

## Exercise 1

## Vocabulary

Match the different substances in the box to the correct definition.

glass wood metal plastic polystyrene foam

1. trees are made of this \_\_\_\_\_
2. a hard substance such as steel or iron \_\_\_\_\_
3. a light strong substance often used for making things like shopping bags or bottles \_\_\_\_\_
4. an artificial substance often used in packaging to protect things \_\_\_\_\_
5. a hard clear substance used for making things like windows \_\_\_\_\_

## Exercise 2

## Vocabulary, Grammar

Choose the correct word to complete each sentence.

1. Most *metals/plastics/woods* are very good conductors.
2. Polystyrene is a better *conductor/insulator* than metal.
3. The *coldest/hottest* substance is metal.
4. *Metal/Plastic/Wood* is a very good insulator.
5. The polystyrene foam is *colder/hotter* than the glass.

Look back at your experiment and check your answers.

## Exercise 3

## Follow-up experiment

Only conduct this experiment with the help of your teacher. Be very careful with hot water.

## Steps

1. Fill a glass with hot water and check the temperature with the thermometer.
2. Wrap the glass in the cardboard cover.
3. Check the temperature and record the temperatures in the chart.
4. Next, refill the glass with hot water and check the temperature is the same as at the start.
5. Wrap the glass in the tin foil cover.
6. Check the temperature and record the temperatures in the chart.
7. Finally, refill the glass with hot water and check the temperature is the same as at the start.

8. Wrap the class in the polystyrene cover.
9. Check the temperature and record the temperatures in the chart.

Time/Cover	Cardboard	Tin foil	Polystyrene
1 minute			
3 minutes			
5 minutes			
10 minutes			
15 minutes			
30 minutes			

#### Exercise 4

#### A Scientific Report: Writing

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

#### Useful Language

*useful language for writing a scientific report*

**1. Say what you did**

*I put hot water in a glass.*

*At the start the temperature was ...*

*The first time I used a .... cover.*

*After ... minute(s) I checked the temperature and it was ...*

*I checked the temperature again at ... minutes and it was ...*

*Then I used a ... cover ...*

*Finally I used a ... cover ...*

**2. Say what you predicted would happen**

*Originally I thought that the ... cover would be the best insulator.*

3. Say what happened

In the end the .... cover turned out to be the most effective insulator and the ... was the worst.

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**Learning objectives**

Pupils learn about which materials are good conductors and which are good insulators.

**Content summary**

Substances such as metals are good conductors of heat whilst other such as plastic and wood are poor conductors and have insulating properties.

**Skills**

Reading, speaking, writing.

**Grammar**

Comparative and superlative adjectives.

**Vocabulary**

Nouns: *metal, wood, plastic, glass, polystyrene*

Adjectives: *better, best, colder, coldest, warmer, warmest, hotter, hottest, worst* etc

Connectors: *at the start, the first time, after, then, finally, and*

**Time needed**

60–90 minutes

**Age group**

7–11

**Materials needed**

- Various materials such as glass, metal, plastic, polystyrene and wood.
- A thermometer

**Practicalities**

Common household objects such as spoons are a good idea as these are things that children can relate to. However, you could simply use blocks of each of the substances for the experiment.

For the follow-up experiment it is essential that you supervise closely, as hot water is involved.

### Procedure

1. Tell pupils they are going to conduct a scientific experiment and learn about conductors and insulators.
2. Introduce/pre-teach the following vocabulary that pupils will need to understand: *substance, packaging, conductor, insulator, room temperature, cover, record, refill, predict* and *findings*.
3. Hand out the experiment or put it up on your interactive whiteboard projector sheet and have pupils read out the instructions in class.
4. Put all the materials out on the table.
5. Ask the pupils to work in groups and predict which of the items will be the coldest/warmest/hottest. Give the groups a few minutes to discuss this and encourage them to speak in English.
6. Have the pupils conduct the experiment and then discuss the two questions.
7. Hand out the worksheet and ask pupils to work with a partner and do exercises 1 and 2. These exercises consolidate the vocabulary and grammar used in the experiment.
8. Check the answers as a class.
9. Supervise the pupils as they conduct the experiment and record the findings in the chart.
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 pupils

Ask the pupils what they think might happen with regards to electrical currents, i.e. which of the substances will conduct a current and which won't?

### Links to everyday life

Ask the pupils why the concepts of conductors and insulators are important for their everyday life. Try and elicit ideas such as stirring your tea with a teaspoon or the insulation around electric wires and plugs or what material a kettle is made from.

**Conductors and Insulators**  
Adrian Tennant

**Exercise 1**

1. wood
2. metal
3. plastic
4. polystyrene foam
5. glass

**Exercise 2**

1. metals
2. insulator
3. hottest
4. Plastic
5. colder