

Weather: Teacher's topic guide

God is God is Protector Year 3

Spiritual Awareness

God has power over creation

God shows His love to us in providing the things we need. Rain and sunshine are essential to life. The world's climate was once perfect. However, with the Fall came a change in those perfect climatic conditions. Extremes in climate, and the problems caused by these extremes were not part of the original creation.

In the Garden of Eden there were no extreme weather conditions. The earth was a perfect temperature for maintaining life, and dew fell each morning to water the earth. With the Fall of mankind, the weather conditions changed, and sin eventually brought about God's judgement displayed in the Great Flood.

Despite extreme weather conditions we now experience on the planet, God is still in control. He is our shelter and protector. We must put our trust in Him and not be afraid.

Bible stories and passages: Protection from extreme weather

1 Kings 17:2-6 God protected Elijah in time of drought. He was fed by ravens.

Genesis 6-8 God protected Noah and his family during the Flood.

Genesis 37-47 God protected Joseph and his family through drought.

Mark 4 Jesus protected the disciples during the storm.

Matthew 7:24-27 The wise man was protected from the storm because he built his house on the rock.

Acts 27 God protected Paul in the storm.

Verses about protection from harsh weather and storms of life:

Psalms 91:1-5 We live within the shadow of the Almighty, sheltered by the God who is above all gods. This I declare, that he alone is my refuge, my place of safety; he is my God, and I am trusting him.

Isaiah 4:6 There will be a booth for shade by day from the heat, and for a refuge and a shelter from the storm and rain.

Nahum 1:7 The Lord is good, a stronghold in the day of trouble; he knows those who take refuge in him.

Isaiah 43:5 Fear not for I am with you.

Psalms 121:5-6 You are my shade; protection from heat

Verses about God's provision through weather:

Deuteronomy 11:13 I will send rain on your land if you love and serve me with all your heart.

Psalms 104:13 From the sky you send rain on the hills, and the earth is filled with your blessing. (GNB)

Psalms 104:19 You created the moon to mark the months; the sun knows the time to set.

Key Questions

How does God provide for us through weather and climate?

Were floods, droughts and hurricanes a part of God's original perfect creation?

What was the weather like in the Garden of Eden?

Why has the weather changed?

How can we protect ourselves in bad weather?

Who is afraid of thunder and lightning? Pets?
What are the dangers of being out in an electrical storm?
How do we prepare for cyclones?

Outcomes

Students will

Knowledge

- Identify suitable clothing to wear in different weather conditions
- explain how weather affects man's lifestyle
- study the weather patterns of the local environment
- study the weather patterns of Fiji
- look at ways of protecting ourselves from the elements

Skills

- classify clothes, toys, games etc. used in different seasons
- problem solving: how to protect ourselves in extreme weather

Values

- appreciate the different seasons and the provision of sun and rain
- show wisdom in preparing for seasonal weather conditions

Activities

- Discuss changes in weather throughout the year: wettest, driest, hottest, coldest
- Make a graph or chart to show times of high/low rainfall.
- Observe the ways in which seasonal changes affect plant and animal life.
- Observe times of planting and harvesting.
- Make a chart showing how we can be wise in preparing for changes in weather, e.g. raincoats, sun hats
- Create a collage of weather pictures.
- Discuss dependence of living things upon rain and sun.
- Discuss ways of protecting ourselves in extreme weather, e.g. hats, sunscreen, staying indoors during electrical storms; our parents protect us so children need to obey parents in order to be protected

Assessment

Create a chart called "Extreme weather". Divide the page into four and show how to protect ourselves in these extreme weather conditions: Hot sun; strong wind; a thunder and lightning storm; ice and snow. Use words and pictures.

What have I learned from the study of weather...

- about God and the Bible?
- about doing what God wants me to do?

Research cards: Weather

Thinking skills: Weather and seasons

Teaching Notes:

Weather and the water cycle

Lightning, thunder and rainstorms were a mystery to people in ancient times. In Rome, Egypt and India people thought that lightning bolts were missiles thrown by the gods. Then Chinese thought that lightning was a goddess. Her job was to flash light here and there to help the thunder god find the people he was angry with.

Since rain is so necessary to our life on earth, ancient people wondered what caused it. Some thought that sprinkling water on the ground would help cause rain. Others tried to stab holes in the clouds with spears. The American Indians performed rain dances in the hope of making it rain. Maybe the most unusual idea is found in one of the holy books of the Hindu religion, the 'Vedas'. It says to tie up a frog with its mouth propped open. If you tie him to the right tree and say the right words, rain will fall!

The Bible talks about rain, lightning, thunder and storms. But it does not include any of the superstitious ideas found in other books written long ago. These books taught that the forces of nature were living beings who often did crazy things. The Bible on the other hand teaches that the earth's weather follows rules and cycles. Not Genesis 8:22.

"As long as the earth continues, there will be planting and harvest, cold and heat, summer and winter, day and night."

Job 28:26 says, "God made rules for the rain. And He set a path for the thunderstorm to follow." God told Jeremiah, "Day and night will always come at the right time," (Jeremiah 33:20).

Later on in history scientists began to discover the "rules for the rain" that Job talked about. We now have weathermen who know about the path of a thunder storm. Of course, all along the Bible had mentioned these laws of nature that we are still discovering. All along, the Scripture reminded us that the laws of nature are really the laws of God.

Where does the rain come from?

Rainfall is a process called the water cycle. Here's how the water cycle works: The sun evaporates water from the ocean. The water vapour rises and becomes clouds. This water in the clouds falls back to earth as rain, collects in streams and rivers, and makes its way back to the ocean. That process repeats itself again and again.

There was a scientist called Galileo who discovered that water follows such a cycle in 1630. But amazingly, the Scriptures mentioned this fact centuries earlier. Amos 9:6 says that God "calls for the waters of the sea. He pours them out on land."

Long before Galileo discovered it, the Bible told us that the water from the sea ends up falling on the land. Maybe it was because believed in the God of the Bible, that God showed Him truths about the creation.

Another verse that talks about the water cycle is Isaiah 55:10. It shows us that rain and snow return to the sky after watering the earth. (This is evaporation.)

"Rain and snow fall from the sky. They don't return without watering the ground."

Values education Year 3

God is Protector

Security

God is a loving Father who can be trusted. We can trust Him to protect us. We can feel secure in His care.

Security is...

- having no fear
- feeling safe
- being sure that God is in charge of my life
- giving my worries to God

I feel safe and secure because:

- my family cares for me
- God cares for me

Activities

1. Why do you think a baby feels secure?
2. What makes you feel secure...at home? at school?
3. Two children can demonstrate a "trust walk". In this activity one student puts all their trust in the other student. The leader will lead the other on a walk while their eyes are closed. The leader will make sure the partner does not walk into things or trip over things.
4. After the trust walk, ask whether the person felt safe and secure on the trust walk. Why? They did not need to be afraid because the leader could be trusted to keep them safe and secure.

Questions:

Who can we trust?

How do these people show their love and care for us?

What does the Bible say about security?

Psalm 91 He who dwells in the shelter of the Most High will rest in the shadow of the Almighty.

Psalm 23 The Lord is my shepherd.

1 Peter 5:7 Casting all your cares on Him, for He cares for you.

Matthew 6:25-31 Do not worry. God cares for the birds and much more for you.

Practical Science: Weather and seasons

What Absorbs More Heat?

<http://www.sciencekids.co.nz/experiments/lightcolorheat.html>

When you're out in the sun on a hot summer day it pays to wear some light colored clothes, but why is that? Experiment with light, color, heat and some water to find out.

What you'll need:

- 2 identical drinking glasses or jars
- Water
- Thermometer
- 2 elastic bands or some sticky tape
- White paper
- Black paper

Instructions:

1. Wrap the white paper around one of the glasses using an elastic band or sticky tape to hold it on.
2. Do the same with the black paper and the other glass.
3. Fill the glasses with the exact same amount of water.
4. Leave the glasses out in the sun for a couple of hours before returning to measure the temperature of the water in each.

What's happening?

Dark surfaces such as the black paper absorb more light and heat than the lighter ones such as the white paper. After measuring the temperatures of the water, the glass with the black paper around it should be hotter than the other. Lighter surfaces reflect more light, that's why people wear lighter colored clothes in the summer, it keeps them cooler.

Practical Science: Weather

Tornado in a Bottle

http://www.madaboutscience.com.au/store/index.php?main_page=page&id=17

Tame the destructive force of a tornado by creating a mini one in a bottle.

What you will need:

- Empty plastic bottle with lid. Any size, 500ml works well
- Two drops of liquid detergent (clear detergent works best)
- Teaspoon of glitter (optional)
- Food colouring (optional)

What to do:

1. Almost fill the plastic bottle with cold tap water.
2. Add the liquid detergent.
3. Add glitter to the bottle.
4. Screw on the cap tightly.
5. Hold the bottle by the neck and turn it upside down. Rotate the bottle in a circular motion hard and fast. When you stop rotating a mini-tornado should form inside the bottle. Some find it easier to hold the bottle horizontally and then with a hard flick of the wrist flip it upside down. It may take several goes before you get it right – all part of the fun.

Note: add a small amount of food dye for a colourful effect, or some tiny animal toys and watch them swirl in the vortex. Coloured lamp oil makes just the vortex coloured.

How does it work?

Most people encounter their first vortex as bath water drains from the bathtub. A vortex is a type of motion that causes liquids and gases to swirl around a center line. In this experiment you have created a water vortex by rotating the bottle. The vortex looks like a tornado in the bottle and is very similar to the effect you see with a real tornado except the medium is water as opposed to air.

For a longer lasting tornado in a bottle check out our vortex valves!

Art Year 3

God is Protector

Topic: Weather

Biblical connection: Humans build shelters for protection from storms, rain and sun. God is our protection from the storms of life.

Bible art as a wall display: Mark 4:39 Jesus said, "Peace, be still," to the storm and the storm stopped.

OR, the wise and foolish builders, Matthew 7:24-27, with caption, "To stay safe, build your life on the rock."

Drawing, painting and collage

Create a series of weather pictures, for all different types of weather.

Construction

Make a model of a house that would stand strong in a storm.

Thinking Skills Protector Yr 3

| | |
|---|--|
| <p>Weather and Seasons 1</p> <p>Draw a fishing rod.</p> <p>Now redesign it by using the following steps:</p> <p>B – make one part bigger</p> <p>A – add something extra</p> <p>R – replace one part with something else</p> | <p>Weather and Seasons 2</p> <p>Create a new product by combining these two things:</p> <p>A raincoat and a sun hat</p> |
| <p>Weather and Seasons 3</p> <p>Name 5 things you would NEVER use in winter.</p> | <p>Weather and Seasons 4</p> <p>What if summer did not exist.</p> <p>Give some consequences.</p> |
| <p>Weather and Seasons 5</p> <p>People should not be allowed out in the summer sun unless they are wearing a hat.</p> <p>Give 3 good points and 3 bad points for this idea.</p> | <p>Weather and Seasons 6</p> <p>Work out 3 things this picture could represent in the story of Noah and his family.</p>  |

Thinking Skills Protector Yr 3

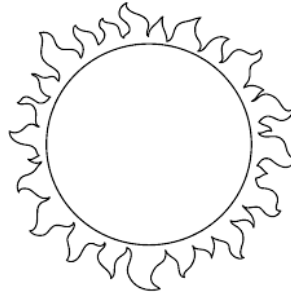
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| <p>Weather and Seasons 7</p> <p>Make an acrostic poem using the name of one of the seasons.</p> | <p>Weather and Seasons 8</p> <p>Design something new to keep the rain off you when riding a bike.</p> |
| <p>Weather and Seasons 9</p> <p>Give 10 different uses for melted ice-creams.</p> | <p>Weather and Seasons 10</p> <p>Name 5 things that swimming pools and beds have in common.</p> <p>e.g. you can dive into both of them.</p> |
| <p>Weather and Seasons 11</p> <p>Make an unusual hat will give you shade in summer.</p> | <p>Weather and Seasons 12</p> <p>Draw 3 pictures of some things you could make at the beach.</p> |

Weather 1

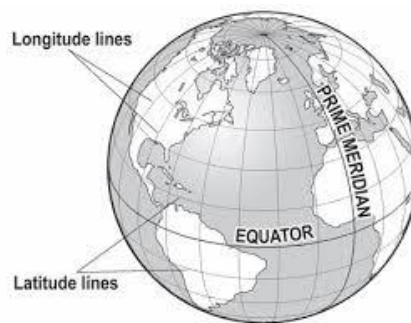
What is weather?

Weather is wind, rain and sunshine.

Weather starts with the Sun.



The Sun is a huge ball of exploding gases. The explosions cause the Sun to send out enormous amounts of heat. Some parts of the Earth are heated much more than other parts. Have a look at a globe of the Earth and you will see why.



Around the middle of the globe is an imaginary line called the equator. While the Earth goes around and around the Sun, the Sun shines almost straight at the Equator. But at the North and South Poles, Sun's rays can't warm the Earth at the Poles nearly as much as at the Equator.

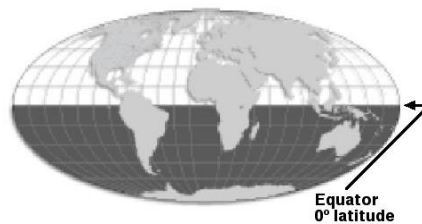
1. How does weather affect the way we dress?
2. How does weather affect our activities?
3. Why is the weather hotter at the Equator than the North Pole?
4. Copy the globe. Mark the Equator and the North Pole.

Weather 2

Seasons

Seasons are different types of weather.

The Earth is tipped on an angle as it goes around the Sun. For half the year, the Southern Hemisphere, (the bottom half of the globe), is tilted towards the Sun. It gets more heat at this time of the year. It is Summer in places like Australia. The northern Hemisphere is tilted away from the Sun, so places like England are cold. It is Winter there.



There are four seasons in countries that are not close to the Equator: Summer, Winter, Autumn and Spring.

Summer = hot

Winter = cold

Autumn and Spring = cool

Countries near the Equator are hot all the time. They have two seasons: wet and dry.

1. Draw a globe. Colour the Southern hemisphere green and the Northern hemisphere blue. Name them.
2. In which Hemisphere is your country?
3. Mark in the Equator.
4. Name the four seasons.
5. Name a country that has all four seasons.
6. Name a country where it is hot all the time.

Weather 3

Snowy weather

Water vapour is made of little water droplets in the air. The clouds are made of water vapour. When water vapour freezes and falls from the sky it is called snow. This happens when the temperature in the clouds is very cold.



Snowflakes are made up of crystals of ice that have formed around bits of dust in the air. The snowflakes start out very small and grow. Each snowflake is different and might contain up to 200 crystals. A snowflake has six sides.



If you live in a place where it snows you can build a snowman.

1. Name a country where it snows.
2. What is snow?
3. Draw a snowflake.
4. What can you do with snow?



Weather 4

Windy weather

What is wind?

Wind is moving air.

How do we measure wind?

When someone gives a weather report on wind, they say how fast the air is moving (*speed*), and from which *direction* it is coming.

What causes the wind to blow?

Some parts of the Earth's surface are hot and other places are cold. Warm air rises because it weighs less than cold air. Then cool air moves in and replaces the rising warm air. This movement of air is what makes the wind blow.



1. What is wind?
2. What are the two words used to give a weather report on wind?
3. List four directions that the wind could be coming from.

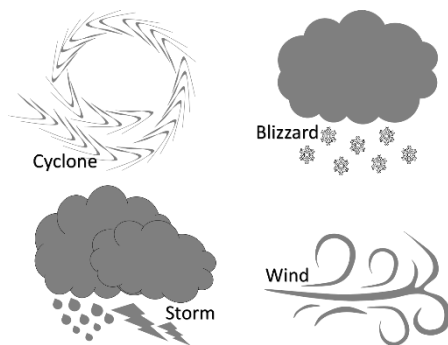
Weather 5

Stormy weather

A storm is when there are extreme weather conditions such as heavy rain, lightning, thunder, hail, snow, damaging winds, and freezing rain.

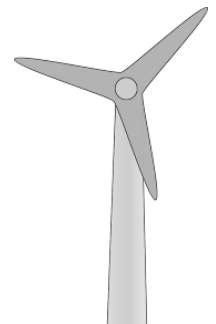
Damaging winds

Damaging winds are winds with a speed of more than 80 kilometers per hour. There can be winds that blow in a straight line, or winds that blow in a circular movement such as a tornado or cyclone.



Wind is helpful

Wind can provide us with electricity. It is not expensive and does not create pollution. Electricity is produced by windmills as wind blows over the blades which turn and cause an electric generator to produce electricity.



1. What types of weather make up a storm?
2. What are damaging winds?
3. How can wind be helpful?

Weather 6

Cloudy weather

A cloud is a large group of tiny water droplets. Clouds are formed when water on Earth is heated by the sun, turns to steam and goes up into the sky. This is called evaporation. Clouds are like balls of steam up in the sky. The steam turns to water droplets and then it rains.

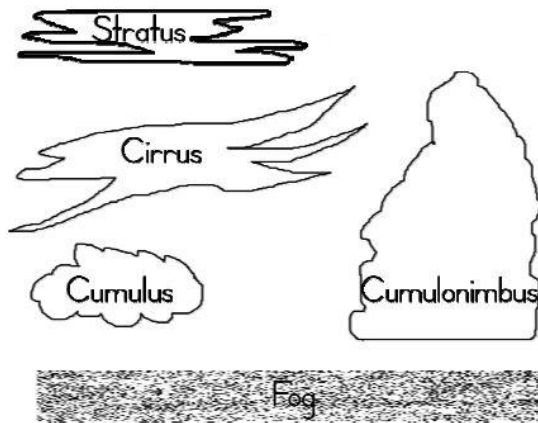
There are different types of clouds, the main types are:

Stratus: flat clouds that look like layers of sheets, high up in the sky.

Cirrus: thin, wispy, high up in the sky.

Cumulus: puffy white clouds that look like cotton wool floating in the sky.

Cumulonimbus: dark clouds that are heavy with rain, not so high up in the sky.



1. Draw and name the different types of clouds.
2. Which type of clouds bring rain?

Weather 7

Rainy weather

Rain is made of water drops that fall from clouds.
This is called precipitation.

Water can also fall from the sky in the form of hail, sleet or snow.

Rain gauges are used to measure the amount of rain over a certain period of time.

Heavy rain can cause flooding and landslides.

Plants need water in order to survive; they receive much of this water from rain.

Forests in areas of high rainfall are called rainforests.

In areas where there is much pollution from factories and power stations, acid rain sometimes falls. It can be harmful to plants and animals.



1. What is precipitation?
2. Draw a picture showing that plants need rain to survive.
3. Draw a picture showing how acid rain can be formed.

Weather 8

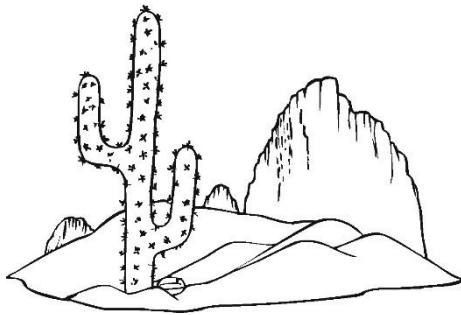
Hot and humid climates

Tropical climates are found in areas that are close to the equator. Here it is hot and steamy (humid). The temperature is much the same every day. You can expect lots of rain, warm nights and hot days. The seasons change only slightly.

Dry climates

Deserts are places with dry climates. Few plants, animals and people can survive here. Deserts are found in parts of Africa and the Middle East.

Deserts can be sandy or rocky. A cactus is a desert plant. It holds water inside the stems and leaves. It can survive a long time with no water. A cactus usually has prickles. These protect the plant from being eaten by animals.



1. What is hot, humid weather like?
2. Where is it hot and humid most of the time?
3. What are deserts?
4. What plants might you find there? Draw and name one.
5. What is this plant like?

Weather 9

Protection from extreme weather

When the sun is hot we can protect our face and head by wearing a

We can protect ourselves from rain by using

We can protect ourselves from a lightning strike by

In countries where it snows, people protect themselves from extreme cold by

We can protect ourselves from very strong winds by

You should not shelter under a tree in very strong winds because

Draw and name what you need to protect yourself from three different weather types: cold, sun and wind.



Weather 10

Protection from extreme weather

The Rotahome

Some houses have been designed to stand firm in wild weather. Here is one type, the “Rotahome”:



These houses have been designed by Peter Drysdale, an Australian, who moved to Fiji. He wanted to design houses that were low cost and also cyclone proof.

Cyclone Winston in early 2016 caused massive destruction in north and east Viti Levu.

In the hills and the sugar cane area near Lautoka there are 943 Rotahomes and 231 of them are at Koroipita. They were hit by the cyclone but there was no damage to these homes.

1. How do you think you would build a cyclone-proof house?
2. Draw your idea.

Weather 11

Protection from extreme weather

The Yurt

The people of Mongolia build tents that are round. These are called yurts. They are made of animal skins and wool. The skins are stretched over bamboo frames. The Yurt is sealed from the cold winds, and inside a fire is lit to keep them warm.



1. Look at a map of the world. Find Mongolia. Name two countries near Mongolia.
2. What is the weather like in Mongolia?
3. Draw a yurt and label the materials used.

Weather 12

The Igloo

The Inuit people live in Alaska, northern Canada and Greenland. They used to build homes of large blocks of ice. The ice sealed the home from the cold air. Inside it was warm.

Today the Inuit people live in normal homes but still make igloos when they go on hunting trips. Now they can buy food that is brought in from other places, but once they had to eat only the food that they could hunt or catch from the sea. They could not grow food because the climate was too cold.



1. Look at a map of the world. Find Alaska, Canada and Greenland. In which country is Alaska?
2. What is the weather like in these places?
3. What was their main food?

Cyclone Season

Cyclones are the most powerful storm in Fiji. They can occur in the hot months from November to April. This period of the year is known as the “cyclone season”.

The waters of the oceans are very warm at this time so there is a lot of evaporation. Huge thunder clouds form in the atmosphere as great amount of water vapor rises. When the

warm air is pushed aside by fast – moving cold air, whirlpool, also occurs if clouds form and spiral upwards.

As these storms move across the water and the land, they cause wild seas and flooding rains. Because their destructive winds can reach up to 300 kilometers per hour, cyclones cause damage to buildings, trees, crops, power lines, shipping and ports. They can also cause injury or death to people and animals. However, the very centre of a cyclone, known as the “eye” is quite calm with clear blue skies. This centre can be up to 50 kilometers wide.

Cyclones are tracked by radar, planes and satellite photographs from space. These tropical storms are named in alphabetical order using male or female names. Frequent warnings are given to communities living in their paths so that people can take precautions. Animals are sheltered, homes are secured and loose objects are removed as people make themselves and their properties as far as possible.

Tropical cyclones are called hurricanes in America and typhoons in Asia. They occur during cyclones season from May to October.

Comprehension

1. What is the centre of a cyclone called?
2. How are cyclones tracked?
3. How are cyclones named?
4. What are cyclones called in America?
5. What are cyclones called in Asia?
6. When can cyclones occur in America?

Terrifying Tornadoes

A tornado is a violent, twisting column of air. It can be seen as a dark funnel shaped cloud, wide at the top and narrow at the bottom. This funnel hangs down from a storm cloud.

Tornadoes only do damage when the bottom of the funnel touches the ground. If they touch down where the person lives, they can wreck house and toss cars, and sometimes even trains, right into the air.

- Tornadoes have the fastest wind on earth- perhaps up to
- 400km/h
- Most tornadoes only touch down for about 10- 15 minutes
- Tornadoes usually travels about 10 km before disappearing.
- The paths make deafening roar as they come close, like a jet
- plane taking off
- The path of the usual tornado is only about 130m wide.
- The United States has more tornadoes than any other
- country- about 700 a year.

Tornadoes are really terrifying. Remember though, that even in North America, nearly everybody goes through life without even seeing a tornado, much less being hurt by one.

Comprehension

- 1.What is a tornado?
- 2.If you see a tornado what would it look like?
- 3.When is the only time a tornado does any damage?
- 4.What sort of damage can it do if it touches down where people live?
- 5.Which country has the most tornadoes?
- 6.Why do you think tornadoes cause so much damage?