

Y6-Y7 Transition Work

This booklet contains a number of different Maths activities for you to have a go at.

Working through them will help make sure that you are prepared to join our Maths department in September.

We look forward to seeing you!

Activities in this Booklet

Activity 1 – Different Types of Numbers

Practise your number skills and ensure you can recognise some key types of number.

Activity 2 – Times Table Challenge

Practise your times tables ready for a challenge when you start at Higham Lane School in September

Activity 3 – Calculator Crossnumber 1

When you start Maths in Year 7 you will need a scientific calculator. Practise using yours with this crossnumber.

Activity 4 – Calculator Crossnumber 2

Practise using your calculator a bit more with these harder questions.

Activity 5 – Knowledge Organiser

Learn these key facts ready to use them in September.

Higham Lane School Maths Department - Different Types of Numbers

Which different types of numbers do you know?

- List the first 15 **square** numbers.
- List the first 5 **cube** numbers.
- List the first 5 **triangle** numbers.
- List the first 10 **prime** numbers.

Questions

- 1) I am thinking of a number. It is a square number and a cube number.
What is my number?

- 2) I am thinking of a number. It is 3 greater than a square number, 1 greater than a cube number and 1 less than a prime number.
What is my number?

- 3) Can you think of a **square number** between 700 and 750?

Gold Challenge

- 1) A "perfect" number is where the sum of its factors (not including the number itself) add up to make the number.
e.g. The factors of 6 are 1, 2, 3 and 6. $1 + 2 + 3 = 6$. 6 is a perfect number.
Can you find any perfect numbers?

- 2) I am thinking of a number. It is 35 greater than a cube number. It is 29 less than a square number. The sum of its digits is 16. It is a prime number.
What is my number?

- 3) To find out if a number is happy or not, you should square the digits and add them up, and then repeat if necessary. If you get 1 you have found a happy number.
e.g. Consider 19: $1^2 + 9^2 = 82$, $8^2 + 2^2 = 68$. $6^2 + 8^2 = 100$, $1^2 + 0^2 + 0^2 = 1$,
19 is a happy number!
How many happy numbers can you find?
Make a poster about happy numbers.

Use your calculator to answer these questions:

Across

- 1 $26 \times 34 - 19 = \dots\dots\dots$
- 4 $(3 \times 4)^2 = \dots\dots\dots$
- 6 $417 \times (29 + 87) = \dots\dots\dots$
- 7 $(1 + 5) \times 61 = \dots\dots\dots$
- 9 $1310 \times 0.4 = \dots\dots\dots$
- 11 $\frac{11 \times 12 \times 13}{1 \times 2 \times 3} = \dots\dots\dots$
- 13 $\frac{274 + 58}{4} = \dots\dots\dots$
- 14 $3 \times 4^2 = \dots\dots\dots$
- 15 $8^3 = \dots\dots\dots$
- 16 $\sqrt{207936} = \dots\dots\dots$
- 18 $706 \times \frac{1}{2} = \dots\dots\dots$
- 20 $417 \times 29 + 87 = \dots\dots\dots$
- 22 $1\frac{9}{10} + 2\frac{4}{5} = \dots\dots\dots$
- 23 $4.8 \div 0.8 = \dots\dots\dots$

Down

- 1 $458 + 5 \times 77 = \dots\dots\dots$
- 2 $42 \times 13 = \dots\dots\dots$
- 3 $3.65 \times 20 = \dots\dots\dots$
- 4 $5^3 = \dots\dots\dots$
- 5 $26 \div \frac{1}{19} = \dots\dots\dots$
- 8 $506 \div 80 = \dots\dots\dots$
- 10 $3.96 \div 1.6 = \dots\dots\dots$
- 11 $\sqrt{6\frac{1}{4}} = \dots\dots\dots$
- 12 $3\frac{1}{2} + 2\frac{7}{10} = \dots\dots\dots$
- 16 $11^2 \times 4 = \dots\dots\dots$
- 17 $\frac{618 + 616}{618 - 616} = \dots\dots\dots$
- 18 $1 + 5 \times 61 = \dots\dots\dots$
- 19 $26 \times (34 - 19) = \dots\dots\dots$
- 21 $\frac{5}{8} \times 16 = \dots\dots\dots$

Now write your answers on the grid below.

If an answer doesn't fit then you've made a mistake... Oops! Can you correct it?

1		2		3		4		5
		6						
7	8					9	10	
	.		11		12		.	
13			.		.		14	
			15					
16		17				18		19
		20		21				
22	.					23	.	

Use your calculator to answer these questions:

Down

- 1 $1 \times 2 \times 3 \times 4 \times 5 = \dots\dots\dots$
- 2 $5 \times 5 \times 5 \times 5 \times 5 = \dots\dots\dots$
- 4 $1 \times (2 + 3) \times (4 + 5) = \dots\dots\dots$
- 5 $5 \times 5 + 5 + 5 \times 5 = \dots\dots\dots$
- 8 $9 + 8 + 7 + 6 + 5 = \dots\dots\dots$
- 9 $9 \times 8 \times 7 \times 6 \times 5 = \dots\dots\dots$
- 12 $(1000 + 100) \times (10 + 1) = \dots\dots\dots$
- 13 $1000 - 100 - 10 - 1 = \dots\dots\dots$
- 15 $9 + (8 \times 7) + (6 \times 5) = \dots\dots\dots$
- 17 $1 + 2 + 3 + 4 + 5 = \dots\dots\dots$

Across

- 3 $9 \times (8 + 7) \times (6 + 5) = \dots\dots\dots$
- 6 $1 + (2 \times 3) + (4 \times 5) = \dots\dots\dots$
- 7 $(1000 \div 100) + (10 \div 1) = \dots\dots\dots$
- 9 $5 + 5 \times 5 \times 5 + 5 = \dots\dots\dots$
- 10 $(1 \times 2) + 3 + (4 \times 5) = \dots\dots\dots$
- 11 $(1 + 2) \times 3 \times (4 + 5) = \dots\dots\dots$
- 14 $(9 \times 8) + 7 + (6 \times 5) = \dots\dots\dots$
- 16 $(9 + 8) \times 7 \times (6 + 5) = \dots\dots\dots$
- 17 $(1000 + 100) \div (10 + 1) = \dots\dots\dots$
- 18 $1000 \times 100 \div 10 \times 1 = \dots\dots\dots$

Now write your answers on the grid below.


If an answer doesn't fit then you've made a mistake... Oops! Can you correct it?


1			2		3	4		5
6								
			7				8	
	9					10		
				11	12			13
	14		15					
					16			
17								
				18				


Task 1: Learn these types of number

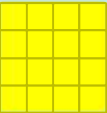
Square number patterns

Square numbers get their name from the pattern they make.

 Area = $1 \times 1 = 1^2 = 1$


 Area = $2 \times 2 = 2^2 = 4$


 Area = $3 \times 3 = 3^2 = 9$

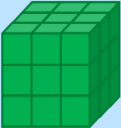
 Area = $4 \times 4 = 4^2 = 16$

See if you can continue the pattern!

Cube numbers get their name from the pattern they make.

 Volume = $1 \times 1 \times 1 = 1^3 = 1$

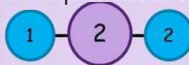
 Volume = $2 \times 2 \times 2 = 2^3 = 8$

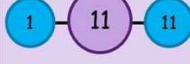
 Volume = $3 \times 3 \times 3 = 3^3 = 27$

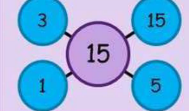
See if you can continue the pattern!

What is a prime number?

A **prime number** has only two factors, 1 and the number itself.

2 is a prime number:
 $1 \times 2 = 2$
 Only two factors

11 is a prime number:
 $1 \times 11 = 11$
 Only two factors

15 is **not** a prime number:
 $1 \times 15 = 15$
 $3 \times 5 = 15$
 Four factors!

Learn the prime numbers up to 50. These are:
 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47.

Top Tip
 2 is the only even prime number. Many of the "weird" odd numbers (11, 13, 17) are prime.

Watch out!
 1 is **not** a prime number! It only has **one** factor: the number 1 ($1 \times 1 = 1$)

Task 2: Remember these tips for working with fractions, decimals and percentages

To write a fraction as a percentage, we can find an equivalent fraction with a denominator of 100.

For example,

$\frac{17}{20} = \frac{85}{100}$ and $\frac{85}{100} = 85\%$

(Note: The diagram shows a circle around the fraction 17/20 with arrows and 'x 5' indicating the conversion to 85/100.)

Percentage	Fraction	How to find it...
50%	$\frac{50}{100} = \frac{1}{2}$	Divide by 2
25%	$\frac{25}{100} = \frac{1}{4}$	Divide by 4
75%	$\frac{75}{100} = \frac{3}{4}$	Find 25%, then multiply by 3
10%	$\frac{10}{100} = \frac{1}{10}$	Divide by 10
20%	$\frac{20}{100} = \frac{1}{5}$	Divide by 5, or double 10%
5%	$\frac{5}{100} = \frac{1}{20}$	Divide by 20, or half 10%
1%	$\frac{1}{100}$	Divide by 100

To work out **43%** of £300 using 1%...

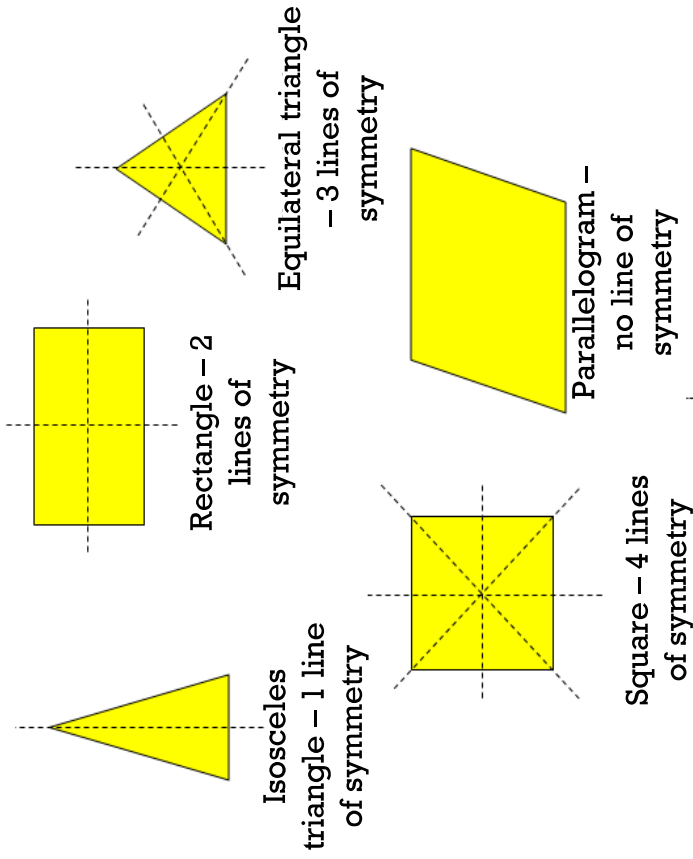
$\div 100$ to find 1% → $\frac{1\% \text{ of } \pounds 300}{\pounds 300 \div 100 = \pounds 3}$
 $1\% = \pounds 3$

$\times 43$ to get 43% → $\frac{43\% \text{ of } \pounds 300}{\pounds 3 \times 43 = \pounds 129}$

Top Tip
 Calculate 3×43 by splitting into **tens** and **units**.
 $3 \times 40 = 120$
 $3 \times 3 = 9$
 $120 + 9 = 129$

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{3}{4}$	0.75	75%
$\frac{1}{10}$	0.1	10%
$\frac{1}{5}$	0.2	20%
$\frac{1}{20}$	0.05	5%
$\frac{1}{25}$	0.04	4%
$\frac{1}{100}$	0.01	1%

Task 3: Lines of symmetry recap



Task 4: Remember these formulae for area and perimeter

To work out the area of a rectangle, multiply length by width.

Area = length \times width
 $A = lw$

A triangle is half of a rectangle, so...

Area = $\frac{1}{2}$ length \times width
 $A = \frac{1}{2} lw$ or $\frac{lw}{2}$

Length and width should always be **perpendicular** (at right angles).

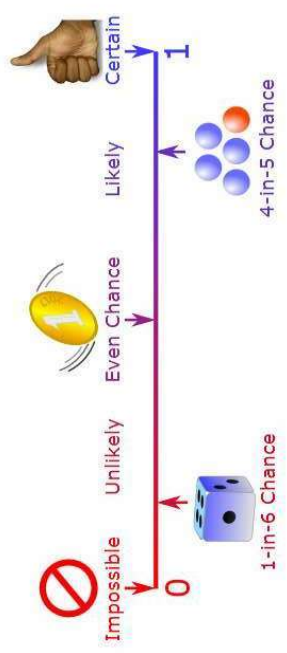
Perimeter of a Rectangle

l - length
 w - width
 P - perimeter

$P = w + l + w + l$
 $P = 2w + 2l$
 $P = 2(w + l)$

Task 5: Remember these important facts about the probability scale

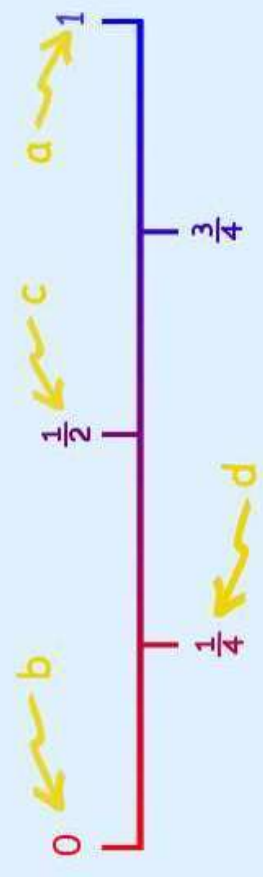
Probability is the **chance** that something will happen. It can be shown on a line:



As well as words, we can use fractions and decimals to show the probability of something happening. These are all between 0 and 1

- Impossible is 0
- Certain is 1

Example: here we show the probability that:



- a) The sun will rise tomorrow
- b) I will not have to learn mathematics at school
- c) If I flip a coin it will land heads up
- d) Choosing a red ball from a bag with 1 red ball and 3 green balls