

Weather Watch

Recommended Lesson Plan for Self-Guided Kit



AOs

Planet Earth

& Beyond

2.1 2.4
3.1
4.1

Living World

2.1 2.4
3.1 3.2
4.1 4.3
5.2

Integrate with:

Scientific Skills
- Information gathering
- Processing & interpreting
- Reporting
Environmental Education
- Biodiversity
- Interdependence

Site

Jan - Dec Winter Garden Glasshouse in Lower Garden.

Please bring

- ❖ Pencils and photocopied worksheets: Today's Weather (either Junior = 6 measurements or Senior = 8 measurements including air pressure and humidity)

Preparation

- ❖ Fill the bucket with water from the tap in the glasshouse.
- ❖ Staff will let you know how much rain has fallen in the past 24 hours. Fill rain gauge to this point and set in soft soil nearby (away from buildings and tall trees).
- ❖ Ensure 8 flags have been set up in the glasshouse.

Activities

1

Measuring the Weather

45 mins

- ❖ Ask students; What do you think of when you I say the word 'weather'?. Encourage ideas about extreme weather, how we feel in different weather and what things we can and cannot do in different weather conditions. Emphasise how important weather is in our lives.
- ❖ Ask students; What causes the weather? Break it down into the relationships between air moving, heat from the sun and the water cycle. How can we measure the weather today? One by one pick up the instruments and ask the group; What do they think it is? What does it measure? How does it work?
 - ❖ Spirit thermometer (air temperature) spirits (or mercury) expands when warm and is pushed up the tube; then shrinks when cold and retracts down the tube. Roleplay being the spirits in a thermometer, start curled up as if you were in the bulb then expand as the sun heats you up and stand with hands as high as possible then slowly cool down and return to a curled up position.
 - ❖ Dial thermometer (soil temperature) a glass instrument would break if pushed into the ground and the numbers could not be read. Instead a metal spike with a metal coil inside a dial is used. Compare the dial to a speedometer in a car and roleplay being the metal coil in the dial - expand and contract in a spiral.
 - ❖ Anemometer (wind speed) blow into the cups and let the students guess what is measured; explain that there are many scales for measuring wind speed and you will use km/h just like the speed of a car. (NB: This is an expensive instrument, please treat with care).

- ❖ Wind vane (wind direction) note that Mt Cargill is approximately North and position the vane appropriately, the arrow points to where the wind comes from and the wind is named after where it comes from (e.g. if arrow points south its a southerly)
- ❖ Rain gauge (rainfall in past 24 hours) ask students; How we could measure rain? Point out where the gauge is for them to read later. Emphasise that it should be away from buildings or tall trees that may prevent the rain falling in.
- ❖ Estimate eighths (cloud cover) imagine the sky is a pizza and the clouds are melted cheese, take an imaginary knife and cut the sky into 8 even pieces. How many are covered in cloud (aka cheese). Each group must agree on the number of eighths when they measure it later.
- ❖ *Seniors only* - Whirling psychrometer (humidity) the reservoir should be filled with water and handle fixed straight. Spin it around for approx 20 seconds then ask 2 students to come up and read the temperatures of the dry and wet thermometers. The difference between them will help you determine the % humidity (use graphs provided). Discuss how the water on the wet cloth will evaporate quicker if the air is dry. As water evaporates from the cloth it cools the thermometer. If the air is full of water droplets (high humidity) the wet cloth will stay damp and the temperatures of the wet and dry thermometers will be similar.
- ❖ *Seniors only* - Barometer (air pressure) inside the barometer is a capsule of air, as air pressure increases the air expands pushing the dial up. Rising air pressure indicates weather is improving. Dropping air pressure indicates weather is getting worse.
- ❖ In groups, students take turns with each instrument measuring the weather and recording it on the worksheet. Then using their observations predict what the weather will be like tomorrow. Discuss the reliability of weather predictions (e.g. on television and radio) and then compare the class predictions with the met service predictions and the real weather back at school the following day.

2 Where in the World is our Water?

15 mins

Ask students to imagine that in the bucket is all the water in the world. Ask them where it would be (rain, rivers, snow, oceans etc), then ask them to estimate what percentage of water in the world is salty. Let anyone who wants to have a guess.

- ❖ Take the milk bottle and fill it $\frac{3}{4}$ full of water and explain that of all the water in the world 97% is salty (i.e. water left in the bucket).
- ❖ Explain that we need to drink freshwater to survive so we're going to try and get a drink out of this bottle, but first we have to take away the frozen water. Ask them to estimate what percentage of freshwater in the world is frozen.
- ❖ Take the glass and pour a third of the water into it, explain that 70% of the world's freshwater is frozen in ice and snow (i.e. water left in the bottle).
- ❖ Ask students where they think the liquid and vapour freshwater is (i.e. the water in the glass; e.g. rivers, clouds, underground etc).
- ❖ Take the teaspoon and fill it from the glass, tell students that the water left in the glass is underground in streams and aquifers and the only liquid freshwater above the ground and available for drinking is in the spoon! Explain that this water has to be shared around every animal and person in the world and it's not much so we have to look after it...
- ❖ Challenge the students to pass the teaspoon from person to person so that it passes through everyone's hands before it comes back to you. Discuss where it could be going, how it may be polluted and refer to the water cycle picture.
- ❖ When the spoon returns to you, note how much was lost then drink the rest.

3 Plant adaptations to different climates

30 mins

- ❖ We live in a temperate climate that is not too hot or too cold, but imagine if we lived on top of a mountain! Ask students; What would it be like? What clothes would we have to wear to survive? Ask the same questions but imagine if we lived in a desert... Explain that inside the glasshouse are plants from two extreme climates, tropical rainforest and desert. These plants can't change clothes so they have adapted over a long time to have features that help them survive. Can you guess what some of these might be?
- ❖ In small groups, give a worksheet, clipboard and pencil to each group and explain that there are 8 flags inside. They have to find the flags (in any order) and answer the relevant question at each flag. Emphasise that they should look closely at the parts of the plant beside each flag because it's shape, colour and special parts will give the clues needed to answer the questions.
- ❖ After completing the trail go through the answers and discuss each plant onsite so students can refer back to them if they wish.

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