Division

Whether you are a parent, teacher or home school educator, we've compiled examples of activities, games and puzzles which can be used to support the learning of division.

These examples are taken from the division packs found in our SMILE resource collection. The mathematical demand increases as you work through the packs. There are lots more ideas in the two packs in the complete packs, which can be downloaded at https://www.stem.org.uk/rxzdt
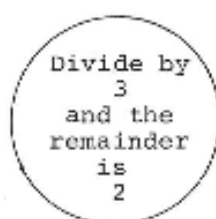
Answers to cards can be found at https://www.stem.org.uk/rxxo5

0758   ODD ONE OUT

Look at this set of five numbers: { 53, 123, 137, 143, 158 }

WHICH IS THE ODD ONE OUT?

Divide by 3 and the remainder is 2   ← With this rule **123** is odd one out →

53 ÷ 3 = 17 rem. 2
123 ÷ 3 = 41
137 ÷ 3 = 45 rem. 2
143 ÷ 3 = 47 rem. 2
158 ÷ 3 = 52 rem. 2

Divide by 5 and the remainder is 3   ← With this rule **137** is odd one out →

53 ÷ 5 = 10 rem. 3
123 ÷ 5 = 24 rem. 3
137 ÷ 5 = 27 rem. 2
143 ÷ 5 = 28 rem. 3
158 ÷ 5 = 31 rem. 3

You can make the other three odd one out with other rules.

These three will do:

odd numbers

Divide by 7 and the remainder is 4

3 digit numbers

(1) Which rule makes which number odd one out?

(2) Here is an easier set of numbers: { 9, 25, 64, 79 }
    Find four rules to make each number in turn odd one out.

(3) Make up a set of numbers and rules yourself.

Multiples of 3 and 9

1. Write the multiples of 3 in a column.

    Continue the pattern
    shown here.

    If the pattern
    goes wrong, find
    your mistake.

3	
6	
9	
12	→ 1 + 2 = 3
15	→ 1 + 5 = 6
18	→ 1 + 8 =
21	→ 2 + 1
24	
39	→ 3 + 9 = 12 → 1 + 2 = 3
66	→ 6 + 6 = 12 → 1 + 2 = 3
69	→ 6 + 9 = 15 → 1 + 5 = 6

2. Continue the table to include some multiples of 3 which are bigger than 100.
    Does the pattern still work?

3. Make a new table for some numbers which are not multiples of 3. What do you
    notice?

4. Write the multiples of 9 in a column. Can you find a pattern for multiples of 9?

5. Is 297 114 236 a multiple of 3? Say why.

6. Is 67 421 502 a multiple of 9? Say why.

7. Write down 3 more large numbers which are multiples of 3.
    Divide your numbers by 3 to check.

8. Write down some multiples of 9 and check them.

Dividing pairs

Smile **1726**

- games for two players

Each player in turn picks two numbers from the lists opposite.

To find your score divide on number by the other.

Your answer	Score
Between 0 and 1	1 point
Between 1 and 10	2 points
Between 10 and 100	3 points
Over 100	1 point

Carry on until you have used all the numbers.

Highest score wins.

Play three different games:

Game 1

7	25
31	95
127	151
251	452
798	1873
2378	2415

Game 2

8	24
32	36
128	150
250	450
799	1143
1875	2379
2416	2875
4770	6247
8432	12500
16000	28000

Game 3
Make up your own list.
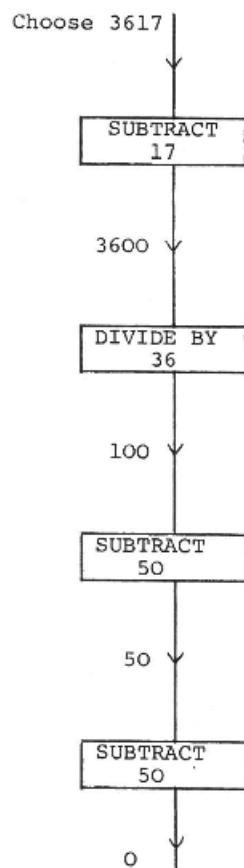
0760 Reduce to Zero

Choose any number with 4 digits.

You have to reduce the number to zero in 4 steps.
At each step you may <u>add</u>, <u>subtract</u>, <u>multiply</u> or <u>divide by</u>
any number with 2 digits.

(1) Try several different starting numbers (with 4 digits).
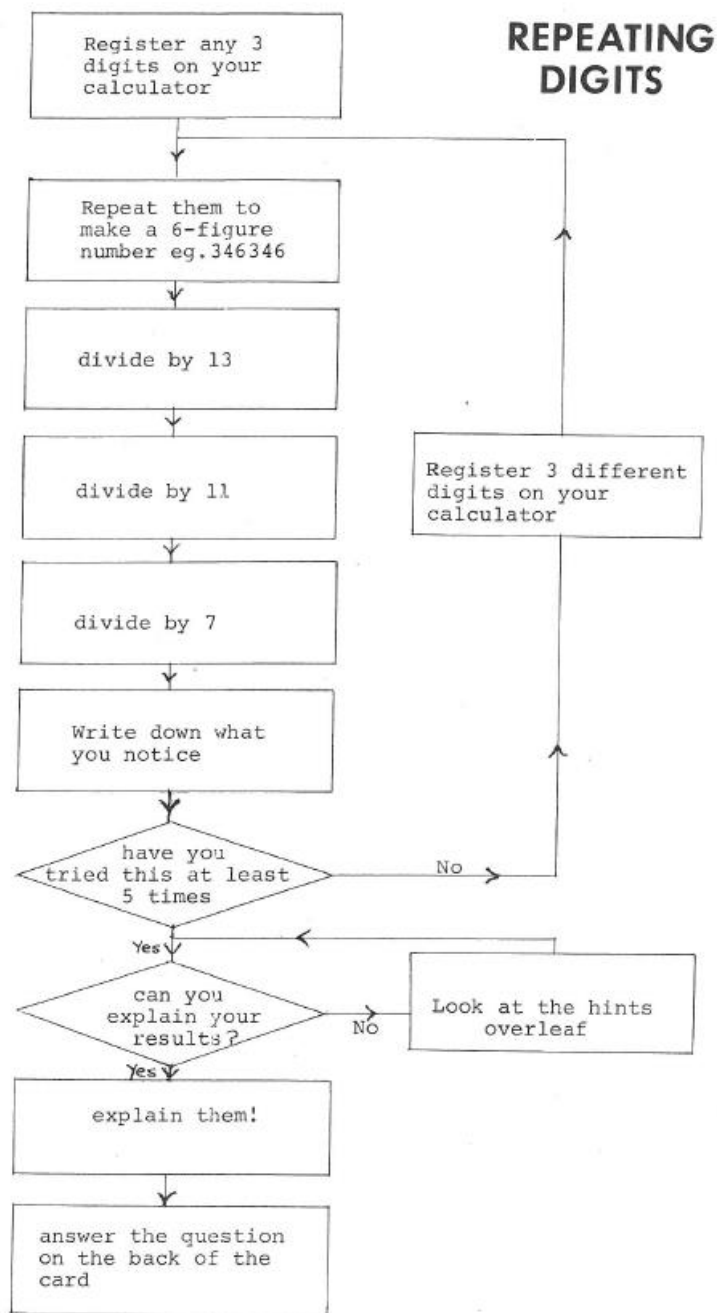Can you <u>always</u> reduce to zero in 4 steps?

(2) Start with 5 digit numbers.
How many stops do you need? Why?

Choose 3617
↓
SUBTRACT 17
3600 ↓
DIVIDE BY 36
100 ↓
SUBTRACT 50
50 ↓
SUBTRACT 50
0 ↓

0752

You will need: electronic calculator

REPEATING DIGITS

```
┌──────────────────────┐
│ Register any 3       │
│ digits on your       │
│ calculator           │
└──────────────────────┘
           │
┌──────────────────────┐
│ Repeat them to       │
│ make a 6-figure      │
│ number eg.346346     │
└──────────────────────┘
           │
┌──────────────────────┐
│ divide by 13         │
└──────────────────────┘
           │
┌──────────────────────┐
│ divide by 11         │
└──────────────────────┘
           │
┌──────────────────────┐
│ divide by 7          │
└──────────────────────┘
           │
┌──────────────────────┐
│ Write down what      │
│ you notice           │
└──────────────────────┘
```

┌──────────────────────┐
│ Register 3 different │
│ digits on your   │
│ calculator   │
└──────────────────────┘

have you tried this at least 5 times → No

Yes ↓

can you explain your results? → No → Look at the hints overleaf

Yes ↓

explain them!

answer the question on the back of the card

— turn over —

Hints

(1) Multiply any 3-digit number by 7, then 11, then 13. What do you get?

(2) What is 7 x 11 x 13?

Question

Make up another flow chart based on the same idea which uses:

10001 = 73 x 137