The Royal Mint MUSEUM

Coins in the Classroom

Maths

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Coin Identification Challenge

Can you work out what coins are in a bag without looking at them?

Work in small groups and record your results using a tally chart

1. Did you find the challenge easy or difficult?
2. How can we tell what coins are without looking at them?
3. Why is it important to be able to do this?

Coins must not be **too big**

and they must not be too small

Why do you think this is?

The Story of the Lazy Threepence

The pre-decimal penny is a **large** coin (slightly bigger than a £2 coin today) and very **heavy**.

Pre-decimal penny

This penny, dated 1933, is one of the rarest pennies in the Museum's collection.

The Story of the Lazy Threepence

In comparison the old silver threepence, worth **three times** as much, is tiny (smaller than a 5p piece).

Old silver threepence

The threepence was so small that people actually avoided using it and carried around more of the larger pennies instead!

The Story of the Lazy Threepence

Coins that aren't used properly in circulation like the threepence are known as **lazy coins**.

The Royal Mint needed people to start using the threepence properly. **How do you think they did it?**

The Story of the Lazy Threepence

The Royal Mint came up with a clever solution…

The new threepence

… they couldn't change people's behaviour, but they could change the coin!

The new threepence coin was introduced in the 1930s. The coin became very popular during the **Second World War**.

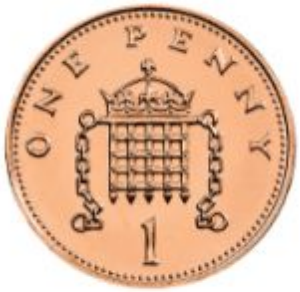
Can you work out why this was?

The Story of the Lazy Threepence

In the UK the **range** all coins need to fall into is very narrow.

The smallest a coin should be is approximately 17mm in **diameter**, and the largest is 30mm. The UK 5p coin is 18mm in diameter.

In the United Kingdom we have eight **denominations**, or types of coin



Activity One: Weighing and Measuring Coins

Using the instructions below, work in groups to measure the coins in your bags.

Diameter

Use your ruler to measure the widest point of the coin. Most of the coins in the UK are circular, however the 50p and 20p are not- they have 7 sides. To measure across a 50p you need to take your ruler and measure from one of the points on the coin straight across to the flat side opposite. Do this at least 3 times to make sure your measurements are accurate.
DID YOU KNOW? That the 50p and 20p coins roll because the distance between the opposite sides is always the same.

Weight

Weigh one coin at a time. You will need to use scales that show decimal numbers.
Clear the scales (so they are showing 0) and then place the coin onto the scales to weigh it. Read the display carefully and then take the coin off. Repeat this 3 times for every coin you need to weigh.
Record the weight of the coin in grams.

Area

Use a sheet of squared paper to measure the area. Draw around your coin using a pencil and then count the number of squares it covers. Remember to count whole squares first and half squares second. Repeat your count 3 times and record your answer in cm².

Thickness

Measuring the thickness of coins can be a bit tricky because some of them are very thin.
One way to measure the thickness accurately is to make a stack of coins by stacking 5 or 10 coins on top of each other. You then need to measure the stack with a ruler, so that you know the thickness of all 5 (or 10) coins together. After you have done this divide your answer by the number of coins in the stack. This will give you the answer you need for 1 coin. You might need to use a calculator to help you.

Circumference

You will need to use a piece of string to measure the circumference of the coins.
Carefully wrap the string around the edge of the coin and mark on the string where the end meets.
Then measure the string against a ruler to get your measurement.
Repeat this 3 times- be careful to make sure the string is not too loose!

Activity Two: The Shape of Coins

As you saw from the threepence, coins don't have to be round. What different **shapes** do you think we could use for coins?

Here are some examples of coins of different shapes from around the world

Click to change

We all need coins to do certain things, for example, fit in our pockets

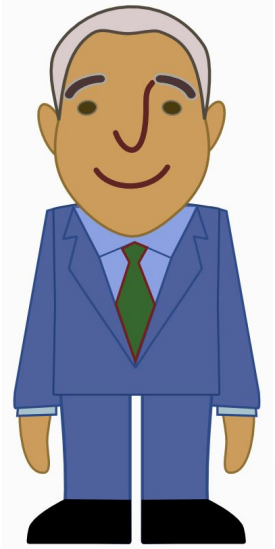
What do coins need to be/do?

In pairs or groups think about what other things coins need to be able to do.

There is something special about 20p and 50p coins, do you know what it is?

Take a 20p or 50p and set up a slope…

Balance the coin on its edge at the top of the slope and let go…



Even though the coins are not round, they still roll.

Can you work out why?

The Equilateral Curve Heptagon

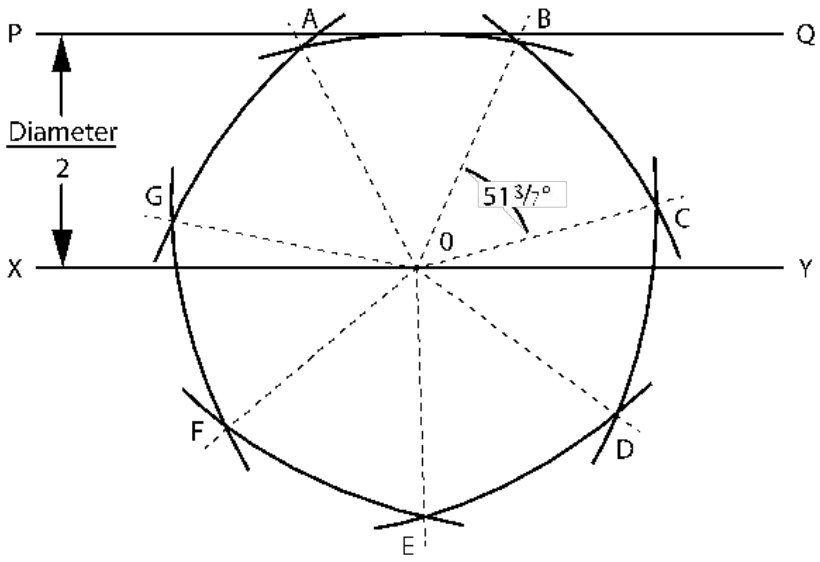
The 20p and the 50p coins roll because they are a special shape, known as an **equilateral curve heptagon**.

If you look carefully you can see that this is because the sides of the shape are slightly curved, not flat like you might expect.

This means that a shape like a hexagon with flat sides won't roll, but these coins will.

Britain was the first country in the world to use this shape for coins.

The Equilateral Curve Heptagon



1. Draw a line 8cm long. Label the ends X and Y and mark the centre O.
2. Draw a parallel line 3cm above and label it PQ.
3. Line the centre of your protractor up with O and then mark every 51 3/7º.
4. Join each of your points up with the centre O.
5. Label your lines A-G copying the diagram carefully.
6. Set your compass to 6cm.
7. Put the point of your compass where your line A crosses your line PQ, then draw a curve between your lines E and D.
8. Next put the point of your compass on your line E and draw a curve between A and B.
9. Repeat this with line D and so on until you have completed your shape.
10. When you have finished rub out your connecting lines to leave you with your equilateral curve heptagon.

Can you draw one?

It is important for coins to roll so that they can be used in vending machines and parking meters.

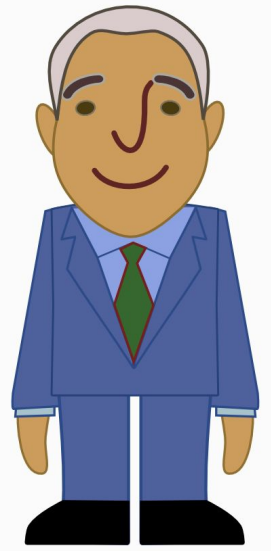
Some countries, rather than having different shaped coins, make their coins into rings.

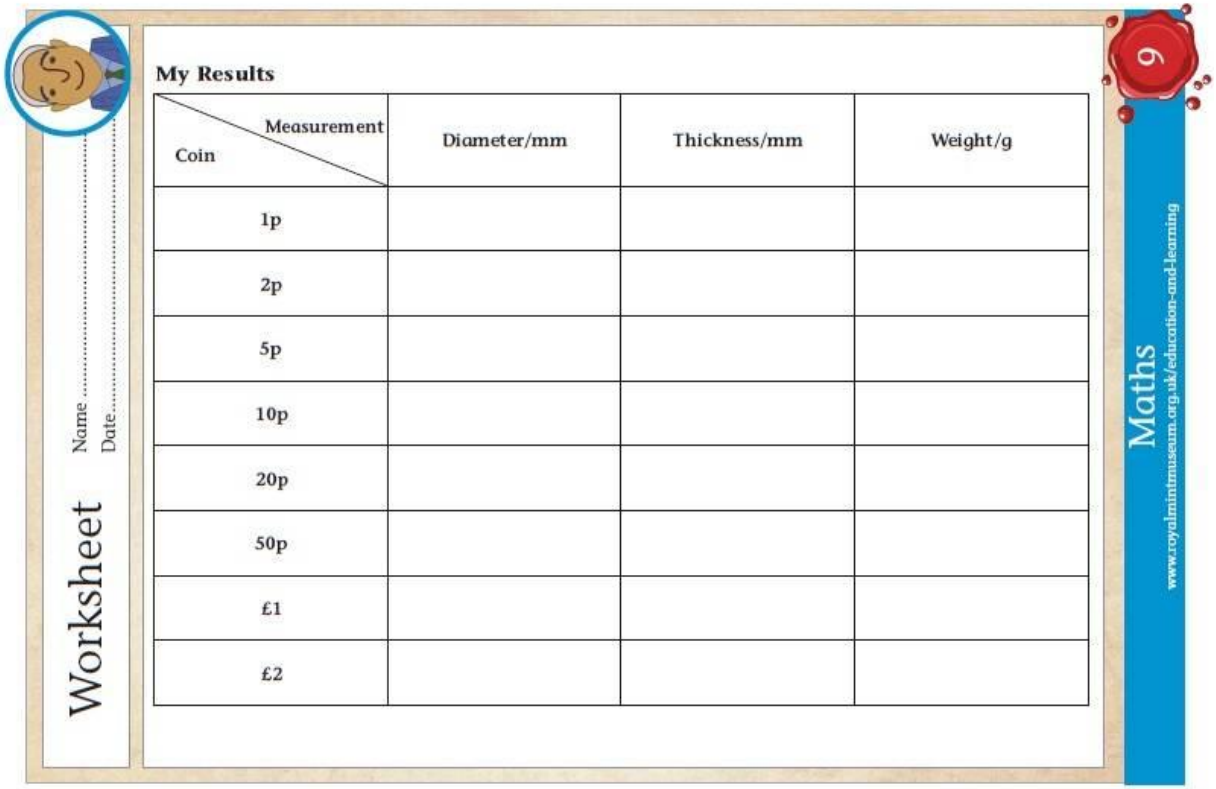
This coin is from Papua New Guinea

Why is it not possible for us to do this in the United Kingdom?

Activity Three: Number Patterns

There is one more thing we can learn about coins from looking at our results. Can you spot what it is?





Worksheet

Name .....

Date .....

My Results

Coin \ Measurement	Diameter/mm	Thickness/mm	Weight/g
1p			
2p			
5p			
10p			
20p			
50p			
£1			
£2			

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Look closely at the weight column of your results table. What do you see?

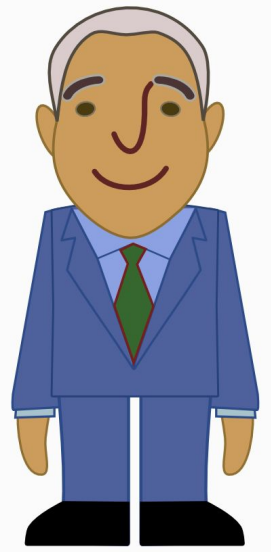
A 2p coin weighs twice as much as a 1p coin, and the 10p coin weighs twice as much as the 5p coin. This is a **weight to value** relationship.

1. What advantages are there to having a 2p coin that weighs twice as much as a 1p coin?

2. What disadvantages are there?

3. Look at your results. Is this the same for the 20p and 50p?

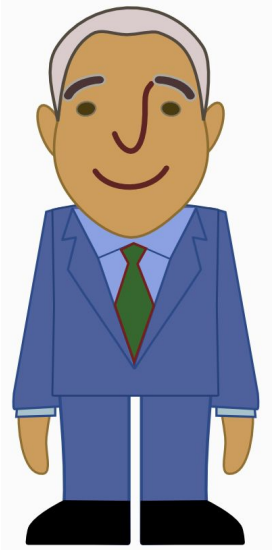
4. Can you work out how much a halfpenny (a coin we no longer use) would have weighed?



Think back to the start of this lesson and the story of the lazy threepence…

1. Do you think that we have any lazy coins today?

2. Are there any coins that you would like to change? Why?



At the moment the United Kingdom has no plans to change its coins. However Canada has decided that it not longer needs its one cent coin.

What does this mean for the people who live there when they go shopping?