SCIENCE

FOLLOW THE ENERGY PATH

Worksheet

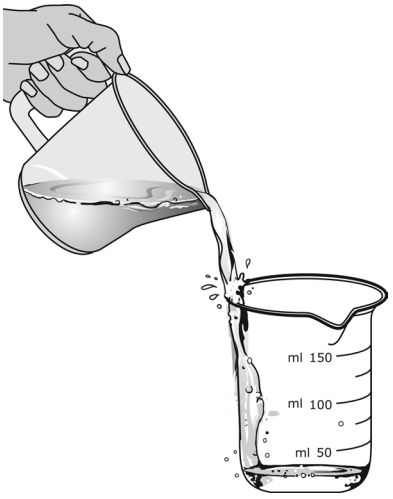
Adrian Tennant

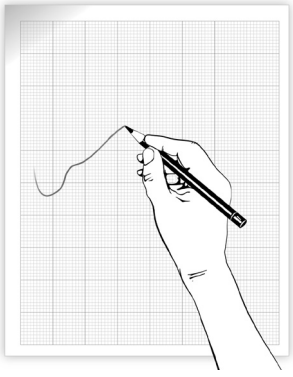
one stop clil

Exercise 1 — **Vocabulary**

Which verbs go with which picture?

chart	empty	fill	heat	measure	pour





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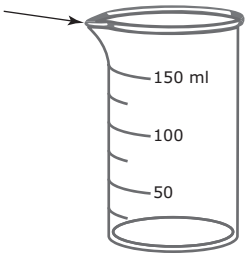
Exercise 2 — Vocabulary

Label the pictures with the words in the box.

brim	beaker	mug	thermometer	dish /container	microwave oven



Exercise 3 — Grammar

Put the words in the correct order to make sentences.

Example

brim / fill / beaker / the / to / plastic / the / .

Fill the plastic beaker to the brim.

1. *changes / chart / on / temperature / any / a graph / .*
2. *heat / two / mugs / for / the / minutes / .*
3. *into / one / contents / the / metal / pour / of / a / dish / mug / .*
4. *microwave oven / the / the / in / place / mugs / .*
5. *mug / the / in / record / of / each / water / the / temperature / .*
6. *temperatures / measure / every / to / continue / minutes / five / .*

Exercise 4

A scientific report: Writing

Now write a report on your experiment. Use the language provided to help you.

Useful language for writing a scientific report

Say what you did

We filled two mugs with cold water.

We measured and recorded the temperature in each.

At the start the temperature was ….

We then placed the mugs of water in a microwave for … minutes and …

We took the mugs out and measured and recorded the temperatures again.

Now the temperatures were …

We then poured the contents of one mug into a ….

We measured the temperatures of the mug and dish every five minutes for the next hour and charted them on a graph.

The graph showed that …

Say what you predicted would happen

Originally I thought that the …

Say what happened

In the end the ….

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Learning objectives

Pupils learn about how heat (energy) dissipates and the rate at which it does depending on what materials it comes into contact with. Indirectly, they also learn about conductors and insulators.

Content summary

Two identical quantities are heated for the same length of time. One quantity is kept in a ceramic mug, while the other is put into a metal dish. Over the course of one hour the temperatures of both quantities of water are measured at regular interval and the result s charted on a graph.

Skills

Reading, speaking, writing

Grammar

Word order (syntax)

Vocabulary

Verbs: *chart, empty, fill, measure, place, pour.*
Nouns: *brim, beaker, mug, thermometer, dish, container, microwave oven.*

Time needed

60–90 minutes

Age group

7–11

Materials needed

a plastic beaker,
2 (microwave safe) mugs
a microwave oven
a thermometer
some water

Practicalities

As a microwave oven is required this experiment may take some planning. Also, because hot water will be used the pupils will need to be well supervised.

Procedure

1. Tell pupils they are going to conduct a scientific experiment about heat (energy).
2. Introduce/pre-teach the following vocabulary that pupils will need to understand: t*o chart, to empty, to fill, to heat, to measure, to place, to pour, brim, beaker, microwave oven, mug, dish.*
3. Hand out the experiment sheet and have pupils read out the instructions in class.
4. Get two pupils to help you measure out the water and help with placing the mugs in the microwave.
5. Have the pupils discuss the two questions in the analysis/discussion section of the worksheet.
6. Get two other pupils to take the initial temperature readings and try and use other pupils for all subsequent readings.
7. Hand out the worksheet and ask pupils to work with a partner and do the first three exercises.
8. These exercises consolidate the vocabulary and grammar used in the experiment.
9. Check the answers as a class.
10. Finally, have pupils write up their findings in the form of a scientific report – encourage them to use the language in the useful language box. This exercise could also be done as homework.

Extra ideas to explore with your students

Draw out the energy path, working all the way back to the Sun's energy being absorbed by plants and animals (Energy flows from sunshine to plants and animals and on to the fossil fuels that they become. Energy flows as these are burned in a power station to make electricity, which powers the microwave. Here the energy flows into the water and then back out into the atmosphere).

Links to everyday life

Ask the pupils to think why the results of this experiment might be useful for their everyday life and see if they can link it back to any experiments they have carried out regarding either conductors/insulators or energy (i.e. energy pairs).

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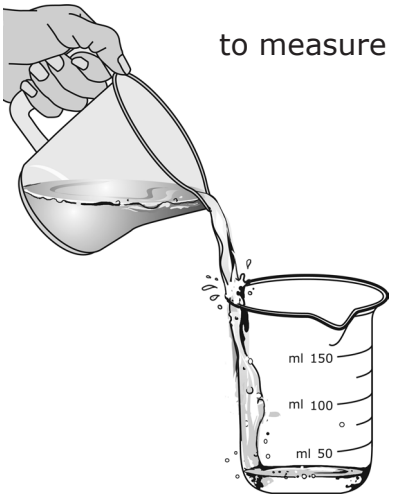
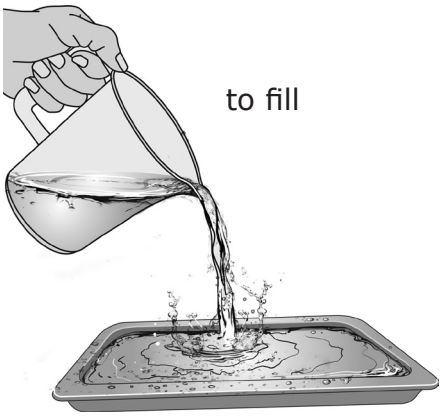
Exercise 1

to pour

to measure

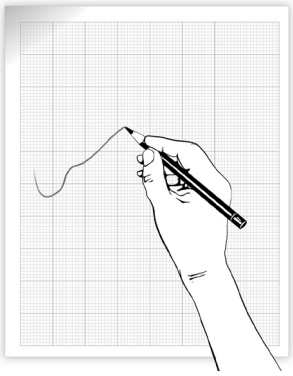


to fill



to heat

to chart



to empty

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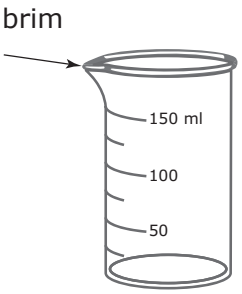
Exercise 2



Exercise 3

1. Chart any temperature changes on a graph.
2. Heat the mugs for two minutes.
3. Pour the contents of one mug into a metal dish.
4. Place the mugs in the microwave oven.
5. Record the water temperature in each of the mugs.
6. Continue to measure temperatures every five minutes.