Reasoning in the classroom

Sharing

Support materials for teachers

Year 4

Llywodraeth Cymru
Welsh Government

Year 4 Reasoning in the classroom – Sharing

These Year 4 activities encourage learners to use their understanding of number to solve simple problems.

Activity 1

Sharing

Learners consider how numbers of items can be divided equally between groups of different sizes.

Includes:

- Sharing questions
- Markscheme

Activity 2

Round and round

They use multiplication tables (or counting on) to create then compare drawings.

Includes:

- Explain and question – instructions for teachers
- Whiteboard – Round and round
- Resource sheet – Round and round (five points)
- Resource sheet – Round and round (seven points)

Reasoning skills required

Identify	Communicate	Review
Learners choose their own method to solve a problem.	They discuss and present their work.	They review their work and reflect on their findings.

Procedural skills

- **Multiplication and division, including multiplication tables**

Numerical language

- **Equal shares**

Activity 1

Sharing

Activity 1 – Sharing

Outline

Learners use their (informal) knowledge of multiples to work out how balloons and toy cars can be shared equally between different numbers of learners.

The second part of the activity is fairly demanding for the year group so learners may need more support than usual, or you may wish to use it as an extension activity.

You will need

Sharing questions
One page for each learner

Markscheme

12 balloons to share.

Which groups below can have **equal** shares?

Yes, **3** each

1m

Toy **cars** to share.

Each of these groups **can** have equal shares.

How many cars could there be?

cars

3m

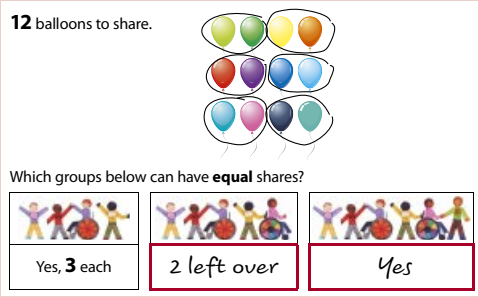
Activity 1 – Sharing – Markscheme

Q	Marks	Answer
i	1m	Gives correct explanations for both groups, e.g. 'No' for the group of 5 and 'Yes, 2 each' for the group of 6
ii	3m	**30**, or any multiple of 30, e.g. • 60
	Or 2m	Works with at least 3 multiples of one of the numbers, e.g. • (multiples of 5) 10 won't ÷ 3, 15 won't ÷ 2, 20 won't ÷ 3 • (multiples of 3) 12 no, 15 no, 18 no … • (multiples of 2) 10 x, 12 x, 14 x
	Or 1m	Gives an answer greater than 14 that uses two of the groups, e.g. • (groups of 2 and 3) 18 or a multiple of 6 greater than 18 • (groups of 2 and 5) 20 or any multiple of 10 greater than 20 • (groups of 3 and 5) 15 or any multiple of 15

Accept any unambiguous means of indicating 'No', e.g. a cross

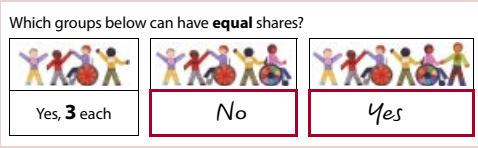
Activity 1 – Sharing – Exemplars

Part i



Correct; **1 mark**

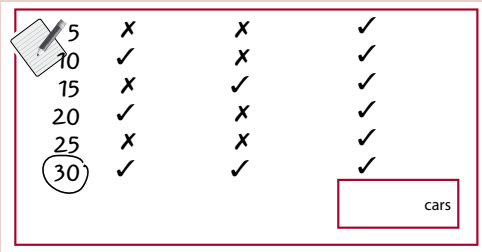
- When 5 children share 12 balloons, there will be 2 left over and so the first response implies No. The picture showing the balloons grouped supports the second decision.



Incomplete; **0 marks**

- The second response is incomplete as the number of balloons per child is not given.

Part ii

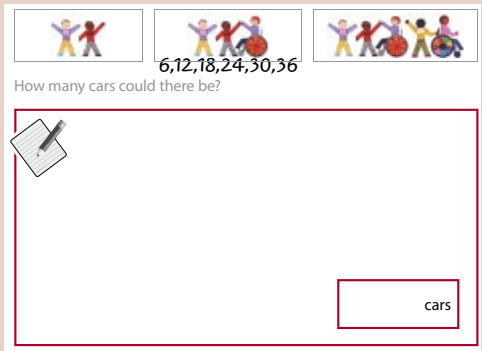


Correct; **3 marks**

- Working with multiples of 5 is an efficient strategy showing good insight into the problem. The answer, 30, is clearly shown in the working.

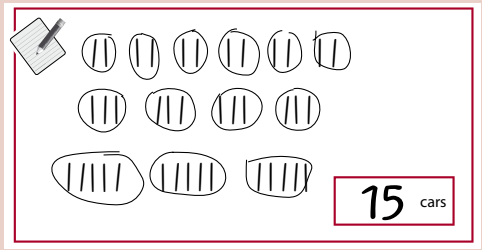
Correct; **3 marks**

- Although 120 is a multiple of 30, this learner shows no working to support their thinking. This learner needs support to improve their numerical communication.



Works with multiples of 3; **2 marks**

- That only the even multiples of 3 are shown suggests that this learner is also working with multiples of 2. Although 30 is listed, it is not identified as the answer so 3 marks cannot be given.



Uses two groups; **1 mark**

- Working with the number 12, this learner groups into twos and threes. When they find that 12 doesn't group into fives, another 3 is added to give 15. However, 15 doesn't share into groups of 2.

Activity 2

Round and round

Activity 2 – Round and round

Outline

This activity follows on from **Activity 1 – Sharing**.

Learners use their number skills to create then compare drawings based on numbers in different multiplication tables.

You will need

Whiteboard – Round and round

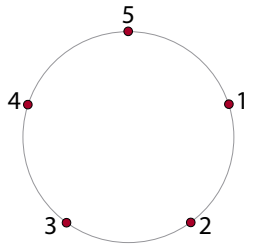
Resource sheet – Round and round (five points)
Each learner will need a copy of this resource sheet

Resource sheet – Round and round (seven points)
Learners may need more than one copy

Activity 2 – Round and round

Explain

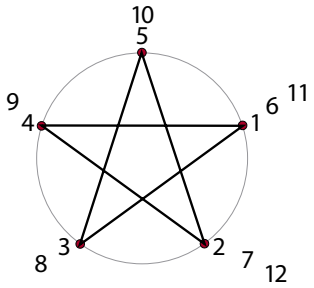
Show **Round and round** on the whiteboard.



Ask what you would see if you joined the numbers in the 1-times table with straight lines *(regular pentagon)*. Draw the pentagon, using a ruler to demonstrate good practice.

Start again, then ask what would happen if you joined numbers in the 2-times table? Allow discussion, then draw a line from 2 to 4.

Now continue writing the numbers around the circle from 6 to 10, as shown below, and then join 4 to 6, 6 to 8, and 8 to 10.



Ask how the star can be finished and write in 11 and 12 around the circle.

Then complete the star, checking that learners understand that the star is complete because we are back where we started.

Learners now work on the resource sheet(s) **Round and round (five points)** and **Round and round (seven points)** to create times table patterns of their own.

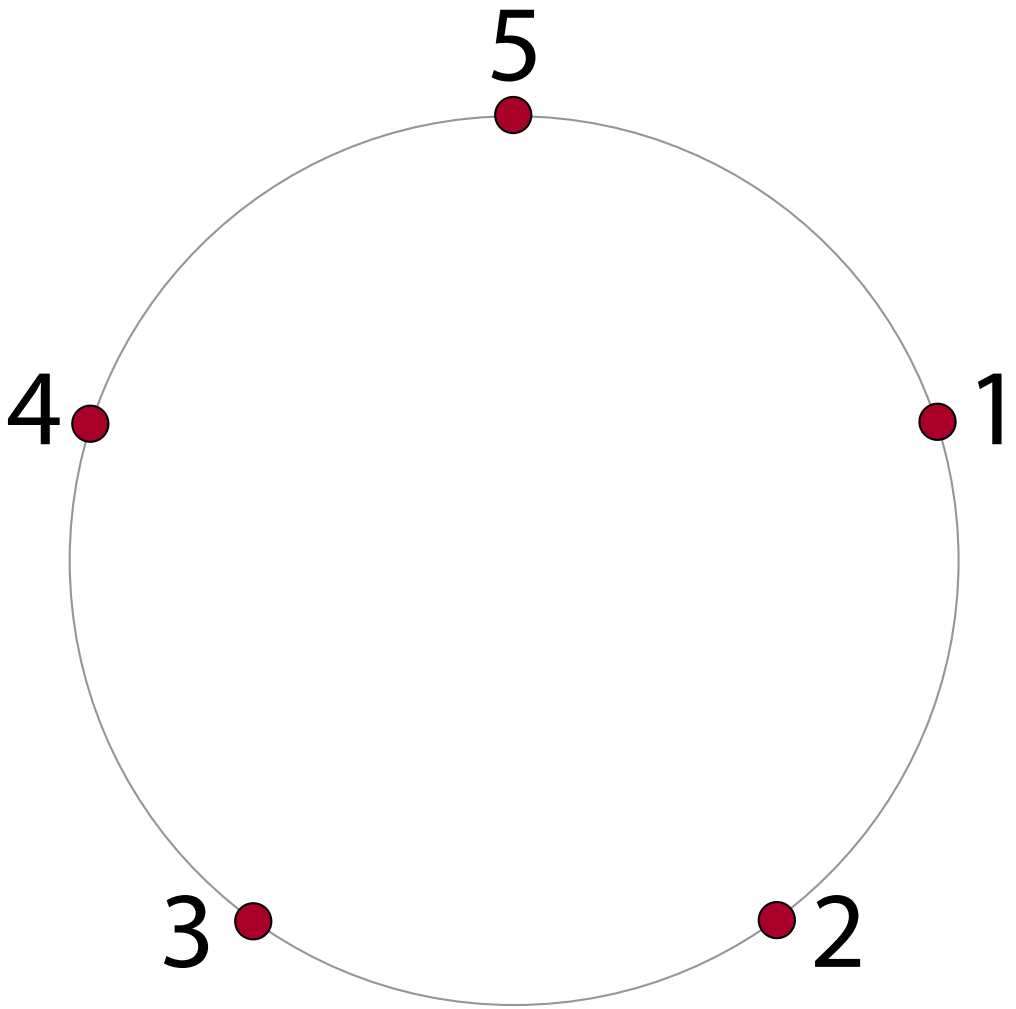
Question

- The 1-times table gave us a regular pentagon. What is special about a regular pentagon? *(All the sides are the same length.)*
- Which pictures are the same? *(For 5 points, the 1- and 4-times tables are identical, as are the 2- and 3-times tables.)* Can you tell me why this happens? *(One goes 'forward', one goes 'backwards', so they are mirror images of each other.)*
- Do you need to write in all the numbers, or just some? Why? *(Using just the numbers in the relevant times table is efficient.)*
- What would you see if there were 6 points around the circle? *(Learners may wish to investigate – the 1- and 6-times tables would create regular hexagons, the 2- and 5-times tables would create equilateral triangles, and the 3-times table would create a straight line.)*

Extension

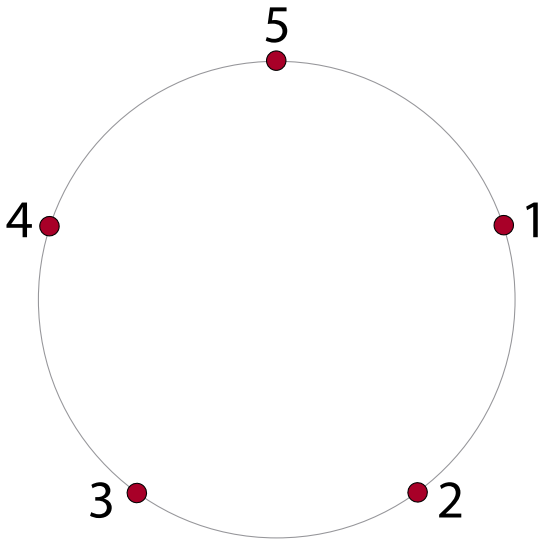
- For the star shapes, what is the greatest number used? Can you find a rule that works out this number for you? *(Add 1 to the number of points then multiply that answer by the times table being used.)*

WB

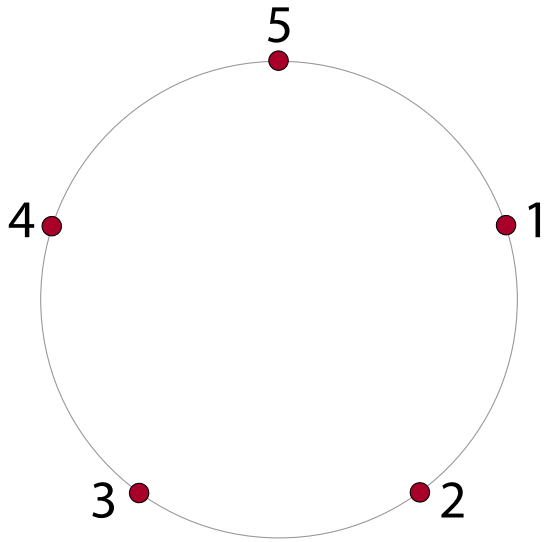


Join numbers that are in . . .

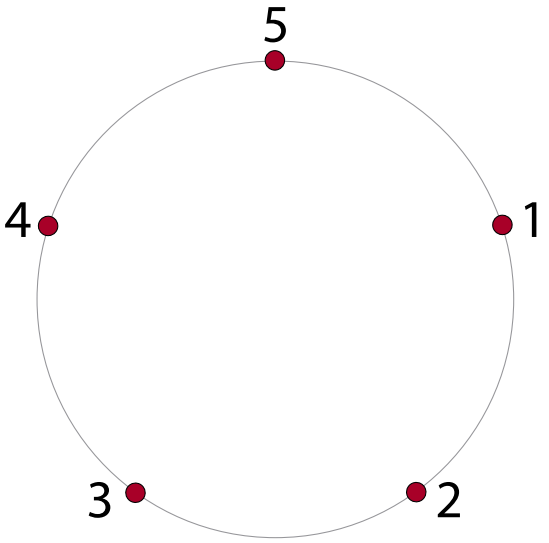
the 1-times table



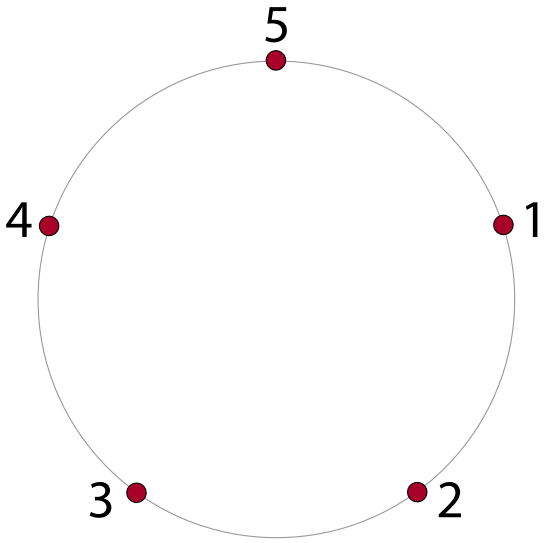
the 2-times table



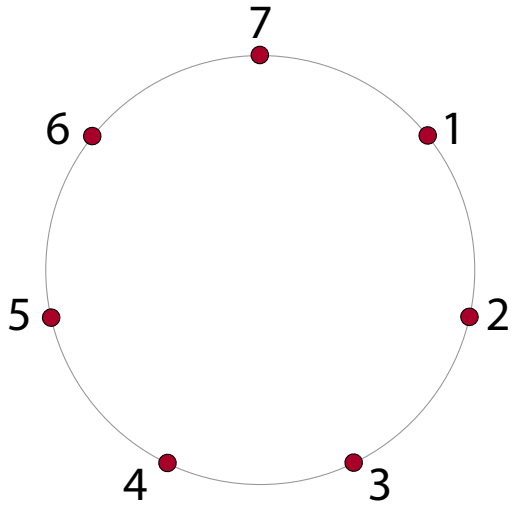
the 3-times table



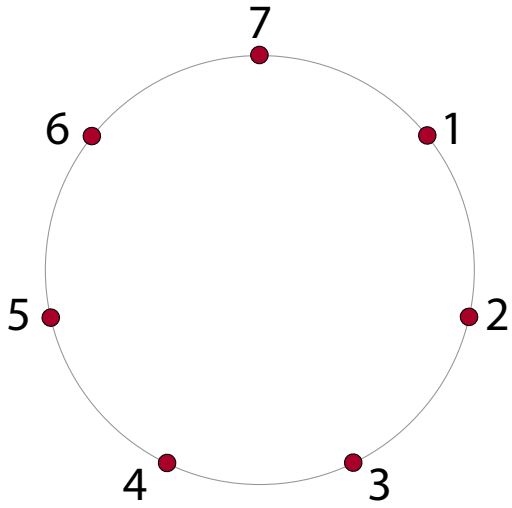
the 4-times table



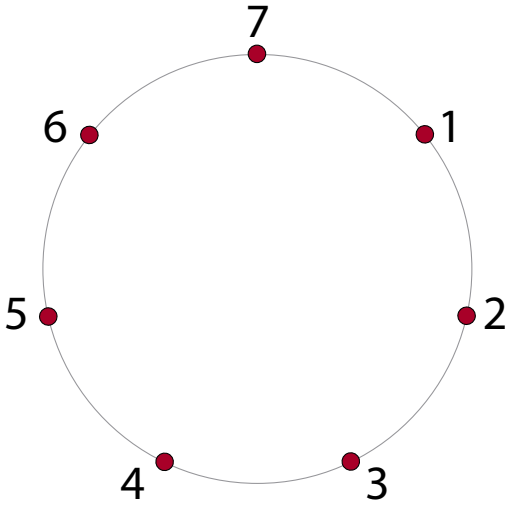
Join numbers that are in . . . the ___-times table



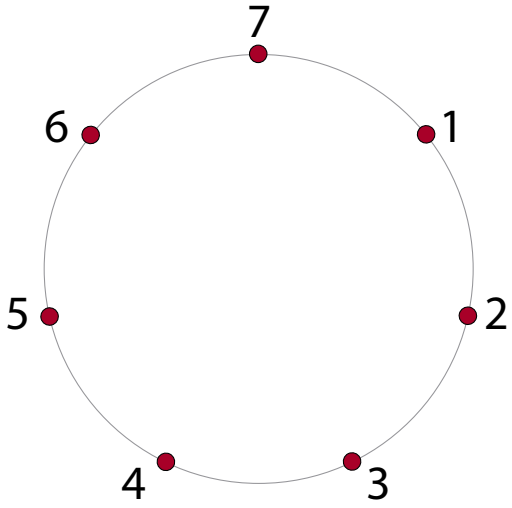
the ___-times table



the ___-times table



the ___-times table



the ___-times table