



MATHEMATICS



N.S. Yr. 4 P.80

**Make and investigate general statements
about numbers and shapes**

Equipment

Paper, pencil, 2D shapes, ruler.

MathSphere

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Concepts

Children should be able to spot a relationship between variables in a situation or, if they are given a relationship, they should be able to investigate it to show that it is true.

Examples can be taken from any aspect of the syllabus, but may typically include the following:

Investigating relationships between odd and even numbers.

Finding a number to go in a box when inequalities are given. Eg what number goes in the box if $12 < \square < 16$?

Finding a number half way between two other numbers.

Spotting if a number is divisible by another number by using the rules.
E.g. If a number ends in a 0, it is divisible by 10.

Using general ideas to find the perimeters of shapes.

Children should also be able to describe in words or on paper how they would calculate a question. E.g. How would you calculate how much change is due from a £1 coin if 63p is spent?

1. Here are some pairs of odd numbers to add up:

$$5 + 13, \quad 7 + 9, \quad 23 + 17, \quad 33 + 57, \quad 41 + 87$$

What happens when you add two odd numbers together?

2. Make up some groups of three odd numbers to add up.
What sort of a number do you get when you add them?

3. What happens to a number when you multiply it by 10.

Try these to see: $6 \times 10, \quad 34 \times 10, \quad 12 \times 10, \quad 354 \times 10, \quad 562 \times 10$

4. How can you tell if a number is divisible by 10 ?

Which of these numbers are divisible by 10 ?

$$34, \quad 20, \quad 89, \quad 300, \quad 570, \quad 254, \quad 1\,009$$

5. How can you tell if a number is divisible by 5 ?

Which of these numbers are divisible by 5 ?

$$45, \quad 16, \quad 79, \quad 90, \quad 255, \quad 672, \quad 850$$

6. How would you calculate the length of the perimeter of a square?

1. What type of number do you get if you double a whole number and add 1 ?

Give an example: _____

2. What type of number do you get if you double a whole number and add 2 ?

Give an example: _____

3. Give some whole numbers that could go in the box.

$$22 < \square < 27$$

4. Give all the multiples of 10 between 150 and 190.

Which one is half way between 150 and 190 ? _____

5. How do you know if a number is divisible by 100 ?

Which of these numbers are divisible by 100 ?

126, 400, 365, 800, 900, 1 263, 4 300

6. How would you calculate the perimeter of a rectangle?

What is the perimeter of a rectangle 7cm long and 4 cm wide ?

What is the perimeter of a rectangle 46cm long and 28cm wide?

1. How would you find the number of months in six years?

How many months are there in six years?

2. If I spent **56p**, how would you calculate the amount of change if I paid with a **£1** coin?

3. How would you calculate the tenth number in this sequence?

5, 10, 15, 20, ...

4. How would you calculate the twelfth term in this sequence?

3, 5, 7, 9, ...

5. How would you subtract **56** from **200** ?

6. How would you work out the time **8** hours after **10** o'clock?

7. How would you work out the perimeter of an equilateral triangle?

1. Give some whole numbers that could go in the box.

$$92 < \square < 103$$

2. Give some whole numbers that could go in the box.

$$78 < \square < 86$$

3. Give some whole numbers that could go in the box.

$$15 < \square < 22$$

4. What do you get if you add two multiples of 5 together? Here are some to try.

$$35 + 25, \quad 10 + 15, \quad 85 + 5, \quad 20 + 50, \quad 25 + 40, \quad 35 + 85$$

5. How would you calculate the perimeter of a regular hexagon if you knew the length of one side?

6. What do you get if you add an odd multiple of 3 to another odd multiple of 3 ?
Here are some to try.

$$15 + 9, \quad 33 + 21, \quad 63 + 15, \quad 27 + 27, \quad 81 + 3$$

7. How would you find how many days there were in 17 weeks?
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8. How would you find how many centimetres there are in 4 metres?
-

1. What is the rule for this sequence?

2, 7, 12, 17, 22, ...

2. What is the rule for this sequence?

0, 1, 3, 6, 10, ...

3. How would you work out how many days there are in **five** weeks and **four** days?
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4. How would you work out how many centimetres there are in **6** metres and **54** centimetres?
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5. How would you double **56** ?
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6. How many lines of symmetry are there in a regular octagon?

7. How many lines of symmetry are there in a rectangle (not a square).

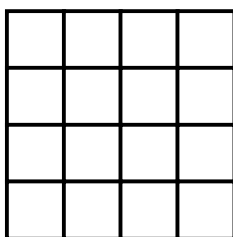
8. What is the perimeter of a regular hexagon if one of the sides is **17** cm long?

9. Which has more lines of symmetry, an equilateral triangle or a rectangle?

1. What is the tenth number in this doubling sequence?

1, 2, 4, 8, ...

2. Describe how you would find how many squares of all sizes there are altogether in this diagram?



How many are there?

3. Two coaches can each carry **25** people and another three coaches can each carry **32** people.
How many people can be carried altogether?
How did you work out your answers?

4. How many edges does a tetrahedron have?

5. A number is greater than three eights and smaller than a half of fifty six. The number is a multiple of three.
What is the number?

Answers

Page 3

In these questions a lot of explanation is asked for. Allow any correct and properly formulated explanation.

1. An even number is obtained.
2. An odd number is always obtained.
3. All the digits move one place to the left. (Do not say anything about 'adding a nought'.)
4. It ends in a 0. 20, 300, 570
5. It ends in a 0 or a 5. 45, 90, 255, 850
6. Multiply the length of one side by 4.

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1. An odd number is obtained. $17 \times 2 + 1 = 35$ or any other correct eg.
2. An even number is always obtained.
3. 23, 24, 25, 26
4. 160, 170, 180. 170 is halfway.
5. It ends in 00. 400, 800, 900, 4 300
6. Add the lengths of the two different sides and double the answer (or similar explanation). 22cm, 148cm.

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1. Multiply six by 12. 72 months in 12 years.
2. Any acceptable explanation.
3. Multiply 5 by 10.
4. Multiply 2 by 12 and add 1.
5. Any acceptable explanation.
6. Any acceptable explanation.
7. Multiply the length of a side by 3.

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1. 93, 94, 95, 96, 97, 98, 99, 100, 101, 102
2. 79, 80, 81, 82, 83, 84, 85
3. 16, 17, 18, 19, 20, 21
4. Another multiple of 5 (not necessarily a multiple of 10!).
5. Multiply the length of a side by 6.
6. An even multiple of 3.
7. Multiply 17 by 7.
8. Multiply 4 by 100.

Answers (Contd)

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1. Start at 2 and go up in fives.
2. Start at 0. Add 1, then 2, then 3 etc.
3. Multiply five by seven and add four.
4. Multiply 6 by 100 and add 54.
5. Any proper explanation.
6. 8
7. 2
8. 102cm
9. Equilateral triangle (3).

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1. 512
2. Count all the 1×1 squares, then all the 2×2 squares etc.
Total $16 + 9 + 4 + 1 = 30$
3. 146 $(2 \times 25) + (3 \times 32)$
4. 6
5. 27