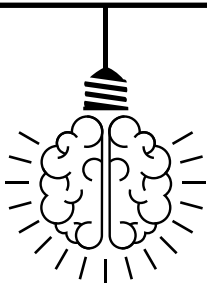




Teachers' notes

- bringing Catalyst to life in the classroom



Discover ideas and resources to build on the issues covered in edition 36 of Catalyst.

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How can you help protect the health of our plants?

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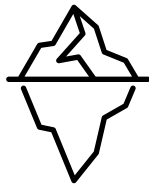
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How can you help protect the health of our plants?

1

By Charles Lane

The United Nations have declared 2020 the International Year of Plant Health. This article aims to raise awareness of why plants are important and emphasises that there is a lot that ordinary people can do to help protect plant health.

Activity suggestion

Split the class into small groups and provide each group with a plant product such as a piece of wood for making furniture, herbs or spices, a food stuff such as potato, rice or flour, a garment made of cotton, bamboo, linen or other plant material. Challenge students to research the source of the materials. Alternatively foster a sense of awe and wonder about plants by providing small groups of students with a plant and get them to observe how it is adapted to survive and what might threaten that survival. This could be followed up by using The Battle for Fortress Plants poster and the video about the job of a plant virologist.

Useful resources:

The Battle for Fortress Plants poster from Science and Plants for Schools: stem.org.uk/resources/elibrary/resource/448123/battle-fortress-plants

What does a plant virologist do? An excellent 5 minute video of a plant scientist explaining his job with follow up activities: stem.org.uk/resources/elibrary/resource/264453/plant-diseases-gcse

External links more about UN International Year of Plant Health:

unenvironment.org/news-and-stories/story/2020-international-year-plant-health

fao.org/plant-health-2020/home/en#IYPH2020

For teachers looking for more ways of teaching using plants look out for free online CPD with our Massive Open Online Course (MOOC) which runs throughout the year on Futurelearn. Next start: 16 MARCH 2020 'Teaching Biology: Inspiring Students with Plant Science'

The terminal velocity of cupcake cases

2

(adapted from an Institute of Physics teaching resource)

You will need

- ✓ A set of up to 10 paper cupcake cases
- ✓ Stopwatch or wristwatch with ability to read to at least 0.1s
- ✓ Metre rule or (better) a tape measure
- ✓ A video camera/phone where you can play back frame-by-frame

What to do

1. Start with some preliminary observations. Drop a cupcake case from a height of several metres, such as a stairwell, and see what happens. Think about such things as acceleration, steady speed.
2. Now fit a second cupcake case into the first and repeat the drop. You have doubled the mass – and the force of gravity acting on the falling object. How does this affect the motion (if at all)? Now fit even more cupcake cases together and drop them. Can you detect any

pattern? Produce some hypotheses linking such things as:

- the mass of the object
- how long it accelerates
- how long it takes to reach the ground
- whether or not it reaches a steady speed
- how large the resistive force on the object is compared with the force of gravity on it
- or anything else that you think might affect the motion.

3. Now set up the video camera so that you can film the cupcake cases falling in front of the metre rule or tape measure. Find out the frame rate of the camera so that you can work out the time between each frame. Play back the videos one frame at a time so that you can plot a graph of distance vs. time for different numbers of cupcakes. What shape would you expect the graphs to be, and how will they change with greater mass?

Will sea levels change?

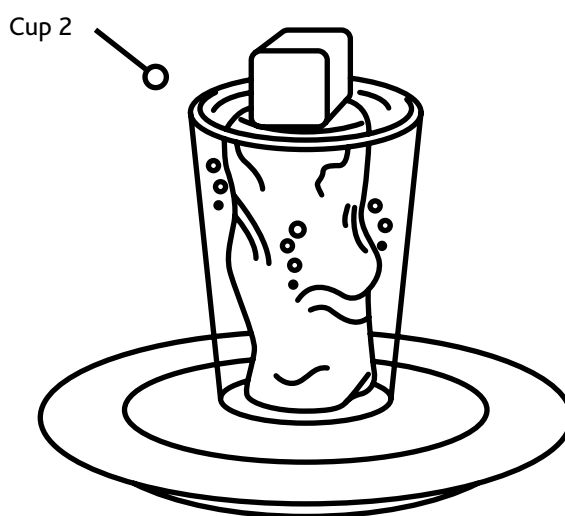
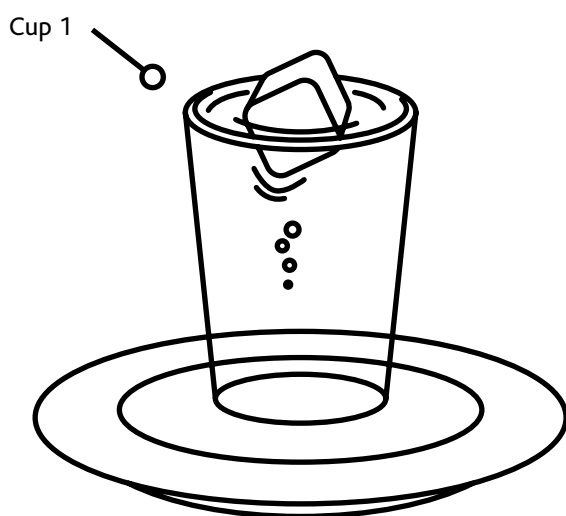
(adapted from teach with space by esa kids)

Do you know what happens when land ice melts? What about when sea ice melts? In this activity, you will work in groups of four to carry out a practical experiment to investigate these questions.

Equipment

- ✓ 2 small plastic cups
- ✓ 2 small plastic plates
- ✓ 2 ice cubes
- ✓ Enough water to fill the two cups
- ✓ Modelling clay

Set-up of the experiment



Wait a few minutes for the ice to start melting. Whilst you wait, answer the following questions.

1. What kind of ice do you think is represented in cup 1, land ice or sea ice?
2. What kind of ice do you think is represented in cup 2, land ice or sea ice?

Exercise

Cup 1:

- a. Put a cup onto a plate.
- b. Wet your hands! Put one ice cube into the cup.
- c. Fill the cup to the very top with water.

Cup 2:

- a. Put the second cup onto a plate.
- b. Put a cylinder of modelling clay into the cup, making sure that the tip of the clay is just above the rim of the cup. Make a small dent at the top of the clay for the ice cube to sit in.
- c. Place an ice cube on top of the modelling clay.
- d. Fill the cup to the very top with water.

Prediction

After ten minutes, examine your cups.

1. Is cup 1 overflowing?
2. Is cup 2 overflowing?

Based on your previous answers, do you think that sea levels will rise if the sea ice melts?

Will sea levels rise if the land ice melts?



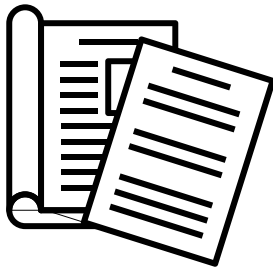
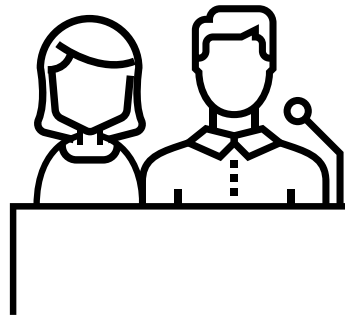
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www.stem.org.uk/stem-ambassadors



Thank you

We hope you enjoyed Catalyst, and matching teachers' notes. If you have any feedback, or ideas for topics you'd like to see covered in future editions, please email:

catalyst@stem.org.uk



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