Name: Class:

Year 6 Signature Work Inquiry:

Cool Water

Central inquiry journal

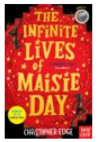
Year 6 Signature Work Heroic Inquiry Journey

Cool Water

Author visit: Christopher Edge

ENGLISH

Reading science-rich fiction: *The Infinite Lives of Maisie Day* by Christopher Edge



Reading scientific non-fiction about heat transfer

SCIENCE

Practical investigation into insulating materials

ART & DESIGN

SUSTAINABLE DEVELOPMENT GOALS

MATHS

Plotting and interpreting graphs of the results from the Science experiments

Designing and making insulating covers for reusable water bottles

Working in teams to plan and deliver a persuasive campaign

Reflective writing: CREST application
Creating a poster to summarise and reflect on the year's work

ICT

Collaborating in groups using Office 365

Using Word and PowerPoint to create effective presentations and posters

Signature Work Celebration

CREST AWARDS

CREST Bronze Award submission

CONNECT WONDER INVESTIGATE CONSTRUCT EXPRESS REFLECT

In Art/DT this term you will be making an insulating cover for your reusable water bottle.

How does this link to these SDGs?

3 GOOD HEALTH AND WELL-BEING

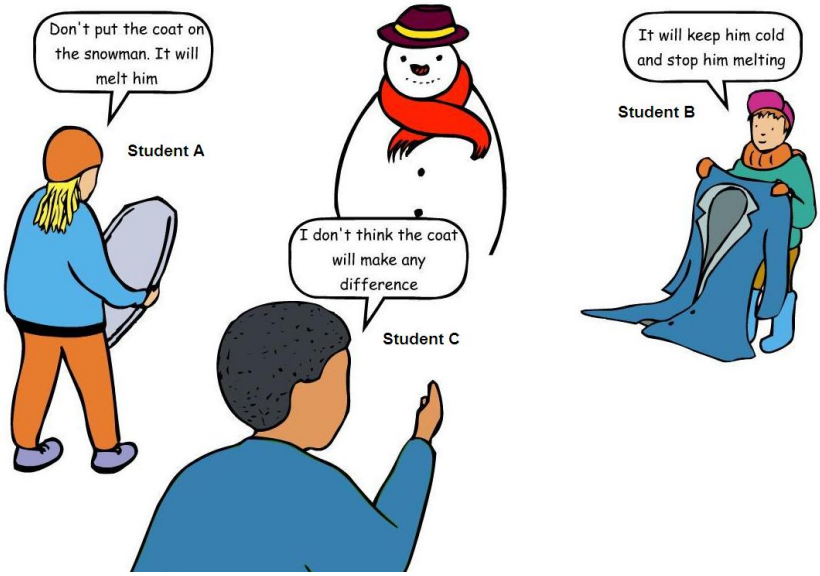
6 CLEAN WATER AND SANITATION

14 LIFE BELOW WATER

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

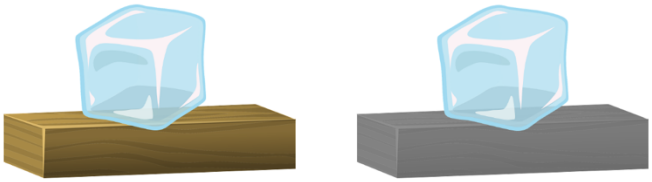
Year 6 Signature Work Inquiry: Cool water bottles

The Snowman's Coat



	The coat will make him melt faster	The coat will make him melt slower	The coat will make no difference
My first thought is...			
After I've spoken to my partner I think...			
After our experiment I think...			

Which will melt faster?

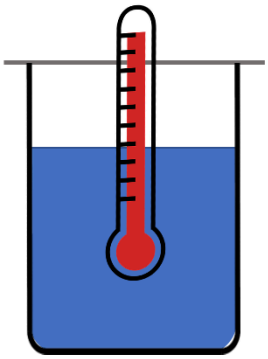


Wooden block

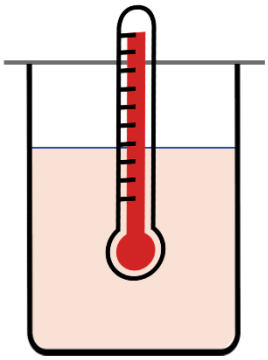
Metal block

	The ice on the wooden block will melt faster	The ice on the metal block will melt faster	They will both melt at the same rate
My first thought is...			
After I've spoken to my partner I think...			
After our experiment I think...			

Which will change in temperature the most?



Ice water



Hot water

	Starting temperature (°C)	Temperature after 10 minutes (°C)	**Change** in temperature (°C)
Ice water			
Hot water			

Which one changed temperature the most in 10 minutes?

_____

If we are trying to find out which materials are good insulators, does it matter if we use hot or cold water (as long as we always do the same thing?

_____

Which do you think we should use in our experiments? Why?

_____

_____

SOURCE A: Claybourne, A. (2013) *My First Book of Science*. P.44-5

This image of p44 of *My First book of Science* has been removed pending copyright permission from the publisher

1. What is heat?

2. How do the atoms and molecules in a hot object move (compared to a colder object)?

3. THINK! if a hot material (e.g. a warm plate) is touching a cold material (e.g. an ice cube) how do you think heat energy will be passed from one to the other?

4. THINK: Given your answer to question 2, why do you think hot materials expand (take up more space) compared to cold ones?

6. What is temperature?

7. Explain in your own words how a thermometer works?

SOURCE A: Claybourne, A. (2013) *My First Book of Science*. P.44-5

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Date

1. Name the three processes by which heat is transferred

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SOURCE B: Dorling Kindersley (2018) *How Science Works*. p.118-9

2. CONVECTION: Convection ONLY happens in fluids. What are fluids?

3. CONVECTION: What happens to the atoms and molecules in a fluid when it gets hotter?

4. CONVECTION: Do hot fluids float or sink? What about cold fluids?

5. THINK: Look at question 1. The walls of your water bottle/ measuring cylinder are solid. Do you think heat energy can travel through them **by convection**? Why/why not?

6. CONDUCTION: Explain in your own words how heat energy travels through solids.

7. CONDUCTION: Look at the box about INSULATION. Is trapped air a good or bad conductor of heat energy?

How do clothes keep us warm?

8. Trapped air is a really good INSULATOR. Think of some materials to wrap your water bottle in that might contain pockets of trapped air.

10. RADIATION: What is the name of the special kind of radiation that carries heat energy?

11. RADIATION: What kinds of objects give out heat radiation?

12. RADIATION: Can radiation travel through places where there are no atoms (like space)?

This image of p119 of DK *How Science Works* has been removed pending copyright permission from the publisher

SOURCE B: Dorling Kindersley (2018) *How Science Works*. p.118-9

Date

Heat transfer notes

Read the articles and make some notes in each red box. Don't forget to say which source you have got the information from (e.g. Source A). Then **in the water bottle outline** suggest how you can use what you have learnt to keep the contents of your bottle cool (or hot).

Heat and temperature

Conduction (and insulation)

Convection (how about a diagram?)

Radiation

Tick the sources you used for your information heat transfer

- ☐ **SOURCE A:** Claybourne, A. (2013) *My First Book of Science*. P.44-5
- ☐ **SOURCE B:** Dorling Kindersley (2018) *How Science Works*. p.118-9
- ☐ **SOURCE C:** Khan, S. & Gillespie, L.J. (2012) *Usborne Junior Illustrated Science Dictionary*. P.94-
- ☐ **SOURCE D:** Parsons, J. (ed) (2004) *DK Illustrated Family Encyclopedia (G)*. p.416-7
- ☐ **SOURCE E:** Hart-Davies, A. (ed) (2021) *Science: The Definitive Visual Guide*. p.471
- ☐ **SOURCE F:** Dorling Kindersley (2020) *The Visual Encyclopaedia*. p.185

Conclusions

Most of the heat energy will travel out of my bottle by *(conduction, convection or radiation?)*

So I need to slow this down by wrapping my bottle in a really good…

Many of good insulators lots of…

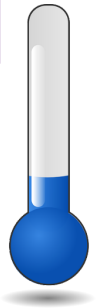
So I think that materials like these might be good at keeping my water cool:

Date

Science, Maths & ICT: Reflection

What **problems** did I (or the group) have with the Science experiments? *(4.4)*

What decisions did we make during our experiments? *(4.2)*



How did I **overcome** these problems? *(4.4)*

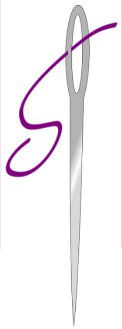
How did this affect the way our experiments turned out? *(3.2)*

What did I learn? If I had to do these experiments again, how would I do them better next time? *(3.3)*

Date

Art & DT: Reflection

What were the hardest things about making my bottle cover? *(4.4)*



What decisions did I make about my bottle cover? *(4.2)*

How did I **overcome** these problems? *(4.4)*

How did this affect the way my project turned out? *(3.2)*

What did I learn? If I had to do a sewing project like this again, how would I do it better next time? *(3.3)*