STUDENT ACTIVITY PACK

KEY STAGE 2: AGES 7-11

Working on behalf of HS2

WHO ARE WE?

We're LM.

LM is made up of Laing O'Rourke and J. Murphy & Sons Ltd working together as a joint venture, to deliver a dynamic enabling works programme for HS2's phase one across the West Midlands.

Both companies are leaders in major rail infrastructure delivery, tunnelling, bridge construction, civil engineering, offsite manufacturing and digital engineering.

Find out more about us: http://www.lm-jv.com/

WHY CONSTRUCTION?

You get to build the stuff people depend on. Can you imagine...

- lifting a bridge into place at midnight, so there is step free access to help hundreds of thousands of people with a disability use our public transport?
- finishing your day knowing you helped millions of people get gas, water and electricity?
- helping to bring green energy to 800,000 homes?
- creating inspiring spaces for people to live, socialise and work in?

Whether your passion is carpentry, engineering, welding, electrician, the environment or IT, there's a place for you in construction.

Find out more about careers at Laing O'Rouke: http://careers.laingorourke.com/ and at Murphy: www.murphyearlycareers.com

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ACTIVITY: **BUILD A BUG HOTEL**

ACTIVITY TIME: 2 hours

MATERIALS: Toilet roll tubes, sticks, grass, sand, stones

Create a safe hideaway for wildlife to shelter anything from hedgehogs to bees to ladybirds.

Collect natural materials such as sticks, wood, grass, sand, soil, bamboo etc from your garden or on your daily walk and build a small structure with them.

You can get some more guidance on the RSPB website

Our teams love building bug hotels and it's a great way to use left over building materials to improve the environment.
Find out more on our website

ACTIVITY: **TALLEST TOWER**

KEY STAGE: 1, 2 & 3

ACTIVITY TIME: 1 hour

How high can you build a tower using household objects?

Every building needs a strong foundation, so think about what shapes will help make a strong base.

If you enjoyed this activity you may want to consider a career in engineering

Sometimes the best bit is demolishing your structure! In construction we need to think about protecting the environment and reusing. Watch this short video to find out more

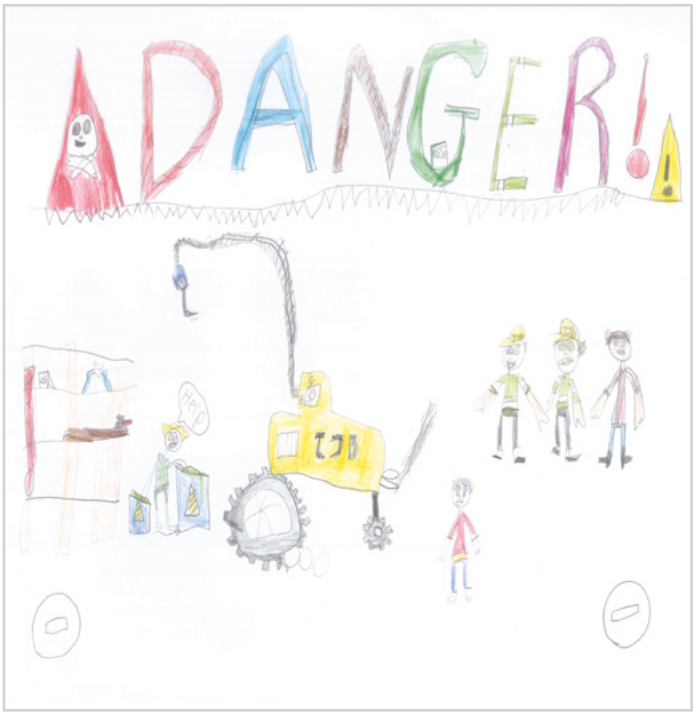
ACTIVITY: **HEALTH & SAFETY POSTERS**

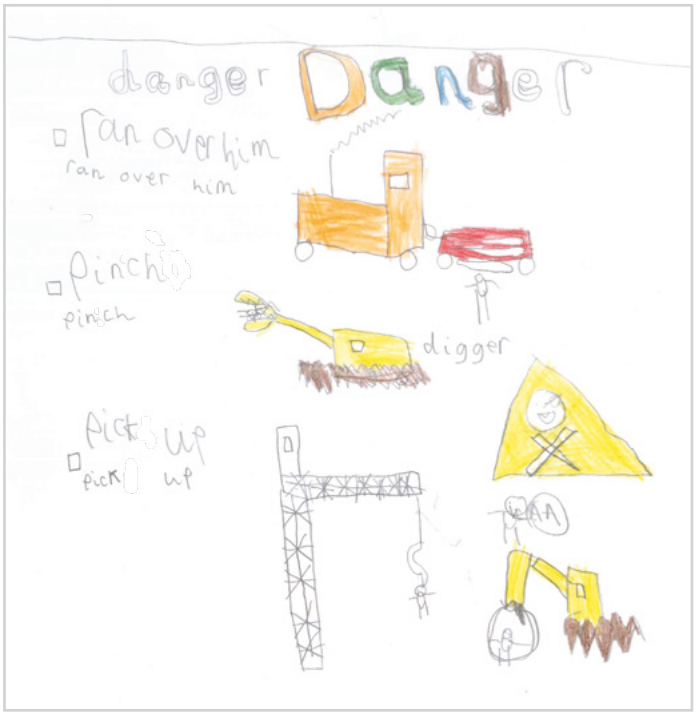
ACTIVITY TIME: 30 mins/1 hour

MATERIALS: Paper, pens, colouring pencils

Create a poster for health and safety on site. You can also play hunt the hazard here

Once you've played the game create a poster around the hazards you just found.





ACTIVITY: **WIND TURBINES**

KEY STAGE: 3 & 4

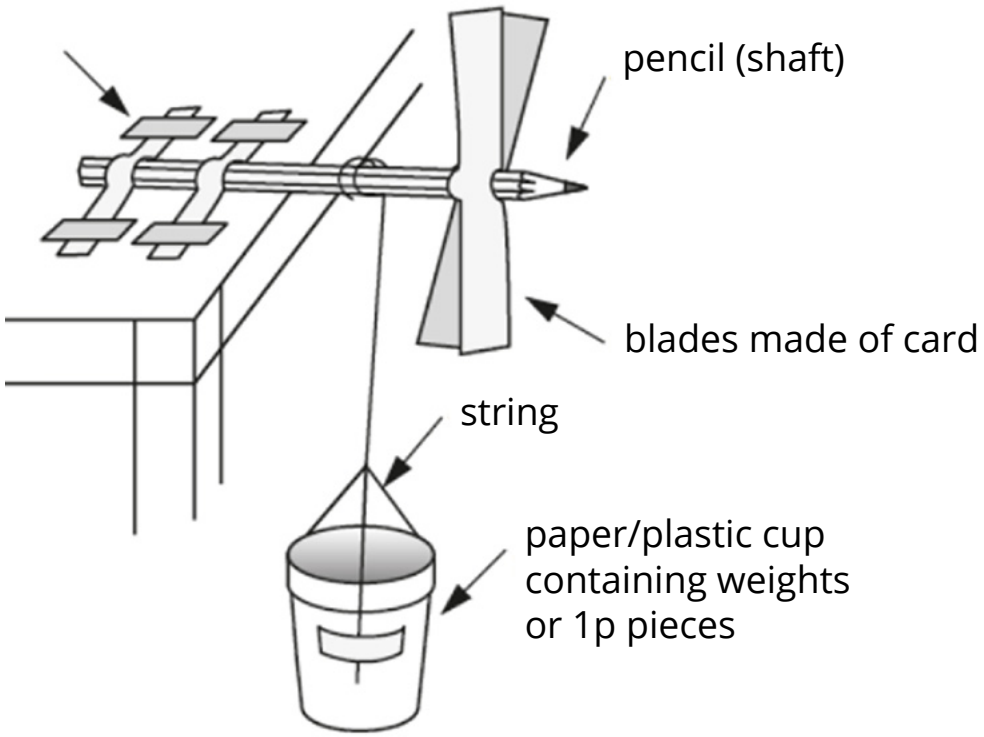
ACTIVITY TIME: 2 hours

MATERIALS: Scrap card, sellotape, scissors, string, paper/plastic cup, pencils, pennies/weight and a hairdryer

Using the materials listed, design a simple wind turbine capable of lifting a cup off the floor to table height. Use a hair dryer to act as the wind to spin the shaft.

POSSIBLE DESIGN

attachment allowing shaft to spin (made from sellotape)



The energy in the wind turns two or three propeller-like blades around a rotor. The rotor is connected to the main shaft, which spins a generator to create electricity that is sent to land.

Disadvantages
initial cost
technology immaturity.

Advantages
Fuel is free
Low operating costs

ACTIVITY: **SOLAR OVENS**

KEY STAGE: 3 & 4

ACTIVITY TIME: 1 hour 30 mins

MATERIALS: Empty pizza box, tin foil, cling film, sellotape, scissors, glue, stick or rod, black card, marshmallows, plain digestive biscuits and chocolate

1. Draw a square on pizza box that is one inch smaller than length of box
2. Glue tin foil, shiny side out, to the inside of the flap that you just made out of the box lid
3. Glue another piece of aluminum foil, shiny side out, to the inside bottom of the box
4. Tape black card over top of the foil you just glued
5. Stick clingfilm to the opening in the lid from the inside of the box. Try to make the seal as airtight as possible
6. Place plain digestive biscuits inside your pizza box on the black card
7. On half the biscuit place chocolate and on the other half marshmallows
8. Close your pizza box
9. Place your pizza box somewhere it can get sun
10. Use stick or rod to prop up your flap with tin foil on it. It should be in a position so that it is reflecting sunlight into the box up to bench height.
11. Eat the cooked marshmallows! Find out more here

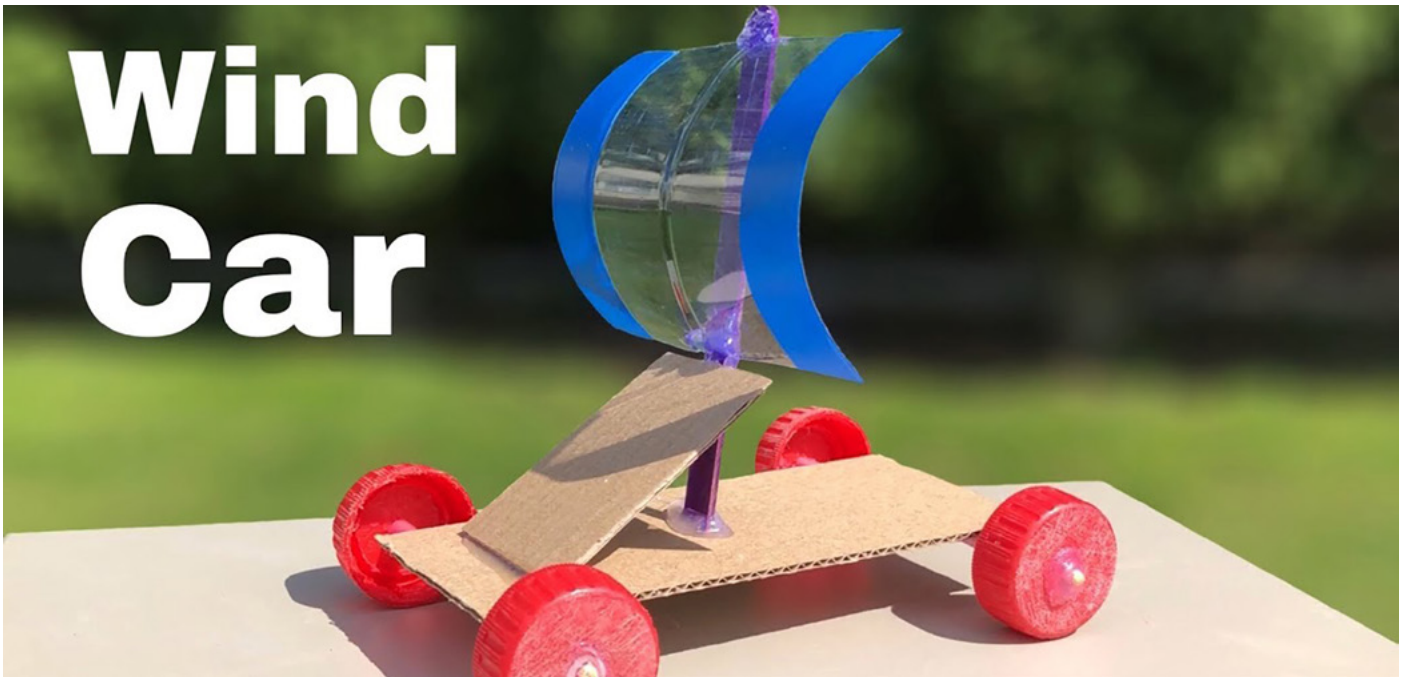
ACTIVITY: **WIND CARS**

KEY STAGE: 3 & 4

ACTIVITY TIME: 1 hour

MATERIALS: 4 Plastic bottle caps, 2 straws, cardboard, card, Sellotape, scissors

1. Cut out a piece of cardboard to form the body of your car.
2. Tape two straws to the bottom of your car, one at each end to form the axles. Make sure the straws are parallel.
3. Carefully poke a "+"-shaped hole in the centre of each bottle cap.
4. Push a wooden skewer through the hole in one of the bottle caps.
5. Thread the other end of the skewer through one of the straws.
6. Push a bottle cap onto the end of the skewer opposite the first bottle cap. You just made an axle with two wheels!
7. Repeat steps 4 through 6 to make the other axle.
8. Make sure the axles can spin and the car can roll smoothly without getting stuck. If needed, adjust the wheels so they are not too wobbly.



9. Poke a small hole in the middle of the cardboard.
10. Insert a wooden skewer upright into the hole to form a mast. Secure it at the base with plenty of tape. If it is still too wobbly, you can build a diagonal support out of a piece of cardboard.
11. Cut out a shape for a sail from a piece of paper.
12. Poke the upright skewer through both ends of the sail to hold it in place.
13. Place your car outside in the wind and watch it go!
14. Watch a video on how to make a wind car here

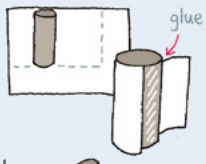
Make your own binoculars

wildlife watch

You will need

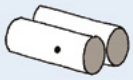
- Two cardboard tubes (you can use toilet roll tubes)
- String
- Paper
- Scissors
- Glue
- Rubber band
- Hole puncher or pen
- Felt tip pens (optional)

1. Cut your paper to size, then cover your tubes with glue and wrap the paper around them.

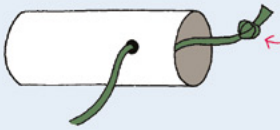


2. Using a pen or hole puncher, insert a hole at the side of each tube, about a third of the way down.

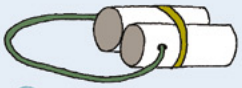
3. Glue the two tubes together so that the holes are facing the outside.



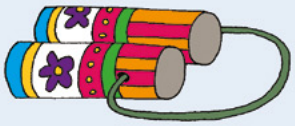
4. Insert string into one of the holes from the outside of the tube. Bring it through the tube and tie a chunky knot. Gently pull the string back from the outside. Repeat on the other side.



5. Place a rubber band around the tubes to help the glue set. Leave to dry over night.



6. Remove the elastic band and then decorate them with pens!



7. Go wildlife detecting!

www.wildlifewatch.org.uk

Find more activities from Wildlife Watch here

How to Make a Mini nature reserve

wildlife watch

1 Choose your site

Choose a safe place to put your window box – somewhere like an old bench or wall at an easy height for inspection.

2 Gather your materials

- window box
- yoghurt pot
- a rock
- a small log
- some compost

3 Fill the box with compost

Always use peat-free compost and save our precious peat bogs.

4 Add a few features

Dig in the yoghurt pot and add the small log and rock.

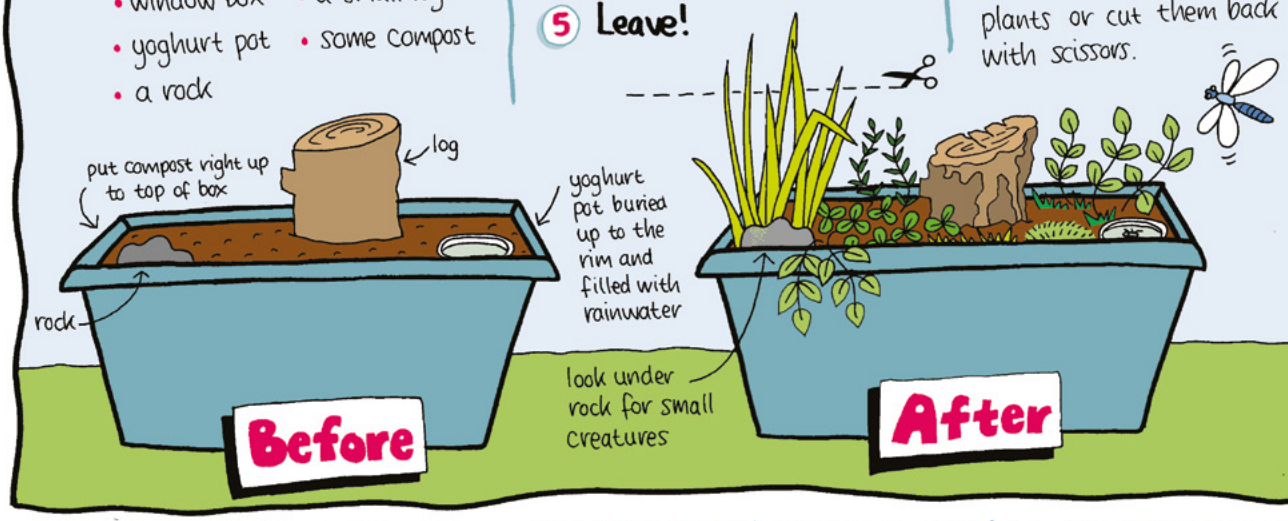
5 Leave!

6 Keep a diary

Record the changes you see. Make notes using guidebooks and take a photo every week.

7 Management

Remove out of control plants or cut them back with scissors.

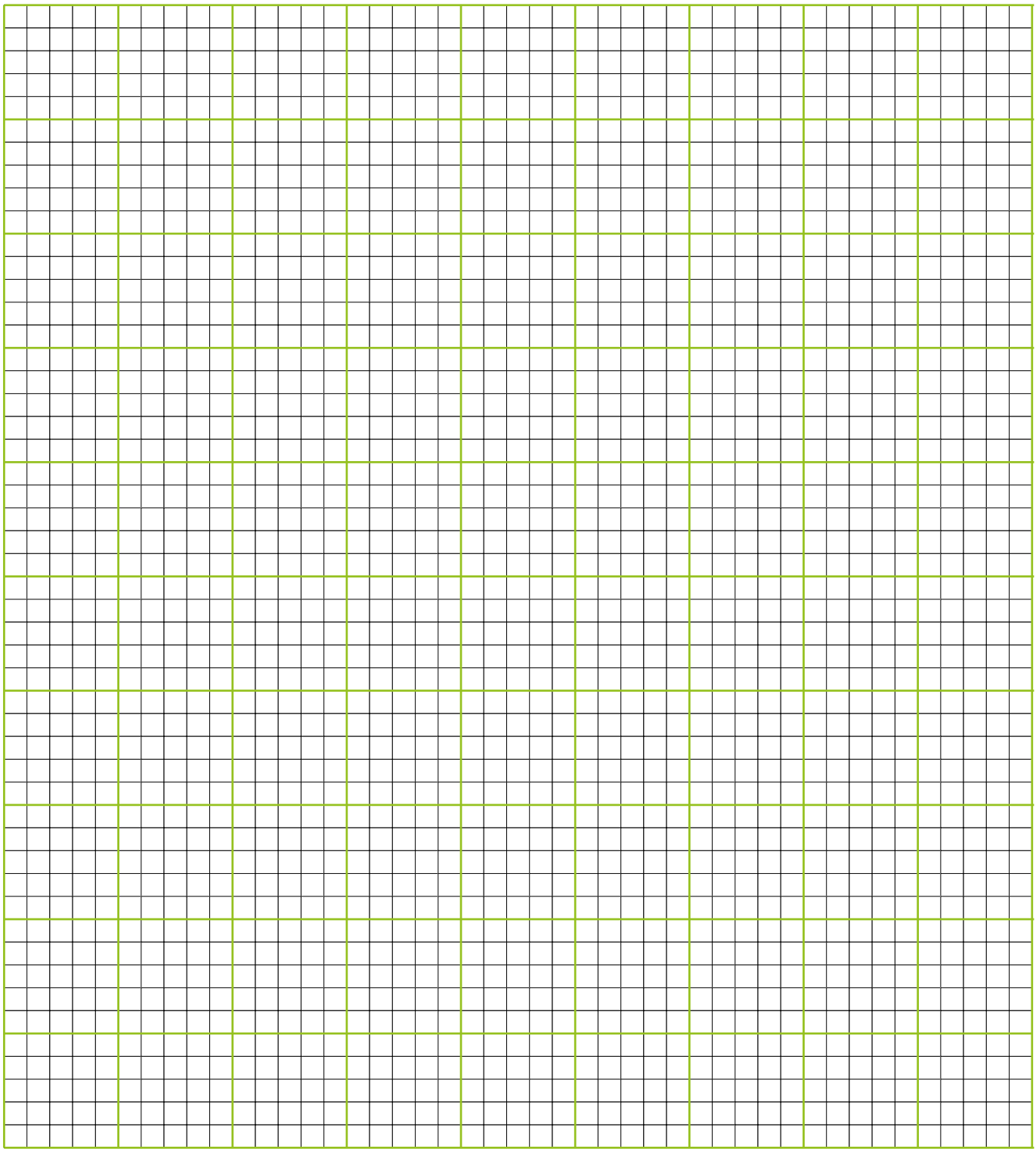


www.wildlifewatch.org.uk

with thanks to patrick roper for original idea (windowboxwildlife.blogspot.com)

ACTIVITY: SURVEYING SKILLS

Draw a map of your garden or a green space and mark out on the grid where you notice all the important pieces of the environment. These could be plants, animals, birds, streams or ponds.



Keep watching your green space because, as our seasons change, so do the plants and animals that we have in our environment.

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