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Google Slides Lessons Preview

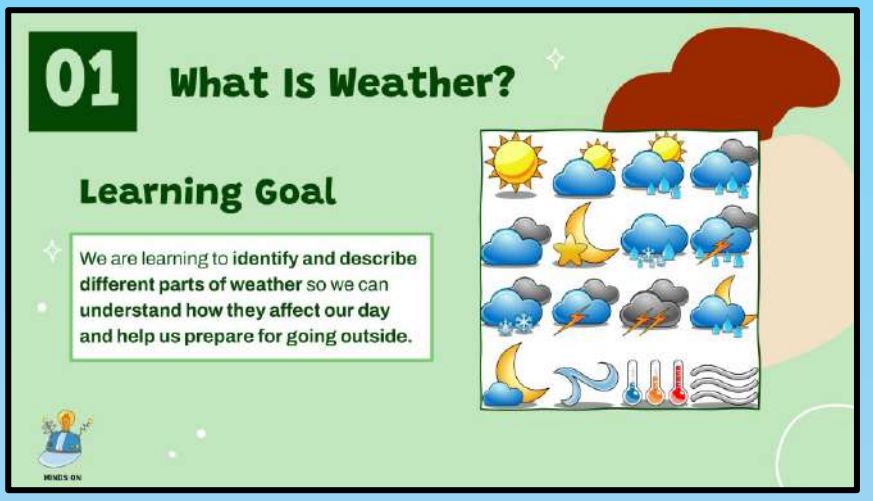
Alberta Science Curriculum

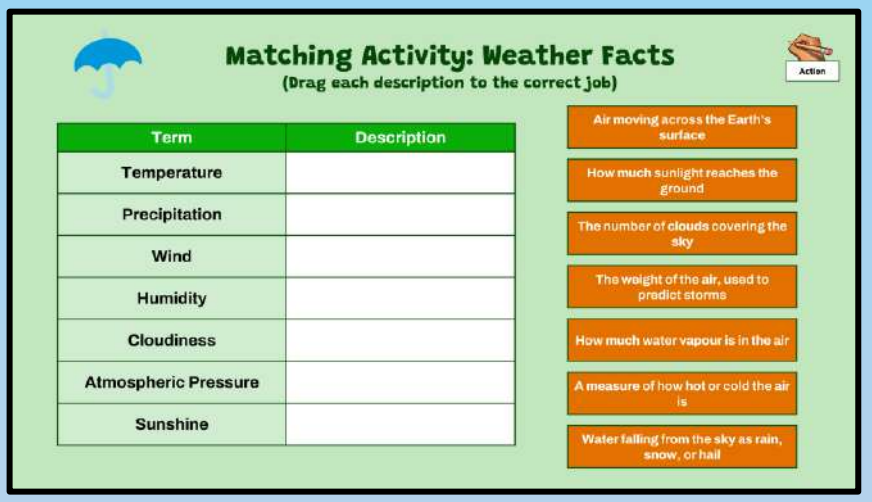
Earth Systems (Climate & Weather) – Grade 5

3-Part Lesson Format

Part 1 – Minds On!

- Learning Goals
- Discussion Questions
- Quotes
- And More!



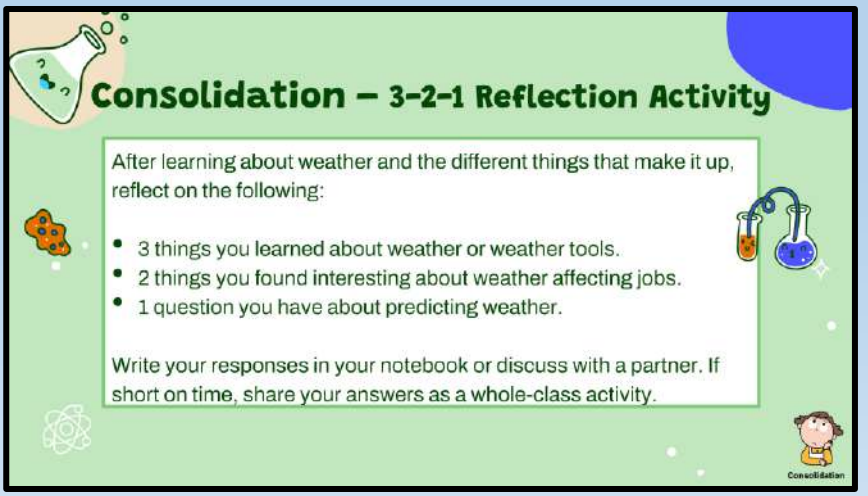


Part 2 – Action!

- Surveys/Polls
- Matching
- Drag and Drop
- Videos
- And More!

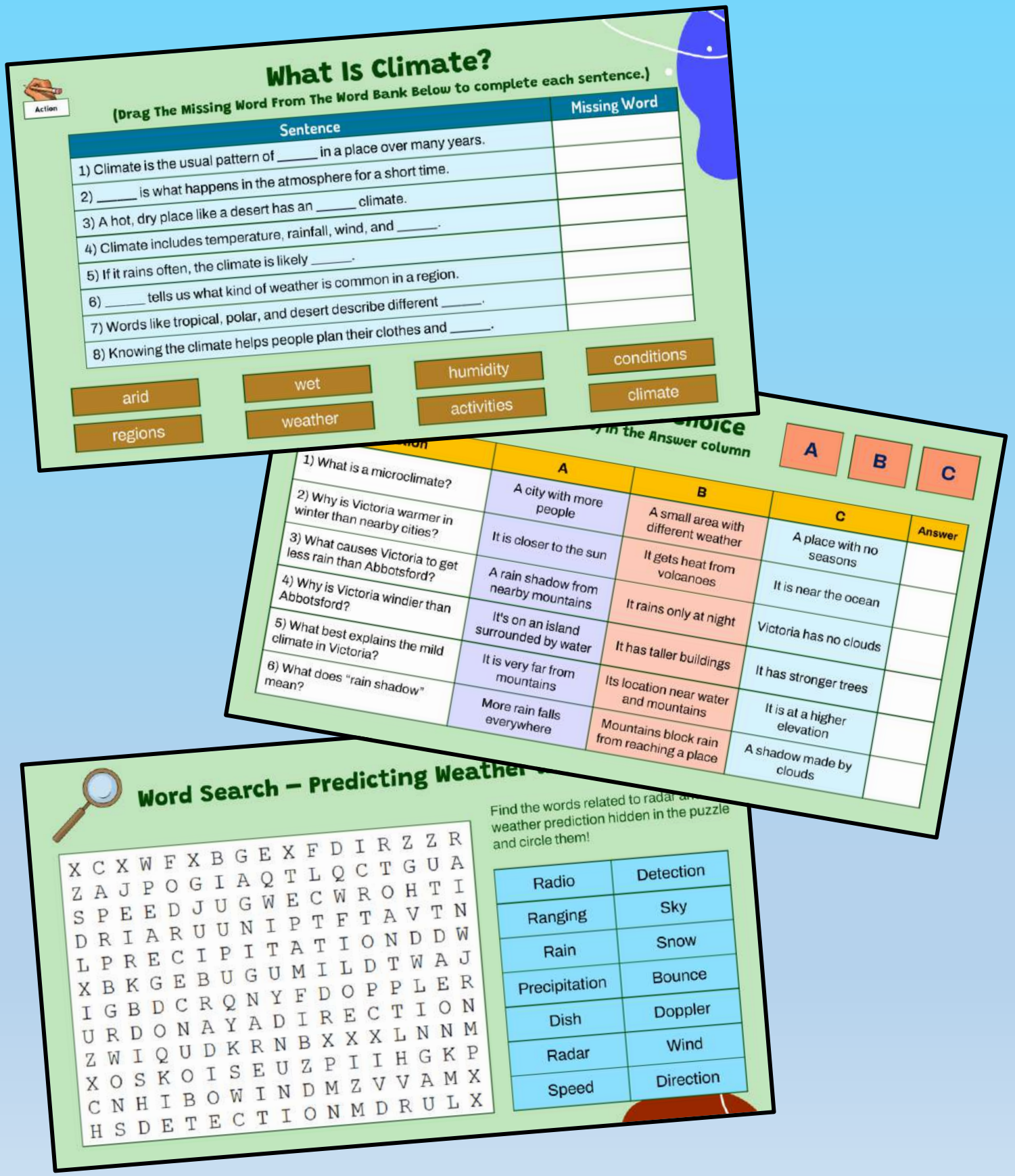
Part 3 – Consolidation!

- Exit Cards
- Quick Draw
- 3-2-1 Reflection
- One-Sentence Summary



Alberta Science Curriculum

Earth Systems (Climate & Weather) – Grade 5



What Is Climate?

(Drag The Missing Word From The Word Bank Below to complete each sentence.)

Action

Sentence	Missing Word
1) Climate is the usual pattern of _____ in a place over many years.	
2) _____ is what happens in the atmosphere for a short time.	
3) A hot, dry place like a desert has an _____ climate.	
4) Climate includes temperature, rainfall, wind, and _____.	
5) If it rains often, the climate is likely _____.	
6) _____ tells us what kind of weather is common in a region.	
7) Words like tropical, polar, and desert describe different _____.	
8) Knowing the climate helps people plan their clothes and _____.	

arid | wet | humidity | conditions

regions | weather | activities | climate

...hoice

...in the Answer column

A | B | C

...tion	A	B	C	Answer
1) What is a microclimate?	A city with more people	A small area with different weather	A place with no seasons	
2) Why is Victoria warmer in winter than nearby cities?	It is closer to the sun	It gets heat from volcanoes	It is near the ocean	
3) What causes Victoria to get less rain than Abbotsford?	A rain shadow from nearby mountains	It rains only at night	Victoria has no clouds	
4) Why is Victoria windier than Abbotsford?	It's on an island surrounded by water	It has taller buildings	It has stronger trees	
5) What best explains the mild climate in Victoria?	It is very far from mountains	Its location near water and mountains	It is at a higher elevation	
6) What does "rain shadow" mean?	More rain falls everywhere	Mountains block rain from reaching a place	A shadow made by clouds	

Word Search – Predicting Weather

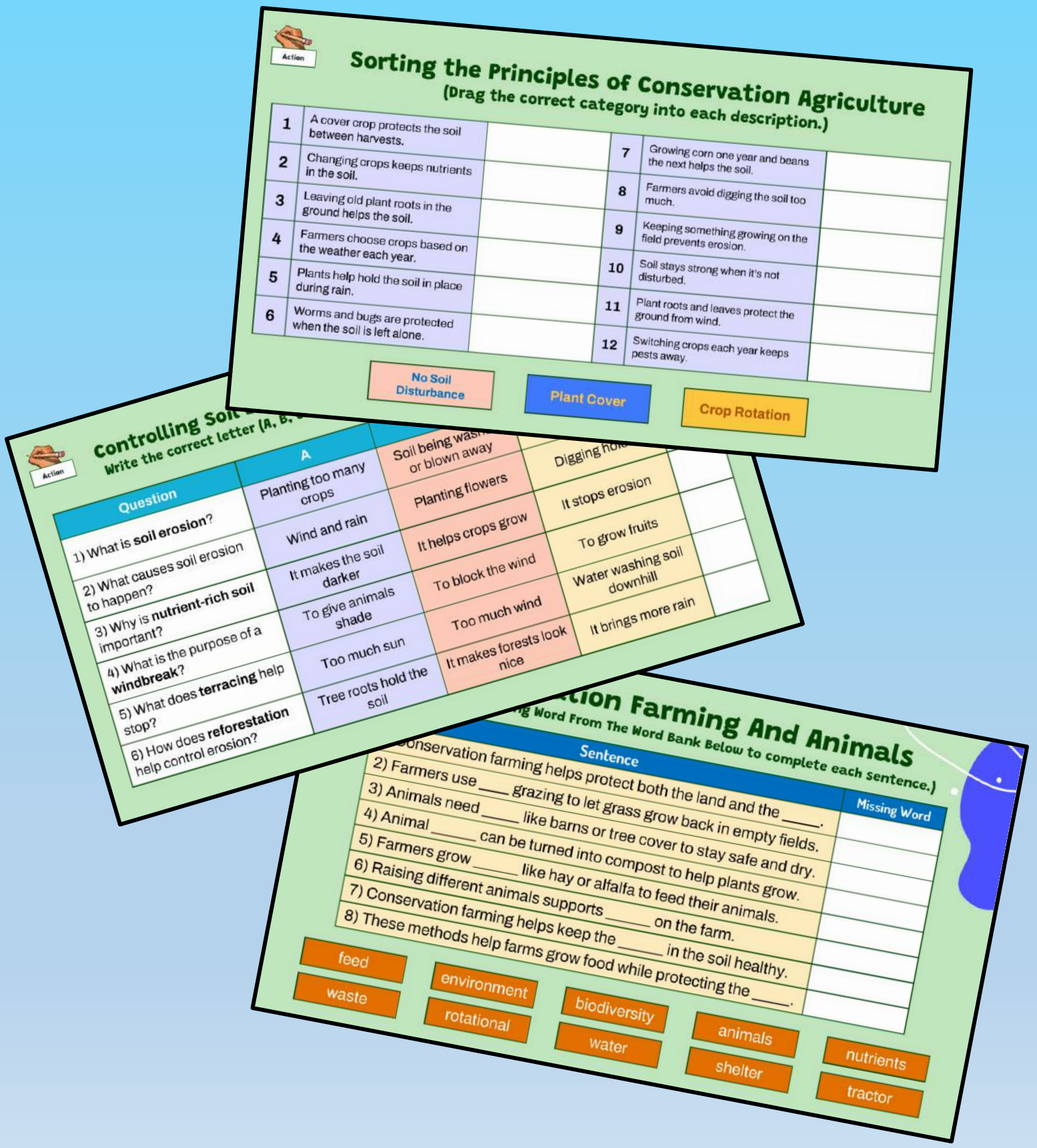
Find the words related to radar a... weather prediction hidden in the puzzle and circle them!

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

Radio	Detection
Ranging	Sky
Rain	Snow
Precipitation	Bounce
Dish	Doppler
Radar	Wind
Speed	Direction

Alberta Science Curriculum

Earth Systems (Climate & Weather) – Grade 5



Workbook Preview

Grade 5 – Science Unit

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

Guiding Question: How can climate and its effects be understood?

	Learning Outcome – Students analyze climate and connect it to weather conditions and agricultural practices	**Pages**
ES.1	Weather is the short-term conditions experienced in a region, including: temperature, wind speed and direction, amount of sunlight, precipitation, humidity, cloud cover Climate is the long-term weather patterns of a region over a period of at least 30 years. [illegible]	[illegible]-51, [illegible]-131
	First Nations, Métis, and Inuit can provide long-term observations of climate for local context.	
ES.2	Tools to measure and track weather conditions include: thermometers, wind vanes, windsocks, anemometers, barometers, rain or snow gauges, hygrometers Websites, weather maps, and weather apps provide access to weather information. First Nations, Métis, and Inuit communities rely on traditional knowledge, in addition to modern tools and methods, to interpret and predict weather patterns. Methods used to predict weather include: computer modelling, historical data, satellite imaging, First Nations, Métis, and Inuit traditional knowledge	7-23, 52-59, 63-65, 69-86, 126-131

Grade 5 – Science Unit

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

Guiding Question: How can climate and its effects be understood?

	Learning Outcome – Students analyze climate and connect it to weather conditions and agricultural practices	**Pages**
ES.3	Climate affects various aspects of human activity, including: agriculture, infrastructure, clothing, transportation, recreation Climate affects various aspects of animal activity, including: migration patterns, accessing food, timing of reproduction	87-94, 126-131
ES.4	Climate and weather events may influence agricultural practices by affecting components such as: crop type, crop production, animal population, soil quality, water access Conservation agriculture is a sustainable practice that responds to local climate and weather events. Conservation agriculture practices are adapted to the requirements of plants and animals farmed. Agricultural practices involve monitoring and responding to climate or weather events such as: drought, flooding, fires, windstorms Conservation agriculture practices include: minimizing soil disturbance, maintaining soil cover, using water efficiently, using sustainable harvesting practices Sustainable harvesting practices support the maintenance of stable plant or animal populations over time and include: crop rotation, companion planting, limiting hunting and trapping, considering future harvests	95-106, 114-123, 126-131
ES.5	Observations of weather conditions and animal behaviour can be used to recognize patterns and cycles, such as seasonal migration.	126-131
Computer Science:		
CS.1	Students apply design processes when creating artifacts that can be used by a human or machine to address a need.	60-62, 66-68, 107-113

NAME: _____

CLIMATE & WEATHER

Name: _____ 7

Curriculum Connection
ES.2

What Is Weather?

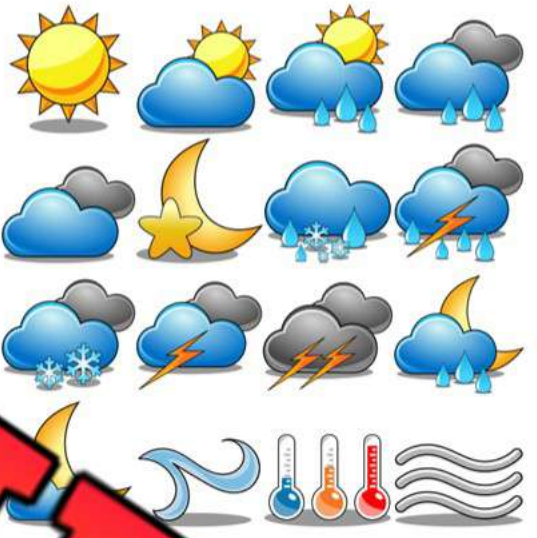
Weather is what we feel when we go outside. It includes things like temperature, precipitation, wind, humidity, cloudiness, atmospheric pressure, and sunshine.

1) Temperature

Temperature is how hot or cold it is. We use thermometers to measure it.

2) Precipitation

Precipitation is water that falls from the sky. This includes rain, snow, sleet and hail.



3) Wind

Wind is moving air. We measure wind speed with an instrument called an anemometer.

4) Humidity

Humidity tells us how much water is in the air. A hygrometer is used to measure it.

5) Cloudiness

Cloudiness tells us how many clouds are in the sky.

6) Atmospheric Pressure

Atmospheric pressure is how heavy the air is. Low pressure can mean bad weather, and high pressure can mean good weather.

7) Sunshine

Sunshine is how much sunlight is reaching us. It can change temperature and is measured with a sunshine recorder.

All these things work together to make our weather. It can change quickly, so it's good to check the forecast before planning your day.

Name: _____ 8

Curriculum Connection
ES.2

True Or False

Circle whether the statement is true or false

1) Wind is measured with a thermometer	True	False
2) Humidity is how much water is in the air	True	False
3) The amount of sunshine can affect air temperature	True	False
4) Precipitation means only rain	True	False
5) Atmospheric pressure is how heavy the air is	True	False

Explain

Describe each of the weather indicators below

Temperature	
Precipitation	
Wind	
Humidity	
Cloudiness	
Atmospheric Pressure	
Sunshine	

Making Connections

Without using any tools, describe the weather where you are

Curriculum Connection
ES.2

Exit Cards

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

Name: _____

Match each weather term to the correct description.

Mark

Temperature	☐ A) Water falling from the sky
Precipitation	☐ B) How hot or cold the air is
Wind	☐ C) How much water is in the air
Humidity	☐ D) Moving air measured with a tool

Name: _____

Match each weather term to the correct description.

Mark

Temperature	☐ A) Water falling from the sky
Precipitation	☐ B) How hot or cold the air is
Wind	☐ C) How much water is in the air
Humidity	☐ D) Moving air measured with a tool

Name: _____

Match each weather term to the correct description.

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Temperature	☐ A) Water falling from the sky
Precipitation	☐ B) How hot or cold the air is
Wind	☐ C) How much water is in the air
Humidity	☐ D) Moving air measured with a tool

Name: _____

Match each weather term to the correct description.

Mark

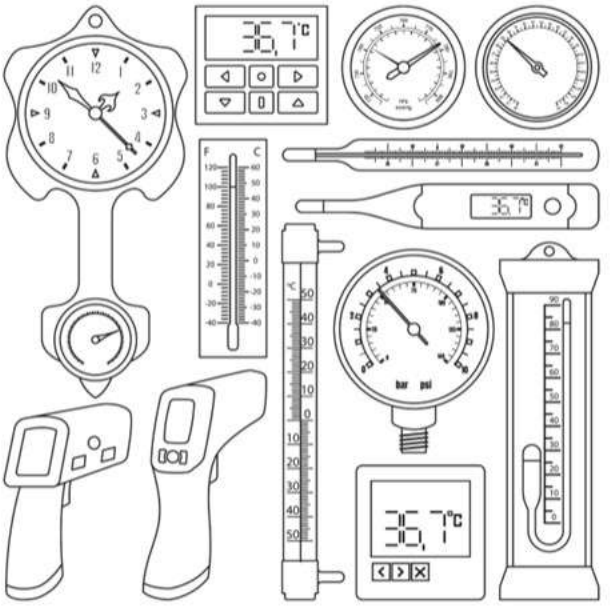
Temperature	☐ A) Water falling from the sky
Precipitation	☐ B) How hot or cold the air is
Wind	☐ C) How much water is in the air
Humidity	☐ D) Moving air measured with a tool

Name: _____ 14

Curriculum Connection
ES.2

Simple Weather Tools

Simple Weather Tools We Use
Weather is something we experience every day, and understanding it is important. There are several simple tools that scientists, called meteorologists, use to measure different parts of the weather.



Anemom
Anemo wind speed using spin ey spin, the stronger the win

Wind Vanes
Wind vanes, or weat van direction of the wind. It s shaped an arrow and spins on a pot ind rrow, and the end of the arrow points to the direction the wind com

Barometers
A barometer measures air pressure, which is ght our atmosphere. Changes in air pressure can tell us a lot about eath if the air pressure drops quickly, it often means that a storm i

Hygrometers
Hygrometers measure humidity, or the amount of water vapor in humidity is high, it often feels hotter than it really is. Low humidity can he air feel dry. This tool is important for understanding how comfortable we' t outside and for predicting rain.

Lightning Detectors
These tools detect lightning strikes, helping keep people safe during storms.

Rain Gauges
Rain gauges measure rainfall. They're clear containers with measurement markings.

Thermometers
Thermometers show temperature by using liquid that expands when hot and contracts when cold.

Name: _____ 15

Curriculum Connection
ES.2

True Or False

Circle whether the statement is true or false

1) Anemometers measure wind speed.	True	False
2) Hygrometers show how much moisture is in the air.	True	False
3) The arrow on a wind vane points to where the wind is coming from	True	False
4) Low air pressure means good weather	True	False
5) Rain ga[illegible]are complex tools that are hard to use	True	False

Mat[illegible] W[illegible]he letter from the description beside the matching weather tool

Answer	[illegible]ool	Description
	[illegible]mete	[illegible] device that indicates how hot or cold it is
	Barom[illegible]	B) [illegible] shows the direction of the wind
	Hygrometer	C) [illegible]s th[illegible]unt of water vapor in the air
	Lightning Detector	D) Records h[illegible] much [illegible]s fallen
	Rain Gauge	E) Detects [illegible] an[illegible]ing strike has occurred
	Thermometer	F) Measures the speed [illegible]the
	Wind Vane	G) Measures the weight of the [illegible] atmosphere

Making Connections

Which of these tools have you used or heard of? Explain.

Name: _____ 16

Curriculum Connection
ES.2

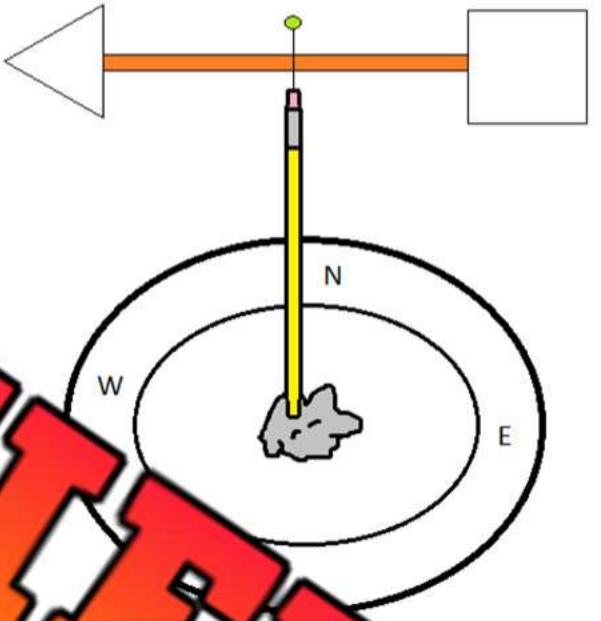
Experiment – Making A Weather Vane

Objective What are we learning more about?

In this activity, students will learn about wind direction by creating their own weather vane.

Materials What do we need?

- ✓ A p[illegible]r plate
- ✓ Clay
- ✓ A plastic d[illegible]aw
- ✓ A pencil with a[illegible]er
- ✓ Thin cardboard
- ✓ Scissors
- ✓ A pin
- ✓ Tape
- ✓ Markers or crayons for decoration



Method How do we complete the experiment?

1) First, cut two shapes out of your cardboard for the arrow: a tria[illegible] arrowhead and a square for the back of the arrow.
2) Decorate your arrowhead and tail with markers or crayons.
3) Attach the arrow to one side of the straw and the tail to the other side using tape.
4) With your pencil standing up, place the straw arrow on top of the eraser so that the eraser is in the middle of the straw. Push the pin down through the straw and into the eraser. When looking at the pencil from the front view, you should see the arrow and tail. Make sure the straw can spin around the pin.
5) Now to make the base, take the paper plate and write the cardinal directions – north, east, south, and west.
6) To finish the base, make a ball out of clay. Stick the pencil in the clay and then attach it to the middle of the plate.

Name: _____ 17

Curriculum Connection
ES.2

Observations

Place your weather vane outside and observe

1) Which direction did the arrow on your weather vane point most often? Why do you think this is?

2) Did the wind ever change directions? Explain.

3) Describe the w... What direction is it moving? How windy do you think it is?

Results

Answer the questions below

1) How did the weather vane respond to changes in wi...

2) What are some ways that people can use information about wind direction in everyday life?

Name: _____ 18

Curriculum Connection
ES.2

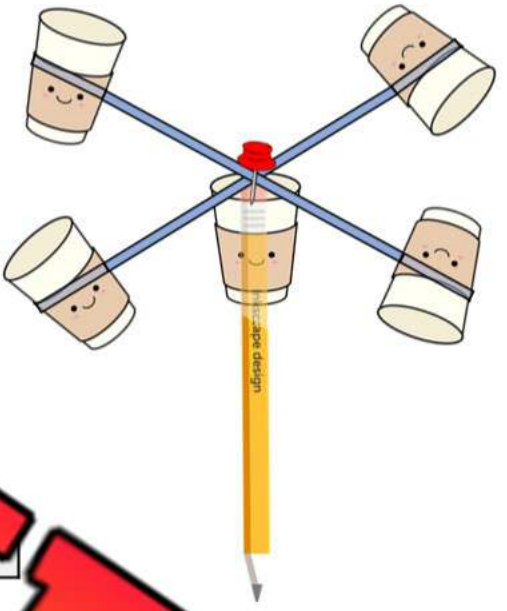
Experiment – Making An Anemometer

Research Question — What are we learning more about?

An **anemometer** is used to measure wind speed. It works by determining how many revolutions per minute (RPM) the tool makes. In other words, it is how many times the anemometer spins in a full circle in one minute.

Materials — What do we need?

- ✓ 5 c
- ✓ 2 straws
- ✓ 1 pin
- ✓ A paper p
- ✓ Scissors
- ✓ Stapler
- ✓ Sharp pencil with an o the e
- ✓ A fan with 3 different spe test



Method — How do we complete th perime

1) Take four of the paper cups and punch a ho ne si e of the cups, about a 2 cm below the rim
2) Take one of the paper cups and put one of the straws it. art of the straw inside the cup and staple it to the opposite side the p. This will secure the straw to the cup. Repeat this process with ing just one other cup.
3) Using the fifth cup, punch four equally spaced holes in the sides of the cup, about 2 cm below the rim. Then punch a hole in the centre of the bottom of the cup
4) Take one of your cups with the straw through it and put the straw through the fifth cup. Attach one of the 2 remaining cups to the end by bending the straw inside the cup and stapling it. Repeat this step with the other cups.
5) Make sure your cups are all aligned properly, so that they open facing the exact same direction every time.
6) Push the eraser end of the pencil through the bottom hole of the fifth cup.
7) Push the pin down through the two intersecting straws into the eraser. Do not push too far or the anemometer won't spin well due to friction

Name: _____ 19

Curriculum Connection
ES.2

Observations — Test out your anemometer

1) Now that your anemometer is ready, it is time to test it. Turn the fan on low and stand back about 6-8 steps

2) Use a marker to draw something on one of the cups. This will make it easier to count that cup spinning.

3) Hold the anemometer up and count how many times it spins around fully in one minute. If it moves too fast back up from the fan.

4) Repe[illegible]h of the different fan speeds and record the wind's RPM

[illegible]eed	[illegible] – 1st [illegible]ng	RPM – 2nd Reading	RPM – 3rd Reading	Average
Low				
Medium				
High				

Results — Answer the questions below

1) What is an anemometer?

2) What did you notice about the wind speed and the fan speed?

3) When would it be helpful to know the wind speed?

Name: _____ 20

Curriculum Connection
ES.2

Graph	Make a line graph below

1) How many RPMs would you predict a speed between Low and Medium ld have?

2) How many RPMs would a setting that was one more increment stronger than High produce? Explain.

Name: _____ 21

Curriculum Connection
ES.2

Experiment – Making An Anemometer

Objective

What are we learning more about?

In this activity, students will learn about precipitation and how it's measured by constructing their own rain gauge.

Materials

What do we need?

- ✓ A cl[illegible]ided plastic container (like a water b[illegible])
- ✓ Ru[illegible]
- ✓ Permane[illegible]k
- ✓ Scissors
- ✓ Tape
- ✓ Pebbles or small stones

Method

How do we complete the [illegible]xperime[illegible]

1) Prepare Your Container: If you're using a pla[illegible]ate[illegible]d need to cut the top off to make the top open. You can ask an adu[illegible]p with thi[illegible]

2) Add Weights: To prevent your rain gauge from tipping ov[illegible]n th[illegible] pebbles or small stones to the bottom.

3) Mark the Measurements: Using your permanent marker and ruler, dr[illegible]easurement lines on the side of the container. Start from the top of the pebbles or stones and draw a line every centimeter (or millimeter) up to the top of the container.

4) Secure the Top: If you're using a cut bottle, you can invert the top and place it back into the bottle like a funnel to help catch rain. Secure this with tape around the edges.

5) Place Your Rain Gauge: Put your rain gauge outside in an open area where it can easily catch the rain. Make sure it's secure and won't tip over.

6) Check the Rain Gauge: After a rainy day, check your rain gauge and record how much rain has fallen by reading the level on your measurement lines.

Name: _____ 22

Curriculum Connection
ES.2

Observations Fill in the table below. For the time, state how many hours have passed, or just write the date.

Time or Date	Centimetres/Millimeters of Rain

Results Answer the questions be

1) How much rain fell in your rain gauge?

2) What could happen if there is too much or too little rain?

3) How could changes in the amount of rain affect people and the environment?

Name: _____ 23

Curriculum Connection
ES.2

Experiment – Making A Rain Gauge

Graph | Make a line graph below

1) Which date or time had the most rainfall?
2) Which date(s) or time(s) had the least rainfall?
3) How much total rainfall was there?

Name: _____ 24

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 rece lot of rain throughout the year, we'd say it has a w e. If it's often hot, we'd say it has a hot clima se like tropical, desert, and polar to desc differ clim ates.

Weather vs. Climate: What's th

Many people confuse wea with clima y are not the same. Weather describes the conditions of the atmosphe er a time, such as hours or days. For example, it could be sunny one day and the nex

On the other hand, climate tells us what kin weathe ical in a place over many years. If you live in a desert, for example, y xpe d 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: _____ 25

Curriculum Connection
ES.1

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 rainy and cold" is describing climate.	True	False
5) "We live[illegible]tropical climate" is describing weather.	True	False

Questi[illegible]er the questions below

1) What does cl[illegible]

2) What is the difference between weat[illegible] clima[illegible]

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

Climate	
Weather	

Making Connections

Describe the climate where you live

Name: _____ 26

Curriculum Connection
ES.1

Comparing Climate Data

Comparing Climate Data in Alberta

The climate of cities in Alberta will differ depending on where in Alberta they are. In the northern parts of Alberta, it is generally colder than in the southern parts.

In g l, Fort McMurray experiences colder winters and milder su th a regular distribution of rainfall throughout the y ge more southern, has slightly warmer condition and its ess frequent and mostly concentrated in the spring a m mont nowfall is also less substantial compare he

	(North)	Lethbridge (South)
Winter Average Temperature	-18 °C	-6 °C
Summer Average Temperature	17	22 °C
Annual Precipitation	4	380 mm
Snowfall	162 cm	cm
Dominant Climate Type	Subarctic climate	S
Average Wind Speed	12 km/h	
Average Number of Clear Days per Year	120 days	1 ays
Average Number of Rainy Days per Year	100 days	70 days

Climate Types

- Semi-Arid Climate: This is a climate where it doesn't rain much, summers are hot, and winters aren't too cold.
- Subarctic Climate: This is a climate with really cold winters and short summers that aren't very warm, usually found near the North Pole.

Name: _____ 27

Curriculum Connection
ES.1

True Or False

Circle whether the statement is true or false

1) Fort McMurray has a semi-arid climate.	True	False
2) Lethbridge experiences more clear days than Fort McMurray.	True	False
3) Lethbridge's average summer temperature is 22°C.	True	False
4) Fort McMurray gets less snowfall than Lethbridge.	True	False
5) The ave[illegible]winter temperature in Lethbridge is -18°C.	True	False

Ques[illegible]wer the questions below

1) Based on th[illegible], whic[illegible]would you rather live in?

2) In one paragraph each, describe Lethbridge's [illegible]e and [illegible]urray's climate.

Lethbridge	[illegible]t McM[illegible]

Curriculum Connection
ES.1

Exit Cards

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

Name: _____ Mark

Explain the meanings of the terms below.

Semi-Arid Climate	
Subarctic Climate	

Name: _____ Mark

Explain the meanings of the terms below.

Semi-Arid Climate	
Subarctic Climate	

Name: _____ Mark

Explain the meanings of the terms below.

Semi-Arid Climate	
Subarctic Climate	

Name: _____ Mark

Explain the meanings of the terms below.

Semi-Arid Climate	
Subarctic Climate	

Name: _____ 31

Curriculum Connection
ES.1

Climate Zones – Where Do Most People Live?

Climate Zones

There are 3 main climate zones in the world. If you live in one zone, your climate will be like someone else who lives in the same zone.

1) Polar and Subpolar Zone

- Cold summers and very cold winters
- Extreme cold in the polar
- Treeless tundra, glacier, permanent layer of ice
- Very dry with not much rainfall, some areas are considered a desert
- Not ideal places to live, difficult to grow crops naturally

2) Temperate Zone

- Moderate temperatures with not much extreme heat or
- Zone will experience snow in the winter and during seasons
- Most of the population in the world lives in the temperate zone because it is the largest and it is ideal for agriculture. It receives plenty of and does not have the extreme summers or winters that can kill plants.

3) Tropical and Subtropical Zone

- Warm temperature throughout the year – there is no marked winter season
- There is lots of rainfall
- Tropical winds can cause hurricanes and tsunamis
- Long growing season which allows many crops to grow that can't grow in the temperate zone – pineapples, bananas, mangos, and more
- The tropical zone is heavily populated. The people who live there need to be able to handle extreme heat and sun exposure. Many locals will have darker skin tones.
- Most of the population in this zone live along the coastal regions

Name: _____ 32

Curriculum Connection
ES.1

True Or False

Circle whether the statement is true or false

1) Most people live in the tropical zone	True	False
2) The temperate zone has the same temperature all year	True	False
3) The polar region has extreme cold most of the year	True	False
4) Most people live in the temperate region	True	False
5) The pol region has hurricanes and tsunamis	True	False

Ques

Answer the questions below using evidence from the text

1) Which climat yo nt to live in?

2) Describe the 3 different climate zone

Polar	
Temperate	
Tropical	

Questioning

Write 2 questions you have about the reading

1)	
2)	

Name: _____ 33

Curriculum Connection
ES.1

Research Activity – Climate Zones

Research Fill in the table to learn more about the climate zones

Climate Zones	Temperatures	Precipitation	Wind/Storms
Polar Z			
Subpolar Zone			
Temperate Zone			
Sub Tropical Zone			
Tropical Zone			
Equatorial Zone			

Name: _____ 34

Curriculum Connection
ES.1

Choose 2 countries that you are interested in to research. Make sure the two countries are in different climate zones. Answer the questions below about the two countries.

Research | Answer the questions below

Questions	Country 1	Country 2
1) Which country did you choose?		
2) Which [illegible] is the c[illegible]		
3) Describe the clim[illegible] in the country.		
4) What is the population of the country?		
5) What is the population density of the country?		
6) If the population density is high, why do you think people want to live here? If it is low, why don't more people live here?		

Name: _____ 35

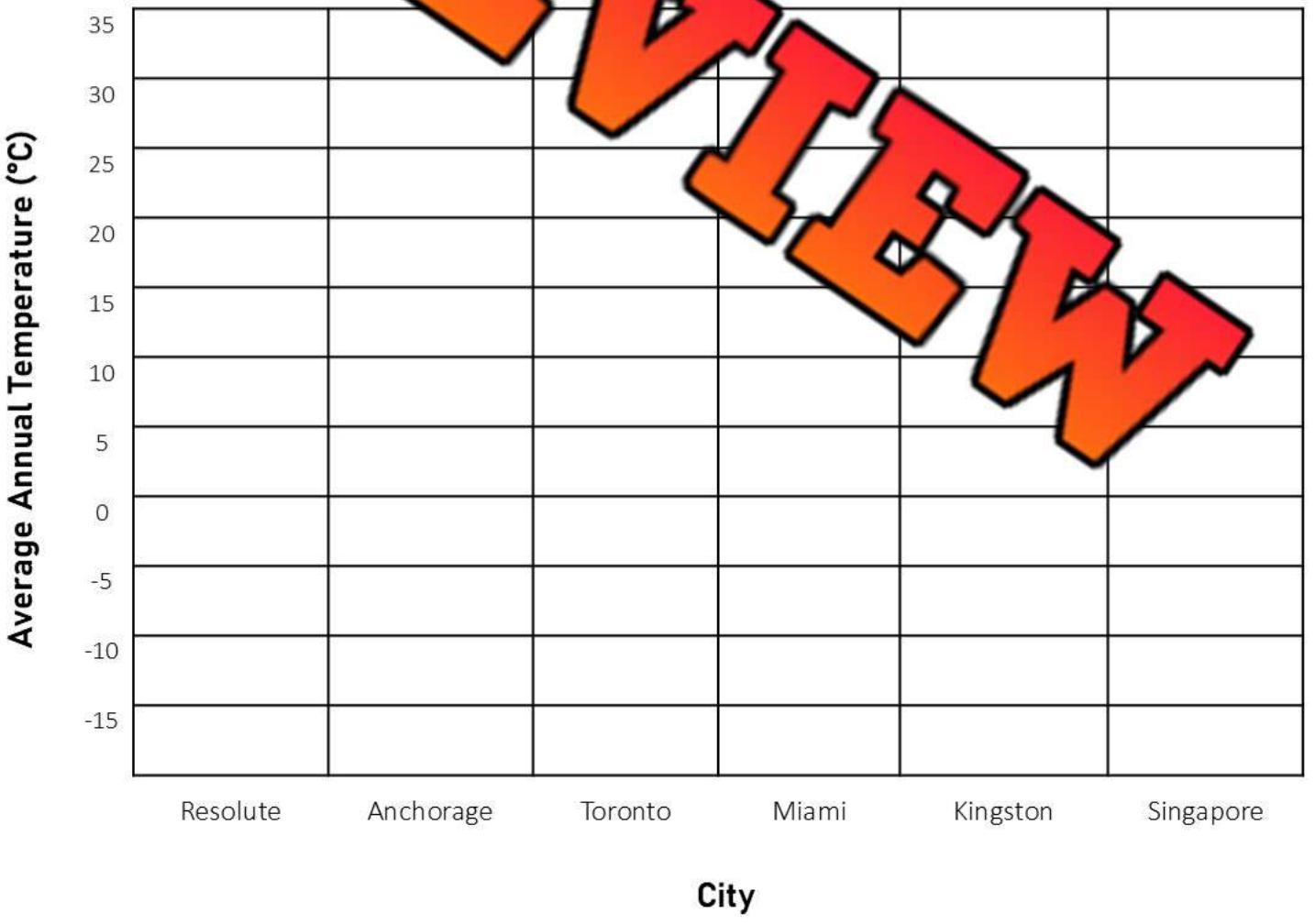
Curriculum Connection
ES.1

Graphing Climate Data

Graph | Draw a bar graph of the average temperatures in cities around the world

City, State/Province (Climate Zone)	Average Annual Temperature (°C)
Resolute, Nunavut, Canada (Polar)	-15
Anchorage, Alaska, USA (Subpolar)	2
Toronto, [illegible] Canada (Temperate)	9
Miami, [illegible] ubtropical)	25
Kings[illegible] Jamaic[illegible])	27
Singapore, Si[illegible]	27

Average [illegible] of Cities in Different Climate Zones



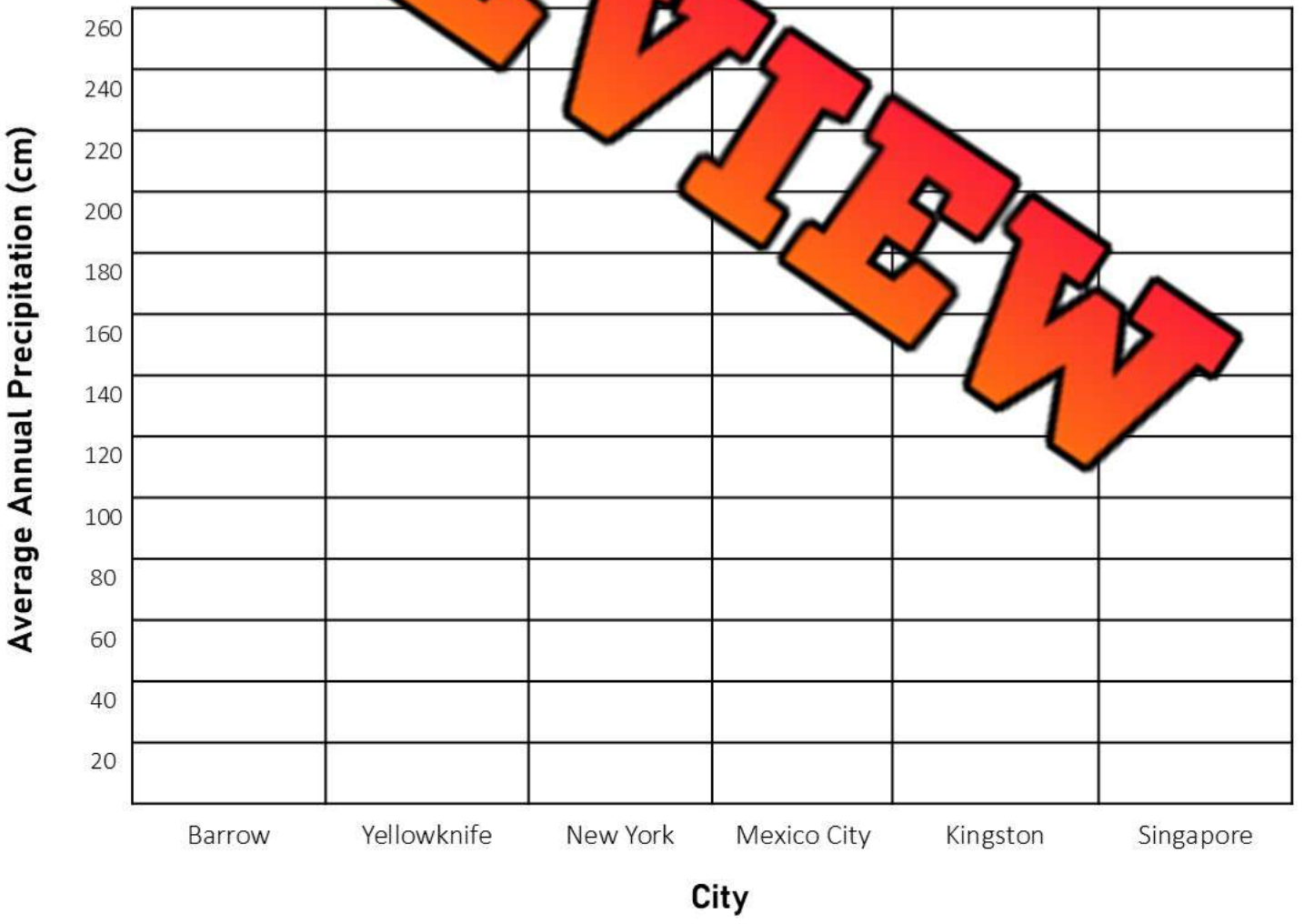
Name: _____ 36

Curriculum Connection
ES.1

Graph Draw a bar graph of the average temperatures in cities around the world

City	Climate Zone	State/Province	Average Annual Precipitation (cm)
Barrow	Polar	Alaska, USA	11
Yellowknife	Subpolar	Northwest Territories, Canada	28
New York	Temperate	New York, USA	126
Mexico City	Subtropical	Distrito Federal, Mexico	88
Kingston	Tropical	Jamaica	130
Singapore	Tropical	Singapore	234

Average Annual Precipitation of Cities in Different Climate Zones



Name: _____ 37

Curriculum Connection
ES.1

Interpret ...ne gra...l in the table. Then answer the questions.

City	Climate Zo...	St... .../Country	Average Annual Snowfall (cm)
Barrow	Polar	...aska, U...	
Yellowknife	Subpolar	Northwest Te...es, Ca...	
Chicago	Temperate	Illinoi...SA	
Sapporo	Subtropical	Hokkaido, Jap...	
Mexico City	Tropical	Mexico	
Nairobi	Equatorial	Kenya	

1) Barrow gets more than 100 cm but less than 200 cm of snowfall.	True	False
2) Yellowknife gets more than ten times the snowfall of Mexico City.	True	False
3) Chicago gets less than 100 cm of snowfall annually.	True	False
4) Sapporo gets more snowfall than the rest of the cities combined	True	False
5) Yellowknife receives more than 200 cm of snow annually.	True	False
6) Sapporo gets more than twice as much snowfall as Chicago.	True	False
7) The total snowfall of Yellowknife and Barrow is more than 300 cm.	True	False

Name: _____ 38

Curriculum Connection
ES.1

Fact Or Fiction – Climate Zones

Objective

What are we learning about?

Students will learn about climate zones by deciding if statements read aloud are true or false. This activity encourages critical thinking about facts or myths they may believe about certain areas around the world.

Materials

...you will need for the activity.

- Fact ... Fiction ...s
- A 'Fact' sign a... ...ction' ...nguish the two sides of the ro...
- Designated areas in the cla...m t... 'Fact' and 'Fiction' signs, allowing s... stude... to move to either side

Instructions

How you will complete the activity

1. Your teacher will read statements from cards. Pay close attenti... ...ent is shared.
2. Consider carefully whether you think the statement is true or false.
3. If you decide the statement is true, walk to the 'Fact' side of the room.
4. If your guess is that it's not true, move to the 'Fiction' side of the room.
5. Stay on your chosen side and listen attentively for the correct answer to be revealed.
6. When the right answer is announced, return to your seat, ready for the next round.
7. Have fun getting up and moving!

Name: _____ 39

Curriculum Connection
ES.1

Fact Or Fiction | Read the statements to the class.

#	Statement	
1	Climate is the same as weather.	Fiction
2	Weather changes quickly, but climate takes many years to change.	Fact
3	Climate includes temperature, rainfall, and wind speed.	Fact
4	Subarctic climates are warm and rainy all year.	Fiction
5	Trop[illegible]es are near the equator and are warm and sunny.	Fact
6	Th[illegible] hot summers and cold winters.	Fiction
7	[illegible]of the w[illegible]pulation lives in the polar zone.	Fiction
8	The temp[illegible]as f[illegible]easons and many weather types.	Fact
9	Semi-arid c[illegible] have [illegible]ers and winters that aren't too cold.	Fact
10	The subequatorial zo[illegible]t a[illegible]ns.	Fact
11	In the subtropical zone, wi[illegible]ers a[illegible]nd [illegible]ers are cool.	Fiction
12	Climate zones help group places [illegible]h simila[illegible]g-te[illegible]eather.	Fact
13	Subpolar zones are warm and great for [illegible]g foo[illegible]	Fiction
14	The tropical zone has no marked winter seaso[illegible]	Fact
15	People in tropical zones deal with extreme heat a[illegible]	Fact
16	Subarctic climates are usually found near the North Pole.	[illegible]ct
17	Polar and subpolar zones are ideal for farming.	Fiction
18	Weather patterns like rainfall and snow are part of climate.	Fact
19	Weather and climate describe the atmosphere at different times.	Fact
20	The tropical zone has cold winters and mild summers.	Fiction
21	Subarctic areas often have short summers and long, cold winters.	Fact
22	Climate zones are based on plant and animal types.	Fiction
23	Temperate climates are only found near the equator.	Fiction
24	Subtropical zones have mild winters and hot summers.	Fact
25	Most people live in the temperate zone.	Fact

Name: _____ 40

Curriculum Connection
ES.1

Quiz Check-In	This quiz will assess students' understanding of the concepts covered in the Fact or Fiction activity.

Name: _____

Mark

Is the statement true (T) or false (F)?

1) Weather changes quickly, but climate takes many years to change.	T	F
2) Most of the world's population lives in the tropical zone.	T	F
3) In the subtropical zone, winters are cold and summers are cool.	T	F
4) Polar and subpolar zones are ideal for farming.	T	F
5) Subarctic areas often have short summers and long, cold winters.	T	F

Name: _____

Mark

Is the statement true (T) or false (F)?

1) Weather changes quickly, but climate takes many years to change.	T	F
2) Most of the world's population lives in the tropical zone.	T	F
3) In the subtropical zone, winters are cold and summers are cool.	T	F
4) Polar and subpolar zones are ideal for farming.	T	F
5) Subarctic areas often have short summers and long, cold winters.	T	F

Name: _____ 41

Curriculum Connection
ES.1

Ocean Climates

How Bodies of Water Affect Temperatures

If you live near a large body of water, you will experience different temperatures as a result. The reason for this is because the temperature of the water in oceans and large lakes takes longer to change than the air temperature.

Therefore, the temperature further inland will only be affected by the air temperature, but the temperatures on the coast will be affected by both the body of water and air temperature. Living on the coast means you will experience more moderate temperatures, without experiencing the extreme heat or cold.

Why [illegible]

Water stores heat more than most other substances. Water needs 4 and a half times more energy than land mass needs to change its temperature. This means that seasonally, the water in oceans and large lakes takes 4 and a half times longer to heat up and cool down than the land does. This results in less dramatic temperature changes.

During the winter, large bodies of water releasing the heat they gained over the summer. This heat makes the area warmer. During the summer, the large lakes and oceans are absorbing heat, which makes less heat available for the coastal region. The cooler bodies of water make cool winds, which stops extreme heat in the summer.

Comparing Coastal Cities and Inland Cities

Cardston vs Vancouver

Both Cardston, Alberta and Vancouver have a latitude of 49 degrees North, meaning they are both the same distance from the equator. However, Vancouver is along the west coast of Canada, along the Pacific Ocean. Cardston is in Alberta, so it is inland from any oceans.

Check out the average high temperatures for August and February in both cities. You can see that Cardston has a warmer summer and a much colder winter. Vancouver has less extreme temperatures because the Pacific Ocean cools the land in the summer and releases heat in the winter.

	August	February
Vancouver	23°C	8°C
Cardston	25°C	-9°C

Name: _____ 42

Curriculum Connection
ES.1

Bodies Of Water – Temperatures

Questions | Use information from the text to support your answer

1) During the winter, if you live along the coast of a large body of water, will the temperature be warmer or colder than a city further inland? Explain.

2) During the s[illegible]ng the coast of a large body of water, will the temperature b[illegible] cold[illegible] city further inland? Explain.

3) How do large bodies of water affect the tem[illegible]e of [illegible]s?

True Or False | Circle whether the statement is true or false

1) Vancouver is warmer all year than Cardston is.	T	F
2) Cardston has colder winters than Vancouver because they are further inland	T	F
3) Coastal cities experience more extreme temperatures – very hot and cold	T	F
4) Inland cities experience more moderate temperatures, less changes	T	F
5) Cardston is further north, so it is colder	T	F

Name: _____ 44

Curriculum Connection
ES.1

Research – Coastal Cities vs Inland Cities

Cities that are at the same latitude will experience the same exposure to the sun's solar energy. However, there are other factors that affect the temperatures of a city, like whether it is on the coast or inland.

Compare the inland cities versus the coastal cities. Three Canadian pairs of cities with similar latitudes have been provided for you. Find 1 more pair of cities that have a similar latitude to compare as well. Use the high temperature for the data you find.

Research fill in the table below to compare the temperatures of each city

Posit		January	April	July	October
Coastal	y otia				
Inland	Sudbu				

Position	City	J		July	October
Coastal	St. John's				
Inland	Lethbridge				

Position	City	January	April	ly	ctober
Coastal	Sault Ste. Marie				
Inland	Timmins				

Position	City	January	April	July	October
Coastal					
Inland					

Name: _____ 45

Curriculum Connection
ES.1

Results | Describe the relationships you discovered from your data collection

1) Nova Scotia and Sudbury

2) St... s and Le...

3) Sault Ste. Marie and Timmins

4) Your choices

Name: _____ 46

Curriculum Connection
ES.1

Microclimate – Victoria, BC

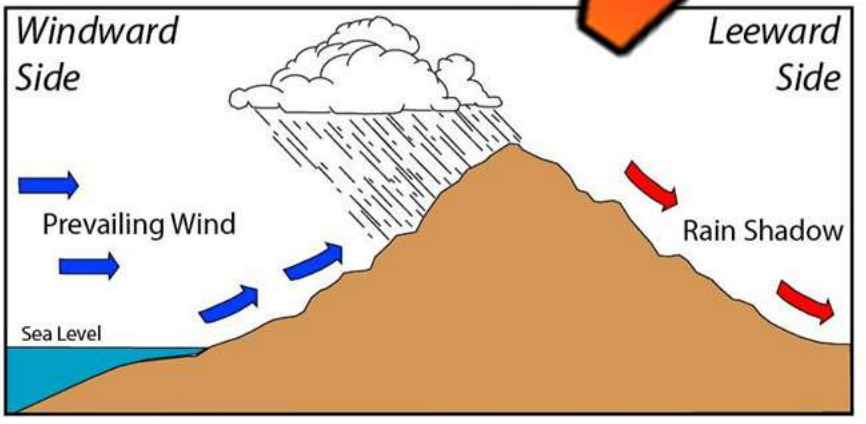
What is a Microclimate?
A **microclimate** has different atmospheric conditions than those in its surrounding area. **Atmospheric conditions** refer to temperature, wind, and precipitation. A microclimate means that your area could experience warmer or colder temperatures along with more or less wind and rain than all of the other areas in your region.

Microclima – Victoria, BC
Victoria is rmest area in Canada. It has the mildest climate in all of Canada, despite it being 6° more north than the most southern part of Canada. Victoria is on st coast of Canada. Therefore, Victoria is a coastal region micr te, as it is much different than the climates of its neighbouring cities.

Winds in Victoria
With Victoria being o dy. The average wind speed in Victoria is 10kph. The average wind ng inland city of Abbotsford is only 6.2kph. Therefore, the wind i different than its neighbouring cities, which contributes to its microcl

Temperature in Victoria
The average high temperature in Victoria in J nly 1 Abbotsford, it is 25°C. That is a massive difference considering th are m apart and have similar latitudes. In January, Victoria's average eratu C. In Abbotsford, the high temperature in January is 6°C. Abb stil m being close to the Pacific Ocean as its winters are milder tha the Calgary's average high temperature for January is -3°C.

Precipitation
Victoria has an average yearly rainfall of only 58.3cm. In Abbotsford, the average yearly rainfall is a whopping 153.8cm! Victoria does not receive as much rain because it is protected by a rain shadow from the Vancouver Island mountains to the northwest. The rainfall coming from the Pacific tends to get blocked by the mountains, causing less rain to reach Victoria.



Name: _____ 47

Curriculum Connection
ES.1

Questions

Use information from the text to support your answer

1) Why is Victoria considered a microclimate?

2) Why does Victoria receive less rain than neighbouring cities, like Abbotsford?

Describe

Describe the microclimate of Victoria by explaining its atmospheric conditions

True Or False

Circle whether the statement is true or false

1) Atmospheric conditions include temperature, wind, and precipitation	T	F
2) Victoria has warmer summers and winters than neighbouring cities	T	F
3) Victoria receives a lot of snow in the winter	T	F
4) Victoria has a mild climate, meaning the temperatures don't get too high or low	T	F
5) Victoria is a coastal microclimate that is also affected by mountains	T	F

Name: _____ 48

Curriculum Connection
ES.1

Activity – Finding A Microclimate

Research Question

What are we learning more about?

A **microclimate** is the climate of a small area, compared to the larger area it exists within. Microclimates have different atmospheric conditions (wind, temperatures, precipitation) compared to the area surrounding it. Examples include caves, the sides of m[illegible]ntains, an oasis in a desert, and even urban areas that trap heat.

Toda[illegible] will look for a microclimate on your school property. You'll want to find an a[illegible] ex[illegible]eriences different wind patterns, temperatures, and preci[illegible]

Materials

What do [illegible]eed?

- ✓ Thermometer
- ✓ Clipboard
- ✓ Soil thermometer/moisture met[illegible]ional
- ✓ An anemometer (wind speed meter). You c[illegible] make one by completing the experimen[illegible]e next page - optional

Method

How do we complete the experiment?

1) Have students work in small groups. Let them try to discover m[illegible]imates on school property.

2) Students should use their tools (thermometer, anemometer) to gather data about their microclimate. If their data is different from the surrounding area, they may have found a microclimate. If students do not have any tools, they can use their senses to describe the wind and temperature.

3) Students will also need to write down what lives in the microclimate – tall trees, shrubs, flowers, grubs, spiders, squirrels, etc.

4) Share your findings with the rest of the class. Decide if this is a microclimate or not.

Name: _____ 49

Curriculum Connection
ES.1

Observations

Investigate 2 different locations

Location	Temperature	Wind	Precipitation	What Lives Here

Results

Answer the questions be

1) What is a microclimate?

2) Did you find a microclimate? Explain why one of the locations was or wasn't a microclimate.

Name: _____ 50

Curriculum Connection
ES.1

Indigenous Climate Observations

Understanding Climate Observations

First Nations, Métis, and Inuit peoples have lived in harmony with the land for thousands of years. They have keenly observed changes in weather and climate over generations. These observations, passed down through stories and traditional practices, can offer unique an lized knowledge about the climate.

Clim Fro lders

Our elde are th f k wledge. They share stories about the weather patterns they have witne se st ell us about longer-term changes in the climate. It might be a tale abo eze solid in winter but now remains partially unfrozen. Or a sto how nts flower earlier in the year than they used to.

The Value of Indigenous Observations

Indigenous observations of climate offer a wealth information that scientists can learn from. For example, they may notice shifts in animal migration patterns or changes in when certain plants bloom. This information can provide a local context to the climate data collected by scientists.

Examples of Indigenous Observations

- Ice Freeze and Thaw Times: Lakes and rivers freeze later and thaw earlier.
- Animal Migration Patterns: Migratory animals change their timing or routes.
- Timing of Plant Blooming: Certain plants bloom earlier or later than usual.
- Seasons: The timing and length of the seasons are changing.

Name: _____ 51

Curriculum Connection
ES.1

Think Do you think that a changing climate is good for plants and animals? Explain.

Ques wer the questions below

1) Why do Indi s ups in have a lot of knowledge about our climate?

2) What useful information do Indigenous groups s abou hanging climate?

Visualizing Draw what you were picturing while you were reading. Exp in the picture

Name: _____ 52

Curriculum Connection
ES.2

Weather Forecasting – Historical Methods

Weather Forecasting
Weather forecasting is how we predict what the weather will be like. People have been doing this for a long time and in many different ways. Read about some historical methods for forecasting the weather.

Historical Methods
People in [illegible]t times had to look at nature to predict the weather.

1) Obse[illegible]
Many [illegible]opl[illegible] their senses to observe the world around them. They looked at the s[illegible]elt the [illegible] smelled the air to predict what the weather might do.

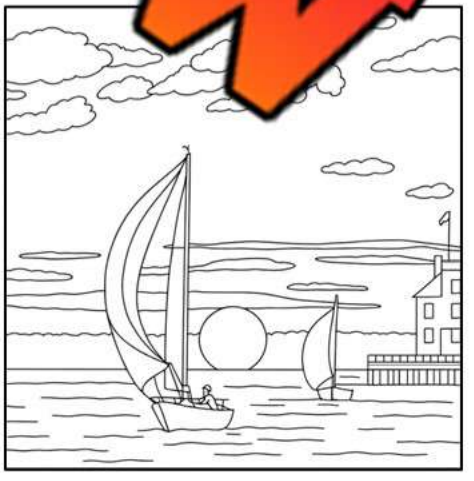
☑ Strengths: [illegible]od wa[illegible]and didn't require any special tools.

☒ Limitations: The pr[illegible]di[illegible]ere[illegible]t[illegible]s accurate and could only predict the weather for a short ti[illegible]

2) Animal Behaviour
Some people watched animals for sig[illegible] weathe[illegible]ge. For example, birds often fly lower before a storm[illegible]re examples include that frogs croak louder and [illegible]ofte[illegible] before it rains and ants build their mounds highe[illegible]ef[illegible]n

☑ Strengths: It's a natural way of predicting weather an[illegible] ac[illegible]rt-term forecasts.

☒ Limitations: It isn't precise, and animals can behave differently for reasons other than weather.



3) Weather Lore
This includes sayings like "Red sky at night, sailor's delight. Red sky at morning, sailors take warning." They're based on years of observation.

☑ Strengths: Easy to remember and sometimes accurate.

☒ Limitations: These sayings aren't always correct, and they can be too simple for complex weather patterns.

Name: _____ 53

Curriculum Connection
ES.2

True Or False

Circle whether the statement is true or false

1) People in the past used computer systems for predicting weather	True	False
2) People watched animals to help predict the weather	True	False
3) Birds fly high up before a storm	True	False
4) Watching animals is a scientific and accurate way of predicting weather	True	False
5) Weather [illegible]vings are always accurate	True	False

Explai[illegible]

[illegible]ribe each of the ways people used to predict the weather

Observation	
Animal Behaviour	
Weather Lore	

Opinion

Do you think people were able to accurately predict the weather in the past?

Name: _____ 57

Curriculum Connection
ES.2

Weather Forecasting – Current Methods

Current Methods
Today, we use technology and science to predict the weather.

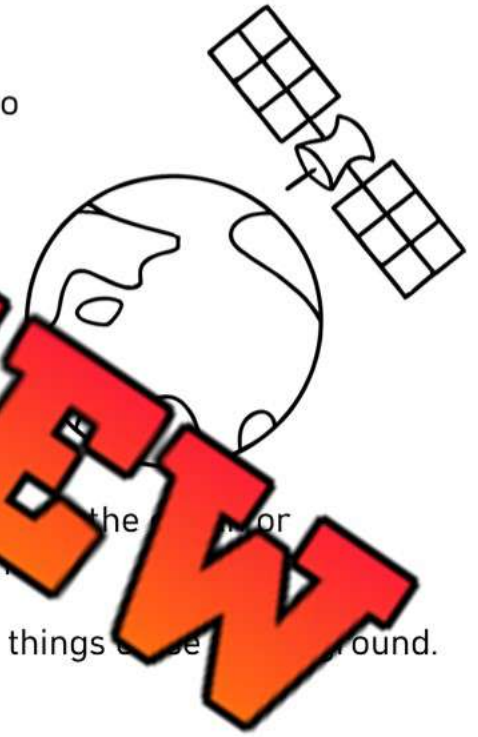
1) Weather Stations
Weather stations are places where we measure temperature, wind speed, and other weather elements. There are thousands of these stations around the world.

In Alberta, Environment Canada operates lots of weather stations. Some of these stations are in places like Edmonton, Calgary, Red Deer, and Lethbridge, plus many more.

☑ Strengths: They provide precise data that helps us understand the current weather and predict the weather.

☒ Limitations: They don't measure every spot on Earth, so there might be gaps in our knowledge.

2) Satellites
Satellites are machines that we send into space. They orbit around the Earth. They have special cameras and instruments to take pictures and collect data about the Earth's atmosphere, the layer of air that surrounds our planet.



☑ Strengths: They can see large parts of the Earth, even the ocean or unpopulated areas where there are no weather stations.

☒ Limitations: They can't measure everything, especially things close to the ground.

3) Computer Models
Computers take all the data we collect and use it to predict what the weather will do. They use complex algorithms with their supercomputing power to make accurate predictions.

☑ Strengths: They can handle a lot of information and can predict the weather for several days ahead.

☒ Limitations: They aren't always right, especially for longer-term forecasts.

So, weather prediction has changed a lot over time. From watching animals and looking at the sky, we now use satellites and computers.

Name: _____ 58

Curriculum Connection
ES.2

True Or False

Circle whether the statement is true or false

1) Weather stations are only in 10 of the biggest cities in the world	True	False
2) Satellites orbit around the Earth	True	False
3) Computers take all the data and use it to predict the weather	True	False
4) Current models are not as accurate as historical models	True	False
5) There are no weather stations in Alberta	True	False

Question

Answer the questions below

1) How is the weather forecasted today?

2) What are weather stations? What do they measure and where are they found?

Visualizing

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

Name: _____ 59

Curriculum Connection
ES.2

RADAR – Predicting Natural Forces

Radar

The term **RADAR** is an acronym formed from the term Radio Detection and Ranging. RADAR systems use an antenna to focus a pulsed radio-frequency beam out into the atmosphere. When the beam of energy strikes particles of precipitation, that energy is reflected back to the radar. The intensity of this energy is related to the number, size, and type of precipitation particles. This allows meteorologists to determine what weather systems are in the area.

Doppler R

The D w ike traditional radar, but it also reports the wind direction, wind speed bounda en warm fronts and cold fronts. Having one tool to determi all the t fa rs of weather systems gives the best information for meteorologist

True Or False

Decide if the statem e or false

1. Radar takes images of the Earth and to ast centres	True	False
2. Radar is used to measure precipitati	True	False
3. Radar gets its name from the term Radio Det and R	True	False
4. Doppler radar is a simpler version of radar	True	False
5. Doppler radar gives information on the wind as well as tio	True	False

Questions

Answer the questions below

1) How does radar work? Explain.

2) Without radar, it would be difficult to predict the weather. What would life be like if we had no idea what the weather would be like day-to-day?

Name: _____ 60

Curriculum Connection
CS.1

RADAR Coding

RADAR works by sending a signal out and measuring the signal sent back. By sensing the return signal's strength, RADAR devices can map 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: _____ 61

Curriculum Connection
CS.1

Coding – Supercomputers Predicting Weather

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

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

On [illegible]ercomputers used by meteorologists can process quadrillions of calcula[illegible]d. The data from the satellites is automatically sent to these com[illegible] sets of code. The supercomputers make models of what the wea[illegible]r will [illegible]o that meteorologists can study them. All of this is possible beca[illegible]s that tell the technology what to do.

Fill In The Blanks

wor[illegible] words to fill in the blanks

models	coding	air	[illegible]	weather

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

Directions

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

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

Curriculum Connection
CS.1

Exit Cards

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

Name: _____ Mark

Is the statement true (T) or false (F)?

1) Meteorologists use satellites to gather data.	T / F
2) Satellites track air movement and take pictures.	T / F
3) Satellites stay on the ground to gather data.	T / F
4) Satellites can track the movement of air from space.	T / F

Name: _____ Mark

Is the statement true (T) or false (F)?

1) Meteorologists use satellites to gather data.	T / F
2) Satellites track air movement and take pictures.	T / F
3) Satellites stay on the ground to gather data.	T / F
4) Satellites can track the movement of air from space.	T / F

Name: _____ Mark

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4) Satellites can track the movement of air from space.	T / F

Name: _____ Mark

Is the statement true (T) or false (F)?

1) Meteorologists use satellites to gather data.	T / F
2) Satellites track air movement and take pictures.	T / F
3) Satellites stay on the ground to gather data.	T / F
4) Satellites can track the movement of air from space.	T / F

Name: _____ 63

Curriculum Connection
ES.2

Investigate – Local Weather

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

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

We	in the information about your local weather

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

Questions	Answer the questions below

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

_____

_____

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

_____

_____

_____

Name: _____ 64

Curriculum Connection
ES.2

Activity – Weather Report

Weather reports are now able to predict the weather each hour. Meteorologists can do this by checking the radar map and analyzing when and where storm clouds are moving. The hourly report can tell us the temperature, wind speed, and percentage of precipitation for each hour.

Research Look up the local weather report and fill in the hourly data

Time	Temperature (°C)	POP
9:00 am		
10:00 am		
11:00 am		
12:00 pm		
1:00 pm		
2:00 pm		
3:00 pm		
4:00 pm		

Time	Temperature (°C)	POP
5:00 pm		
6:00 pm		
7:00 pm		
[illegible]		
[illegible]		
[illegible]		
[illegible]		
12:00 am		

Results Answer the questions below

1) What time is the warmest of the day? What time is the coldest of the day?

_____

_____

2) Do you think it will rain today? If so, when will it start and when will it end?

_____

_____

Name: _____ 65

Curriculum Connection
ES.2

Investigate – Weather Report

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

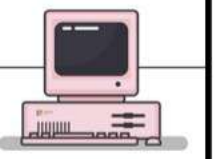
- Should they plan for surfing or skiing?
- Should they be staying inside?
- Should they be golfing?
- Should they be finding shelter in the case of lightning?
- Should they see some movies this week?
- Should they water their gardens because there isn't much rain for

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

Name: _____ 66

Curriculum Connection
CS.1

Writing Code – Weather Reports



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

Input	Output
dark clouds full of rain are coming	It will rain today
winds ar g, over 100 kph	It will be windy and a tornado is possible
the tem s C	The temperature is cool, almost freezing

Coding put e that goes with the inputted data

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

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

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

Name: ______________________

Curriculum Connection
CS.1

Writing Code – Weather Reports

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.

<u>Example</u> – A program that collects data from a supercomputer

Fetch [rainfall percentage] as the variable [rain]
Display [illegible] on the screen
If [rai[illegible]] [illegible]e[illegible]an 50%
The[illegible]lay, "It w[illegible]ly rain today"

Coding	W[illegible]own co[illegible]ollects wind, rain, and temperature data and displa[illegible]s we[illegible]a[illegible]e on a screen

1) ____

____

____

____

2) ____

____

____

____

3) ____

____

____

____

Name: _____ 68

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, melts in warm air, then refreezes before reaching the ground.
- **Snow** – starts as snow and stays frozen

Direction A weather app displays which type of weather is coming. Write the THEN statements that would follow the If statements.

1) IF the snow refreezes on the ground

THEN display, "

2) IF the snow melts and stays melted

3) IF the snow stays frozen

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

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

Name: _____ 69

Curriculum Connection
ES.2

Activity – Making a Weather Map

Create a weather map for Alberta by finding out the temperature, percentage of precipitation, wind speed, sunlight, and humidity in the cities below. Then you will fill in the map on the backside of the page.

Research Fill in the tables below

City Number 1: [illegible]ge	
Te[illegible]ure	
Relative Hum[illegible]	
Wind Speed and Direction	
Probability of Precipitation (POP)	
Sunny/Cloudy?	

City Number 2: Edmonton	
Temperature	
Relative Humidity	
Wind Speed and Direction	
Probability of Precipitation (POP)	
Sunny/Cloudy?	

Name: _____ 70

Curriculum Connection
ES.2

Research	Fill in the tables below

City Number 3: Fort McMurray	
Temperature	
Relative Humidity	
Wind Speed and Direction	
Proba f Precipitation (POP)	
loudy?	

City Numbe ity	
Te ure	
Relative Hu	
Wind Speed and Direc	
Probability of Precipitation (POP	
Sunny/Cloudy?	

Questions	Answer the questions below

1) Some of these cities are close by. Do they have similar weather? E .

_____

_____

_____

2) Lethbridge and Zama City are far away. Do they have similar weather? Explain.

_____

_____

_____

Name: _____ 71

Curriculum Connection
ES.2

Mapping Create a map that displays the weather for the cities you researched

Zama City	
Temperature	
Humidity	
Wind	
POP	
Cloud	

Fort McMurray	
Temperature	
Humidity	
Wind	

Edmonton	
Temperature	
Humidity	
Wind	
POP	
Cloud Cover	

Lethbridge	
Temperature	
Humidity	
Wind	
POP	
Cloud Cover	

Name: _____ 72

Curriculum Connection
ES.2

Mapping	Create a map that displays the weather for the cities you researched

Name: _____ 73

Curriculum Connection
ES.2

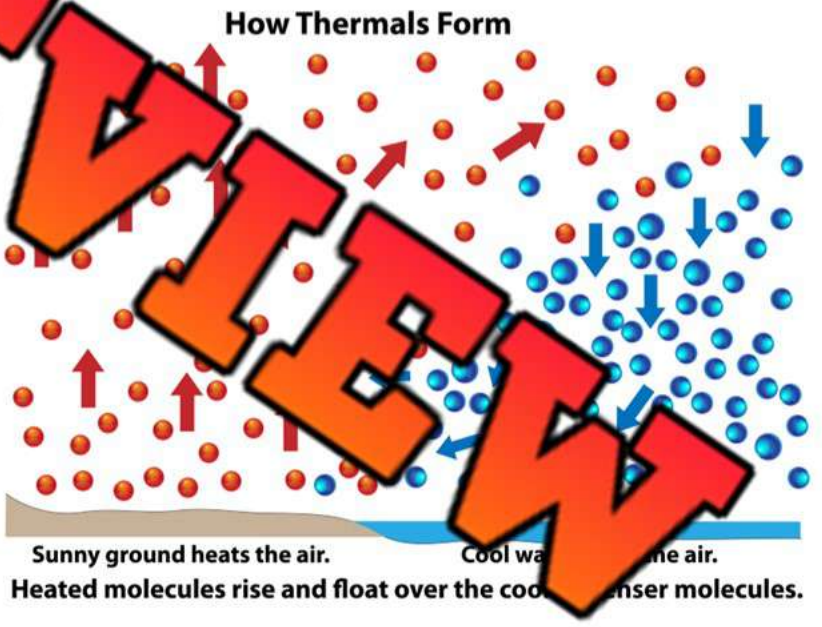
Properties Of Air

Properties of Air
Air is all around us, but we usually don't see it or think about it much. However, air has some pretty cool properties that are important to understand:

Air Takes Up Space
Even though we can't see air, it takes up space. An easy way to see this is to blow up a balloon. When you blow air into the balloon, it gets bigger because the air fills up the inside.

Air Has Weight
Believe it or not, air has weight! We don't usually notice it because air's weight is spread out all around us. But when you put a lot of air together, like in a big weather balloon, you can feel it really weigh something.

Air Expands and Rises When Heated
When you heat air up, it gets bigger, or "expands." That's why hot air balloons rise: the hot air inside the balloon is lighter than the cooler air outside, so it goes up. This is because hot air is less dense as the air particles are spread out. The lighter air moves up, above the colder, denser air.



Air Exerts Pressure
Air pressure is the force that air puts on everything around it.
When we talk about "high pressure" or "low pressure" in the weather, we're talking about how much force the air is exerting. For example, on a nice, sunny day, the air pressure is usually high.

Air Moves From High Pressure to Low Pressure
Air likes to move around. It always tries to go from areas of high pressure, where there's a lot of air pushing down, to areas of low pressure, where there's less air pushing down. This movement of air is what we feel as wind.

Understanding these properties of air can help us understand a lot of things, from how weather works to why airplanes can fly.

Name: _____ 74

Curriculum Connection
ES.2

True Or False

Circle whether the statement is true or false

1) Air shrinks and falls when heated.	True	False
2) Wind is air moving from low to high pressure.	True	False
3) On a sunny day, the air pressure is usually low.	True	False
4) Hot air balloons rise because hot air expands.	True	False
5) Air doesn't take up space because we can't see it	True	False

Question

Answer the questions below

1) How we kn s up space and has weight?

2) What happens with air when it is h

Draw

Draw a diagram of warmer air rising over cold air

Curriculum Connection
ES.2

Exit Cards

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

Name: _____ Mark

Circle the correct answer.

1) What takes up space?	Light / Air
2) What can you feel in a full balloon?	Heat / Weight
3) What happens to heated air?	Expands / Shrinks
4) How does air move?	High to low / Low to high

Name: _____ Mark

Circle the correct answer.

1) What takes up space?	Light / Air
2) What can you feel in a full balloon?	Heat / Weight
3) What happens to heated air?	Expands / Shrinks
4) How does air move?	High to low / Low to high

Name: _____ Mark

Circle the correct answer.

1) What takes up space?	Light / Air
2) What can you feel in a full balloon?	Heat / Weight
3) What happens to heated air?	Expands / Shrinks
4) How does air move?	High to low / Low to high

Name: _____ Mark

Circle the correct answer.

1) What takes up space?	Light / Air
2) What can you feel in a full balloon?	Heat / Weight
3) What happens to heated air?	Expands / Shrinks
4) How does air move?	High to low / Low to high

Name: _____ 78

Curriculum Connection
ES.2

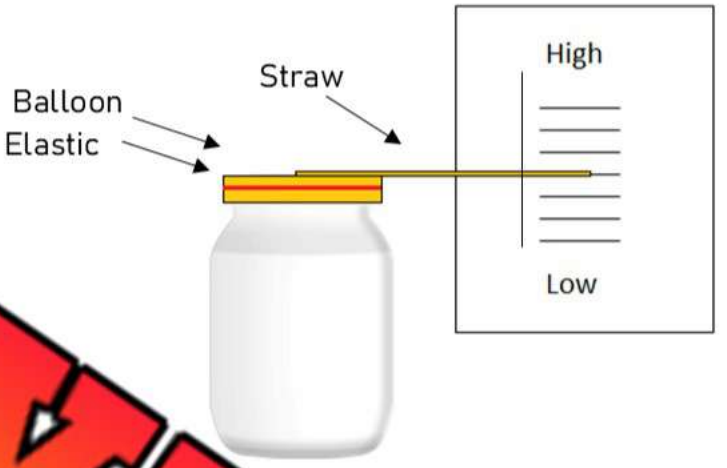
Experiment – Air Pressure

Objective What are we learning more about?

In this activity, students will learn about atmospheric pressure and its impact on weather by constructing their own barometer.

Materials What do we need?

- ✓ [illegible] or can
- ✓ A b[illegible]oon
- ✓ A rubber
- ✓ A straw
- ✓ Tape
- ✓ Thick paper
- ✓ A marker



Method How do we complete th[illegible]erimen

1) Prepare the Balloon: Cut off the neck of the [illegible]on. A[illegible]d is enough balloon to stretch over the mouth of the jar. St[illegible]toon o[illegible] opening of the glass jar or can. It should cover the top comple[illegible]re th[illegible]oon with the rubber band around the rim of the jar or can, ensuring [illegible]tig[illegible]

2) Attach the Straw: Tape a straw onto the top of the balloon, with[illegible]e middle of the balloon and the other end hanging off the side.

3) Create a Measurement Marker: Make a scale on the piece of paper using your marker. Draw a line down the middle and mark it with lines for high and low pressure.

4) Position Your Barometer: Position the jar next to the paper, so that the end of the straw points to the line on the card. If the balloon bulges (indicating high pressure), the straw will point higher on the card. If the balloon sinks in (indicating low pressure), the straw will point lower.

5) Observe the Changes: Over the next few days, watch how the end of the straw moves up and down as the air pressure changes. Record the position of the straw at the same time each day.

Name: _____ 79

Curriculum Connection
ES.2

Observations Fill in the table below. Was the air pressure low, average, or high? What was the weather like at that point in time?

Time		Day 1	Day 2	Day 3	Day 4	Day 5
Morning	Air Pressure					
	Weather					
Afternoon	Pressure					
	Weather					

Results Answer the questions below

1) Did you notice any patterns with the air pressure in the morning [illegible]. Explain.

2) Did you notice a pattern between high or low air pressure and stormy or nice weather?

Name: _____ 95

Curriculum Connection
ES.4

Farming In Alberta: Weather's Big Role

Climate's Role in Alberta Farming

Climate plays a big role in farming in Alberta. Check out below how farmers need to understand their climate in order to have their best growing season.

Crop Type[illegible] the Best Plants

The w[illegible]be[illegible]s farmers decide which plants to grow. Because[illegible] usual[illegible] dry here, they often choose plants like canola, wheat, and barley. These p[illegible]a[illegible]ough a[illegible]handle our weather. But, if it gets too hot or dry, like during the big d[illegible]t in [illegible]nts might have a hard time growing.

Crop Production - Growing Lot[illegible]ood

The amount of food a farmer can grow [illegible]s on th[illegible]her. Too much rain can cause floods that hurt the plants. If it's too dry, the grou[illegible] get [illegible] for plants to grow. This is what happened in the summers of 2015 an[illegible]8. It [illegible]t less food was grown.

Soil Quality - Taking Care of the Soil

Good soil is important for growing plants. But bad weather can hurt the s[illegible]eavy rain, for example, can cause soil erosion, which is when soil washes away the top layer of soil. This layer has all the nutrients that plants need to grow. If it's gone, it can be harder for the plants to grow.

Water Access - Giving Plants Water

Farmers need to make sure their plants get enough water. But the weather can sometimes make this hard. During dry times, there might not be enough water for the plants. If there's too much rain, it can cause floods that can also hurt the plants.

Name: _____ 96

Curriculum Connection
ES.4

True Or False

Circle whether the statement is true or false

1) Alberta has a hot and humid climate.	True	False
2) Canola, wheat, and barley are commonly grown in Alberta.	True	False
3) The drought in 2002 helped the crops in Alberta.	True	False
4) Rainy seasons always lead to more food being grown.	True	False
5) Heavy r[illegible] can cause soil erosion.	True	False

Ques[illegible]

Answer the questions below

1) What are the[illegible]ps [illegible]wn in Alberta and why are they chosen?

2) How can heavy rains affect soil heal[illegible] crop g[illegible] W[illegible] can it be good and bad?

Questioning

Write 2 questions you have about the reading

1)	
2)	

Name: _____ 100

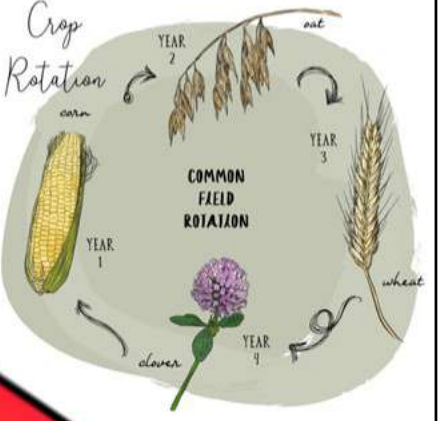
Curriculum Connection
ES.4

Improving Soil – Crop Rotation

What is Crop Rotation?

Crop rotation is the planned order of growing different crops year after year to get better results. If you grow the same crop every year, you will have problems with:

- Weeds – weeds will grow out of control because their environment is stable
- Pests – pests like locusts or Japanese beetles enjoy certain types of crops. If you keep growing the same crops, these pests will stay
- Disease – diseases like black spot or blight will survive in the soil if the crops are not changed



Benefits of Crop Rotation

If you use crop rotation, you will have fewer weeds, pests and diseases on your farmland.

Another benefit for using crop rotation is better soil. When you grow a new crop, it has different nutrients in the soil. When it dies, those nutrients go into the soil, making the soil richer in different nutrients. If you only grow one type of crop for years and years, the soil will lose its nutrients.

Common Crop Rotation – Soybeans and Corn

Corn and soybeans are commonly rotated year after year. Corn needs lots of nutrients, especially nitrogen.

Adding nitrogen to the soil is expensive for farmers, so instead, they grow soybeans the year before growing corn. When soybeans decompose, they provide the soil with nitrogen, which then naturally fertilizes the soil for the corn the next year.


Corn following Soybeans


Corn following Corn

Name: _____ 101

Curriculum Connection
ES.4

Questions

Use information from the text to support your answer

1) What is crop rotation? Why is it used?

2) How do corn and soybean crop rotation work? How does it help corn?

Summarize

What is the main idea of the reading? What are some supporting details?

True Or False

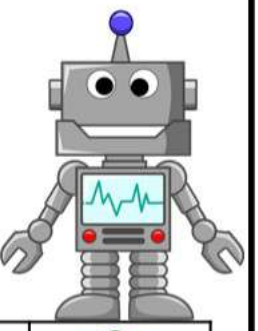
Circle whether the statement is true or false

1) Crop rotation can help reduce pests, disease, and weeds	True	False
2) Crop rotation using any crops is the best method	True	False
3) The crops used last year will provide nutrients for the new crops	True	False
4) Using crop rotation will improve the soil	True	False
5) When corn decomposes, it provides nitrogen for soybeans to grow in	True	False

Name: _____ 107

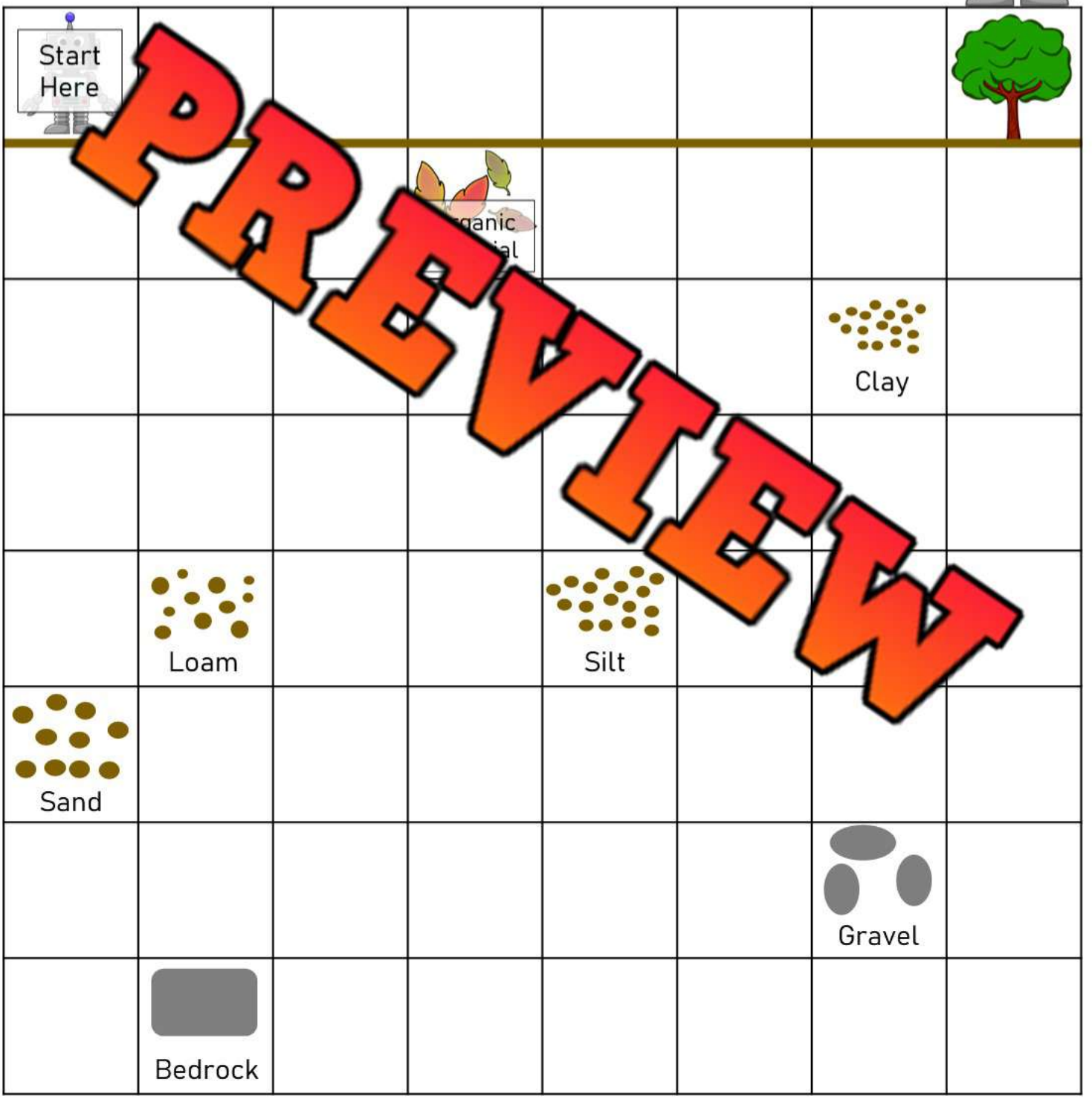
Curriculum Connection
CS.1

Writing Code – Soil Types



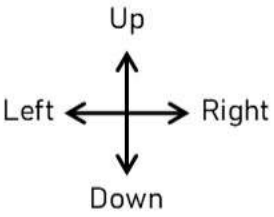
Tobor is a robot that is digging through soil. Help Tobor find the different soil types below by writing code that directs him.

Soil | Use the map to write code on the back of the page



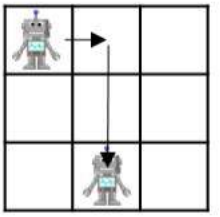
Name: _____ 108

Curriculum Connection
CS.1



Commands – Use the example below to learn the code

Move 1 right
Move 2 down



Soil

Tell Tobor where to dig so that he gets to all the materials

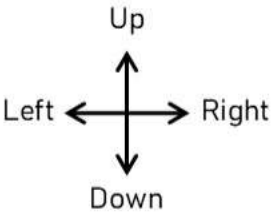
1) Find the organic material and gravel

2) Find the clay and sand

3) Find the loam, bedrock, and gravel.

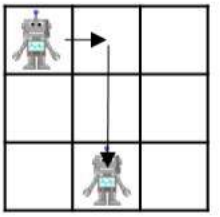
Name: _____ 109

Curriculum Connection
CS.1



Commands – Use the example below to learn the code

Move 1 right
Move 2 down



Soil

Tell Tobor where to dig. He always starts in his robot station

4) In any order, find the loam, bedrock, and silt. Use the least amount of lines to write your code.

5) In any order, find the gravel, bedrock, clay, and [illegible]. Use the least amount of lines to write your code.

Name: _____ 111

Curriculum Connection
CS.1

STEM Assignment – Soil Testing Machine

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

Test Results	What to Add
Too much sand and clay	Add silt
...much silt and sand	Add clay
...h clay and silt	Add sand
...o high	Add sulfur
...pH lev... ...ow	Add limestone

IF/THEN Writ... your invention

If there is too much silt ...and ... high

THEN

If there is too much clay and silt and the pH is ...

THEN

If there is too much sand and clay and the pH is high

THEN

If there is too much sand and silt and the pH is low

THEN

If there is too much clay and sand and the pH is low

THEN

If there is too much silt and clay and the pH is high

THEN

Name: _____ 112

Curriculum Connection
CS.1

Draw your invention. Make sure the invention has:

- ✓ A place to put the soil
- ✓ A screen to tell you the results
- ✓ A place to hold the materials that will be added to the soil
- ✓ A start button

Name: _____ 113

Curriculum Connection
CS.1

Questions	Answer the questions about your machine below

1) How does your soil testing machine work?

2) How does [illegible]? Write one example line of code for the machine to pro[illegible]

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

4) Who will you sell your machine to?

5) How much will you sell it for?

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

Name: _____ 114

Curriculum Connection
ES.4

Farming Animals In Alberta

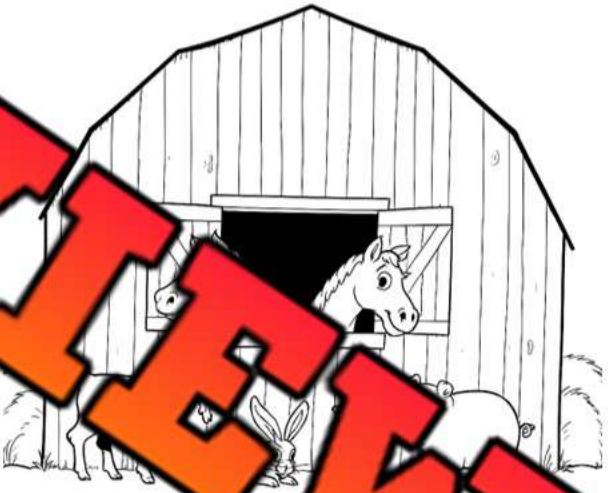
Taking Care of Farm Animals in Alberta's Climate

In Alberta, our climate is unique and can sometimes be a bit tough. We have cold winters and hot summers. These conditions affect how we care for our farm animals. Here's how:

1) Hot and Alberta Summers

Summers in Alberta can get quite hot, especially in July and August. This can affect farm animals like chickens. In the hot season, farmers in Alberta have to make sure that animals have:

- Lots of fresh water to drink
- Shaded areas where they can cool down



2) Cold and Snowy Alberta Winters

Winters in Alberta are often very cold, with a lot of snow. This can be tough for farm animals. During the winter, Alberta farmers make sure their animals have:

- Warm barns or other shelters to protect them from the cold and snow
- Enough food because finding food can be hard when there is a lot of snow.

3) Wet Conditions in Alberta:

Sometimes, Alberta can get lots of rain, especially in the spring. This can cause some problems for animals. When it's very rainy, farmers have to make sure that their animals have:

- Dry places to rest and sleep.
- Medicine if they get sick from being too wet for too long.

Name: _____ 115

Curriculum Connection
ES.4

True Or False

Circle whether the statement is true or false

1) Farmers don't need to provide shade for animals during summer.	True	False
2) Farmers need to provide warm barns for animals during winter.	True	False
3) Alberta gets lots of rain in the spring.	True	False
4) Animals don't need dry places to rest during rainy seasons.	True	False
5) Farmers need to understand Alberta's climate to care for their animals	True	False

Questio

Answer the questions below using evidence from the text

1) How [illegible] for their animals during Alberta summers?

2) How do farmers need to care [illegible] Alberta winters?

3) How do farmers need to care for their animals during A[illegible]?

Questioning

Write 2 questions you have about the reading

1)	
2)	

Name: _____ 119

Curriculum Connection
ES.4

Farmers Responding To Weather Event

How Farmers Respond to Weather Events

Farming is a job where the weather matters a lot. Farmers always have to keep an eye on things like droughts, floods, fires, and windstorms. They must make changes based on these events to keep their farms healthy. Let's see how they do it!

Drought

Drought[illegible]gh rain. When drought happens, farmers may:

- U[illegible]n irrigat[illegible]em that drips water right to the roots of plants.
- Plant crop[illegible]et, which don't need much water.
- Collect and s[illegible]wate[illegible] ponds to use later.

Floods

Floods happen when too much ra[illegible] falls[illegible]ds, farmers might:

- Build raised beds, so the crops are[illegible]r than t[illegible]rs.
- Plant trees to soak up extra water.
- Dig ditches to guide water away from fields.

Wildfires

To protect their farms from wildfire, farmers may:

- Keep tools ready to put out small fires quickly.
- Make "firebreaks" where they clear plants to stop fire spreading.
- Clear away dead leaves and branches which could catch fire easily.

Windstorms

Windstorms can cause damage. To handle windstorms, farmers might:

- Plant trees or build structures to block the wind.
- Build strong fences or windbreaks to protect animals and buildings.

Name: _____ 120

Curriculum Connection
ES.4

True Or False

Circle whether the statement is true or false

1) Drought happens when there's too much rain.	True	False
2) Farmers use drip irrigation during droughts.	True	False
3) Farmers dig ditches to guide extra water away during floods.	True	False
4) Plants grow well in the extra water they get during floods.	True	False
5) Cutting down trees to make firebreaks is bad for the environment	True	False

Question

Answer the questions below using evidence from the text

1) If a [illegible] is fore[illegible]at could you do as a farmer to prepare?

2) If a fire is spreading towards your far[illegible]u do to prepare?

3) If a windstorm is forecasted near your farm, what coul[illegible]to [illegible]?

4) If there is a long-term forecast suggesting less rainfall this growing season, what could you do to prepare for it?

Name: _____ 121

Curriculum Connection
ES.4

Activity – Conservation Agricultural Role Play

Objective
What are we learning about?

Students will gain an understanding of the dilemmas faced by farmers, regarding easier farming practices versus conservation agricultural practices. They will engage in discussion, problem-solving, and decision-making processes.

Materials
What do we need for our activity?

- A [illegible] farming scenarios (incl[illegible]d)
- A planning sh[illegible]luded)
- A space for each grou[illegible]tice a[illegible] perform their role-play.

Method
How do we complete[illegible] activit[illegible]

Step 1: Scenario Selection
In groups of 4, have each group pick a scenario from[illegible]at

Step 2: Discussion and Planning
Groups have 30 minutes to discuss their scenario, identify the pr[illegible] both easier and conservation farming practices, and plan their role-play. Th[illegible]uld consider the pros and cons of each farming practice as it relates to thei[illegible]cenario. They can fill out the questions on the back of this paper to help plan their role play.

Step 3: Role Play Performance
Groups take turns performing their role-plays in front of the class. They should explain the scenario and their decision-making process. They should make a decision at the end of their role play.

Step 4: Reflection and Discussion
After each performance, hold a brief class discussion about the scenario and how the group chose to handle it. Did they favor easier methods or conservation? What factors influenced their decision?

Name: _____ 122

Curriculum Connection
ES.4

Planning | Answer the questions to plan your role play

1) Name the two choices you are debating with your farming team?	
Choice 1	
Choice 2	

2) What are the benefits of choosing choice 1 and 2? Consider performing more research on these choices to decide.

Choice 1	Choice 2

3) What characters will you have in your role play? Who will believe in which choice?

Name: _____ 123

Curriculum Connection
ES.4

Scenarios | Cut out the scenarios below.

You are deciding between using chemical pesticides to quickly deal with a pest problem or introducing beneficial insects that can naturally control the pest population.

You are considering whether to overgraze a single pasture for convenience, or rotate your livestock to different pastures to allow the grass to regrow.

You have to choose between planting the same crop year after year because it sells well, or rotating crops to maintain soil fertility.

You are weighing the option of using synthetic fertilizers for immediate crop growth or employing compost and green manures to enrich the soil over time.

You are deciding whether to clear more land for crops or use permaculture principles (growing crops around existing plants – bushes, trees) to increase yield in existing farmland.

You are considering using a fast-growing but non-native species of grass for animal feed, or sticking with native plants that are more beneficial to the local ecosystem.

You are trying to decide whether to create a firebreak that would stop a wildfire from entering your farmland or to just put out fires using fire extinguishers and water if it does spread to your farm.

You are deciding whether to use heavy machinery for farming tasks or employ manual methods that cause less soil compaction.

Name: _____ 126

Curriculum Connection
ES.1, ES.2, ES.3, ES.4, ES.5

Memory Game: Weather, Climate, And Agriculture

Objective

What are we learning about?

The goal of this activity is to help students understand weather, climate, and how these affect people, animals, and farming. Students will match terms with their definitions or examples.

Materials

You will need for the activity.

- Memory game cards with terms on one set & matching meanings on the other.
- A flat surface like a table or floor to lay out the cards.

Instructions

How you will complete the activity.

1. Divide the class into groups of 3 or 4. Give each group a set of Memory Game cards. (Provided)
2. Have each group lay all the cards face down in a grid on a table.
3. Each group takes turns flipping over two cards at a time, aiming to find a matching term and definition.
4. If a student finds a match, they remove those cards from the grid and keep them.
5. If the cards do not match, they are turned back over, and the next student takes a turn.
6. The game continues until all the cards have been matched.
7. After the game, review each term and its meaning with the class.
8. Discuss how weather and climate influence people, animals, and farming.

Name: _____ 127

Curriculum Connection
ES.1, ES.2, ES.3, ES.4, ES.5

Cards | Memory Game Cards

Term	Definition
Anemometer	A tool that measures wind speed.
Hi tion	When animals sleep through winter.
Compost	ural er made from te.
Biodiversity	Having many diffe t types of animals and plants.
Precipitation	Water that falls from the sky as rain, snow, sleet, or hail.

Name: _____ 128

Curriculum Connection
ES.1, ES.2, ES.3, ES.4, ES.5

Cards | Memory Game Cards

Term	Definition
Radar	A tool that uses waves to detect precipitation and wind.
_ _ te	A device in space that takes pictures of Earth to track weather.
Shelter	plac ers build to pr ct m weather.
Meteorologist	A person who st es and predicts the weather.
Soil Erosion	The wearing away of soil by wind or water.

Name: _____ 129

Curriculum Connection
ES.1, ES.2, ES.3, ES.4, ES.5

Cards | Memory Game Cards

Term	Definition
Humidity	The amount of water vapor in the air.
Air Pressure	The force of air pushing on everything.
Coding	Instructions that tell computers how to process information
Climate	The usual weather in a place over a long time.
Weather Lore	Old sayings people use to predict the weather.

Name: _____ 130

Curriculum Connection
ES.1, ES.2, ES.3, ES.4, ES.5

Cards | Memory Game Cards

Term	Definition
Conservation	Farming that protects soil and helps the environment.
Crop Rotation	Changing the crops grown each year to protect the soil.
Rain Gauge	A tool that measures how much rain has fallen.
Observation	Using your senses to study the weather.
Wind	Air that moves due to pressure changes.

Name: _____ Date: _____

Unit Test – Climate And Weather

Multiple Choice /10

1) What happens to soil during heavy rain? a) Erosion b) Drought c) Expansi d) Growth	2) Which weather tool measures wind speed? a) Anemometer b) Barometer c) Thermometer d) Hygrometer
3) Wh asure? a) Wind ed b) Air Pressure c) Humidity d) Temperature	4) What animal behavior predicts a storm? a) Ants migrating b) Bees returning to hive c) Bears hibernating rogs hibernating
5) How do farmers manage fires a) Use water b) Floods c) Use fans d) Use firebreaks	oes hibernation in bears signal? a) Sum b) S g c) r d) Fall
7) What invention allows us to view Earth's weather from space? a) Radar b) Satellite c) Barometer d) Radiosonde	8) Which is a erva practice? a) Using chemical pesticide b) Clear-cutting forests c) Using crop rotation d) All of the above
9) What causes wind? a) Rainfall b) Humidity c) Oceans d) Air pressure	10) Air moves from ____ pressure to ____ pressure. a) Low to high b) Low to low c) High to high d) High to low

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

Air Pressure	
Radar	
Short [illegible] Forecast	

Short Answer An[illegible] – Each question is worth 2 marks.

1) What is the difference betw[illegible]?

2) Why is Victoria, BC a microclimate? How is its climate different fr[illegible]

3) What would life be like without a weather forecast? Why would it be dangerous?

Long Answer	Answer the questions below – Each question is worth 5 marks.

1) How is the weather forecasted now versus how was it forecasted hundreds of years ago? Explain the differences and the accuracy of then versus now.

2) What is conservation agriculture? W some rs participate in conservation agriculture?