

CODE CRACKERS

TEACHERS NOTES



This is a fun way to help develop and practice:

- arithmetic
- problem solving.

How to raise money:

Pupils can get sponsored for taking part, or they can get sponsored for each question they get right, eg £1 per correct question. Alternatively, parents and carers can make a donation.

What you'll need:

These questions, either printed off for your students or displayed on your whiteboard.

How to play:

1. In a word sum, each letter stands for one of the digits 0–9. Different letters stand for different digits, and each letter stands for the same digit each time it occurs. None of the integers in a word sum starts with a 0.
2. Students must work out which digits the different letters could stand for (try to use logic rather than guesswork).
3. A word sum may be impossible (in which case explain why it cannot have a solution). It may have just one solution (in which case try to find that solution and prove that it is the only one). Or it may have several solutions (in which case you might like to think how many solutions there are, but start by finding one that works).

Answers:

Find one solution to each of these word sums.

$$\begin{array}{r} 432 \\ +432 \\ \hline 864 \end{array}$$

$$\begin{array}{r} 734 \\ +734 \\ \hline 1468 \end{array}$$

$$\begin{array}{r} 8645 \\ +8645 \\ \hline 17290 \end{array}$$

$$\begin{array}{r} 431 \\ +6420 \\ \hline 6851 \end{array}$$

$$\begin{array}{r} 1960 \\ +1872 \\ \hline 3832 \end{array}$$

OR

$$\begin{array}{r} 928 \\ +928 \\ \hline 1856 \end{array}$$

OR

$$\begin{array}{r} 8652 \\ +8652 \\ \hline 17304 \end{array}$$

OR

$$\begin{array}{r} 138 \\ +9140 \\ \hline 9278 \end{array}$$

OTHER SOLUTIONS ARE POSSIBLE

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- 6A. Can you work out what T has to be in this word sum?
T HAS GOT TO BE 8
- 6B. Try to find all the possible solutions to the word sum.

$$\begin{array}{r} 8976 \\ +76 \\ \hline 9052 \end{array}$$

$$\begin{array}{r} 8967 \\ +67 \\ \hline 9034 \end{array}$$

$$\begin{array}{r} 8956 \\ +56 \\ \hline 9012 \end{array}$$

$$\begin{array}{r} 8957 \\ +57 \\ \hline 9014 \end{array}$$

$$\begin{array}{r} 8973 \\ +73 \\ \hline 9046 \end{array}$$

$$\begin{array}{r} 8971 \\ +71 \\ \hline 9042 \end{array}$$

CODE CRACKERS

PUPILS WORKSHEET



Questions:

Find one solution to each of these word sums.

1.

$$\begin{array}{r} \text{ONE} \\ + \text{ONE} \\ \hline \text{TWO} \end{array}$$

2.

$$\begin{array}{r} \text{TWO} \\ + \text{TWO} \\ \hline \text{FOUR} \end{array}$$

3.

$$\begin{array}{r} \text{FOUR} \\ + \text{FOUR} \\ \hline \text{EIGHT} \end{array}$$

4.

$$\begin{array}{r} \text{ONE} \\ + \text{FOUR} \\ \hline \text{FIVE} \end{array}$$

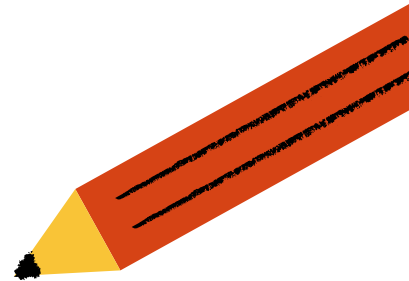
5.

$$\begin{array}{r} \text{FOUR} \\ + \text{FIVE} \\ \hline \text{NINE} \end{array}$$

6A. Can you work out what T has to be in this word sum?

$$\begin{array}{r} \text{T H I S} \\ + \quad \text{I S} \\ \hline \text{H A R D} \end{array}$$

6B. Try to find all the possible solutions to the word sum.



CODE CRACKERS 2

TEACHERS NOTES



This is a fun way to help develop and practice:

- arithmetic
- systematic searching and calculation.

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What you'll need:

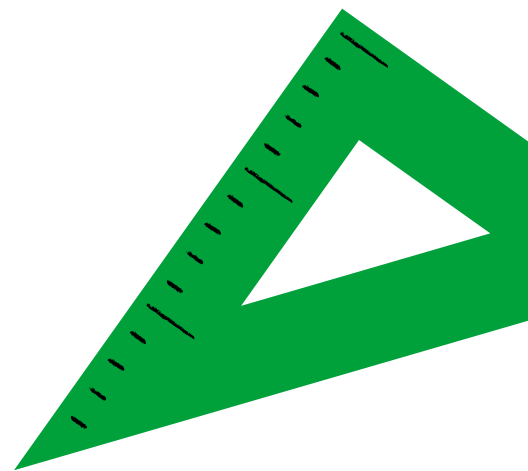
These questions, either printed off for your students or displayed on your whiteboard.

How to play:

1. Your job here is to use simple arithmetic, and systematic searching and calculation to find all possible solutions without guessing. There may be more than one answer, so keep alert.

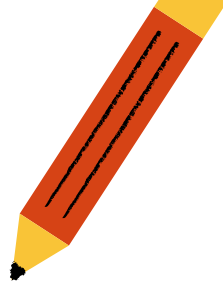
Answers:

- 1A.
NO, THERE ARE TWO POSSIBLE NUMBERS: 14 AND 74
- 1B.
YES, THE NUMBER IS 44
2.
91
- 3A.
20 OR 26
- 3B.
23 OR 29
4.
35 OR 42
5.
THERE ARE FIVE SUCH NUMBERS:
20, 21, 30, 50 AND 70
6.
52 OR 87
7.
21, 56 OR 98
8.
61 OR 85



CODE CRACKERS 2

PUPILS WORKSHEET



Questions:

1. I am thinking of a number less than 100. When divided by 6 the remainder is 2. When divided by 5 the remainder is 4.

A. Suppose I tell you that the sum of its digits is odd. Could you tell me my number?

B. Suppose I tell you that the sum of its digits is even. Could you tell me my number?

2. I am thinking of a number less than 100. My number is a multiple of 7, its digits add to 10 and it is odd. What could my number be?

3. I am thinking of a number between 20 and 30. When divided by 3, the remainder is 2.

A. Suppose the sum of the digits is even. What could my number be?

B. Suppose the sum of the digits is odd. What could my number be?

4. I am thinking of a number less than 50. It is a multiple of 7 and its digits differ by 2. What could my number be?

5. I am thinking of a number between 20 and 100. The sum of its digits is a prime number, and the original number is an exact multiple of this prime number. How many such numbers are there?

6. I am thinking of a number between 20 and 100. When divided by 7 the remainder is 3. When divided by 5 the remainder is 2. What could my number be?

7. I am thinking of a number less than 100. It is a multiple of 7 and its digits differ by 1. What could my number be?

8. I am thinking of a number less than 100. When divided by 8 the remainder is 5. When divided by 3 the remainder is 1. The sum of its digits is an odd number. What could my number be?

