 blizzard that hit Newfoundland, dropping 76 cm of snow in St. John's in a single day.

Tornadoes in Tornado Alley, US
Tornado Alley in the United States, an area encompassing the states of Texas, Oklahoma, Kansas, and Nebraska, is infamous for its frequent tornadoes. The area's unique geography and atmospheric conditions make it a hotspot for these devastating storms. One of the most destructive tornadoes in U.S. history occurred in May 2011, striking Joplin, Missouri, and causing significant loss of life and property.

Monsoons in India
Monsoons, characterized by heavy rainfall and often accompanied by strong winds, are a common weather event in India, particularly during the summer months. The Western Ghats and northeastern states usually receive the highest rainfall. These rains are essential for agriculture, but when too severe, they can lead to catastrophic flooding, like the Kerala floods in 2018.

Typhoons in the Philippines
The Philippines, an island nation in the Pacific Ocean, is often hit by typhoons (the name for hurricanes in the Western Pacific). Its location in the warm waters of the Pacific typhoon belt makes it particularly vulnerable. One of the strongest typhoons ever recorded, Typhoon Haiyan (known in the Philippines as Super Typhoon Yolanda), struck the Philippines in November 2013, causing widespread devastation.

Name: _____ 83

Curriculum Connection
E5.8

Extreme Weather Events Around the Earth

True or False

Circle whether the statement is true or false

1) Newfoundland and Labrador are known for their frequent tornadoes	True	False
2) Tornado Alley is located in Canada.	True	False
3) Monsoons occur in the winter in India.	True	False
4) Typhoon Haiyan struck the Philippines in 2013.	True	False
5) Tornado Al[illegible]udes the states of Texas, Oklahoma, Kansas, and Nebraska.	True	False

Map

[illegible]untry that experiences extreme weather. Then label what [illegible]ather e[illegible] experience.

Question

Use information from the text to support your answer

Why do some regions around the world get more extreme weather events then others?

Name: _____ 84

Curriculum Connection
ES.8

Activity: Tornado in a Bottle

Background

What is this activity all about?

To understand the formation and function of a tornado by creating a model tornado in a bottle.

Materials

What will you need for this activity?

- Tw[illegible] bottles
- Wate[illegible]
- Glitter or la[illegible] optiona[illegible]
- Duct tape or a to[illegible]

Method

How you [illegible] co[illegible] ity

1. Fill one of the bottles about three-quarter[illegible] f wa[illegible]
2. If you want to visualize the tornado better, add a[illegible] s or la[illegible] or a sprinkle of glitter.
3. Take the second bottle and connect it to the first bottle's open[illegible] uct tape. Make sure the connection is secure and tight. Alternatively, yo[illegible] can use a tornado tube connector if you have one.
4. Turn the bottles over so that the bottle with the water is on top, and swirl it in a circular motion.
5. Watch as the water from the top bottle spirals into the bottom bottle, creating a tornado effect.

Name: _____ 85

Curriculum Connection
ES.8

Activity: Tornado in a Bottle

Observations

What happened?

1) What happened?

2) What does the water spiraling down represent in a real tornado?

Discussion

Answer the questions below.

1) What conditions in the atmosphere do you think are needed to create a tornado, based on your observations from the tornado in a bottle experiment?

2) How do you think the size and shape of a tornado might affect the damage it can cause?

3) Tornadoes are often associated with specific weather patterns and geographical areas. Based on the conditions needed to create our model tornado, why do you think certain areas might be more prone to tornadoes?

Name: _____ 86

Curriculum Connection
ES.9

Technologies Predicting Extreme Weather Events

Technologies Predicting Extreme Weather Events

Today, we're better equipped than ever before to predict extreme weather events, which can save lives and protect property. This is possible thanks to the rapid advancement in technology. Let's take a closer look at some of the key technologies used in weather forecasting: Radars, Weather Satellites, and Computer Modelling.

Radars

Radar, whic[illegible]or "Radio Detection and Ranging," is an essential tool in predicting weathe[illegible]sp[illegible]hose that might lead to severe storms. Weather radars send out radio w[illegible]es tha[illegible]pa[illegible]icles in the atmosphere. When these waves return to the radar dish, th[illegible]inform[illegible]out the distance, size, and nature of the particles, whether they [illegible]rain[illegible]s, or even insects. This information helps meteorologists detect where [illegible]or s[illegible]ing and how heavy it is.

Weather Satellites

Weather satellites orbit Earth from space, [illegible]pturing i[illegible]es ar[illegible]acting data about our planet's atmosphere, land, and oceans. They help [illegible]colo[illegible]ather patterns, monitor storm development, and provide a big-picture v[illegible]plane[illegible]ther.

Satellites can detect different things, such as temperat[illegible]mi[illegible] wind speed, and cloud patterns. Some satellites even capture images at night, enabling meteorologists to monitor weather conditions around the clock.

Computer Modelling

Computer modelling is a powerful tool used to predict weather conditions. Meteorologists input vast amounts of data from radars, satellites, and ground-based observations into supercomputers. These computers then run complex algorithms to simulate future weather patterns. The result is a weather forecast that predicts the likelihood of extreme weather events, like hurricanes or snowstorms, and their potential path and intensity.

Name: _____ 87

Curriculum Connection
ES.9

Technologies Predicting Extreme Weather Events

True or False

Circle whether the statement is true or false

1) Radar stands for "Radio Detection and Ranging."	True	False
2) Satellites can only capture images during the day.	True	False
3) Radars give information about the size and nature of atmospheric particles.	True	False
4) Weather satellites can track wind speed.	True	False
5) Radars ca tect snowflakes.	True	False

Ques

information from the text to support your answer

1) How do weath k t dict weather patterns?

2) What kind of information can weather satellites ?

Draw

Draw a diagram showing how a radar works. Label the rad dish, the radio wave, and the atmospheric particle it bounces off.

Name: _____ 88

Curriculum Connection
CS.1

RADAR Coding

RADAR works by sending a signal out and then measuring the signal being sent back. By sensing the strength of the return signal, RADAR devices can make a map of precipitation in an area.

RAdar Follow the codes below to put raindrops on the map using the coordinate plane

❑ (10, 7)	❑ (12, 4)	❑ (10, 6)	❑ (3, 4)	❑ (10, 5)
❑ (11, 5)	❑ (13, 4)	❑ (11, 7)	❑ (4, 3)	❑ (11, 6)
❑ (11, 4)	❑ (12, 5)	❑ (5, 2)	❑ (6, 4)	❑ (6, 2)
❑ (7, 2)	❑ (14, 5)	❑ (8, 2)	❑ (3, 3)	❑ (6, 3)
❑ (5, 3)	❑ (14, 4)	❑ (7, 3)	❑ (2, 3)	❑ (8, 3)
❑ (9, 3)	❑ (13, 5)	❑ (8, 4)	❑ (2, 4)	❑ (7, 4)

Name: _____ 90

Curriculum Connection
CS.1

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] ore than 50%
Then displ probably rain today"
```

Fetch means to find data

Coding Write y de that collects wind, rain, and temperature data and disp as essage on a screen

1)

2)

3)

Name: _____ 91

Curriculum Connection
CS.1

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** – as snow and stays frozen

Directions isplays which type of weather is coming. Write that would follow the If statements.

1) IF the snow the

THEN display, "

2) IF the snow melts and stay

3) IF the snow stays frozen

4) IF the snow melts and then refreezes before reaching the gr und

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

Name: _____ 94

Curriculum Connection
CS.1

Programming Flow Chart

Program Flow Chart – Basics

To represent an abstraction of how a system works, we can use a flow chart that simplifies the process. We use different shapes for different parts of the flowchart.

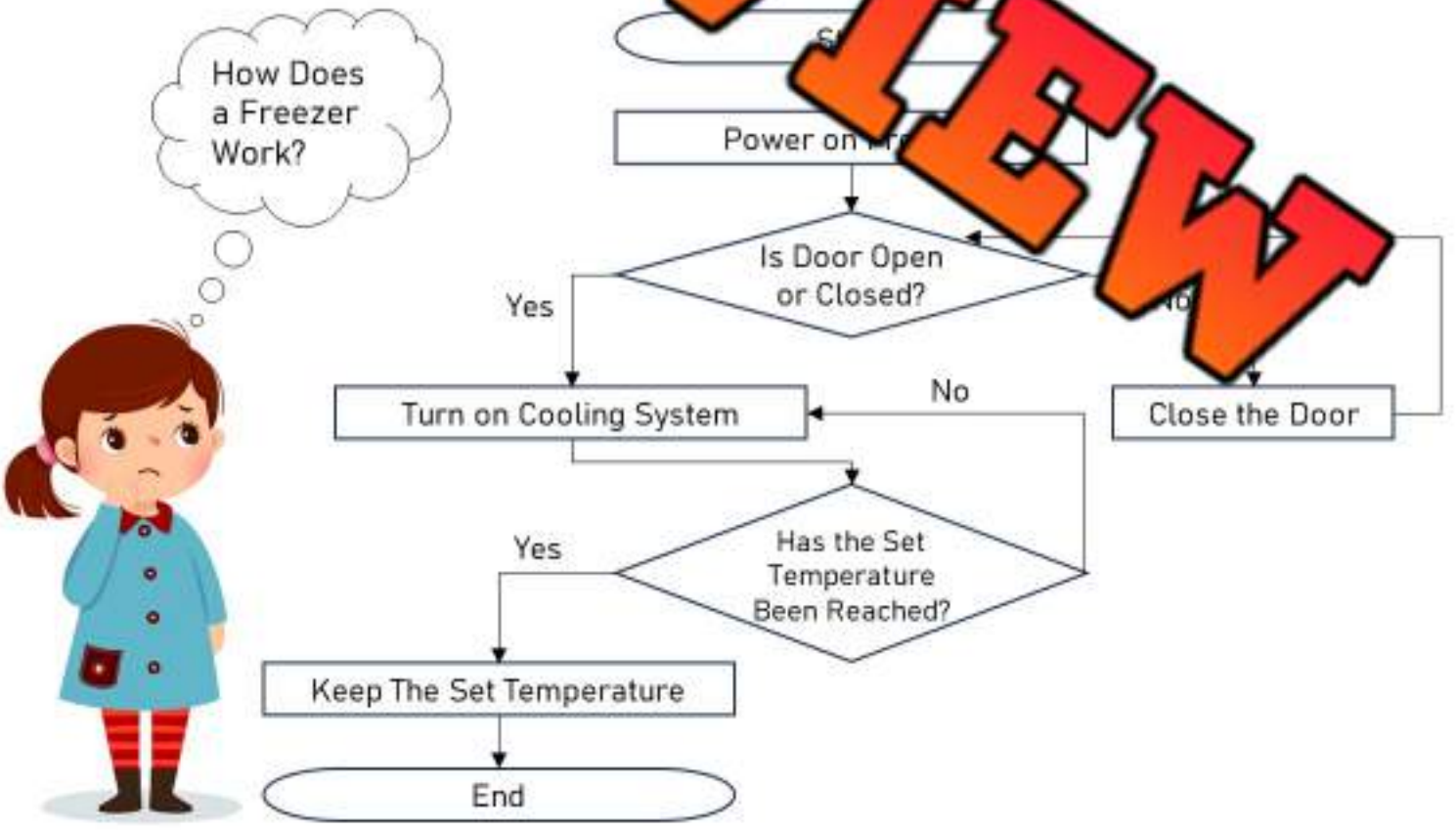
1) Start/End Symbol: This is usually represented by an oval shape. It shows where the process starts or ends. There's typically one start and one end symbol for each process.

2) Process Symbol: This is a rectangle. It represents a task or work being done. For example, 'turn the power' or 'set the temperature.'

3) Decision Symbol: This is a diamond shape. It represents a decision or a question that needs to be answered. For example, 'is the power on?' or 'is the door open?'

4) Arrow Symbol: These are the lines with arrows that connect the symbols. They show the direction of the process flow. An arrow should start from a process or decision symbol and end at another symbol.

5) Input/Output Symbol: This is sometimes called a data symbol. It represents information entering or leaving the system, such as user input or display results.



Name: _____ 95

Curriculum Connection
CS.1

Coding: Radar Programming Flow Chart

Plan Make a plan so you can program a radar system

1) What does a radar system do? How does it work?

2) Break down 4 or 5 steps a radar system does. For example:

1) Send radio wave 2) Does wave hit a particle? 3) Is the particle rain or snow?

1	
2	
3	
4	
5	

3) Which symbols will you use for each step above in your flow chart? Which steps have yes/no decisions? Which steps will loop back to the beginning. For example:

Step 2 in the example will loop back to Step 1 because if the wave doesn't hit the particle, the code needs to repeat.

Name: _____ 96

Curriculum Connection
CS.1

Coding: Radar Programming Flow Chart

Program Draw a flow chart for how a radar system works

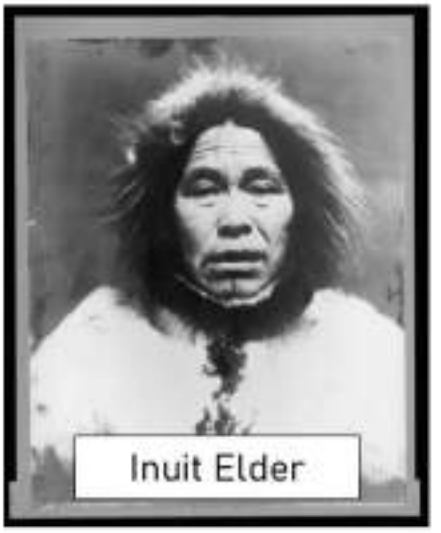
Name: _____ 97

Curriculum Connection
E5.10

Traditional Knowledge and Modern Technologies

Traditional Knowledge and Modern Technologies in Tracking Climate Change
Both traditional knowledge and modern technologies play an important role in providing information about long-term climate changes. These two methods may be different, but when used together, they can give us a more complete understanding of our environment.

Traditional Knowledge
Traditional k[illegible]ledge comes from local Elders and Knowledge [illegible] who have observed nature for many years. They [illegible]dge passed down through generat[illegible] patterns, animal behaviour, and cha[illegible]n the l[illegible]


Inuit Elder

For examp[illegible]ders i[illegible]ctic regions have observed changes [illegible]e co[illegible]nges in the migration patterns of a[illegible]tation over the years. These obse[illegible]elp u[illegible]nd how climate change is impacti[illegible]en[illegible]

Modern Technologies
Modern technologies refer to scientific tools use[illegible]searc[illegible]collect data about climate change. These include weather satellites[illegible]rs, a[illegible]models.

For example, weather satellites can monitor chang[illegible]lev[illegible] ice coverage, radars can track changes in precipitation, and co[illegible]f m[illegible]ict future climate conditions based on current trends. These tools prov[illegible] precise data about climate change.

Collaboration Between Elders, Knowledge Keepers, and Scientists
Both traditional knowledge and modern technology have unique strengths. When local Elders, traditional Knowledge Keepers, and scientists work together, they can share information and gain a more comprehensive understanding of local climate and climate change.

For instance, Elders and Knowledge Keepers can share their observations with scientists, who can then use modern technology to study these observations in a more detailed way. Scientists can share their findings with Elders and Knowledge Keepers, who can then connect these findings with their knowledge of local history and culture.

Name: _____ 98

Curriculum Connection
E5.10

Traditional Knowledge and Modern Technologies

True or False

Circle whether the statement is true or false

1) Traditional knowledge comes from local Elders and Knowledge Keepers.	True	False
2) Inuit Elders cannot observe changes in sea ice conditions.	True	False
3) Weather satellites are a type of modern technology.	True	False
4) Traditional knowledge cannot help us understand climate change.	True	False
5) Traditiona ledge is passed down through generations.	True	False

Questi

information from the text to support your answer

1) Why is traditio e in tant in understanding climate change?

2) How can local Elders, traditional Knowledge Kee and s work together to understand climate change better?

Write

Below, an Inuit Elder is working with a climatologist. What could they be saying?

Name: _____ Date: _____

Unit Test - Earth Systems

Multiple Choice /10

1. What causes sea levels to rise? a) Desertification b) Earthquakes c) Volcanic eruptions d) Climate change	2. Droughts are... a) Wet periods b) Cold snaps c) Dry periods d) Windstorms
3. What has increased due to climate change? a) Wildfires b) Plant life c) Oxygen levels d) Crop production	4. Radars detect... a) Animals b) Planets c) Weather d) Music
5. Satellites help with... a) Farming b) Building c) Fishing d) Forecasting	6. Global warming is caused by... a) Ozone depletion c) Greenhouse gases d) Lunar cycles
7. Which gas is a greenhouse gas? a) Oxygen b) Nitrogen c) Carbon dioxide d) Helium	8. What reflects most of sunlight back into space? a) Vehicles b) Forests c) Ice caps d) Deserts
9. Dinosaurs went extinct because of... a) Scientists aren't exactly sure b) Climate change c) Meteor hitting Earth d) Volcanic eruption	10. Meteor impacts affect climate by... a) Increasing oxygen b) Causing earthquakes c) Causing tsunamis d) Blocking sunlight

Definitions (1 marks each) **/3**

Term	Definition (what does it mean)
Climate	
Radar	
Greenh… Eff…	

Short Answer Questions (…ks e…

1. Why do we have different clim… the… d the world?

2. How has the frequency of wildfires changed over the past 50 ye…

3. What is happening to the sea ice on Earth? Why is it a problem?

Long Answer Questions **/10**

1) How has our climate changed over the last 100 years? Why is this a problem? Explain how Earth is habitable now but may become uninhabitable.

2) How do we track climate change? How do sc k w igenous groups to monitor climate change? What methods do Indigenous Elders u at meth tists use?