

futureworld
eco-technology centre

Student Worksheets
Sustainability

Stage 1 – 2

futureworld *eco-technology centre*
Patron: The Hon Bob Carr

Station 1 - The Model Greenhouse

How big is the sky? How much air is there? What is it made from?

What is the **atmosphere**? Our atmosphere is a thin layer of air surrounding the earth

Pretend the plastic bubble in the model is the **atmosphere**.

- 1 While the bubble is off, put one hand on the volcano at the middle and one hand near the yellow wire on the blue edge of the circle.

Circle the answer that fits best

Edge feels warmer

Feels the Same

Middle feels warmer

- 2 Put the bubble on and wait for **two minutes**. Get your hand ready, and as the volunteer lifts the lid, quickly put your hand in the same places as before.

Circle the answer that fits best

Edge feels warmer

Feels the Same

Middle feels warmer

- 3 With the lid off wait for 10 seconds and then feel the two spaces again.

Circle the answer that fits best

Edge feels warmer

Feels the Same

Middle feels warmer

Where did the warmth go when the lid was lifted? Why?

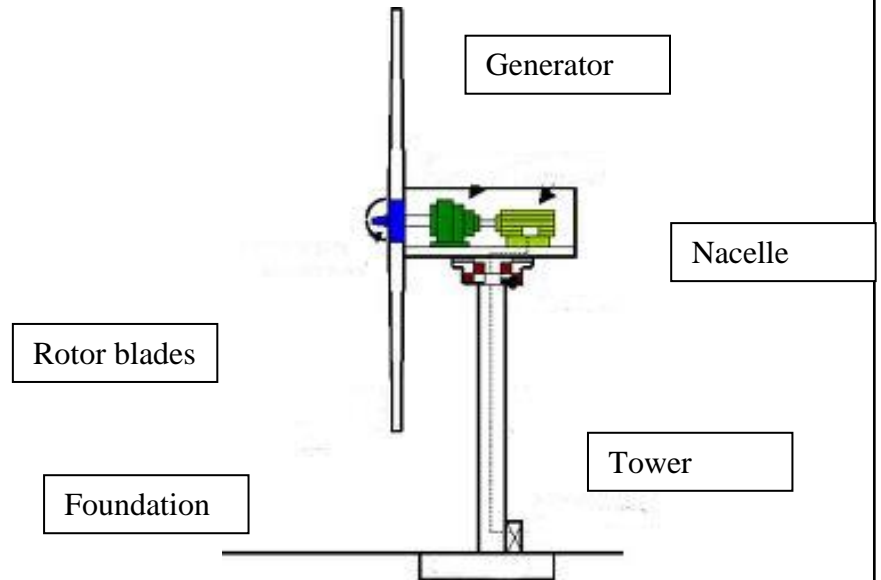
Would you like to live in a world that was as hot as it got under the bubble all the time?

Station 2 – Sustainable Technologies - Wind Power

Wind turbines come in many different sizes. The bigger the wind turbine blades, the greater the power output from the wind turbine.

The higher the wind speed the greater the power generated.

1. Look at the the picture of a turbine and draw arrows from the labels to the parts of a wind turbine.



2. Use the fan and the model of the wind turbine.

Turn the handle and use the anemometer to record the maximum wind speed you produced and the number of houses you have powered.

WIND SPEED

HOUSES POWERED

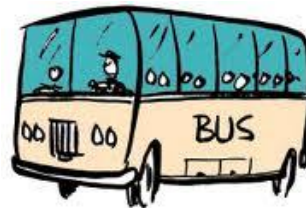
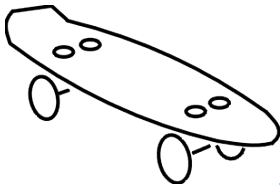
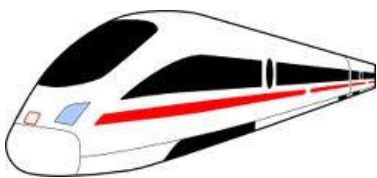
Station 3 Sustainable Transport

How do we use energy to move ourselves and our things around?

What are some examples of fossil fuels?
(ask your volunteer if you're unsure)

What are some ways we can choose to move ourselves around which use less fossil fuels (or even none at all)? (Lift the red lids for clues)

Circle **ONLY** the sustainable friendly transport being used below



Station 4 – Reducing Waste – The four “Rs”

Reducing waste is a good way of becoming sustainable.

To help us, we can remember the four “R”s

- Reduce** - Don't buy things we don't really need
- Refuse** - Don't buy packaged items
- Reuse** - Take green shopping bags to the shops
- Recycle** - Use old things to make new ones

Activity

Each person in your group is given a piece of garbage. You have to place the item in the proper garbage bin.



Yellow bin – used for _____



Green bin – used for _____



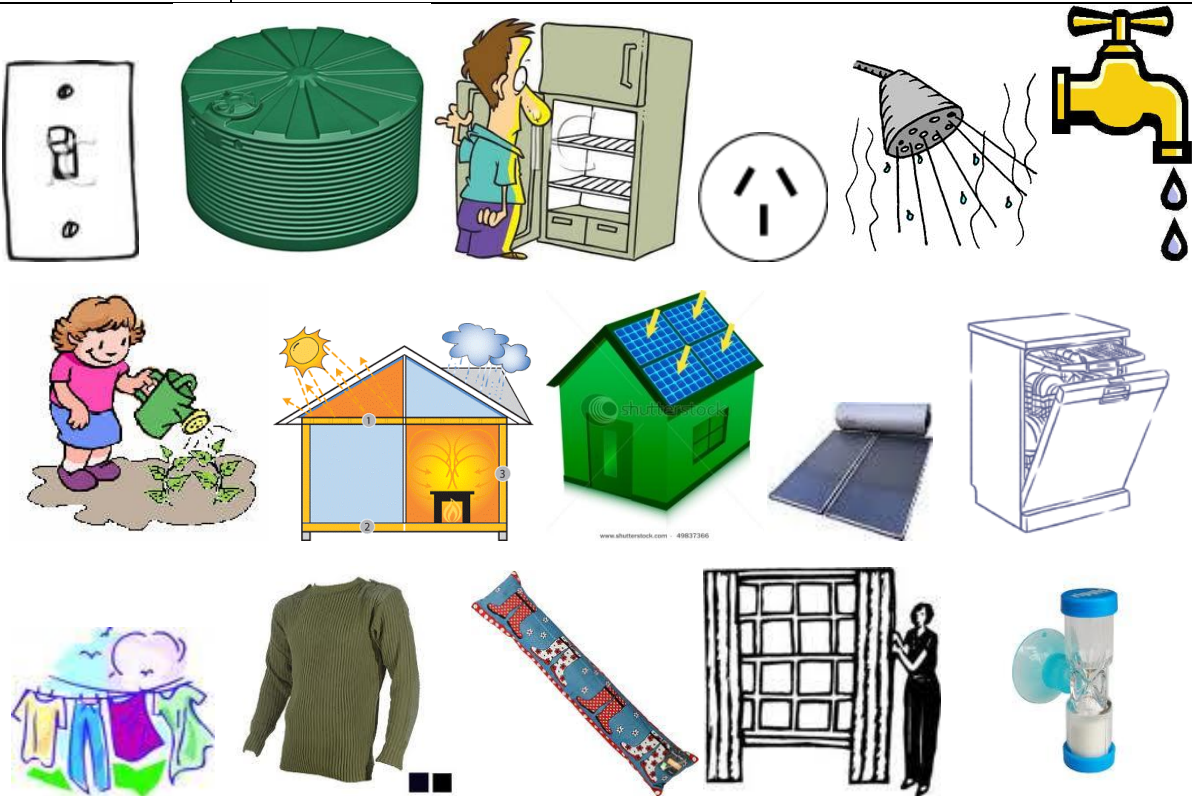
Red bin - - used for _____

Station 5 Reducing our Impact on the Environment

How can we save energy and water at HOME?

1. Using ideas you have seen in the Eco-House or by looking at the pictures below, list 10 ways you can save energy and water at home.

| | |
|-----------------|--|
| In the kitchen | |
| In the bathroom | |
| Yard/ garden | |
| Other places | |



Station 6 - Composting – Worm Farm

Food scraps can be recycled into new soil by worms

Consider making your own worm farm or compost heap.

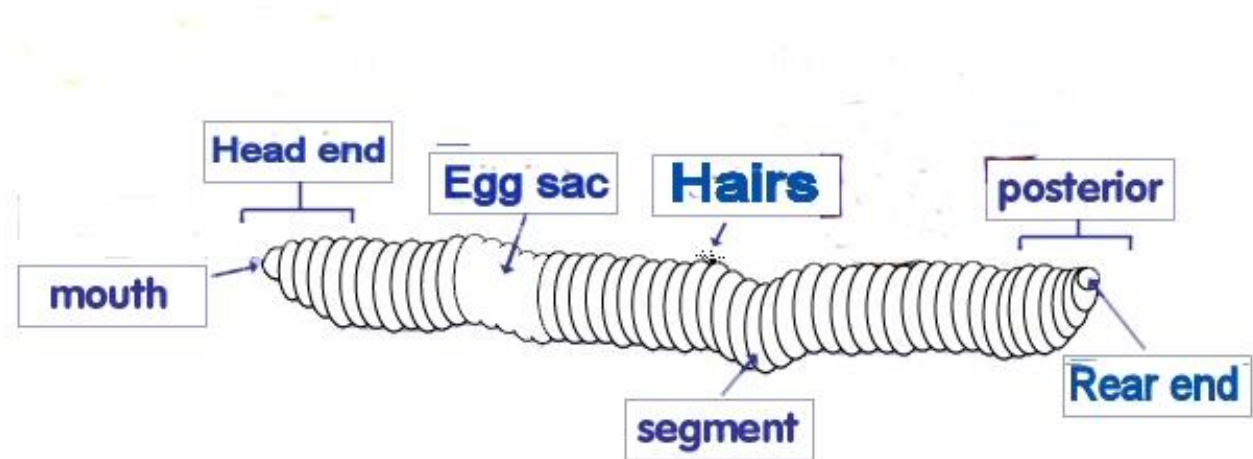


Earthworms dig large burrows which let water and air into the soil. This helps stop erosion and lets the water and air get down to the roots of plants. The burrows also helps plant roots to move more easily through the soil and into new spaces. Worms drag leaves and plant bits down into the earth. As they burrow, the worms swallow soil and eat the plant matter that is in it. The soil they swallow passes though the worm's body and is left in little piles on top of the ground. This is called **castings** and is excellent fertiliser (food for

plants). People who farm worms do it to collect the castings to sell to gardeners.

Working in your group, complete the following investigation..

Look at the worms under the TV microscope.



Circle the parts of the worm that you saw.

Worm Facts

- ◆ Earthworms eat as they burrow through the soil
- ◆ Earthworms do not have teeth
- ◆ Earthworms help make the soil healthy
- ◆ Earthworms lay eggs
- ◆ Earthworms have 5 hearts
- ◆ Earthworms have a brain
- ◆ Some earthworms grow up to 4 meters long

Station 7 - Solar Investigation - Solar Powered Pump

Making electricity from the sun is called **Solar Power**. Solar energy does not pollute the air and can be used instead of the energy from a power point. Solar Pumps can be used in areas with no conventional electricity for pumping water to crops or for drinking water.

The solar photovoltaic panel converts sunlight into electricity. We can use solar electricity to power a water pump.

Working in your group, complete the following investigation..

Objective: When does the solar pump work best?

Procedure: Record how long it takes to fill the bucket with water from the solar pump in the following conditions.

Results:

| Pump operating conditions | Time (seconds) |
|--|----------------|
| The solar panel pointing directly towards the sun. | |
| The solar panel held parallel to the sun's rays. | |

The pump works best when _____

What things could make the cells best?

Conclusion: The solar pump works best when
