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January 2021 – Spring Term

#SolveItWithSTEM@Home

Secondary Activity Pack

*Friday 22<sup>nd</sup> January 2021*

# Hey Everyone!

Hi everyone and welcome back...we hope you enjoyed last week's pack focussing on *Recycling, Re-using and Reducing Waste*...this week we are exploring another theme which surrounds the **Weather and the Earth**...

...Eddie was actually caught in a **whirlwind** recently – left his head spinning for days!

**Did you know** if the whirlwind connects to the cloud above and the ground below – it actually becomes a tornado?

**Did you know** the winds of a tornado can reach speeds of up to 480km per hour?

**Did you know** tornadoes are measured using the Fujita Scale (or F-Scale), ranging from F0 to F5? F5 being the strongest and most destructive

You can find more at:  
<https://www.natgeokids.com/uk/discover/geography/physical-geography/tornado-facts/>



...this theme covers a wide range of learning opportunities and we think our chosen activities reflect this.

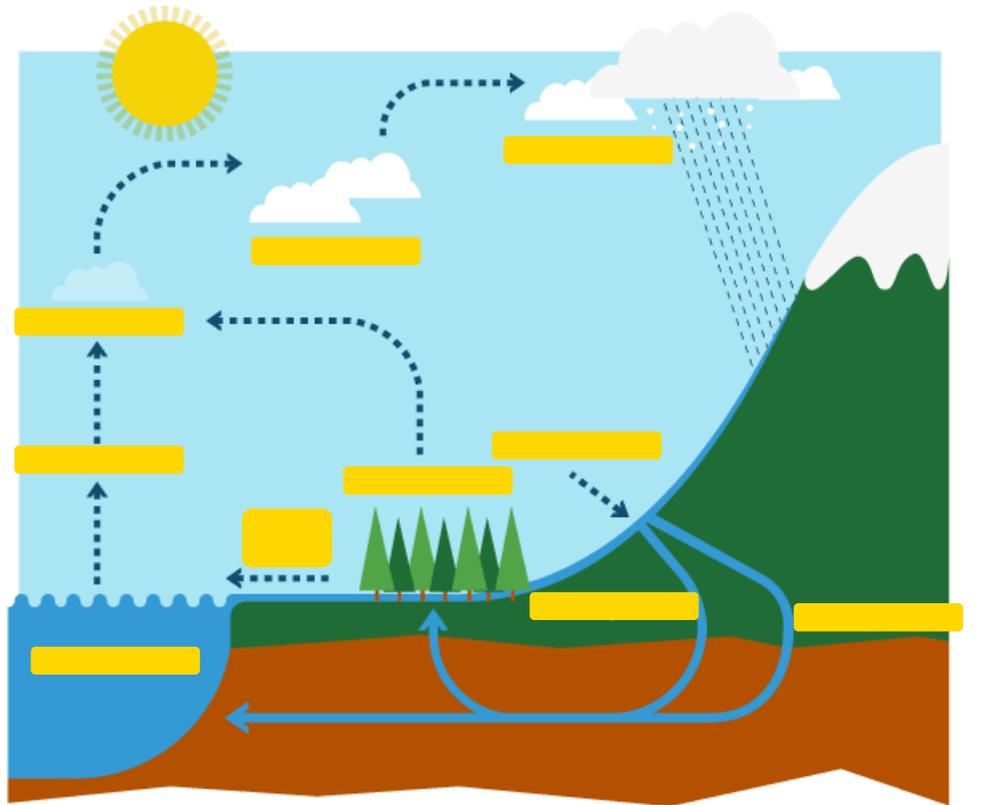
As always, don't forget these packs will be available online at [www.fawleyonline.org.uk](http://www.fawleyonline.org.uk) – please share with family and friends.

Enjoy and see you next week!  
**Alice and Eddie**

# Activity: The hydrological cycle

Using your own knowledge of the water cycle, also known as the hydrological cycle, complete the following:

1. Fill in the blanks on the illustration below using the words highlighted in the yellow boxes.
2. Have a go at finishing the sentences by filling in the blanks. (**Some of the words are used in the illustration, some are not.**)



Infiltration

Surface run-off

Clouds

Evaporation

Transpiration

Percolation

Precipitation

Throughflow

Condensation

Ocean

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## How does the water cycle work?

- Energy from the Sun heats the surface of the Earth.
- Water is **e**..... from oceans, rivers, lakes, etc.
- The warm, moist air rises because it is less **d**.....
- **C**..... occurs when water vapour is turned back into water droplets as it cools down. Clouds are formed.
- **P**..... occurs as water droplets get bigger and heavier they begin to fall as rain, snow and sleet, etc.
- When the precipitation reaches the surface, some falls directly into the sea but other water falls on land:
  - Some water is **i**..... by vegetation. Some water may then slowly reach the ground. Some will evaporate from the surface of leaves or be taken up by the plant roots, and some of this water will eventually return to the air as vapour through the process of transpiration. This slows down or prevents some water flowing back to the river.
  - Some water flows across the surface of the ground - **s**..... This happens when the surface doesn't allow water to penetrate. Surface run-off is more likely to occur if the ground is **s**..... with water or when the rock is **i**..... This water moves quickly to the river.
  - Some water infiltrates into the soil. This **t**..... moves more slowly back to the river than surface run-off.
  - Some water **p**..... deeper into the ground and is slowly transferred back to the river or sea.

This exercise was created using the BBC Bitesize website...if you are really stuck – visit there!



# Experiment: How to make a sundial

(Make sure you have an adult help you with this activity)

Please note this experiment takes place outside so please keep track of the weather forecast throughout the day.

## Items Required:

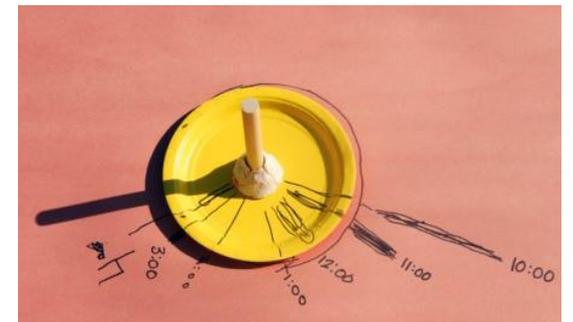
- Cardboard or a large piece of paper
- Paper plate
- Blu tack or plasticine
- Straight pencil or stick
- Marker pen
- Clock
- Stones

## Instructions:

- Place the pencil in the centre of the plasticine and place this in the centre of the paper plate.
- Go outside and place the cardboard on the ground – make sure this is in an area that will get full sunlight and won't be easily disturbed.
- Place the paper plate (along with the plasticine and pencil) in the centre of the cardboard.
- Trace a circle around the paper plate just in case your sundial gets knocked over or moved. You may want to weigh down the paper plate with some stones so it doesn't get blown away.
- It is easier to start marking times on the hour, i.e. 10:00 – record the time and mark a line on the shadow.
- Set a timer on your clock so it will go off on the hour for the rest of the day. Each time the timer goes off, head outside and mark the shadow and the time. Eventually your board will start to resemble a clock.

Also look at the length of the shadows...have you noticed anything? Depending on the position of your sundial, the shadow displayed can change in shape. This is to do with the Earth's rotation on its axis.

Sundials are often referred to as an Egyptian shadow clock. They became popular around 1500 B.C. We didn't use sundials regularly until 1600's. Around year 1000, they tried using a marked candle to tell time during the night, though in those days the candle mix was pretty irregular, and would burn down at different rates as candles use a mix of bees wax and tallow (animal fat)!...



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# Maths: We hope these questions aren't too MEAN! 😊

These questions are centred around the **measure of central tendency**, in other words, **averages**.  
Why not give them a go....answers will be provided next week!

The below frequency table shows the amount of rainfall (mm) over a period of two autumn months.  
Work out what the **median** would be.

Rainfall (mm):	0	1	2	3	4	5	6
Frequency (f):	2	5	10	18	8	12	5

The below frequency table shows the amount of rainfall (mm) over a period of two summer months.  
Work out what the **mean** would be.

Rainfall (mm):	0	1	2	3	4	5
Frequency (f):	4	12	15	16	9	4

The table shows the midday temperature over five days. Each temperature is in degrees Celsius.  
Work out the **range** of the temperatures and the **mean** temperature.

<b>Day</b>	Monday	Tuesday	Wednesday	Thursday	Friday
<b>Temperature</b>	-4	1	-6	1	-2

# Answers: w/e 15<sup>th</sup> January 2021 STEM Pack

## Activity (Page 3): Do you know your recycling symbols?

1. This symbol indicates that the item is made from recyclable aluminium.
2. In addition to the seedling symbol for industrial composting, you may see this one which means that it is suitable to be home composted.
3. This indicates that an object is capable of being recycled, not that the object has been recycled or will be accepted in all recycling collection systems.
4. This symbol asks that you recycle the glass container.
5. This symbol from Keep Britain Tidy asks you not to litter.
6. This symbol explains that you should not place the electrical item in the general waste. Electrical items can be recycled through a number of channels.
7. This identifies the type of plastic resin used to make the item by providing a 'Resin Identification Code'. It is represented with a 'chasing arrows' symbol surrounding a number between 1 and 7 that defines the resin used.
8. Products certified to be industrially compostable according to the European standard EN 13432/14955 may bear the 'seedling' logo.



## Maths (Page 5): Plastic bag questions

1. 93%
2. Approximately 95 single-use plastic bags per household (For April 2016 to April 2017, Assuming 22 million households in England)
3. Bags per household is probably more reflective of reality, because most households shop together. 'Per person' will include children and babies - Who don't usually do the weekly shop!
4. PROS - Paper bags can be designed to biodegrade, for example in household compost. The paper used can be produced from sustainable forestry. CONS - Paper bags might break if it suddenly rains on your way home from the shop! In general they can be re-used fewer times than a reasonable-quality plastic bag.

We hope you enjoyed this week's activities.

Another pack will be on its way to you next week...

Best wishes

The ExxonMobil Fawley #SolveItWithSTEM Team!

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