Odd numbers

Reasoning in the classroom

13579

Support materials for teachers

Year 3

Llywodraeth Cymru
Welsh Government

Year 3 Reasoning in the classroom – Odd numbers

These Year 3 activities require learners to apply their understanding of number.

Activity 1

Odd numbers

Learners reason how many odd numbers are within defined ranges.

Includes:
- Odd numbers questions
- Markscheme

Activity 2

My number

They find their 'name number', then work to analyse the results and prepare a short presentation.

Includes:
- Explain and question – instructions for teachers
- Whiteboard – Name number
- Resource sheet – Name number (English and Welsh)

Reasoning skills required

Identify	**Communicate**	**Review**
Learners identify ways of approaching problems.	They discuss and agree how to record their work so it is understandable to other people.	They check their work and that of their peers.

Procedural skills

- **Odd and even numbers**
- **Addition**
- **Bar charts/bar line graphs/pictograms**

Numerical language

- **Odd and even**
- **Digits**
- **Most common/least common**

Odd numbers

Activity 1 – Odd numbers

Outline

This activity requires learners to think about odd numbers, and how many there are within defined intervals.
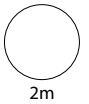
You will need

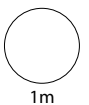**Odd numbers questions**
One page for each learner

Markscheme

There are **5 odd** numbers between **10** and **20**

How many odd numbers are there between **20** and **50**?

2m

How many odd numbers are there between **50** and **80**?

1m

Activity 1 – Odd numbers – Markscheme

Q	Marks	Answer
i	2m	**15**
	Or 1m	Lists **all** the odd numbers between 10 and 50, with no errors Or Shows a correct method, e.g. **Efficient method** • 3 × 5 (or 5 + 5 + 5) • 50 − 20, then that answer ÷ 2

Q	Marks	Answer
ii	1m	**15** Or Gives the same number as shown in part i

Activity 1 – Odd numbers – Exemplars

How many odd numbers are there between **20** and **50**?

$$5 \quad 5 \quad 5 \quad 5$$
10   20   30   40   50

15

Part i correct; **2 marks**

- This learner shows impressive reasoning skills, applying what they know (that 5 odd numbers are between 10 and 20) to other intervals of 10.

How many odd numbers are there between **50** and **80**?

Its the same as last time.

15

Part ii correct; **1 mark**

- The relationship between the two question parts is clear to this learner.

How many odd numbers are there between **20** and **50**?

It goes even odd even odd all the way so it is $\frac{1}{2}$

15

Part i correct; **2 marks**

- This is another efficient method that shows impressive reasoning skills. Knowing that half of all numbers are odd, this learner reasons that as there are 30 numbers between 20 and 50, half of them must be odd.

How many odd numbers are there between **50** and **80**?

15

Part ii correct; **1 mark**

How many odd numbers are there between **20** and **50**?

21 23 25 27 29
31 33 35 37 39

10 + 5 = 15

15

Part i correct; **2 marks**

- This learner lays out their work effectively, allowing them to see that the odd numbers are grouped in 5's.

How many odd numbers are there between **50** and **80**?

5 + 5 + 5 = 15

15

Part ii correct; **1 mark**

How many odd numbers are there between **20** and **50**?

21 23 25 27 29 31 33
35 37 39 41 43 45 47
49

15

How many odd numbers are there between **50** and **80**?

51 53 55 57 59
61 63 65 67 69
71 73 75 77 79

15

Part i correct; **2 marks**

- Although this method is slower than the ones above, it does lead to the correct answer.

Part ii correct; **1 mark**

- This learner needs support to recognise the connection between the two question parts.

How many odd numbers are there between **20** and **50**?

21,23,25,27,29,31,33,35,37,39,
41,43,45,47 and 49

49

How many odd numbers are there between **50** and **80**?

49

Part i lists all the odd numbers correctly; **1 mark**

- It is likely that this learner has forgotten the question by the time they have completed the long list!

Part ii correct follow-through; **1 mark**

- The relationship between the two question parts has been identified.

How many odd numbers are there between **20** and **50**?

21 25 23 24 25 26 31 32 33
34 35 36 41 42 43 44 45 46 50

19

How many odd numbers are there between **50** and **80**?

51 52 53 54 55 56 61 62 63 64
65 66 71 72 73 74 75 76 80

20

Part i incorrect; **0 marks**

- This learner needs support in understanding odd numbers.

Part ii incorrect; **0 marks**

- The different answers to the two question parts should have caused this learner to stop and think!

My number

Activity 2 – My number

1	2	3	4	5	6	7	8	9
A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	

Outline

Learners add digits to find their 'special name number', then reason why it could not be 'special' (unique) just to them. They then work in groups/pairs to analyse the results and create a presentation, including a chart, to show to others.

Activity 2 – My number could be extended to a homework activity by asking learners to find their friends' and families' special numbers which they then add to their group sample, before completing their charts and drawing their own conclusions.

You will need

WB   **Whiteboard – Name number**

R   **Resource sheet – Name number (English and Welsh)**
One page per group/pair

Activity 2 – My number

Ask learners if they have ever heard anyone talk about a 'lucky number'. Explain that for hundreds of years people have seen numbers as important, not just for numeracy, but also for other things – like bringing them luck. *(Other people think the idea of numbers bringing luck is nonsense!)* There is one number that some people think is special to each of us – our name number. But is it special – just for us and no one else?

Show **Name number** on the whiteboard and explain that each letter has been given a number. Write a name of your choice and underneath each letter write the relevant digit, e.g. K E V I N
      2 5 4 9 5

Add the digits, i.e. 2 + 5 + 4 + 9 + 5 = 25. Explain that although 25 is usually 2 tens and 5 units, in this activity, and **only** for this activity, we are going to pretend that they are two separate digits, 2 and 5, so we add them again to get 7. The name number for Kevin is 7.

Show another example, e.g. the name number for Jacob is 4 because
1 + 1 + 3 + 6 + 2 = 13, 1 + 3 = 4.

Give learners a copy of the resource sheet **Name number** *(note that both English and Welsh versions are provided)*. Ask them to work out their own name numbers, and encourage groups/pairs to check each other. Bring the class together to discuss their findings and pool their results. *(These can be summarised on the whiteboard for future reference.)* Are their numbers 'special' to them? *(There are only the digits 1 to 9, so the name numbers cannot be unique.)*

Tell learners that you would like them to work in their groups/pairs to create a short presentation, comparing their group results with the data for the class. Ask what sorts of things they could include *(e.g. the most common name number)* and say that it would be helpful to include a diagram to show their findings *(e.g. a bar chart, bar line graph, or pictogram)*. As much as possible, let them lead on the discussion and the actions that follow.

- What are the only numbers a name number can be? *(1 – 9, as any number above 9 has the two digits added together.)* So why is it not possible for your name number to be special just to you? *(Also some letters, e.g. S, are a different number in English and Welsh.)*

- Have you checked your name number? How?

- When you bring all the results together, are you going to include the numbers for all of the class? Why/why not?

- What are you going to include in your presentation? What are the most important findings?

- Which diagram(s) are you using? Why?

Extension

- A boy has 5 letters in his name and his name number is 5. What could his name be?
  A girl has 7 letters in her name and her name number is 7. What could her name be?
  And so on.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z	

R

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

A	B	C	D	E	F	G	H	I
J	K	L	M	N	O	P	Q	R
S	T	U	V	W	X	Y	Z

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

A	B	C	Ch	D	Dd	E	F	Ff
G	Ng	H	I	L	Ll	M	N	O
P	Ph	R	Rh	S	T	Th	U	W
Y