Staying Warm: Project Insulation

Design your own insulation to keep a pot of water warm, and conduct an experiment to test how good it is.

For this you will need:

1. Two pots that are the same size e.g. jam jars or yoghurt pots. They will need lids – if you don't have lids you could make a temporary lid out of card.
2. Measuring cylinder or jug.
3. Thermometer. (You could use a kitchen thermometer for this.)
4. Materials to make your insulation. You could try scraps of fabric, shredded paper, wadding, old socks.. whatever you can find at home (check with a grown up that it is ok for you to use it). You will also need things like string or rubber bands to hold your insulation in place.
5. Warm water. Ask a grown up to help you with this – the water should be no more than 40°C. Warmer than that and it could scald your skin if you spill it. Safety first.
6. Space in the fridge.

What to do:

1. Create insulation around one of your pots. Top tip: make sure you keep the base of the pot flat so that it doesn't tip up, and don't forget to insulate the lid.
2. Use the measuring cylinder/jug to pour the same amount of warm water into this pot and into a pot of the same size that doesn't have any insulation. This will give us a comparison: how quickly is heat lost when there is no insulation at all.
    - *Question: Why do you think the two pots need to be the same size and contain the same amount of water?*
3. Measure the temperature of the water in each and log it in your table. Then fasten on the lids and put in the fridge.
4. Leave for 15 minutes (or you could use 10 minute, 20 minute, 30 minute intervals). Then come back and measure the temperatures in each pot again.
5. Put the lids back on and return to the fridge for another 15 minutes (or however long you decide to leave between measurements – just remember to record it in your table).
6. Keep doing this until the temperature stops changing - it will have reached the same temperature as the fridge.
7. Draw a graph of your results (see the outline over the page).

MUSEUM OF ZOOLOGY
UNIVERSITY OF CAMBRIDGE

Staying Warm: Project Insulation

Record your results

Insulation Design

For my insulation I used:

_____

_____

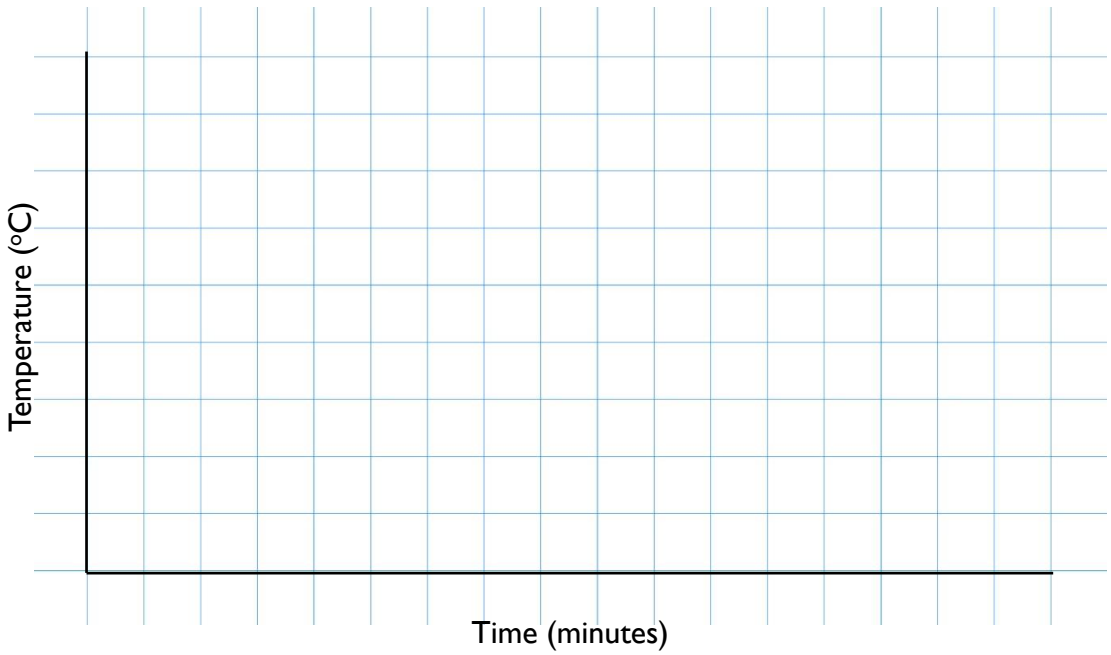
Results

Fill out the table with the temperatures taken at the start and at each time interval

Pot	°C at start	°C after__ minutes	°C after __ minutes	°C after __ minutes	°C after __ minutes	°C after __ minutes
Insulated						
Not Insulated						

Graph

For each pot, plot the points and then draw a line joining the points together.



Conclusions:

How successful was your insulation? Did it keep the water warm for longer than the pot without any insulation? Is there anything you would change about your insulation design?

_____

_____

_____

_____

MUSEUM OF ZOOLOGY
UNIVERSITY OF CAMBRIDGE