Money, money

Reasoning in the classroom

Support materials for teachers

Year 2

Llywodraeth Cymru
Welsh Government

Year 2 Reasoning in the classroom – Money, money

The focus in these Year 2 activities is on money.

Activity 1

Money, money
Learners use their numerical skills and knowledge of money to convert 5p coins into 2p and 1p coins.
Includes:
- Money, money questions
- Markscheme

Activity 2

Money patterns
They create patterns, using 5p, 2p and 1p coins.
Includes:
- Explain and question – instructions for teachers
- Whiteboard – Coin pattern
- Resource sheet – My pattern

Reasoning skills required

Identify

Learners choose what to do and how to do it.

Communicate

They talk about their ideas and choices.

Review

They review their work and consider whether their patterns are correct.

Procedural skills

- **Money (5p, 2p, 1p)**
- **Addition**
- **Multiplication (or repeated addition)**
- **Simple reflection (same both sides)**

Numerical language

- **Altogether**
- **Patterns**
- **Mirror image**

Activity 1

Money, money

Activity 1 – Money, money

Outline

This short Year 2 activity can readily be embedded into more extended work with learners on money.

It requires learners to use their numerical reasoning to work out the equivalent number of 2p and 1p coins to three 5p coins.

You will need

Money, money questions
One page for each learner

Markscheme

Joe has these coins.
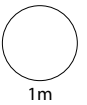
He changes **each 5p** coin for **one 1p** coin and **two 2p** coins.
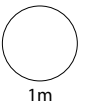
How many coins does Joe have?

number of **1p** coins =
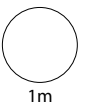
number of **2p** coins =
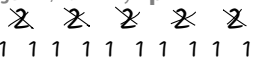
Then Joe changes **each 2p** coin for **two 1p** coins.

Altogether, how many **1p** coins does he have now?

Activity 1 – Money, money – Markscheme and exemplars

Q	Marks	Answer
i	1m	**3**
ii	1m	**6**
iii	1m	**15**

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number of **1p** coins = 3
number of **2p** coins = 6

Then Joe changes **each 2p** coin for **two 1p** coins.
Altogether, how many **1p** coins does he have now?

6 × 2 = 15

✓, ✓, ✓; 3 marks in total

- This learner shows understanding of multiplication.

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5 = 1 + 2 + 2
5 = 1 + 2 + 2
5 = 1 + 2 + 2

number of **1p** coins = 3
number of **2p** coins = 6

Then Joe changes **each 2p** coin for **two 1p** coins.
Altogether, how many **1p** coins does he have now?

⑤ ⑤ ⑤ = 15

✓, ✓, ✓; 3 marks in total

- The third part of the question shows that this learner understands the link between the question parts.

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⑤ ⑤
①②② ①②②
⑤
①②②

number of **1p** coins = 3
number of **2p** coins = 6

Then Joe changes **each 2p** coin for **two 1p** coins.
**Altogether**, how many **1p** coins does he have now?

2 2 2 2 2 2 = 12

✓, ✓, ✗; 2 marks in total

- The diagrams at the top of the page are an effective way of supporting understanding. The third part shows understanding of conversion, but the learner has forgotten to add on the existing three 1p coins.

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number of **1p** coins = 3
number of **2p** coins = 5

Then Joe changes **each 2p** coin for **two 1p** coins.
Altogether, how many **1p** coins does he have now?

2 2 2 2 2
1 1 1 1 1 1 1 1 1 1 = 13

✓, ✗, ✗; 1 mark in total

- This learner has made a slip when finding the number of 2p coins in the second part of the question. Although the third part shows understanding of conversion, as the question is assessing conservation of money, no mark can be given – this would mean that 15p at the start of the question has now become only 13p.

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number of **1p** coins = 1
number of **2p** coins = 1

Then Joe changes **each 2p** coin for **two 1p** coins.
Altogether, how many **1p** coins does he have now?

= 2

All three parts incorrect; **0 marks**

- This learner has ignored the questions and may need support with reading.

Money patterns

Activity 2 – Money patterns

Outline

In this activity, learners consider patterns that can be made using 5p, 2p and 1p coins. The activity includes a focus on mirror images (symmetry).

As the activity is practical, it is recommended that an adult works with a small group of learners at one time.

You will need

WB   **Whiteboard – Coin pattern**

Each group/pair will need:

R   **Resource sheet – My pattern**

About 20 1p coins, 10 2p coins and four 5p coins (real or plastic)

A mirror

Activity 2 – Money patterns

Explain

Tell learners that they are going to use coins to make patterns. On the whiteboard show **Coin pattern**, saying this is a pattern made with 1p coins and 5p coins. Discuss why it is a pattern, and use language such as 'same both sides'. Use a mirror to explain the term 'mirror image' *(or symmetry, if appropriate)*.

Tell learners that this pattern is worth 16p and discuss why. Then give them the resource sheet **My pattern** and ask them to make different patterns that are worth 16p.

Let them 'play' for a while, then, as they work, probe their thinking with the questions below.

Question

- Why is there a red line? *(To show where one side of the pattern ends)*

- How can you use a mirror to check your pattern is correct? Why do you think we call the red line a mirror line?

- If you put a 2p coin here *(point to a square that touches the red line)*, where else must you put a 2p coin? What about if you put a 5p coin here?

- This pattern *(show **Coin pattern** again)* uses 1p coins and 5p coins. How could I change it so that I use some 2p coins? *(Replace two 1p coins on one side with a 2p coin, and do the same on the other side.)* How else could I change it?

- Can you make a pattern worth 16p using only 1p coins? Altogether, how many 1p coins do you need? How many 1p coins should you have on each side? *(Eight)* How do you know? *(Half of 16 is eight.)*

- Can you make a pattern worth 16p using only 2p coins? Altogether, how many 2p coins do you need? How many 2p coins should you have on each side? *(Four)*

- Can you make a pattern worth 16p using only 5p coins? Why not? *(Three 5's are 15, four 5's are 20, so it is not possible to make 16p.)*

- I would like a pattern worth 16p using only 2p coins and 1p coins. Which coins will I need? How do you know? *(This has a variety of solutions and allows learners to share ideas, e.g. six 2p coins, three for each side, and four 1p coins, two for each side.)*

Extension

- Is it possible to make a pattern worth 15p? *(Give them time to try.)* How can you convince me that it is not possible? Can you tell me another pattern that it is not possible to make? *(Any pattern that is worth an odd number of pence is not possible, assuming that coins cannot be centred on the red line.)*