

Measuring Wind Speed and Displaying Data

Having discussed the variety of ways and range of media used to present data, I can interpret and draw conclusions from the information displayed, recognising that the presentation may be misleading. MNU 2-20a

Meteorologists use instruments known as anemometers to measure wind. Anemometers record wind speed and the direction the wind is coming from. A 'southerly wind', for example, is blowing from the south.

Anemometers are pieces of modern specialist equipment. Even without access to modern equipment we can still make observations of wind conditions using the Beaufort Scale.

<https://www.rmets.org/resource/beaufort-scale>

The Beaufort Scale asks you to observe what the wind doing to objects outdoors (leaves, smoke, tree branches ..) and match that to a number on a scale from 0 to 12. This number is the **Wind Force**. You can read across the table to find the matching **wind speed**.

Observe the impact of the wind over several days or longer. Record what you observe. Decide whether you are going to record the **Wind Force** or the **wind speed**. What will be the best way to a) record and b) display the data? Make your observations once a day or more frequently but make your observations at the same time(s) each day.

Which measure, wind force or wind speed, would you find most useful if you heard it in a weather forecast? Can you explain why?

Extension – Investigate Wind Direction

Make your own Weather Vane Activity – requires a compass

<https://www.metoffice.gov.uk/weather/learn-about/met-office-for-schools/other-content/other-resources/weather-station/wind-vane>

Observing Temperature – above and below zero/freezing point – without a thermometer

I can show my understanding of how the number line extends to include numbers less than zero and have investigated how these numbers occur and are used. MNU 2-04a

Observe the Effect of Temperature on Water

You will need:

plastic container filled with shallow layer of water (no more than 5 cm deep)
an outdoor space (this could be a garden or balcony)
a number line extending from -1, through 0, to +1

What you do:

place the container in an open outdoor space (if it is likely to be blown over, sit it in a shallow hole or place stones at the bottom to anchor it)
around 8 am, check – has the water solid (frozen) or is it still in its fluid, liquid state?
record your observation by marking above, on or below a line marking zero

Additional Information and Discussion Points

Water freezes (changes from a liquid to a solid) at 0 degrees C. Without using a thermometer, what can we say about the air temperature if water is frozen? Can you suggest why we measure temperature on a scale that extends above and below zero?

To see a variety of ways to set up a weather station with scientific instruments including thermometers see <http://www.weatherforschools.me.uk/html/weatherboxes.html>

Outdoor Learning Numeracy and Mathematics

Second Level

Context – Weather

I have worked with others to explore, and present our findings on, how mathematics impacts on the world and the important part it has played in advances and inventions. MTH 2-12a

The topic is designed for remote learning but can be adapted to school based work. Equipment is kept to a minimum and use is made of everyday, household materials wherever possible

This grid is designed for teacher use.



Cloud Cover Observations

I have investigated the everyday contexts in which simple fractions, percentages or decimal fractions are used and can carry out the necessary calculations to solve related problems. MNU 2-07a

Meteorologists use oktas or 1/8s to describe the amount of cloud in the sky (cloud cover).over.

This link takes you to a definition of oktas [Defintion of Oktas \(wmo.int\)](http://www.wmo.int) and [How we measure cloud - Met Office](http://www.metoffice.gov.uk/learn-about/met-office-for-schools/other-content/other-resources/weather-station/rain-gauge) provides information on cloud measurement processes in general..

Measure Cloud Cover

You will need:

a grid of 8 equal cells (a piece of paper folded into 8 equal parts/ 1/8s)
pencil or pen
1 grid per observation

What you do:

Date your pieces of paper. If making observations several times in one day, add time of observation.

Make observations at same time or times of the day
Fill in a cell (1/8) of your grid for each okta required to describe the cloud cover you see.

If it is foggy and it is not possible to see the sky, you record 9 oktas (9/8s) on your grid.

Look at each observation grid in turn. What fraction of the sky was cloud covered? Express this fraction in its simplest form. Why do you think meteorologists prefer to express in 1/8s?

Citizen Science - Add Observations to WOW Data Base

This mini topic is based around making and recording observations of weather. The focus is on gathering data and making decisions about how to record and display. There is the opportunity to contribute to a well-established and well respected Citizen Science project WOW (the Weather Observations Website) <https://wow.metoffice.gov.uk/>

Adding data to the website is simple

1. Enter your location (address or where you made your observations)
2. Choose a quick observation (written description) or detailed (which will allow you to enter your cloud cover observations, for example).
3. Enter as many observations as you can, you do not need to complete every section or box.

Adding your information helps build up a detailed picture of weather around the UK. Having lots of information is helps weather scientists (meteorologists) look for patterns and trends in the weather.

Measure a Puddle

I can explain how different methods can be used to find the perimeter and area of a simple 2D shape or volume of a simple 3D object. MNU 2-11c

Calculate the Perimeter of a Puddle

You will need:

length of wool, string or thin cord.

What you do:

1. Mark out the edges of a puddle using string. The total length of the outside edge of a 2D shape is called its *perimeter*.
2. Lift the string away from the puddle and measure the string that was in contact with the puddle with a ruler or tape measure. What is the puddle's perimeter?

Can you explain why this would be difficult to do with a ruler or metre stick?

Return to the puddle later or the next day and remeasure. Can you suggest the reason(s) for any change?

Calculate the Area of the Puddle Surface

Convert the perimeter measurement into a square (divide length by 4) and use the dimensions of the regular 2D shape to calculate area. Alternatively, use the perimeter measurement to define a rectangle and calculate the area of the rectangle. **Did you get a different answer? What size of rectangle/square with this perimeter gives the largest area? Which rectangle is the closest to the shape of your puddle?!**

Make Rain Gauge, Record and Display Results

I have carried out investigations and surveys, devising and using a variety of methods to gather information and have worked with others to collate, organise and communicate the results in an appropriate way. MNU 2-20b

I can display data in a clear way using a suitable scale, by choosing appropriately from an extended range of tables, charts, diagrams and graphs, making effective use of technology. MTH 2-21a / MTH 3-21a

Make and Use Simple Rain Gauge

You will need:

empty plastic bottle (cut to 2/3 size, filled with water past the taper/dimples and height of water marked on side)
ruler

What you do:

place bottle in open space away from building, in shallow hole to keep stable
measure the water level from the mark each day at the same time
record measurement and empty bottle before refilling to mark
record observations for 7 consecutive days

<https://www.metoffice.gov.uk/weather/learn-about/met-office-for-schools/other-content/other-resources/weather-station/rain-gauge> provides detailed instructions which we have adapted to take account of limited resources at home.

What is the most appropriate way to record and display this data?

<https://www.bbc.co.uk/bitesize/topics/z9fv4wx/articles/zbkrrj6>

Explore mean, median and mode

<https://www.bbc.co.uk/bitesize/topics/z9fv4wx/articles/zfftt39>

Developed by Numeracy Sac Team and COACH

East Ayrshire Council

