Dear Parent/ Carer,

I have created this resource to provide weekly work that children can complete at home. This could be used in conjunction with your home learning packs. I have included:

* Outdoor Learning Activities (to take advantage of the beautiful weather)

Many Thanks,

Mr Garvey

**10 Ways to measure a tree:**

Estimate and Measure

1. Estimate

Compare the height of the tree to a known object. If your partner is 1.5m tall, is the tree 7 times as high? A football goal is usually 2.44m tall, a car height can be measured and compared etc.

2) Look through your legs

Stand with your back to the tree, about as far as you estimate the tree height is from the tree. Look backwards, through your legs. You are trying to just see the top of the tree. You will need to move towards or away from the tree until you are just able to see the tree top. The distance you are from the centre of the trunk is the tree’s height.

3) Use a pencil and a pal

Hold a pencil up vertically at arm’s length, with the sharpened tip at the top of the tree. Hold the pencil near the opposite end. Move towards or away from the tree until your thumb lines up with the ground level, while keeping the tip of the pencil on the top of the tree. Without moving your grip, arm length or feet, turn the pencil horizontally. Line your thumb up with the centre of the trunk on the ground. Get your partner to move out from the tree until their feet are at the tip of the pencil – without walking towards or away from you, only sideways. The distance from their feet to the centre of the trunk is the height of the tree.

4) Use two people the same height

You need a partner who is as close to your height as possible. One of you lies down, feet towards the tree, about the distance from the tree that you estimate it high. Your partner stands at your feet. The person lying on the ground needs the top of their partners head to line up with the top of the tree. You will need to shuffle and wriggle, to move away or towards the tree a few times until you achieve this. The distance from the lying down person’s eyes to the centre of the tree trunk is the height of the tree.

5) Use a measuring stick (Simple version)

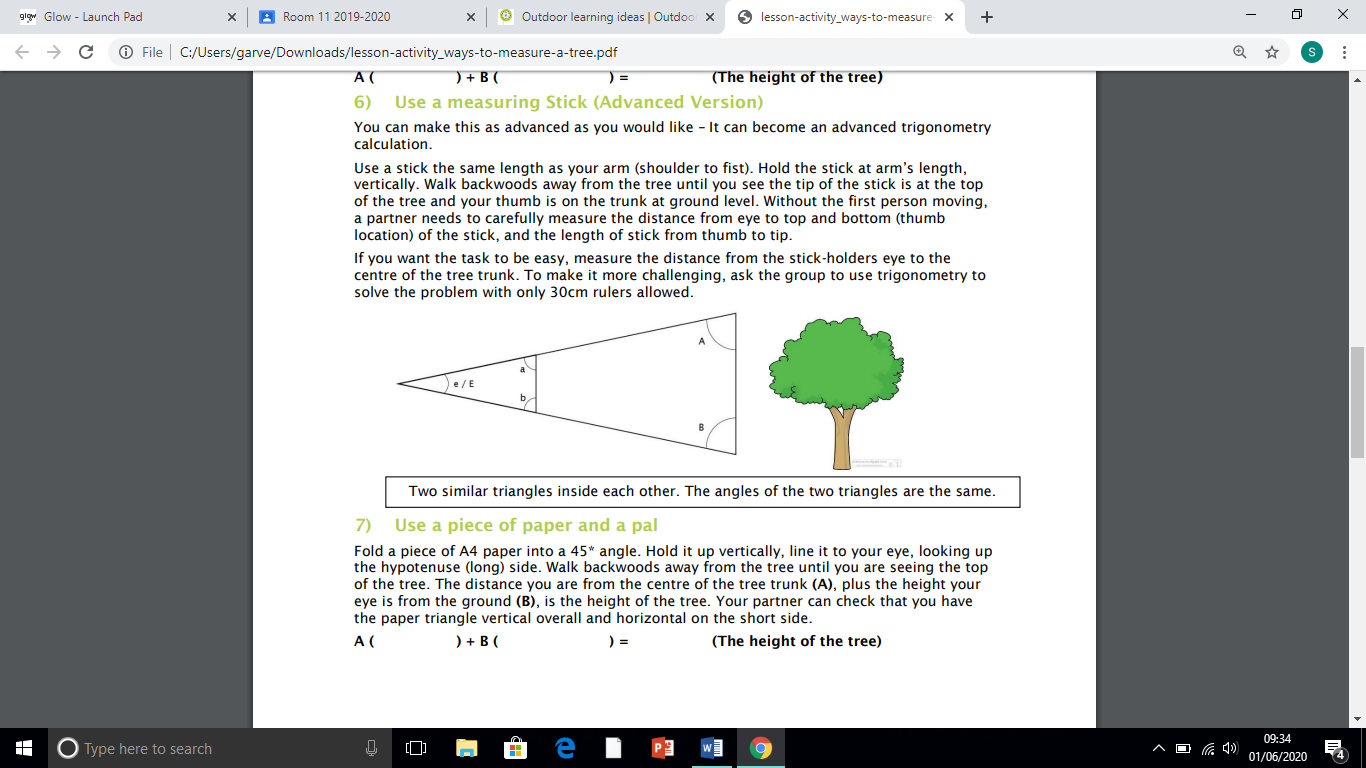
Each pair need a stick (a metre rule would also work). You need to hold your arm out, lay the stick on your arm and line the tip of the stick up with your shoulder. Grasp the stick where it lies in your hand. Hold the stick vertically, without letting it go or moving your hand on the stick. Walk backwoods until the tip of the stick lines up with the top of the tree. Your partner can check that your arm is parallel to the ground and the stick is vertical.

The distance you eye is from the centre of the tree trunk (A), plus the height your eye is from the ground (B), is the height of the tree.

A ( ) + B ( ) = (The height of the tree)

6) Use a measuring Stick (Advanced Version)

You can make this as advanced as you would like – It can become an advanced trigonometry calculation. Use a stick the same length as your arm (shoulder to fist). Hold the stick at arm’s length, vertically. Walk backwoods away from the tree until you see the tip of the stick is at the top of the tree and your thumb is on the trunk at ground level. Without the first person moving, a partner needs to carefully measure the distance from eye to top and bottom (thumb location) of the stick, and the length of stick from thumb to tip. If you want the task to be easy, measure the distance from the stick-holders eye to the centre of the tree trunk. To make it more challenging, ask the group to use trigonometry to solve the problem with only 30cm rulers allowed.



7) Use a piece of paper and a pal

Fold a piece of A4 paper into a 45\* angle. Hold it up vertically, line it to your eye, looking up the hypotenuse (long) side. Walk backwoods away from the tree until you are seeing the top of the tree. The distance you are from the centre of the tree trunk (A), plus the height your eye is from the ground (B), is the height of the tree. Your partner can check that you have the paper triangle vertical overall and horizontal on the short side.

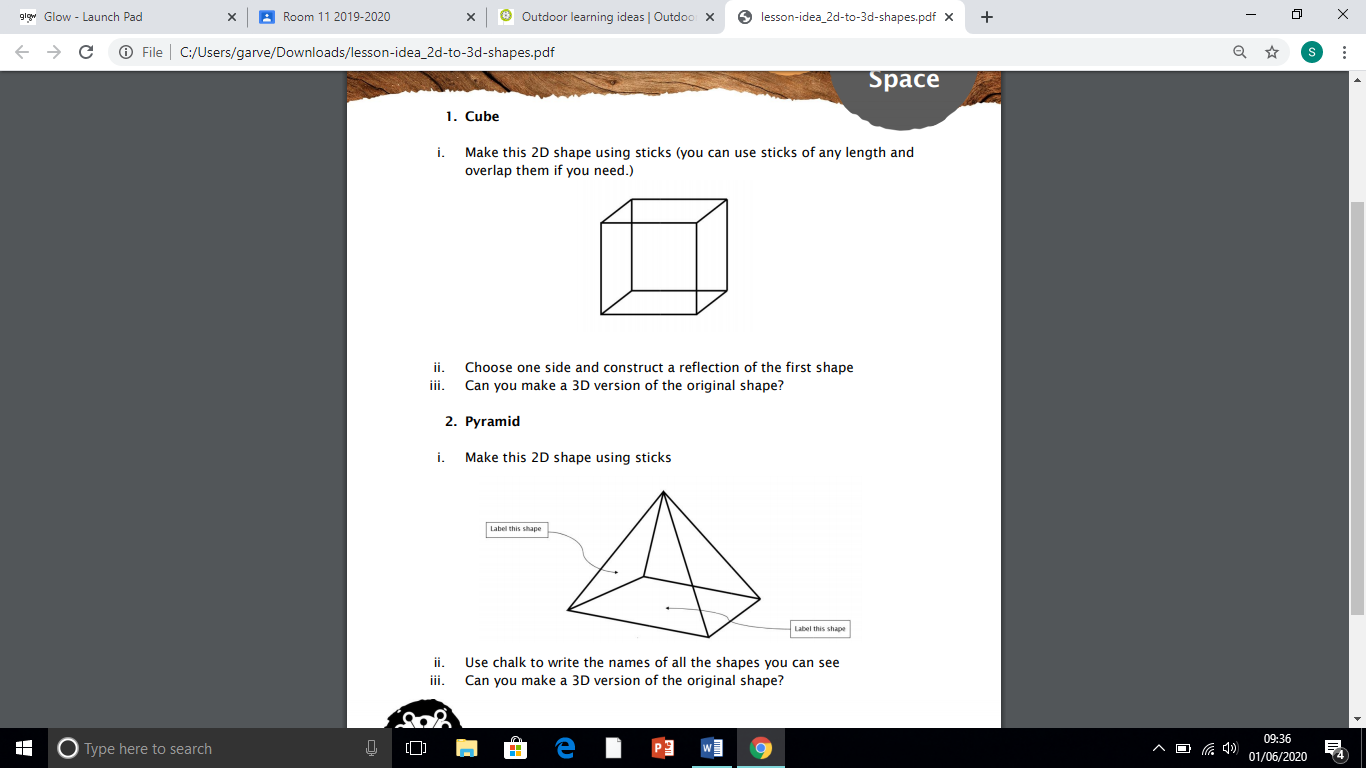
A ( ) + B ( ) = (The height of the tree)

**2D to 3D Challenge**

Use sticks to learn about shapes, dimensions and reflection

1. Cube

i. Make this 2D shape using sticks (you can use sticks of any length and overlap them if you need.)

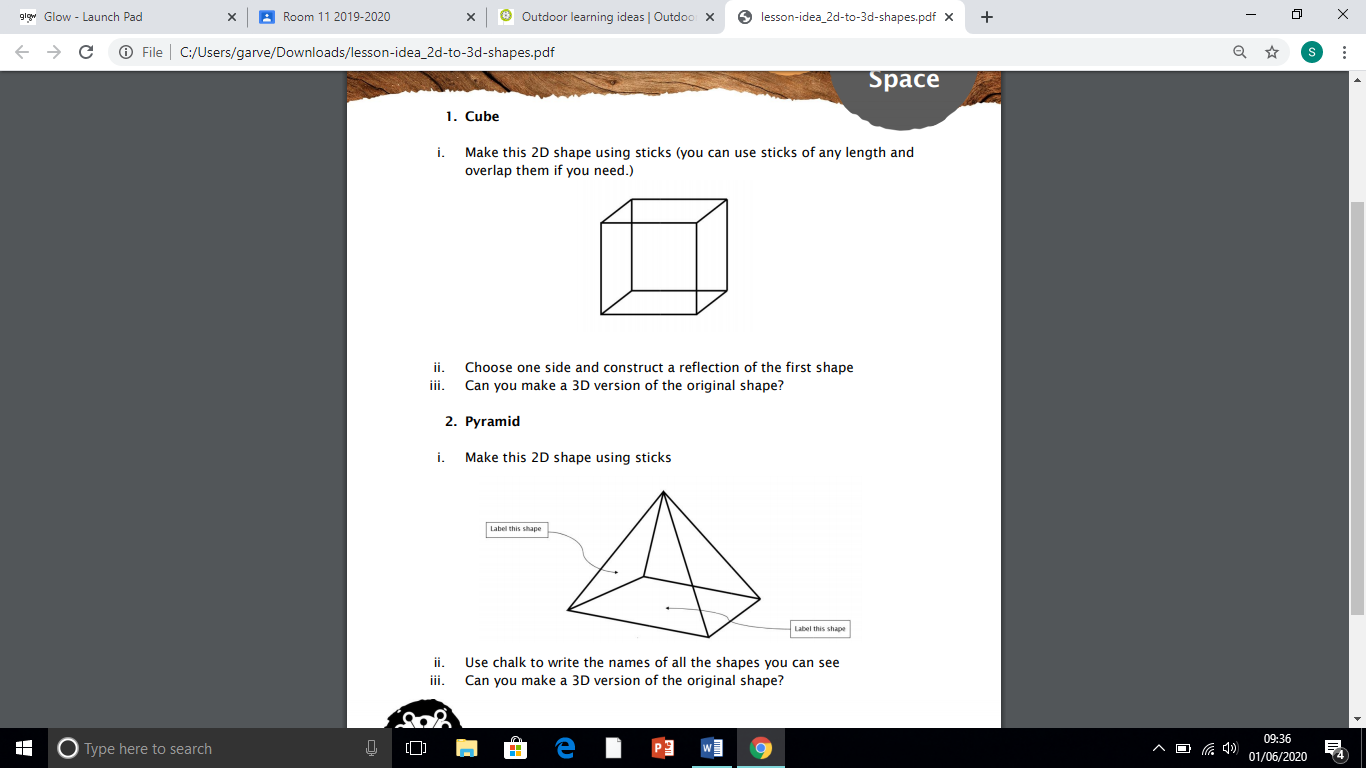


ii. Choose one side and construct a reflection of the first shape

iii. Can you make a 3D version of the original shape?

2. Pyramid

i. Make this 2D shape using sticks



ii. Use chalk to write the names of all the shapes you can see

iii. Can you make a 3D version of the original shape?

**Active Maths Games**

Playful Practice of number processes outdoors

Active maths encourages the body to be considered as an object to think with and help children make sense of otherwise abstract concepts.

These numeracy activities use addition, subtraction, multiplication and division to consolidate best use of the mental strategies and written skills.

You could challenge your children to devise their own active maths games to scaffold their understanding of any area of mathematics from properties of circles to Pythagoras’ theorem!

Equipment

• A big space

• A ball suitable for the catching abilities of the group

• Tape measure

• String

• Chalk

Activities

1. Ball Function Game: Throw a ball between the group, where the ball represents what happens to the number being said by the thrower. e.g. if the ball represents ‘doubling’, a thrower says ‘4’ so the catcher answers ‘8’.

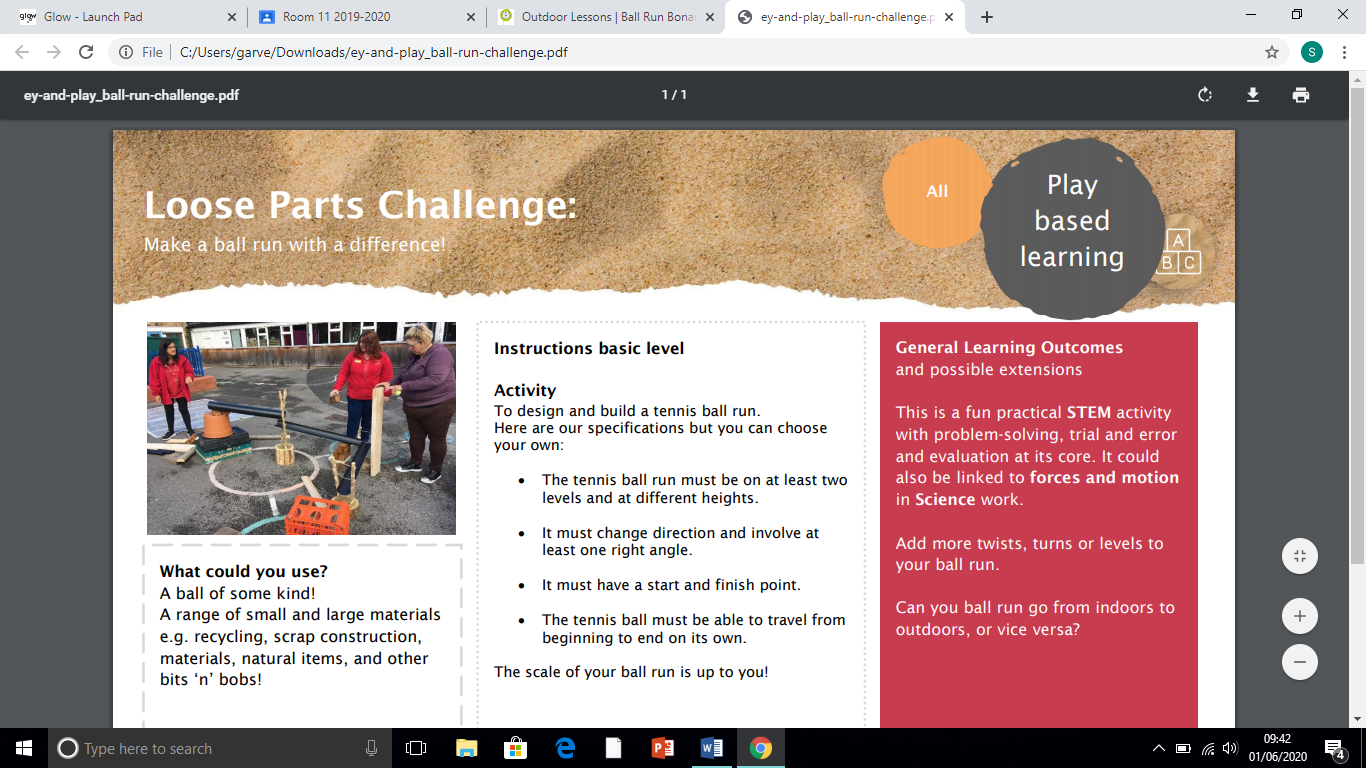
2. Jumping Equations: if you jump 3 times and then hop 4 times, how many times have your feet touched the ground? Express this as an equation, e.g. (3 x 2) + 4 = 10. What if 5 students holding hands do the same? 5 (3 x 2 + 4) = 50

3. Stables Times Tables: With the group in a circle, start counting from 1 around the group. Every time a number is in the 3 times table the child saying that number must moo instead. When a number in the 4 times table is encountered then the child must baa. If the number is in both then the child must neigh like a horse!

4. Circles: Jump as far as you can from a chalk-marked point. Use this length as the radius of a circle and draw the whole circle. Measure the circumference with string and a tape measure. Compare with others how long their diameters are and whether this affects circumference length.

**Loose Parts Challenge:**

Make a ball run with a difference!



What could you use?

A ball of some kind! A range of small and large materials e.g. recycling, scrap construction, materials, natural items, and other bits ‘n’ bobs!

Activity

To design and build a tennis ball run. Here are our specifications but you can choose your own:

• The tennis ball run must be on at least two levels and at different heights.

• It must change direction and involve at least one right angle.

• It must have a start and finish point.

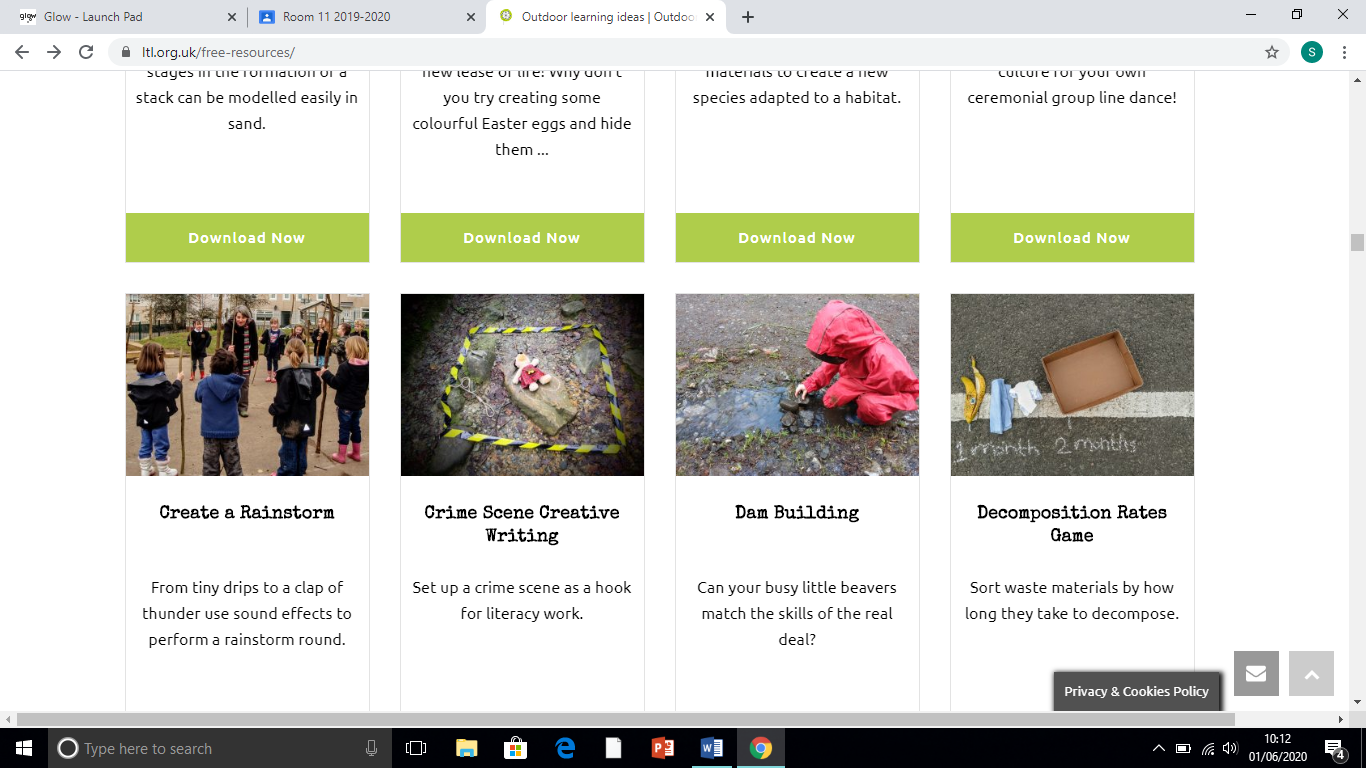
• The tennis ball must be able to travel from beginning to end on its own.

The scale of your ball run is up to you!

Add more twists, turns or levels to your ball run. Can you ball run go from indoors to outdoors, or vice versa?

**Crime scene creative writing**

Set up a crime scene as a hook for literacy work



The multisensory nature of the outdoors provides stimuli not possible indoors and can prompt the formulation of richer ideas and responses whether in speaking or writing. Research from the University of Curtin supports this through evidence of much more vivid language and descriptions from those pupils with direct outdoor experience compared to those who have ‘imagined’ inside the classroom. The crime scene is one potential hook.

Equipment

• A teddy

• Hazard tape

• Chalk

• Loose parts

Activity

There are many ways that this activity could run so let the children lead in devising their own way of responding to the stimulus.

In advance of the lesson you could prepare a crime scene outdoors. Brief the pupils that they are going to be detectives encountering an incident.

The pupils can invent a chain of events which led to the crime and write the resultant story.

The pupils can devise questions for a witness using: who, what, where, when and why and prepare a written interview.

The pupils could introduce different suspects and invent motives for them or role play being the different characters under interview.

Pupils could even be challenged to set up their own crime scenes.

**The Japanese Art of Hapa zome**

A fun art activity which involves pounding plants to release their natural pigments into cloth



Hapa-zome is a Japanese term meaning ‘leaf-dye.’ It provides a great context for pupils to investigate the natural world using a range of materials from nature and then express themselves creatively through this traditional art and design technique.

It could also be used: to support relevant geography or history topic work; as the basis of a science investigation into fabric absorbency or natural dyes or children could even be challenged to incorporate symmetry within their composition.

Equipment

• Mallets, rolling pins or even just hand-sized rocks

• Cotton fabric such as calico, cut up bed sheet or muslin. Kitchen roll also works.

• Various leaves, berries and flowers.

Activity

1. Collect a range of leaves, berries and flowers.

2. Position the natural matter as desired on a small piece of cotton fabric.

3. If creating a symmetrical image place the natural matter on one half so that the fabric can be folded over.

4. Or cover the natural matter with a second piece of fabric or kitchen roll.

5. Hammer all over the top layer of material until the dye can be seen seeping through.

6. Remove the top layer and the plant matter to enjoy the resultant imprint on the fabric.

**Loose Parts Challenge: Recreate a famous landmark in your grounds**



What could you use?

A range of small and large materials e.g. recycling, scrap construction, materials, natural items, and other bits ‘n’ bobs!

Activity

There are some incredible landmarks across the UK, from Big Ben to Edinburgh Castle. Recreate some of your favourite famous landmarks to save you having to go and visit them all!

• Your landmark could be a manmade building or structure, or a natural feature.

• Think carefully about what size it should be – should it include certain shapes?

• What specific features does your landmark need to have?

• You could use natural materials that you can find outside or manmade materials.

• Look at a photo of the landmark to try to add more attention to detail.

Challenge:

• Add some tourists who are enjoying their visit to the landmark.

• Make facilities such as a car park etc.

• Create the landmark from different perspectives e.g. birds eye view etc.

• Write an advert or make a poster to encourage people to visit your site.

• Make the landmark to a chosen scale.

**Solar Kettle**

Investigate how effectively you can harness solar energy to heat water



A great way to investigate the renewable energy source of solar power and understand how it can be harnessed.

The solar kettle design has similarities with solar panel design. Solar panels comprise a series of photovoltaic (PV) cells which are made from layers of semiconducting material, usually silicon. Photovoltaic simply means the cells convert photons of sunlight into electricity.

In addition to the PV cells, a solar panel has a glass casing that offers durability and protection. Under the glass, the panel has an additional glass layer for insulation and a protective, reflective back sheet, which protects against heat dissipation and humidity inside the panel. The exterior surface has an antireflective coating to maximise sunlight absorption by the PV cells.

Equipment

• Tall and medium assorted plastic bottles and smaller glass, metal or plastic containers that will fit inside the taller bottles.

• Aluminium foil

• Short length of hose or inner tube

• Tape, scissors, paint and blue tack.

• Stop clock and thermometer

• Sunshine!

Activity

1. Select a small dark coloured container or paint a small bottle black.

2. Insert a tube or piece of hose into the black bottle

3. Cut the bottom off a medium plastic bottle and ensure that it is stable when standing on the ground.

4. Make sure it is tall enough to sit over the small black bottle.

5. Next cut the base off a large plastic bottle ensuring it is tall and wide enough to cover the medium plastic bottle.

6. Cover half of the inner surface of the larges bottle with aluminium foil.

7. Stack the medium and then large bottle over the top. Ensure the hose is poking through the top bottle.

8. Replace the large bottle’s base and use tape or blue tack to hold it in place.

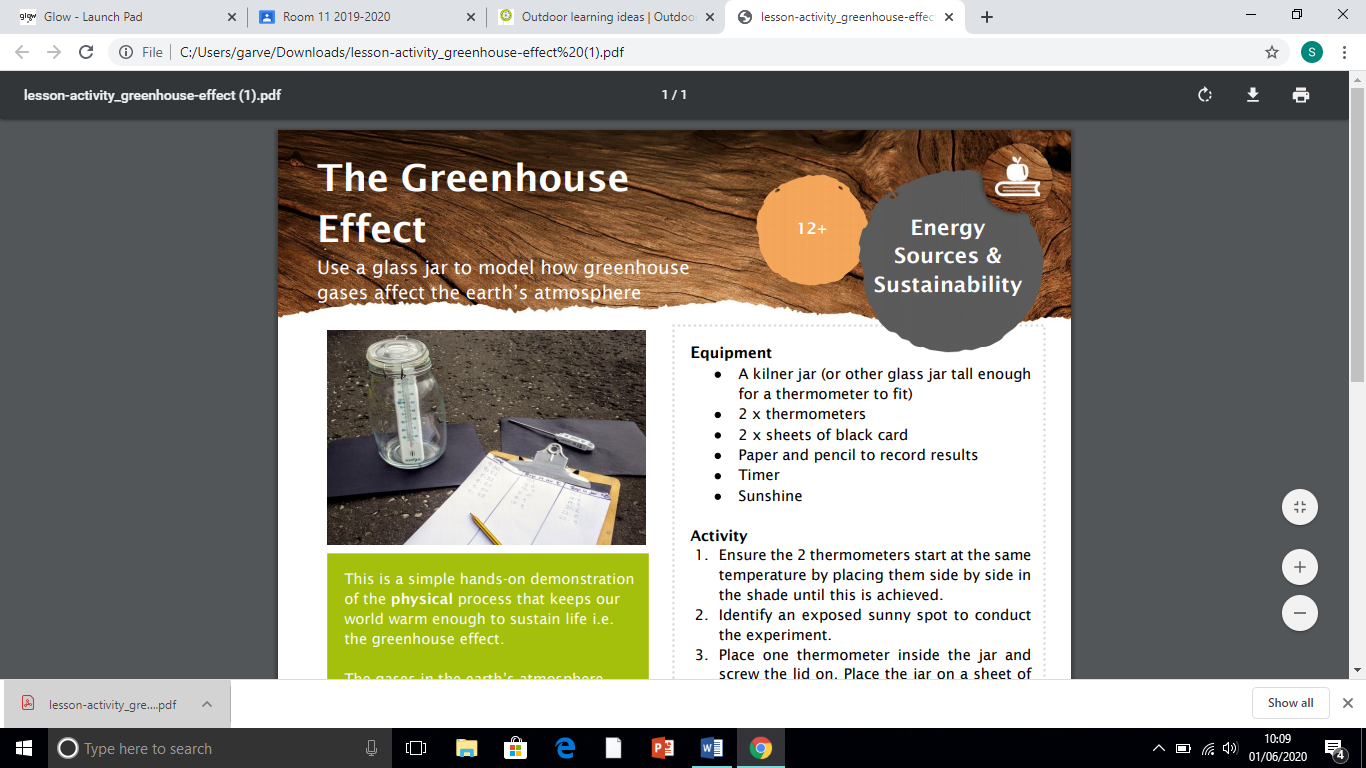
9. Fill the inner black bottle via the tube/hose.

10.Position the solar kettle in a sunny sheltered position with the foil surface furthest from the sun so it reflects the heat inwards.

11.Measure the temperature of the water via the tube/hose at regular intervals.

**The Greenhouse Effect**

Use a glass jar to model how greenhouse gases affect the earth’s atmosphere



This is a simple hands-on demonstration of the physical process that keeps our world warm enough to sustain life i.e. the greenhouse effect.

The gases in the earth’s atmosphere work similarly to the glass in a greenhouse in that they trap the warming IR radiation from the sun whilst any unabsorbed or reflected UV radiation can pass back out.

In the jar the air is trapped and unable to mix with cooler surrounding air, so the temperature rises inside.

The problem on earth is the accumulation of additional greenhouse gases like CO2 due to human activities. This upsets the natural balance and the planet’s temperature rises leading to long-term climate change.

Equipment

• A kilner jar (or other glass jar tall enough for a thermometer to fit)

• 2 x thermometers

• 2 x sheets of black card

• Paper and pencil to record results

• Timer

• Sunshine

Activity

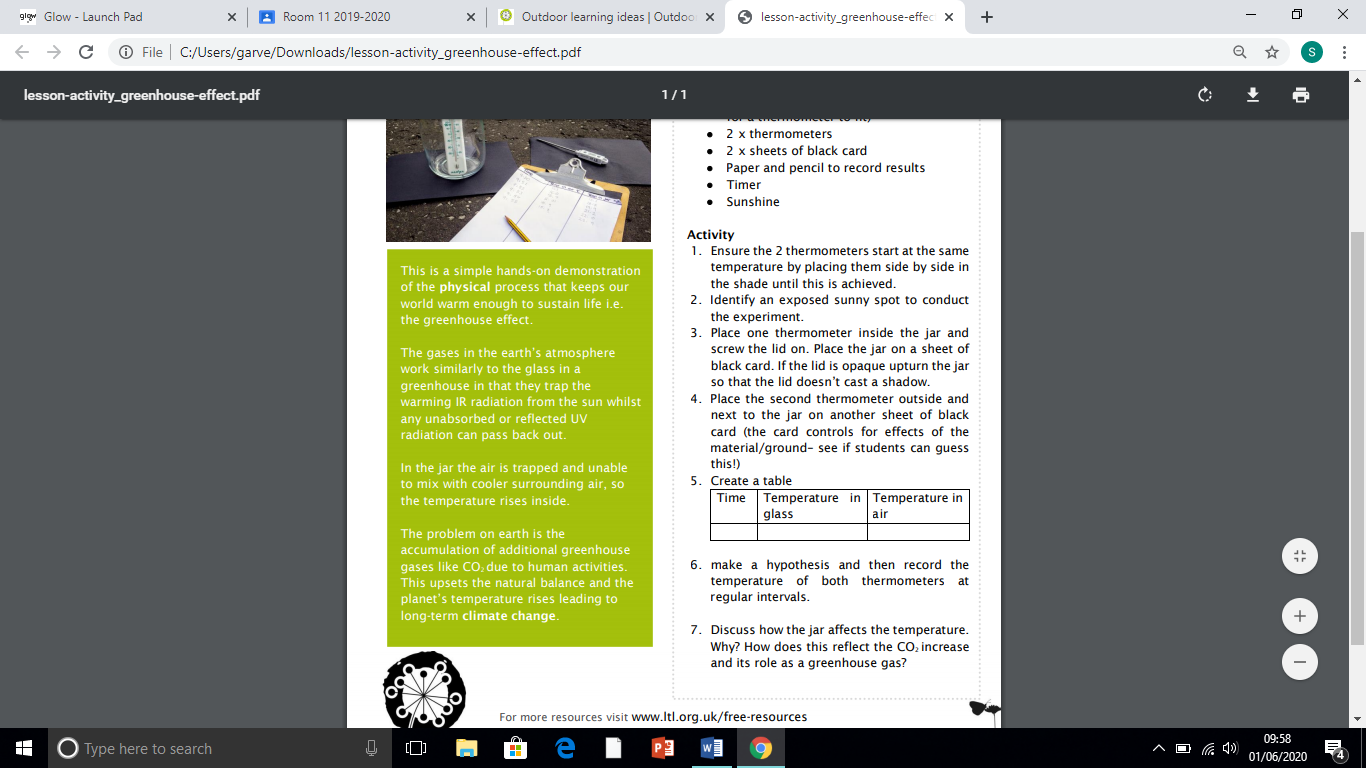
1. Ensure the 2 thermometers start at the same temperature by placing them side by side in the shade until this is achieved.

2. Identify an exposed sunny spot to conduct the experiment.

3. Place one thermometer inside the jar and screw the lid on. Place the jar on a sheet of black card. If the lid is opaque upturn the jar so that the lid doesn’t cast a shadow.

4. Place the second thermometer outside and next to the jar on another sheet of black card (the card controls for effects of the material/ground– see if students can guess this!)

5. Create a table

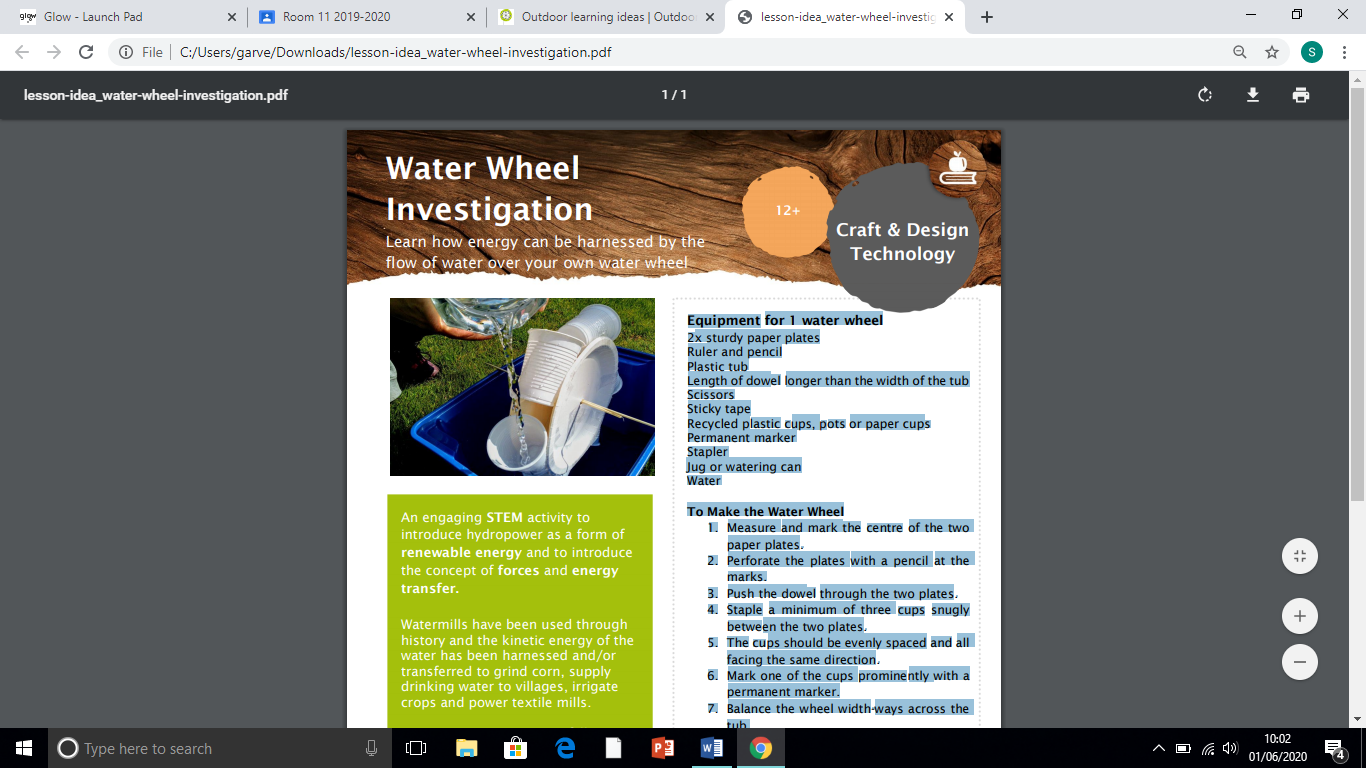


6. make a hypothesis and then record the temperature of both thermometers at regular intervals.

7. Discuss how the jar affects the temperature. Why? How does this reflect the CO2 increase and its role as a greenhouse gas?

**Water Wheel Investigation**

Learn how energy can be harnessed by the flow of water over your own water wheel



An engaging STEM activity to introduce hydropower as a form of renewable energy and to introduce the concept of forces and energy transfer.

Watermills have been used through history and the kinetic energy of the water has been harnessed and/or transferred to grind corn, supply drinking water to villages, irrigate crops and power textile mills.

Modern hydropower uses falling water often retained by a dam to generate electricity.

As an extension you could attempt to harness the energy from your wheel attaching a string and a small weight to the shaft to see how much weight the mechanism can lift.

Equipment for 1 water wheel

* 2x sturdy paper plates
* Ruler and pencil
* Plastic tub
* Length of dowel longer than the width of the tub
* Scissors
* Sticky tape
* Recycled plastic cups, pots or paper cups
* Permanent marker
* Stapler
* Jug or watering can
* Water

To Make the Water Wheel

1. Measure and mark the centre of the two paper plates.

2. Perforate the plates with a pencil at the marks.

3. Push the dowel through the two plates.

4. Staple a minimum of three cups snugly between the two plates.

5. The cups should be evenly spaced and all facing the same direction.

6. Mark one of the cups prominently with a permanent marker.

7. Balance the wheel width-ways across the tub.

Investigation

Steadily pour the water from a jug into the top cup of the water wheel and watch it begin to rotate as the water flows. Count how many rotations the wheel makes using 1 litre of water. Use the marked cup to keep track of rotations. Experiment by changing the height and speed of the flow of water. What difference does a faster flow make?

**Additional Activities:**

