

Thursday 3rd December 2020

L.O: To find materials that are good thermal conductors through an investigation.

Complete the starter.

Stick into your books and fill in the missing words.

Read the text about thermal conductors and insulators.

Design a New Lunch Box

The Brilliant Bags Company want to make a new lunch box for children to bring their packed lunches to school in.

Food will be stored in the lunch box for quite a long time – probably all morning.

They want to make sure the lunch box keeps the children's lunches cool and fresh, so they need to think about the best material to use to make the inner lining of the lunch box.



Design a New Lunch Box



The company want you to help them choose the best material for the inner lining of the lunch box.

The lining will need to stop heat getting through from the air to the cool food inside.

Will the lining need to be a good thermal conductor or a good thermal insulator?

Conductor

Insulator

Design a New Lunch Box

You will need to find the best thermal insulator for the inner lining of the lunch box. Thermal conductors will let heat through and make the food warm up quickly.

Thermal insulators will stop the heat getting through and keep the food cool for longer. You will need to set up a comparative investigation to test the different materials to see if they conduct heat or insulate from it.



Testing Materials



Can you test the thermal conductivity of the different materials?

You can use the following equipment:

containers



thermometers



ice cubes



rulers



stopwatches



different materials



Talk to your partner about your ideas.



Testing Materials

You could wrap the different materials around the containers, and then fill them with the ice cubes.

By checking the temperature of the containers at intervals of time, you will be able to see which materials allow heat from the surroundings through easily. These materials will cause the ice to melt quicker. They are thermal conductors



Any material which stops heat from the outside getting through will keep the ice cubes solid for longer. These materials are thermal insulators.

Identifying the Variables

When setting up investigations, scientists have to consider the variables of each experiment. A variable is any factor or condition that will change or can be changed in the investigation.

There are three types of variables:

Independent	Dependent	Controlled
The independent variable is the thing that the scientist purposefully changes or alters throughout the investigation.	The dependent variable is the thing that is measured or observed, and changes as a result of the changes to the independent variable.	All the other things in the investigation should remain the same throughout, and are called controlled variables.

Identifying the Variables



Think about the variables for the investigation you are going to do today. Talk to your partner about all the possible variables there are in this investigation into thermal conductors and insulators.



Some ideas include:

Type of container.

Type of thermometer.

Quantity of ice cubes.

Temperature of room.

Length of time.

Size of material.

Size of container.

Type of container.

What materials will you test?

What material do you predict will be the best choice for your lunch box?

Why?

Material	Starting Temp/ State	Temp after 5 mins/ State	Temp after 10 mins/ State	Temp after 15 mins/ State	Temp after 20 mins/ State

Conclusion

Write a report to the lunch box company explaining your findings.

Use the key words in your answer.

cool

warm

heat

conductor

through

allows

temperature

insulator

