

Dr Fog Presents

**Division as
repeated
subtraction**

Year 5 (National Numeracy Strategy)
(Based on DFEE Sample Lessons)



Resources

- Demonstration number line



Mental Learning Objective

- I can count forwards and backwards in nines and twelves.



Mental Learning Task

- We are going to start by practicing counting with nines and twelves.



Mental Learning Task

- Count in nines with your teacher to over 100 and count back to your start number... starting with...

9



Mental Learning Task

- Count in nines with your teacher to over 120 and count back to your start number... starting with...

12



Mental Learning Task

- Count back in nines to 0, starting from.....

180



Mental Learning Task

- Why was counting in nines easy?
- You can quickly add 10 and take off 1.



Mental Learning Task

- Counting in twelves is also easy.
- You can quickly add 10 and 2.
- The numbers are always even.



Mental Learning Objective

- I can count forwards and backwards in nines and twelves.



Main Learning Objective

- I can understand division uses repeated subtraction.
- I know two methods of repeated subtraction.



Key idea

**I can discuss methods
using repeated
subtraction.**



Main Learning Task

- This lesson will look at the way division can be seen as repeated subtraction.
- You will be developing an efficient method of division of three-digit numbers by one-digit numbers.



Main Learning Task

$$360 \div 8 =$$

- We can think of 360 divided by 8 as 'how many 8s in 360?'
- We could find the answer by repeatedly subtracting 8.
- This would take a long time...
- How could we make it faster?



Main Learning Task

$$360 \div 8 =$$

- We could work with 'chunks' of eight... such as 8, ten times 8, five times 8, or twenty times 8.
- Lets first first roughly estimate what the answer might be...



Main Learning Task

- There are two ways we could solve this problem...

$$360 \div 8 =$$

360

- 80 (10 lots of 8)

280

- 80 (10 lots of 8)

200

- 80 (10 lots of 8)

120

- 80 (10 lots of 8)

40

- 40 (5 lots of 8)

0

4 x 10 lots of 8 and
five lots of 8
together make 45.



Main Learning Task

- There is a second faster way to solve this....

$$360 \div 8 =$$

$$360$$

$$- \underline{160} \text{ (20 lots of 8)}$$

$$200$$

$$- \underline{160} \text{ (20 lots of 8)}$$

$$40$$

$$- \underline{40} \text{ (5 lots of 8)}$$

$$0$$

$$20 + 20 + 5 \text{ lots of } 8$$

This makes 45 lots of 8

$$360 \div 8 = 45$$



Main Learning Task

- Now try and solve these sums using repeated subtractions.

$$351 \div 9$$

$$360 \div 8$$

$$693 \div 3$$

$$168 \div 8$$

$$168 \div 7$$

$$168 \div 12$$

Challenge

$$256 \div 6$$

$$1452 \div 5$$

$$482 \div 15$$



Main Learning Task

- Simplification:-
- Some children will feel happier with smaller steps and a longer calculation.
- Encourage children to work at the level they understand but encourage discussion about the efficiency of different chunks.



Main Learning Objective

- I can understand division uses repeated subtraction.
- I know two methods of repeated subtraction.



Plenary

- How did you solve $351 \div 9$?
- Compare short and long methods.



Review of Key Idea

- I can discuss methods using repeated subtraction.
- Did you learn this today?



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