Outdoor lesson

primary

Ice cylinders

Design an experiment to show how fast ice melts

Great for...

- **Science** scientific enquiry of materials and their properties
- **ICT** measuring/recording temperature, data analysis
- **Maths** investigating space and measures, handling data

Activity

1. Tell the children they are going to test the hypothesis that the colour of ice affects the rate of melting.
2. Show them the large tins and food colouring and let them come up with suggestions for an experiment. Encourage them to consider what variables might be important – for example, volume of ice, colour, ambient temperature. Discuss the need for careful measurements and explore how they are going to record/present their findings.
3. Fill each tin with the same volume of water (leave some space for expansion) and add food colouring to some (you could do a range of colours or use varying amounts of the same colour).
4. Place in the freezer and leave to freeze – this will take a few days (if freezer space at school is limited you may be able to send each child home with their own tin and instructions).
5. Remove from the freezer and leave somewhere warm for a couple of hours or just long enough for the blocks to come out of the tins.
6. Place the blocks in the school grounds – they should all be in the same area.
7. Using digital scales weigh them at the start and then at regular intervals throughout the day/days – carefully recording the results. Depending on the temperature they may take a long time to thaw (or not at all in winter). The children could also record the ambient temperature readings.
8. Analyse the data and decide how best to present the results. What do they show? Why?

What you need

- **Large empty, clean tins** sourced from the school kitchen and checked for sharp edges
- **Food colouring**
- **Access to a large freezer**
- **Digital scales**
- **Digital camera/tripod**
- **Thermometers**

Preparation

- Research water facts – for example, water is essential for all life on earth, covers 70% of the world's surface and is the only common substance found naturally in all three common states of matter (liquid, solid and gaseous).
- Depending on resources you can either let the children work in groups or prepare one class experiment that they can all help to record/analyse.

Less challenging

- Outline the experiment yourself for the children to carry out.

More challenging

- Use digital cameras to capture the thawing – speed up the event by using the time lapse function.
- Write a science press release/report recording the outcomes.
- Plan further experiments – ask questions like 'Would the results be the same in the dark? What would happen if we dissolved salt/sugar in the water (ice lollies)? Does this have any implications for melting glaciers/sea ice (look at Albedo effect)?'

Your notes

Use this space to evaluate the activity

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