

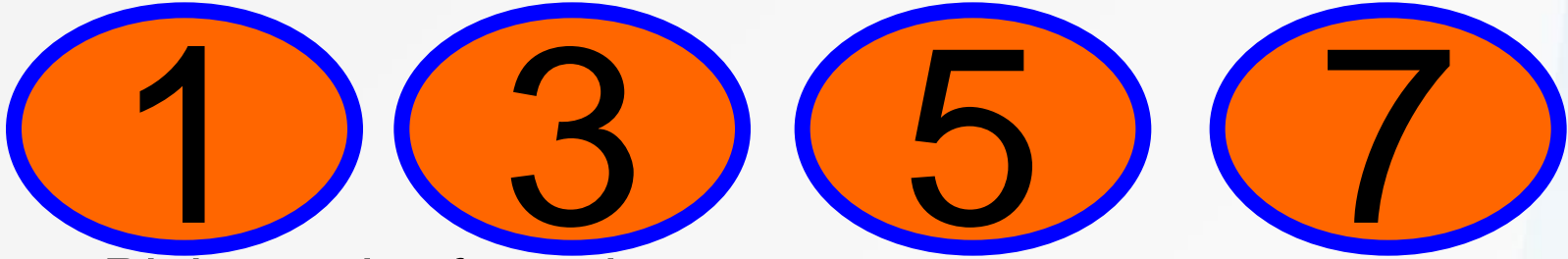
Mathematical challenges for able pupils

Year 1 B Securing number
facts, understanding shape



Pick a pair

Choose from these numbers.



1. Pick a pair of numbers.

Add them together.

Write the numbers and the answer.

Pick a different pair of numbers.

Write the numbers and the answer.

Keep doing it. How many different answers can you get?

2. Now take one number from the other.

How many different answers can you get now?

Learning Objective:

- Solve mathematical problems or puzzles.
- Know addition and subtraction facts up to 10.

Solution to the Pick a pair problem.

There are six different sums and six different (positive) differences.

1. $1 + 3 = 4$

$1 + 5 = 6$

$2 + 7 = 9$

$3 + 5 = 8$

$3 + 7 = 10$

$5 + 7 = 12$

2. $3 - 1 = 2$

$5 - 3 = 2$

$5 - 1 = 4$

$7 - 5 = 2$

$7 - 3 = 4$

$7 - 1 = 6$

Adapt the puzzle by using larger numbers.

Learning Objective:

- Solve mathematical problems or puzzles.
- Know addition and subtraction facts up to 10.

Card sharp

Take ten cards numbered 0 to 9.

0

1

2

3

4

5

6

7

8

9

1. Pick three cards with a total of 10. How many different ways can you do this?
2. Now pick two cards with a total of 10. How many different ways can you do this?
3. Can you pick five cards with a total of 12? How many different ways can you do this?

Learning Objective:

- Solve mathematical problems or puzzles.
- Know addition facts to at least 10.
- Solve a problem by sorting, classifying and organising information

Solution to the problem.

1. There are 10 different ways to choose three cards with a total of 12:

0, 3, 9	1, 2, 9	2, 3, 7	3, 4, 5
0, 4, 8	1, 3, 8	2, 4, 6	0, 5, 7
1, 4, 7	1, 5, 6		

2. There are 9 different ways to choose four cards with a total of 12:

0, 1, 2, 9	0, 2, 3, 7	1, 2, 3, 6	0, 1, 3, 8
0, 2, 4, 6	1, 2, 4, 5	0, 1, 4, 7	0, 3, 4, 5
0, 1, 5, 6			

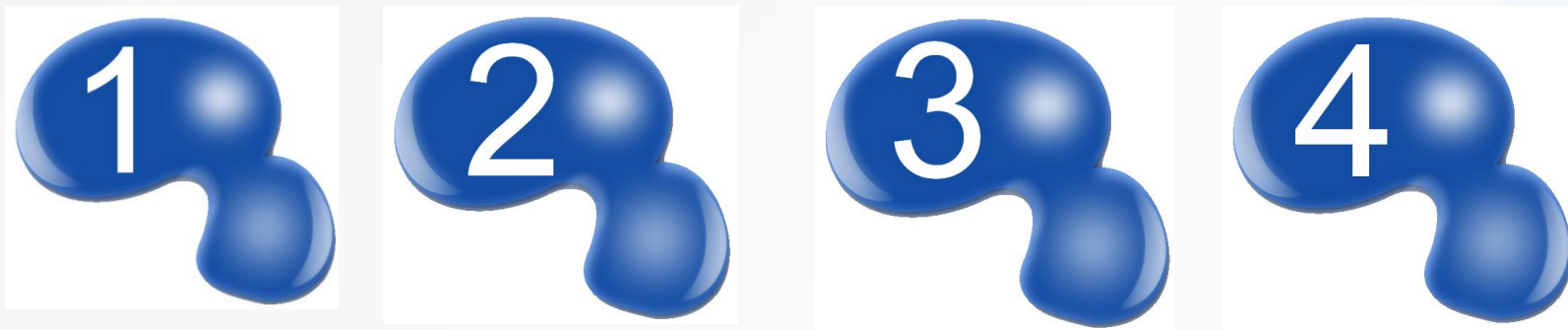
3. **No.**

Learning Objective:

- Solve mathematical problems or puzzles.
- Know addition facts to at least 10.
- Solve a problem by sorting, classifying and organising information

Ducks and puddles

- Dan threw 3 rubber ducks.
- Each duck went in a puddle.
- More than one duck can go in a puddle.
- The scores are written in the puddles.



2. What are the ways to get 3? Dan can

get 3 by 1 + 2 or 2 + 1.

Next click brings you the solutions...

Learning Objective:

- Solve mathematical problems or puzzles.
- Know addition facts up to 10.

Solution to the Ducks and Puddles problem.

1. The highest score is 12 (3 ducks in 4).
2. Score 6 in three ways:
 - 1 duck in 4 and 2 ducks in 1, or 1 duck in 1, 1 duck in 2 and 1 duck in 3, or 3 ducks in 2.
3. Score 9 in three ways:
 - 1 duck in 1 and 2 ducks in 4, or 1 duck in 2, 1 duck in 3, 1 duck in 4, or 3 ducks in 3.
4. Besides 6, 9 and 12, other possible scores are:
 - 3:** 3 ducks in 1
 - 4:** 2 ducks in 1, 1 ducks in 2
 - 5:** 2 ducks in 1, 1 duck in 3, or 1 duck in 1, 2 ducks in 2
 - 7:** 1 duck in 1, 2 ducks in 3, or 2 ducks in 2, 1 duck in 3, or 1 duck in 1, 1 duck in 2, 1 duck in 4
 - 8:** 2 ducks in 2, 1 duck in 4, or 1 duck in 2, 2 ducks in 3, or 1 duck in 1, 1 duck in 3, 1 duck in 4
 - 10:** 1 duck in 2, 2 ducks in 4

Learning Objective:

- Solve mathematical problems or puzzles.
- Know addition facts up to 10.

Fireworks

Emma had some fireworks.

Some made **3** stars.
stars.

Some made **4**



Altogether Emma's fireworks made 19 stars.
What if Emma's fireworks made 25 stars?
How many of them made 3 stars?
Find two different answers.
Find two different answers.

Learning Objective:

- Solve mathematical problems or puzzles.
- Count on in steps of 3 or 4 from zero, or from any small number.

Solution for Fireworks

For 19 stars:

5 fireworks made 3 stars and 1 made 4 stars

or

1 firework made 3 stars and 4 made 4 stars

For 25 stars:

3 fireworks made 3 stars and 4 fireworks made 4 stars, or

7 fireworks made 3 stars and 1 firework made 4 stars

Learning Objective:

- Solve mathematical problems or puzzles.
- Count on in steps of 3 or 4 from zero, or from any small number.

Thank You

The background is a smooth gradient of blue, transitioning from a darker shade on the left to a lighter, cyan shade on the right. At the bottom, there is a decorative wavy ribbon that starts with a yellow center, bordered by light blue and white, curving across the width of the slide.

References and additional resources.

These units were organised using advice given at:

http://www.edu.dudley.gov.uk/numeracy/problem_solving/Challenges%20and%20Blocks.doc

PowerPoint template published by www.ksosoft.com

These Mental Maths challenges can be found as a PDF file at :

http://www.edu.dudley.gov.uk/numeracy/problem_solving/Mathematical%20Challenges%20Book.pdf

The questions from this PowerPoint came from:

Mathematical challenges for able pupils in Key Stages 1 and 2

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