



Welcome to Whalley Range High School!



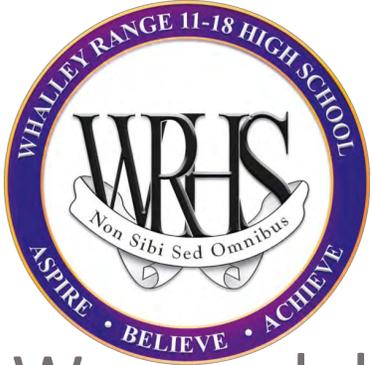
Melting Ice Investigation

LO: To plan a fair investigation that answers the key question

To be able to take and record measurements

To conclude the results and evaluate evidence to answer the key question.

Answers to all questions can be found at the end of this powerpoint , I recommend you check each piece of work as you go along.



Information for Parents

We are delighted to welcome your daughter to Whalley Range High School and are committed to ensuring she is fully prepared to start her studies here in September. This lesson aims to recap the key stage 2 curriculum [Right] in preparation for the upcoming year. I will look forward to working with you to ensure your daughter gets the best opportunity for success in science, across the school and onto further education/employment.

Working scientifically

Statutory requirements

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

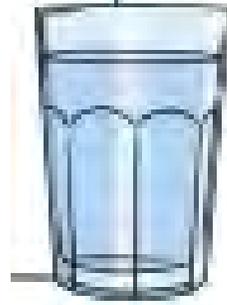
- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments.

Use the word bank to fill in the blanks, some have been completed for you. You can use the word bank to help you.



Word Bank

Boiling ,Liquid, Freezing, Gas, Cooling



	Solid	Liquid	Gas
What does it look like?			
What does it feel like? DO NOT FEEL THE STEAM FROM THE KETTLE.			DO NOT FEEL THE STEAM FROM THE KETTLE. INSTEAD breathe out into your hand and describe what that feels like.
Draw a picture			

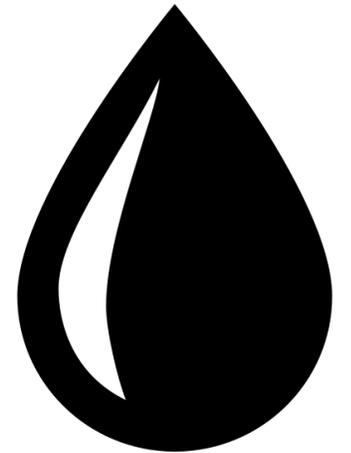
How to make ice.

Write some instructions on how to make ice. Use the pictures to help you. Use as much scientific language as possible from the wordbank.

1.

2.

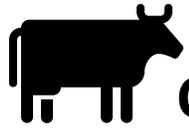
3.



Word Bank

Liquid, Measure, Freeze, Solid, Millilitres.

How to plan a **Fair** investigation?



Cows – **C**hange one thing

Moo- **M**easure one thing

Softly – Keep everything else the **S**ame

In all investigations we must stick to this rule in order to make the investigation fair.

What does the word fair mean?

What does fair test mean?

Melting Ice Investigation

We are going to plan an investigation to find out the best way to melt ice. we are going to **change** the environment we put the ice in by using these 4 things.



heat



cold



water



salt



sugar

Can you think of anything we might keep the same?



1.

How will we ensure this is kept the same?



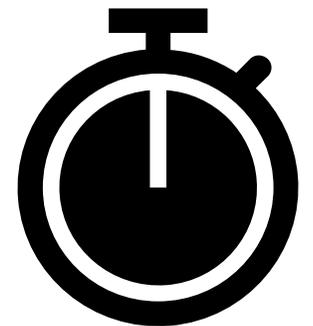
2.

How will we ensure this is kept the same?

What are we going to measure

In order to answer the scientific question...

We are going to measure the _____ it takes for _____ to melt depending on the _____ it is in.



Risk Assessment – Match the definitions

Risk

actions and/or activities that are taken to prevent, eliminate or reduce the occurrence of a hazard that you have identified.

Hazard

anything that can cause harm or damage to humans, property, or the environment.

Control measures

the chance or probability that a person will be harmed if exposed to a hazard.

Risk assessment – complete the table.

1. Identify the hazards in the experiment
2. Assess what Risk this is, High Medium or Low
3. Describe how we can reduce the risk of this happening

The first one has been done for you

Hazard	Risk	Control Measures
Spillage	Medium	If you identify a spillage stop what you are doing immediately and clean it up or ask an adult to clean it up. Make sure you clear up any spillages appropriately -using a tea towel.
Ice on skin		

Equipment

Draw each of the things we are going to need to conduct our investigation. Take a look back through the PowerPoint if you are struggling. Think about what we could use to measure time.

Method- how will we use the equipment?

1. Place 1 ice cube in _____.
2. Measure _____
3. Record results in a _____.
4. Repeat the experiment, changing the _____ each time. Untill you have gathered a result for each _____.
5. Repeat steps 1- ____ 3 times.

Results table – fill in your results.

Environment	Time taken for Ice to Melt (s)			Mean time taken for ice to melt (s)
	1	2	3	
Heat				
Salt				
Sugar				
Fridge				
Water				

Lets work out a mean score for all of our results.

- First we need to take out any results that don't fit the pattern. I have circled the results that don't fit the pattern, because they are too different to the others in that column. Do this for your results.

Environment	Time taken for Ice to Melt (s)			Mean time taken for ice to melt (s)
	1	2	3	
Heat	30	64	34	
Salt	129	123	127	
Sugar	100	108	30	
Fridge	464	500	478	
Water	345	322	315	

Now remove any results that didn't fit the pattern.

Environment	Time taken for Ice to Melt (s)			Mean time taken for ice to melt (s)
	1	2	3	
Heat	30		34	
Salt	129	123	127	
Sugar	100	108		
Fridge	464	500	478	
Water	345	322	315	

Now you can work out the mean for your results as I have done here.

Environment	Time taken for Ice to Melt (s)			Mean time taken for ice to melt (s)
	1	2	3	
Heat	30		34	$30+34 \div 2 = 32$
Salt	129	123	127	$129 + 123 + 127 \div 3 = 126$
Sugar	100	108		$100 + 107 \div 2 = 104$
Fridge	464	500	478	$464 + 500 + 478 \div 3 = 481$
Water	345	322	315	$345 + 322 + 315 \div 3 = 327$

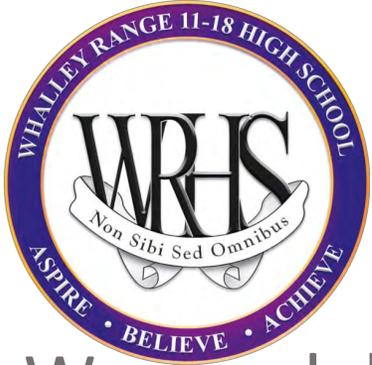
You can watch this video to help you ...

https://www.youtube.com/watch?v=7Zni81m_7wM

Conclusion

What is the best environment to melt ice?

Why?



Information for Parents

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Working scientifically

Statutory requirements

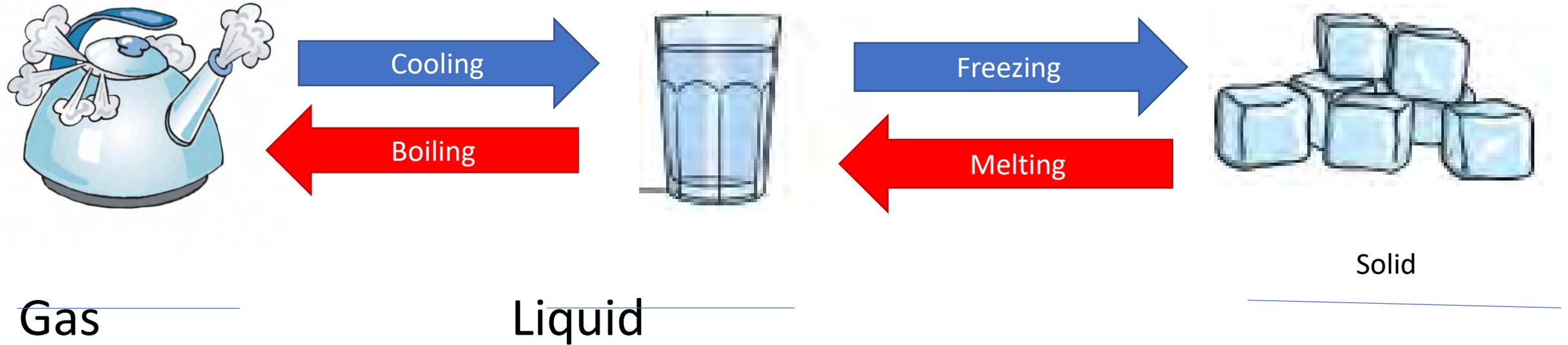
During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
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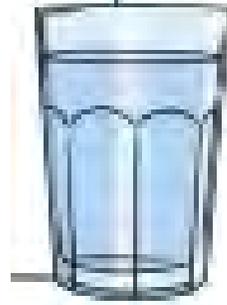
A green starburst shape with a dark green outline and a lighter green fill. The word "ANSWERS" is written in a bold, dark green, sans-serif font in the center of the starburst.

ANSWERS

Use the word bank to fill in the blanks, some have been completed for you. You can use the word bank to help you.



Word Bank
Boiling ,Liquid, Freezing, Gas, Cooling

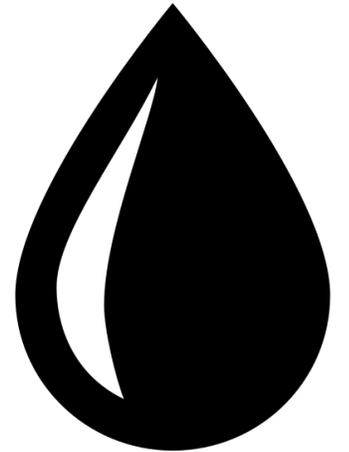


	Solid	Liquid	Gas
What does it look like?	Square, Firm, Ridgid	Flows, Slipery, Transparent	Cloud-like , sometimes invisible
What does it feel like? DO NOT FEEL THE STEAM FROM THE KETTLE.	Cold, hard, slippy	Wet, runny, slippy	DO NOT FEEL THE STEAM FROM THE KETTLE. INSTEAD breathe out into your hand and describe what that feels like. Walm, moist
Draw a picture			

How to make ice.

Write some instructions on how to make ice. Use the pictures to help you. Use as much scientific language as possible from the wordbank.

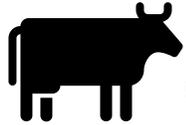
1. Measure 100ml of water.
2. Pour the liquid evenly onto the ice cube tray.
3. Freeze in the freezer until solid.



Word Bank

Liquid, Measure, Freeze, Solid, Millilitres.

How to plan a **Fair** investigation?



Cows – **Change** one thing

Moo- **Measure** one thing

Softly – Keep everything else the **Same**

In all investigations we must stick to this rule in order to make the test fair.

What does the word fair mean?

without cheating or trying to achieve unjust advantage.

What does fair test mean?

a **test** which keeps all but one thing the same when attempting to answer a scientific question.

Can you think of anything we might keep the same?



1. Amount of ice or size of ice cube or number of ice cubes

How will we ensure this is kept the same?

Mesure out the water into the tray, ensure each cube us the same size, only add one ice cube.



2. The liquid we use

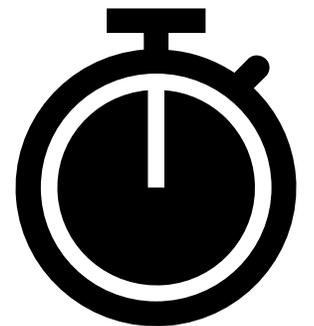
How will we ensure this is kept the same?

Make all ice cubes with water

What are we going to measure

In order to answer the scientific question...

We are going to measure the time it takes for ice to melt depending on the conditions it is in.



Risk Assessment – Match the definitions

Risk

Hazard

Control measures

actions and/or activities that are taken to prevent, eliminate or reduce the occurrence of a hazard that you have identified.

anything that can cause harm or damage to humans, property, or the environment.

the chance or probability that a person will be harmed if exposed to a hazard.

Risk assessment – complete the table.

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2. Assess what Risk this is, High Medium or Low
3. Describe how we can reduce the risk of this happening

The first one has been done for you

Hazard	Risk	Control Measures
Spillage	Medium	If you identify a spillage stop what you are doing immediately and clean it up or ask an adult to clean it up. Make sure you clear up any spillages appropriately using a tea towel and quickly.
Ice on skin	Medium	Ask and adult to pop out each ice cube without touching it/ put gloves on to remove the ice cube from the tray

Equipment

Draw each of the things we are going to need to conduct our investigation. Take a look back through the PowerPoint if you are struggling. Think about what we could use to measure time.

Sugar

Ice

Hands

Ice cube Tray

Measuring jug

Glass

Water

Clock or Stopwatch

Salt

Fridge

Freezer

Method- how will we use the equipment?

1. Place 1 ice cube in the first condition (sugar/heat/salt/fridge).
2. Measure the time it takes to melt completely.
3. Record results in a results table.
4. Repeat the experiment, changing the condition each time. Untill you have gathered a result for each condition.
5. Repeat steps 1- 4 3 times.

Conclusion

What is the best environment to melt ice?

Heat or the condition where your ice melted the fastest.

Why?

Because in the heat the ice melted quicker than all other conditions.