

After our biscuit-themed Science Week, July 2022, 2 children from each group were selected for a pupil voice.

# Science Week - Biscuits



## What did you learn?

We learnt cheap cookies are the most durable.

We learnt that the higher the temperature the more the biscuits drop off.

That in cold water the hardest biscuit to dunk and break off is the chocolate oatie biscuit. It took over a 100 dunks to break off.

The slowest biscuit to break in the tea was actually the rich tea cos that had the less amount of sugar than the others.

I also found out that there's a lot more jobs than you think of that makes cookies...taste testers, mechanics if the machines go wrong, flavour designers, biscuit designers and there could be designers for the packaging and people packing them.

For ours the M&S chocolate chunk biscuits were the worst...they were the most expensive biscuit!

I thought the rich teas would fall apart easier because they're more plain.

## Did anything surprise you?

Brilliant!

Awesome!

I noticed that the cheaper the cookies are, the more it will hold.

Interesting!

## What did you think of Science Week?

Amazing!

I feel like I got a bit better at theorising because we would have to look at a question and put the factors in order of how important they were and it turned out the most important was the cost.

We could have a science week about space.

I'd love to investigate chocolate next.

Reception started by reading the story The Gingerbread Man. Children were asked what might happen if he fell in the water.

He might break.

The sugar might come off.

He might melt.

He might go soggy.

The children decided to test by placing the gingerbread men in water.

He got soggy. He broke.

He wasn't crunchy.

He went soft and wasn't hard.

He didn't snap any more.



# Reception

They then decided to explore whether all biscuits react the same way in water. Children made simple predictions...

It's chocolate. It might not break, it has a cover.

The chocolate might come off.

It might still go soggy.



They found out that biscuits with cream lasted the longest in water.

The cream stayed. Maybe because it's hard.

The chocolate has stayed. It didn't melt.

It feels soft where it's in the water..

It's still hard!



# Reception

Finally, they decided to see what would happen to the gingerbread man in different liquids.



They tried milk, oil and water again.

The oil might not work because it's thicker.

It (milk) might make the biscuit harder.

What did they find out?

It melted the most in the water, it's soft and soggy.

It stayed a bit hard in the bowl with milk. It just broke a bit.

The oil one stayed hard. It still snapped. It was crunchy.

The gingerbread man stayed in oil, but wouldn't have tasted nice.





# Year 1

Year 1 started by reading the story The Gingerbread Man.

They then moved on to test other biscuits using a simple dunking test.



We observed and talked about what happened when the Gingerbread Man got wet.



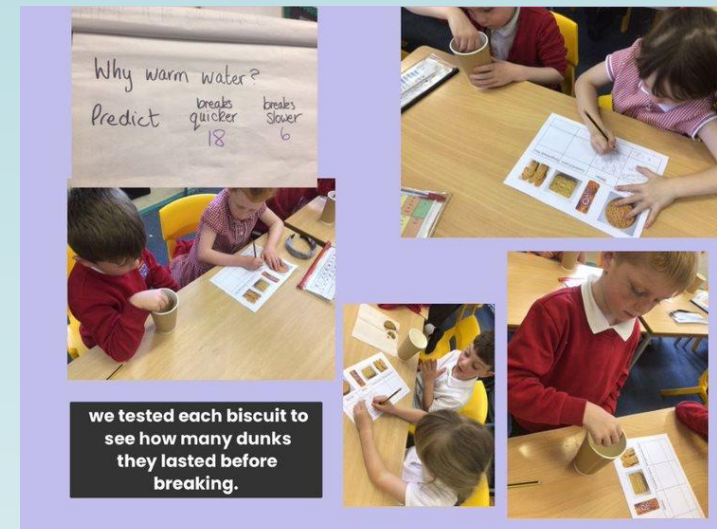
Completing our observation sheets.



We placed the Gingerbread Man in some water to see what happened after a short length of time.

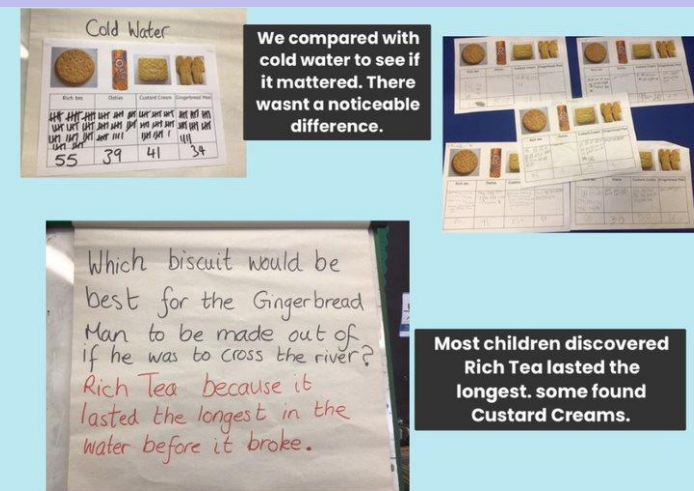
We planned to leave it and observe at 1 minute, 2 minutes and 3 minutes but the Gingerbread completely disintegrated around 1 minute.

We set it up again and observed closely, making note at 10 seconds, 30 seconds and 1 minute. We tried less water.

Why warm water?  
Predict breaks quicker 18 breaks slower 6

We tested each biscuit to see how many dunks they lasted before breaking.



Cold Water

Rich Tea	Digestive	Custard Cream	Shelf Life
55	39	41	38

We compared with cold water to see if it mattered. There wasn't a noticeable difference.

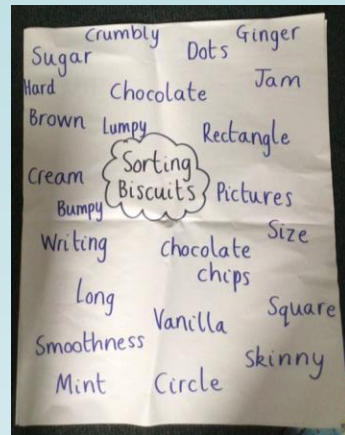
Which biscuit would be best for the Gingerbread Man to be made out of if he was to cross the river?  
Rich Tea because it lasted the longest in the water before it broke.

Most children discovered Rich Tea lasted the longest. Some found Custard Creams.



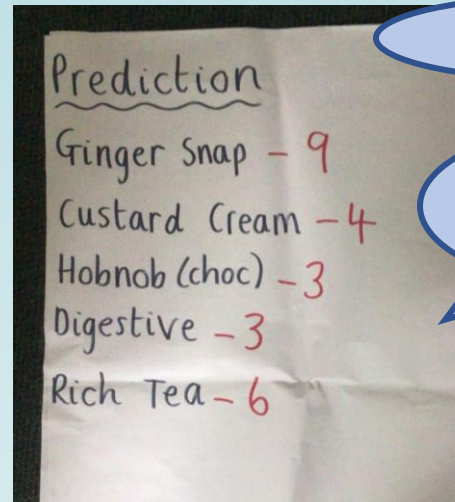
# Year 2

Year 2 started by using their senses to explore a range of different biscuits. They found different ways to sort the biscuits.



## Which biscuit will be the best to dunk into a cup of tea?

Children talked about how to find the answer to their question and made predictions.



It felt strong.

I tried to snap it and it didn't snap.

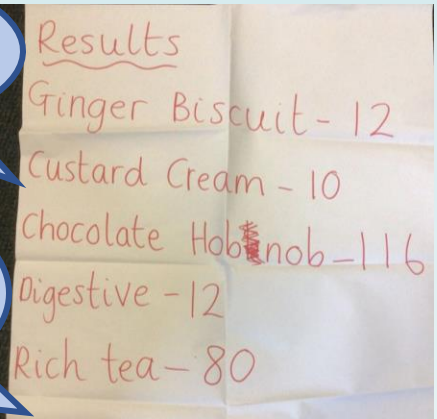
I tapped it on the bowl and it didn't break.

Rich tea. It has tea in the name.

It felt strong and big.

All biscuits didn't break at the same time.

What surprised me was the one that got up to 10 just broke up in seconds...it would have been the custard cream.



# Year 3

## Does the thickness of a biscuit affect how many times it can be dunked before it breaks?

Year 3 received a letter from Kevin from the story Kevin and the Biscuit Bandit. He asked them to help him.

First, Year 3 looked at ways to sort the biscuits.



13.7.22  
Willington P  
Chapel Street,  
Willington  
County Durham  
DL15 0EQ

13.7.22

Dear Kevin,  
How are you? Thank you for your letter. We think we have solved your problem. In science we dunked 4 different biscuits of different thickness. We discovered that the Rich Tea lasted 09:41:75 before it fell into the cup of warm water. We think this happened because the Rich Tea had the least amount of sugar. This means that less of the biscuits dissolved. We hope we have helped you!  
Love  
Year 3

Our rich tea lasted the longest.

If they have more sugar, they drop off quicker and if they have less sugar they will stay longer.

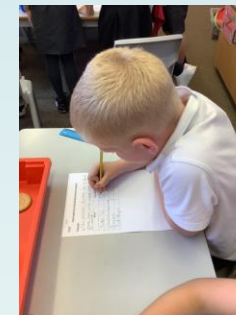
The children wrote back to Kevin to tell him what they found out.

5.7.22 Science week: Do thicker biscuits make better dunkers?

Prediction  
Yes because the thick biscuits take much longer to fall apart.

Biscuit	Time dunked before falling apart	
Rich Tea	01:36:23	01:52:59
Chocolate chip cake	01:13:09	00:36:20
Bourbon	02:14:38	00:52:76
Pink wafer	01:56:70	2:18:71

The children then set to with their investigation. They used iPads to time how long they were able to dunk the biscuit before it fell apart.

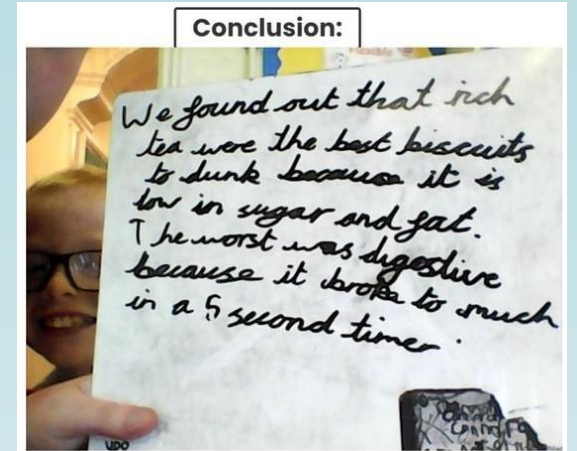




# Year 4

## How does the temperature of the drink affect a dunking biscuit?

Year 4 learned how to use the digital thermometers to measure the temperature of each cup of tea.



The hot drinks were worst for dunking.

They recorded the number of dunks before the biscuit broke.

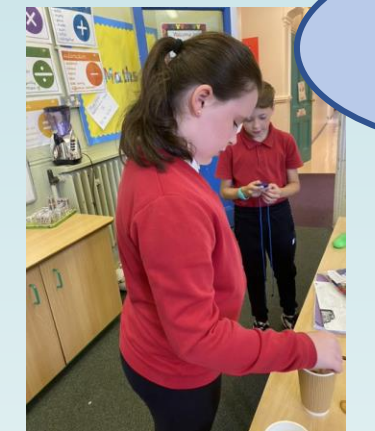
Biscuits	20 °C	40 °C	60 °C	80 °C
ginger nut	3	2	2	1
rich leaden	4	3	3	3
rust digestive	3	2	1	1
mustard creme	3	2	2	2

Key:  
1. = broken  
2. = weak  
3. = firm  
4. = no change

Hot drinks melt the sugar quicker.

### Conclusion:

We were looking at whether temperature would affect biscuits when they are dunked in a cup of tea. We dunked the same biscuits in four different temperatures of tea: 20 degrees, 40 degrees, 60 degrees and 80 degrees. We also observed the changes. All together, we found out that the digestives are the worst for dunking because it snapped in half at 60 and 80 degrees. Rich teas were the best for dunking because they are low on sugar and fat, this is because sugar dissolves in liquid easily. My prediction was correct because I thought that digestives were the worst for dunking from my experience.

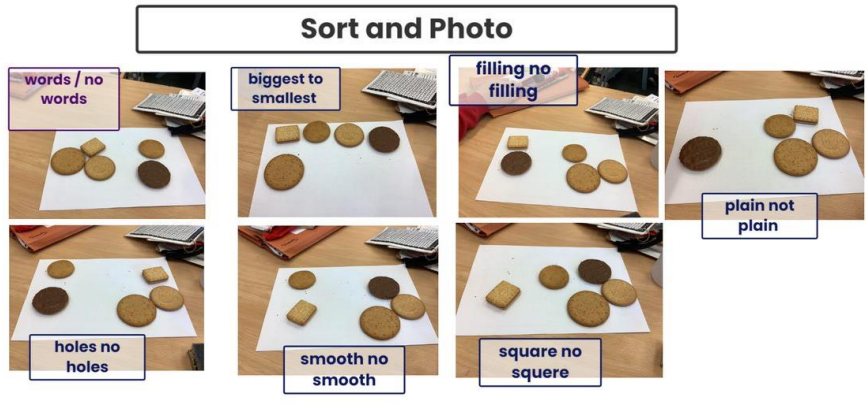


Each group tested 4 different temperatures of tea.



# Year 5

## What factors make a biscuit great for dunking?



Children started by exploring the factors that may affect how well a biscuit dunks. They sorted their biscuits using these different factors.



<b>We will keep these variables the same:</b>	<b>This is the variable we will change:</b>
The amount of water Same type of liquid water . Same container Water temperature (tap) Length of each dunk Amount of biscuit dunked (50 )	The type of biscuit .

They planned a fair test, deciding on their own dunking test.

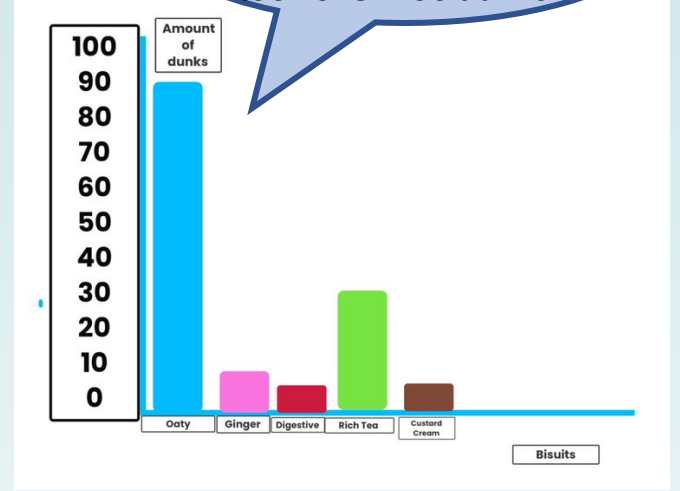
The best biscuit for dunking will be the ginger nut. I think this because it is harder than the other biscuits.

The best biscuit for dunking will be the chocolate oatie. I think this because it's got chocolate on the top and the chocolate won't weaken to let the biscuit go soggy.

The hardest biscuit to dunk was the chocolate oatie. It took over 100 dunks...

**Results:**

Biscuit	Numbers of dunk
Oaty	90
Ginger	9
Digestive	5
Rich Tea	30
Custard Cream	5



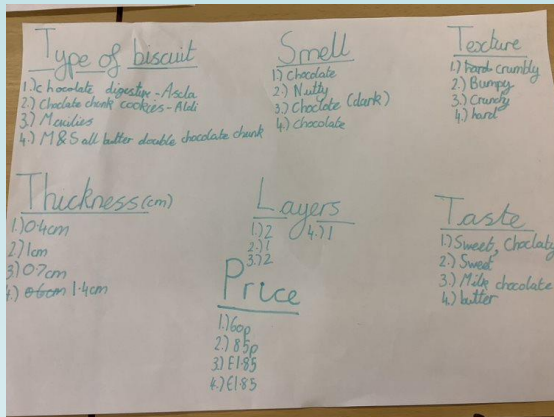


# Year 6

## Are more expensive biscuits better for dunking?

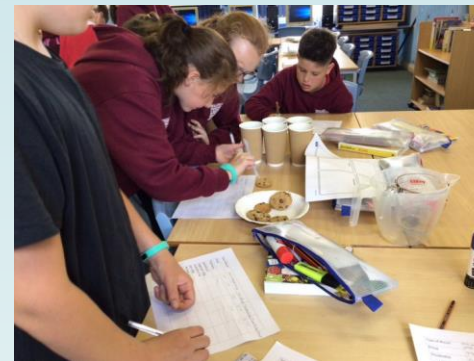
After being posed the question, children discussed how we could determine this. They decided on their own criteria to explore.

Children then worked in groups to plan their own investigations, recognising which variables to control.



Groups decided on their own dunking test and what data to collect.

Type of Biscuit	Aldi Digestive	Asda milk choc	M&S choc	Maudies	M&S cookie
Price	55p	60p	90p	£1.85	£2.10
Thickness	0.5cm	0.5cm	0.3cm	0.3cm	0.4cm
quantity of sugar per 100g	29.2	24.5	30.4g	28.5g	32.2
quantity of fat per 100g	23.6	23.6	25.2	23.6g	27.4
Number of layers	2	2	2	2	3
size/shape	circle	circle	circle	circle	circle
number of "dunks" before breakage	17	38	30	20	22



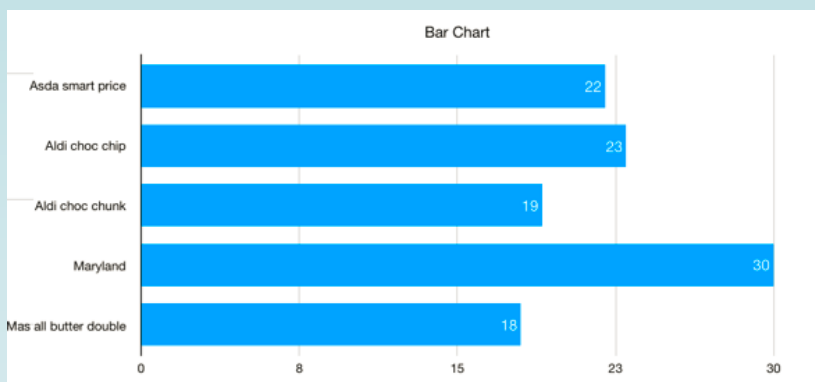
I also found out that there's a lot more jobs than you think of that makes cookies...taste testers, mechanics if the machines go wrong, flavour designers, biscuit designers and there could be designers for the packaging and people packing them.



Are more expensive biscuits more durable in warm liquid

Type of biscuit	Number of dunks until it crumbles	Price	Quantity of sugar per 100g	Quantity of fat per 100g	Thickness
Asda smart price	22	39p	23g	24g	0.3cm
Aldi choc chip	23	41p	64g	24g	Zero . Two
Aldi choc chunk	19	85p	33g	23g	1cm
Maryland	30	One pound thirty five pence	20g	22g	0.2cm
Mas all butter double	18	One pound eighty five pence	67g	25g	0.6cm

Column Chart



Children then used computers to represent their findings and draw their own conclusions.

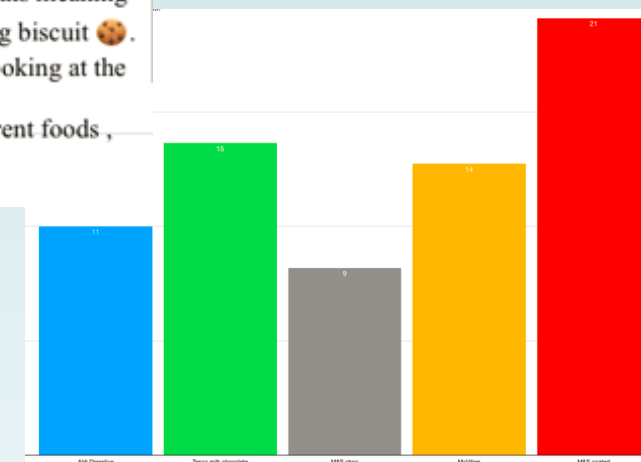
We found that the more sugar in your cookie, the worse it would be for dunking.

We learnt the cheap cookies were the most durable ones.

In conclusion we found out that the price did not impact the durability of the biscuit. We know this because: the Tesco digestive, one of the cheapest was only 60p and the hardest to break. We also found out that biscuits with the most sugar breaks the easiest and the biscuit with the less sugar is the hardest to break. The Aldi digestive took 17 dunks, the M&S biscuit took 30 dunks, the McVities took 20 dunks, M&S took 22 and last but not least took 38 dunks meaning the Tesco milk chocolate was the winning biscuit 🍪.

We chose a bar chart because we were looking at the categories and type of biscuit.

In further experiments I would test different foods , temperatures and liquids.



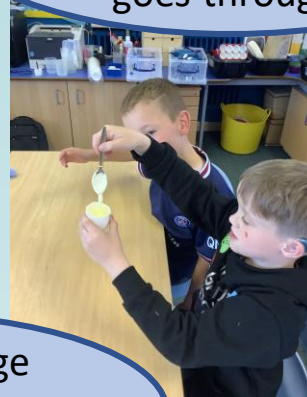


# Dr Lorraine Coghill

We were lucky enough to have Dr Lorraine Coghill in school for the day. She worked with children in Years 1 – 4 carrying out some fun food-based science experiments.



It's translucent...so when it's translucent only a bit of the light goes through.



It's taking longer to go down. It's thicker.



It's got smoother.



It's turning into syrup getting runnier and runnier.

It might change texture...it might get softer.

It's an opaque liquid.



It's gooey...it doesn't move. It only moves slowly.



It dissolved.



The ketchup changed colour. Now it's very dark.

The outside is going white. The colour went in the water. .



# Dr Lorraine Coghill

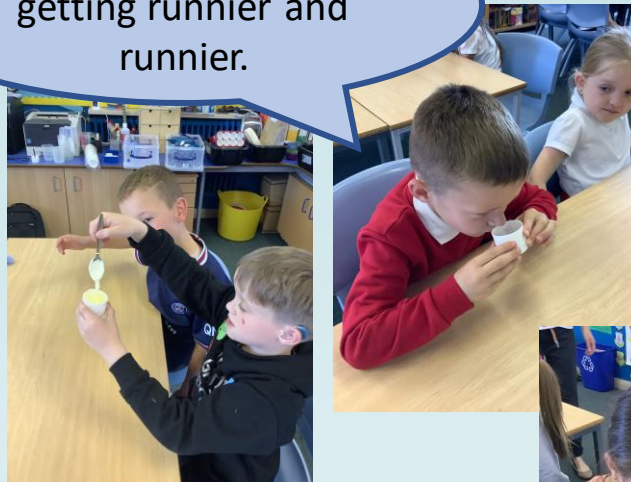
We were lucky enough to have Dr Lorraine Coghill in school for the day. She worked with children in Years 1 – 4 carrying out some fun food-based science experiments.



Dr Lorraine Coghill also talked about the role of science in some areas of food e.g. designing flavours for crisps and ice cream.



It's turning into syrup getting runnier and runnier.



It's gooey...it doesn't move. It only moves slowly.

