



## Family Home Learning Pack

# ALL ABOUT WEATHER

**Notes for parents and carers:**

These home learning packs have been compiled by the Young People's Trust for the Environment to support you whilst your children are at home during the Covid-19 lockdown.

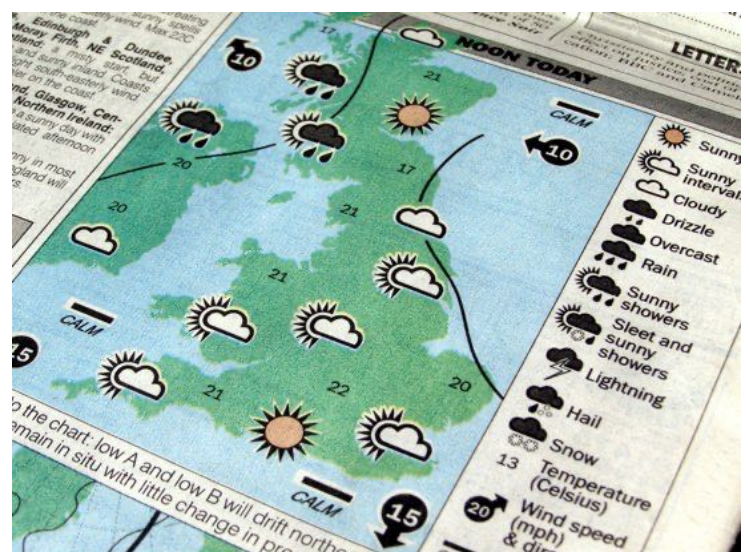
Each week, we will include suggestions for activities you can do alongside your children, as well as those that they can do independently, whilst you are working from home.

We will attempt to suggest activities which require no special materials other than those you may find around the house. It may be possible to pick up some resources during your occasional shop for essentials but please do not aim to shop specifically for listed supplies! We will also attempt to minimise the need to print out any materials.

We'd love to hear your suggestions for making the packs more useful for you, or your children's ideas for future topics. You can follow us on Facebook at <https://www.facebook.com/WeAreYPTE/> or on Instagram @weareypte. You can share your pictures with us using #yptelearning

**In your pack each week:**

- \* Open ended project ideas and research topics
- \* Activities to explore independently or together
- \* Games to play
- \* Ideas for science experiments
- \* Art and craft ideas
- \* Links to other learning resources
- \* A use each week for toilet roll tubes...





# ACTIVITY IDEAS

The weather affects many aspects of our days including what we wear, the activities we do and often, our mood! In this pack, you can find out some ways that

meteorologists measure different types of weather and learn how to build your own weather station! You can also consider the difference between weather and climate.



NASA

over many years.

## What do we mean by weather?

When we go outside, or look out of the window each day, we can observe different types of weather, such as whether it is cold or warm, rainy or dry and how much cloud cover there is.

When we talk about weather, we mean the changes in the atmosphere from day to day. Climate refers to typical weather conditions in a particular place

People who measure changing weather conditions are called meteorologists. They gather lots of detailed information all across the world and use this to help them predict what the weather will be like in the near future.

Satellites help us to build a picture of what the weather is like around the world so that we can make better weather forecasts.

This video helps explain how weather forecasts are made (Youtube link, supervision is recommended):

[https://www.youtube.com/watch?v=fdErsR8\\_NaU](https://www.youtube.com/watch?v=fdErsR8_NaU)

## Weather Stations

Meteorologists use information gathered from weather stations to help them measure and predict the weather. A weather station is made up of lots of different instruments. Each one measures a different aspect of the weather.

The following activities will help you to build your own weather station at home.

### Make a wind vane

A wind vane tells you which direction the wind is blowing *from*, which can help to show whether the weather is likely to get warmer, cooler, wetter, or dryer. (In very general terms, in the northern hemisphere, if the wind is from the north, the weather will get colder. If it's from the south, it will get warmer)



#### You will need:

- A pot with a lid
- Two straws (preferably paper ones, unless you already have plastic ones in the house that you need to use up)
- a pen
- Scissors
- sticky tape
- a pin
- some card
- A compass to find North



Stephen Matthews Photography

To make the base, take a cup with a lid. A pot that contained cream or potato salad could be re-used for this. Make a small hole in the lid (get help using any sharp tools if needed)



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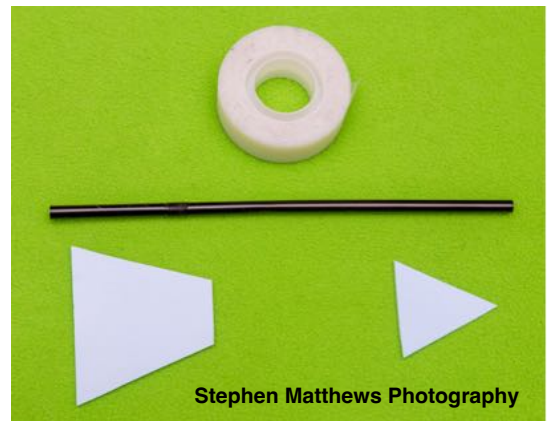
Label the 4 cardinal directions on the lid (North, East, South, West).



Stephen Matthews Photography

Cover the top end of the straw with a piece of masking tape.

To make the top, take a second straw – cut slits in each end and cut shapes from card to make an arrow. Push the shapes into the slits in the straw.



Stephen Matthews Photography



Stephen Matthews Photography

Balance that straw on your finger to find the centre of gravity.



Stephen Matthews Photography

Push a pin through that point, then through the tape on top of the straw. Make sure the top straw spins freely.

Use a compass to position your wind vane so that the label for North is facing in the right direction. You can add some water or small stones to your pot if you need to weigh it down!

*Thanks to Alex in Durham for this awesome weather vane!*



Stephen Matthews Photography



Stephen Matthews Photography

Your wind vane will now be able to spin and tell you which direction the wind is blowing in from.

## Pine cone rain gauge

Did you know that you can use a pine cone to predict whether the day will be wet or dry? Under dry conditions, the outer part of the pine cone's scales dry more than the inner parts and this causes the pine cone to open out. This helps the pine cone seeds to be dispersed on bright dry days. In wetter weather, the cone stays more tightly closed to protect the seeds. So, by putting a pine cone on your windowsill, you can tell if the weather will be wet or dry!



needpix.com

## Make a simple rain gauge

### You will need:

- A recycled 2 litre plastic bottle
- Scissors
- A ruler
- Modelling clay
- Masking or gaffer tape
- A permanent marker



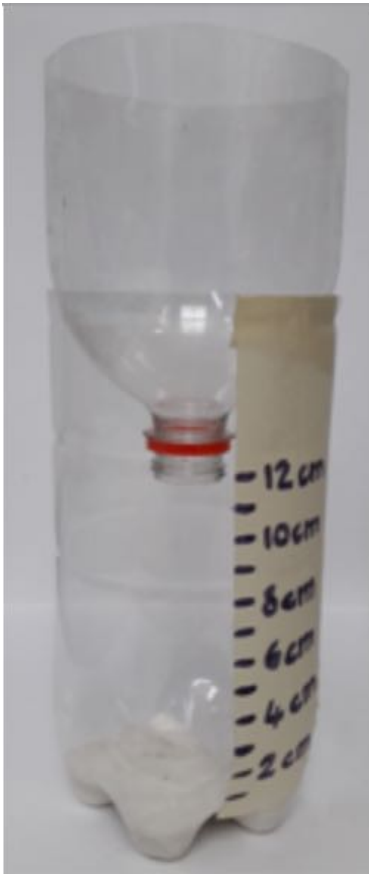
Cut a section approximately 15cm from the top of the plastic bottle, being careful as the edges of the plastic can be sharp.



Use modelling clay to fill in the indentations in the bottom of the bottle, to give some stability and also to make the measurements more accurate.

Invert the top of the bottle inside the bottom, to create a funnel. You may want to tape or clip this in place with paper clips.





Cut a piece of tape to the length of the bottle.

Using the ruler, mark off a scale along the tape. (You might want to talk about suggestions for these intervals depending on the stage of measuring your child is at. As the bottom of the bottle is unlikely to be even modelling clay will take up varying amounts of space in the bottles, the measurements made in this way won't be very precise and are more a point for observation and discussion)

Stick the length of tape from the rim to the bottom of the remaining bottle, with the lowest number at the foot of the bottle.

Place the bottle outside, somewhere where it will not be disturbed and where drips from overhanging trees won't .

At the end of each day, or week, either use the scale along the side of the bottle to take a reading, or pour the resulting water into a measuring jug and record your results.



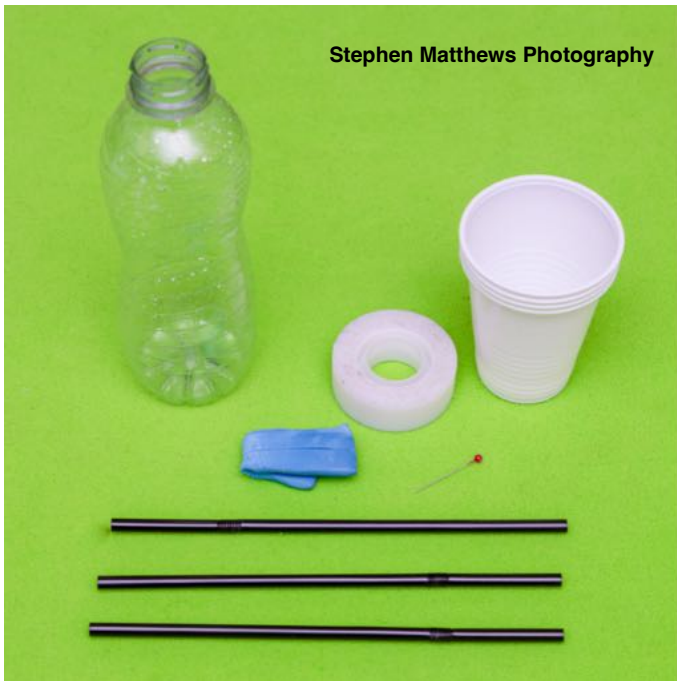
## Make an anemometer

An anemometer (that's one to try saying quickly!) measures wind speed.

The cups catch the wind and spin round and the number of revolutions (turns) in a given time allows us to calculate how fast the wind is blowing.



Laura Nawrocik



To make your own anemometer,

**You will need:**

- A recycled plastic bottle
- 4 paper cups, or similar
- modelling clay
- sticky tape
- 3 straws
- A pin



First, you will need to make a stable base. Alex used a bottle (which you could fill part way with water for added stability). Cover the top of a straw with tape and then wedge the straw upright in the bottle using modelling clay.



Make a plus sign with two straws and tape them together so that the straws are perpendicular at 90 degree angles.







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Make a hole in both sides of each cup about a third of the way down from the top.

Insert the ends of each straw into a cup. Be sure to mark one of the cups in some way so that you can tell one apart from the others.

Make sure all the cups face in the same direction.



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Poke the pin through the centre of the straws and into the straw inserted in your base bottle. Make sure it turns easily.

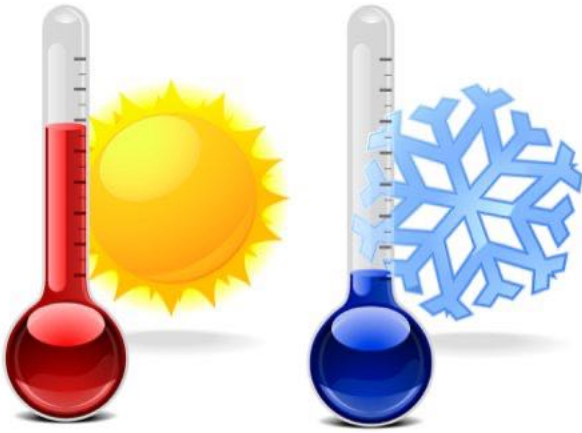
Place your anemometer in a place where it will catch the wind. As it spins round, count how many times your marked cup comes round in a set time.

The idea for the weather vane and anemometer that Alex made came from this website which also explains some techniques for calculating wind speed:

<https://inventorsof tomorrow.com/2018/01/23/diy-weather-vane-and-anemometer/>



Stephen Matthews Photography



## Make a thermometer

A thermometer is used to measure temperature. Hopefully, you haven't been needing to use them too often in your family during lock down! They can also measure the temperature of the air as well as of people!

This simple thermometer will help you to check whether the air is warmer or cooler than the last time you checked, but you could calibrate your thermometer using a

real one and marking the sides of your bottle or jar to match.

### You will need:

- A clear bottle or jar
- Water
- rubbing alcohol if you have it (water will work on it's own, but adding the alcohol will make the effect quicker)
- A clear straw
- Food colouring or watercolour paint
- modelling clay



Take a clear plastic or glass bottle. Fill it 1/4 of the way with rubbing alcohol, if you have it, and top up with water up to half full. Otherwise fill half way with water. Add food colouring or paint so that it's easier to see the water level.

Place a clear straw in the bottle so that it is suspended where the bottom end is in the liquid, but *not* touching the bottom of the bottle and the top end is poking out the top of the bottle. Do not seal the top end of the straw – it needs to be open to the air in order to work. (When the water and air in the bottle heat up, they expand, but can't escape the bottle, so the water is pushed up the straw.)



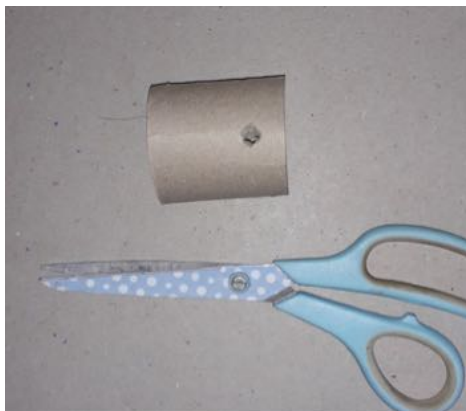
To test your thermometer, look at the level of the water inside the straw. Try this first at room temperature. Then place the thermometer somewhere cool, like the fridge. What do you notice about the water level? What happens if you place it somewhere very warm?

## This week's use for a toilet roll tube:

### Make a wind sock

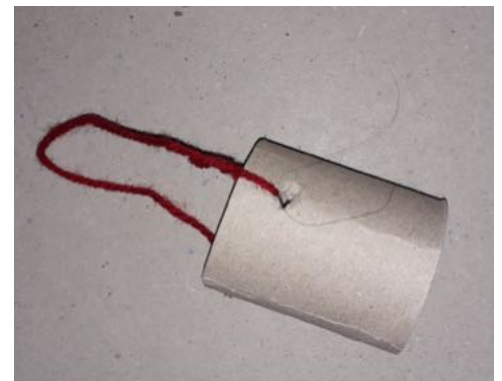
- You will need:
- A toilet roll tube
- tissue paper
- some wool or string
- scissors
- glue
- a paperclip (or some wire, cut to about 5cm long)

Cut your toilet roll tube in half and pierce a hole in opposite sides. Be careful not to poke your fingers!



Thread a length of wool or string through and tie it as shown.

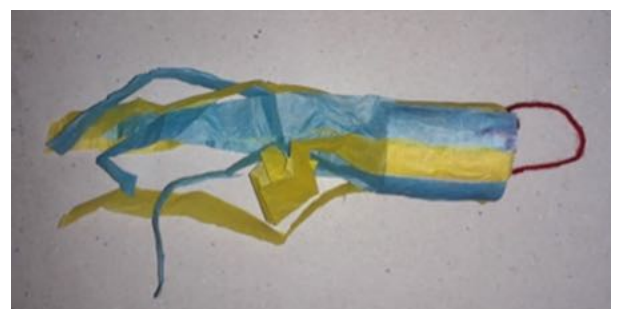
Cut the tissue paper into thin strips.



Glue these all around the toilet roll tube, so that they over hang the sides, like streamers.



Attach your paper clip to the string, or twist the wire round the wool as shown.





Poke the ends of the wire into a bamboo cane, or wind them round a stick.



Place your wind sock in the garden and it will show you how strongly the wind is blowing!



### **Make a cloud in a jar**

A cloud forms when water vapour condenses into water droplets that attach to particles (of dust, smoke, pollen, etc.) in the air. Clouds help carry water from one place to another in the form of vapour.

In this activity, some of the warm water turns into water vapour in the jar. This water vapour rises and meets the colder air made by the ice. As it cools, the vapour condenses. The cloud swirls inside the jar as it rises and falls.

#### **You will need:**

- A kettle
- Some ice cubes
- a jar with a lid
- A can of hairspray



Pour warm (not boiling) water from the kettle into the jar until it is around one quarter full. Swirl the water around in the jar to warm the sides.

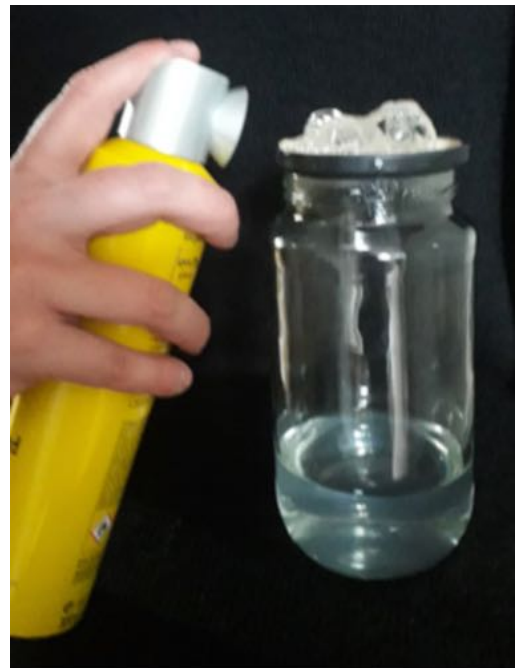
(It's important not to use boiling water, as children need to understand that evaporation also happens without the liquid temperature reaching boiling)

Be careful, nonetheless, to avoid risk of scalding with hot water.



Place the ice on the upturned lid and balance this on top of the jar.

Moving quickly, lift the lid and spray a short burst of hairspray into the jar.



Replace the lid as quickly as possible.

Observe what is happening inside the jar. Can you see the cloud forming? How is it moving? Why do you think this is happening?

Some water vapour can be released from the jar and the activity repeated by replacing the lid again.





A cloud can only form when water vapour has something to condense on to. If we hadn't warmed the sides of the jar, the water might have condensed there, like it does on a window, or on a mirror in your bathroom. In nature, water vapour might condense on to pollen, volcanic ash or pollution in the air. In this demonstration, the water vapour condensed on the hairspray particles.



## Where do the puddles go?

This simple activity never fails to fascinate younger children as they try to work out where their puddle is going and what is making it shrink! Choose a puddle that you will be able to revisit a few times, at regular intervals. Once the rain has stopped, draw around the puddle with chalk. You can draw around the puddle each time you visit it, using a different colour. As the puddle gets smaller, discuss ideas about where you think the water has gone... and watch this video for an explanation of evaporation! (Youtube video, supervision recommended)

<https://www.youtube.com/watch?v=iRLqAhaniyg>

## Make a sundial

On a sunny day, you can use the sunshine to make a clock! They are called 'sundials' and are a



way that people used to tell the time before clocks were invented. There are lots of different ways that you can make a sundial.

*Beth in Berkshire* made this sundial from the following link:

[https://www.winchestersciencecentre.org/media/3868/12720\\_s-h\\_observingspace\\_additionalresource.pdf](https://www.winchestersciencecentre.org/media/3868/12720_s-h_observingspace_additionalresource.pdf)

### You can also make a simple sundial with the following materials:

- A paper plate
- some stones to weigh it down
- A straw or stick
- pens
- a ruler
- a compass (for precision, not vital!)



Start preparing your plate at around 11.30 on a sunny day. Use a pencil to poke a hole through the middle of your paper plate.

Write the number 12 on the edge of the plate then use the ruler to draw a line from the centre of the plate to the number 12.



Shortly before 12 noon, take your plate outside and place it in a sunny spot which will be in sunlight during daylight hours. Poke a stick or straw through the hole in the centre of the plate. For precision, you might like to tilt the stick slightly towards the North pole, using your compass.



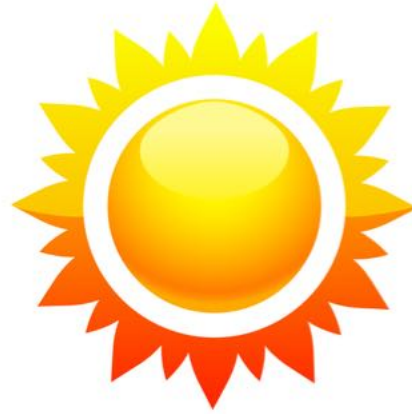
When it reaches 12 noon, rotate the plate so that the shadow from the stick falls across the number 12. You can then revisit the dial at different times to mark further numbers on. Test your clock over a few days (if dry!) Does the shadow from the sundial always tell the same time as your other clocks?





# RESEARCH IDEAS

What is the difference between weather and climate?



## Think about:

How many different types of weather can you think of?

Do we see all of these types of weather in the UK?

Are there places in the world that don't ever see certain types of weather?

## Some questions to answer:

- \* What different types of climate are there?
- \* Which places in the world have these types of climate?
- \* Why are people concerned about the climate? What kinds of things are affected by the climate that we live in?

This helpful link from **NASA Kids** helps to explain the difference between weather and climate <https://climatekids.nasa.gov/weather-climate/>

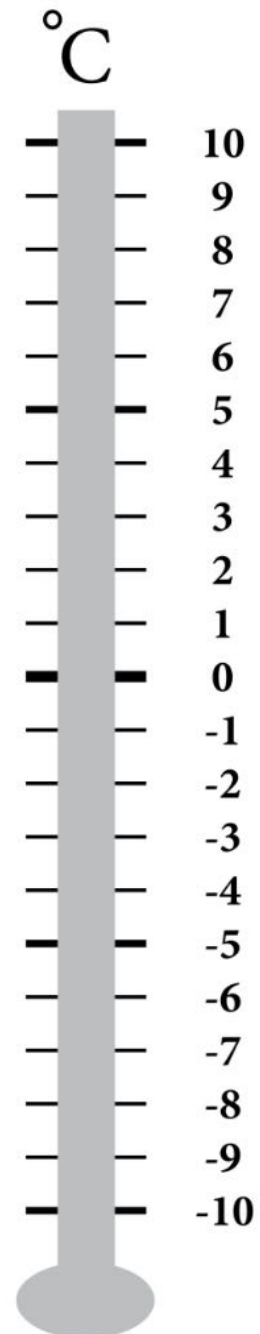
# MATHS CHALLENGES

## Negative numbers using a thermometer

Children often find it difficult to calculate using negative numbers and using a thermometer as a visual aid can really help with this!

### Use the thermometer to try the following calculations

- The temperature on Tuesday is  $5^{\circ}\text{C}$ . On Wednesday it is 6 degrees colder. What is the temperature on Wednesday?
- The temperature on Friday is  $-7^{\circ}\text{C}$ . The following day, the temperature rises by 9 degrees. What is the temperature the following day?
- The temperature in London is  $-5^{\circ}\text{C}$ . In Birmingham it is  $-8^{\circ}\text{C}$ . What is the difference between the 2 temperatures?
- What is 7 minus 11?
- How many degrees more is  $2^{\circ}\text{C}$  than  $-2^{\circ}\text{C}$ ?



# WORD CHALLENGES

## Make a weather report:

Take some notes about what the weather is like over a few days, maybe by making some of the weather station ideas in this pack.

Then write a report about the weather. You might like to record it together with your forecast for the next few days!



## It's raining it's pouring:

Do you know the song: "It's raining, it's pouring, the old man is snoring, he went to bed and bumped his head, then couldn't get up in the morning."? Try making up songs or rhymes about other types of weather!



## Weather word search:

Play online using a mouse, or print out a version to colour in. This site offers word searches so that you can hunt for all the weather related vocabulary!

[https://www.ducksters.com/games/word\\_search/weather.php](https://www.ducksters.com/games/word_search/weather.php)



# ART AND CRAFT

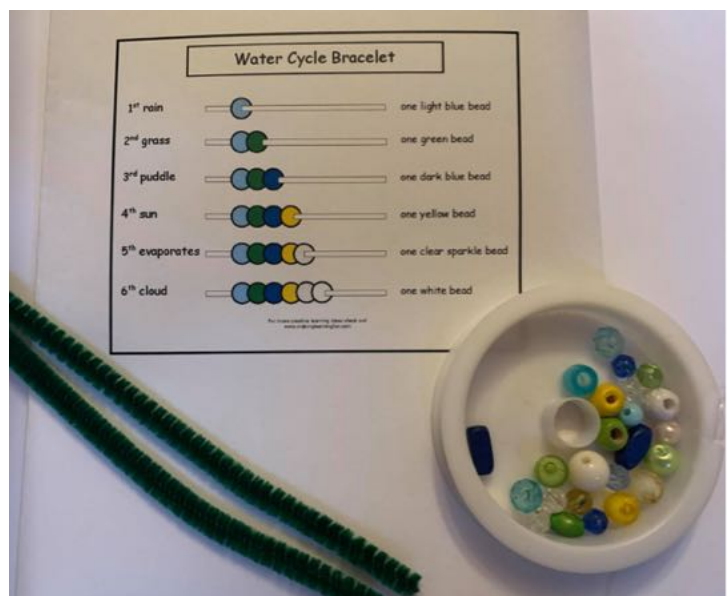
## Water Cycle Bracelet

Making a bracelet can support children with remembering key processes from the water cycle and the fact that these are repeated.

### You will need:

#### Beads in the following colours:-

- yellow (to represent the sun)
- clear (to represent water vapour / evaporation)
- white (to represent the cloud / condensation)
- light blue (to represent rain / precipitation)
- green (to represent the ground / infiltration)
- darker blue (to represent lakes, rivers, the ocean / collection)
- Thread, ribbon or a pipe cleaner. (pipe cleaners can be easier for young children to thread on to, but you may need to join 2 together to make the bracelet long enough.



You can print out a sheet to help remember the order here: <http://www.makinglearningfun.com/themepages/RainbowWaterCycleBracelet.htm?fbclid=IwAR3gg8k4ip1lrgGCRAOrjkZqOfQ2-ZMwMGKO7LxG5VSCT7sXyErlvAgu4IE>

As the children thread each bead in sequence, talk about what each bead stands for. The children can then move the beads round on their bracelets to help them remember the cycle.

*Thank you to Dylan from Rochdale for making this great water cycle bracelet to send us!*



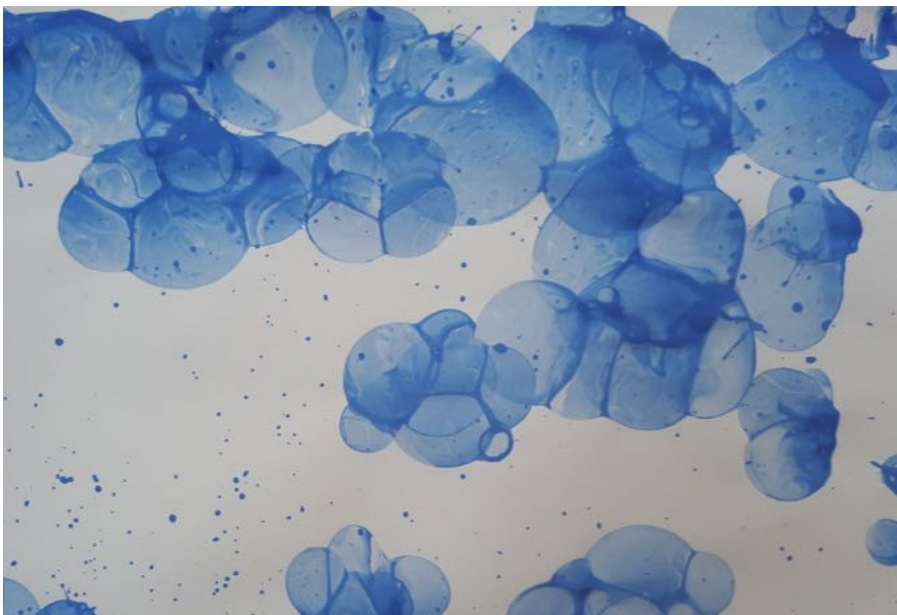


## Bubble printed clouds:

This simple activity is a fun way to print some clouds using the bubbles from washing up liquid! Simply mix up some blue paint with water in a cup and add in a squirt of washing up liquid. This simple activity is a fun way to print some clouds using the bubbles from washing up liquid! Simply mix up some blue paint with water in a cup and add in a squirt of washing up liquid.



Put a straw in the mixture and BLOW gently into the mixture. Young children might like to practice blowing rather than sucking with normal water first, to help them avoid drinking the soapy paint!



When the painty bubbles froth up one the edge of the cup, press a piece of paper down on top to 'print' the bubbly clouds!

## Cotton wool cloud painting:

For this painting, you will need to experiment with adding enough water to your paint so that it is runny enough to trickle down a piece of paper.

Do the painting outside, or somewhere you don't mind getting messy! It helps to do the painting on a tray that you can tilt.



First, paint blobs of paint along the top of your paper.

Next, add water and tilt it to let the paint dribble down like rain.



When the paint is dry, fluff up some cotton wool and glue it on to the top of the paper to look like clouds!

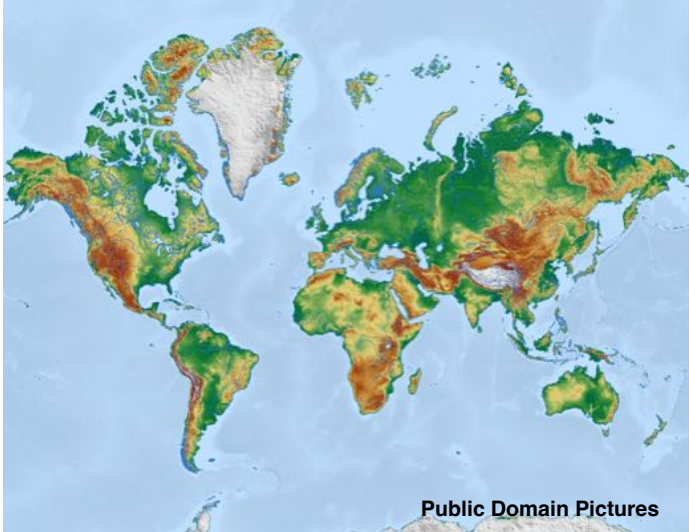
*Thank you so much to Felix and Dylan in Devon for sending in these photographs of their cloud and rain pictures.*

# GAMES

## Pin the climate on the map:

This game is useful for starting discussions about what the climate is like in other parts of the world. You will need a world map and some sticky tack or a pin. Like 'pin the tail on the donkey' the players take turns to approach the map with their eyes closed, or wearing a blindfold. Pin / stick a marker at a certain point then try to find out what the climate is like in the chosen

location. You can help with children guesses by discussing the idea of the equator and the 2 poles first!



## Dressing for the weather:

Children take it in turns to go and choose an outfit that suits a certain kind of weather (including props if they can find them!) Other players have to guess which kind of weather they have dressed for, then everyone decides on a location where they might find that kind of weather!



## Move like the weather:

Make some drawings of different weather symbols, or simply call out the types of weather. Either shuffle and show pictures or say a type of weather and everyone has to try to think of a movement that makes them think of that weather. Once you have played this way for a few goes, stop using the cards / calling out weather types and, instead, choose someone to act out the type of weather and everyone else has to guess what it is.



# LEARNING LINKS

There are a large number of resources available for online learning at this time. We'd always recommend that you support your child with this and only follow links from reputable names. **Any links provided here have been checked for suitability.**

This episode of **Crash Course Kids** is very helpful for explaining the difference between weather and climate (Youtube clip, supervision recommended):

<https://www.youtube.com/watch?v=YbAWny7FV3w>

This great link from **3D geography**, explains what we mean by 'weather' and gives lots of examples of things that we measure to make forecasts.

<https://www.3dgeography.co.uk/weather-for-kids>

This useful 'crib sheet' page from **The School Run** will help you support your children with weather topics that they might encounter at school, or other questions that might come up as they work through this pack!

<https://www.theschoolrun.com/homework-help/weather>

Find out how a **BBC** weather forecaster presents their findings for the television and see if you can make your own forecast with this activity designed for children to do in school, but adaptable for home.

<http://www.bbc.co.uk/schoolreport/25430933>

For useful information on climate change (aimed at parents) visit:

<https://ypte.org.uk/downloads/climate-change-for-parents>

A short video by YPTE to explain climate change, narrated by YPTE President Cel Spellman: <https://ypte.org.uk/videos/climate-change>

## Answers to Maths Challenges:

- a)  $-1^{\circ}\text{C}$
- b)  $2^{\circ}\text{C}$
- c)  $3^{\circ}\text{C}$
- d) - 4
- e)  $4^{\circ}\text{C}$