




Savio Salesian
College

Year 8 Maths Revision List – Summer 2018

The list below should give an indication of the material that Year 8 pupils will be tested on in Summer 2018. Pupils should rate their confidence in each of the skills below:

Savio Salesian College Mathematics Department



100's of FREE videos to help support students with their revision. Also includes practice questions.



SCAN THE QR CODE TO GO TO WEB SITE


ONLINE REVISION VIDEOS

<https://vle.mathswatch.co.uk/vle>




Username

Password



MathsPad



Username:

Password:

Raising achievement
Foundation/Higher Tier
Grades 1 – 9

Mathematics department

Tiers

Foundation Tier (Grades 1 – 5)

Higher Tier (Grade 4 - 9)

How to revise for Maths

Below offers a guide on how best to use your time to prepare thoroughly for GCSE Mathematics.

Identify the topics into three categories:

- **Green**, **Amber** and **Red**. **Green** means you have mastered the topic, **Amber** means you are not yet secure, **Red** means this is a priority.

Develop:

- Speak to your teacher to guide you through each topic so you can start practising independently.
- Use the online resources to support your understanding and help you to develop model answers.

Consolidation:

- The best way to improve your understanding is by completing questions for each topic rather than reading over notes/revision guides. You will find practice questions, as well as guided videos to support you at home, on the Mathswatch website.
- If you are stuck, make a note of the question you don't understand and ask for support in school. During revision sessions use the opportunity to tackle your **Amber** and **Red** topics. Bring your revision list to revision!!

Mastering the skill:

- Completing past papers, in timed conditions, will be a great way to assess your understanding and to develop confidence.
- Use the past paper mark schemes to identify where the marks are going to be awarded.
- Develop revision cards to summarise the key learning points for each topics.

Don't give up:

- Replace I can't do with, I can't do it yet!!

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 7	Mathswatch clip	Green	Amber	Red
Number	Fractional Indices	188			
Ratio	Direct and Inverse Proportion	199			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 5	Mathswatch clip	Green	Amber	Red
Number	Negative Indices	154			
Ratio	Compound Interest and Depreciation	164			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 4	Mathswatch clip	Green	Amber	Red
Number	Index Notation	131			
Algebra	Expanding and Simplifying Brackets - Single Set of Brackets	134a			
	Expanding and Simplifying Brackets - Double Set of Brackets	134b			
	Solving Equations - Balancing	135a			
	Solving Equations - Float & Ping	135b			
	Rearranging Simple Formulae	136			
	Forming Formulae and Equations	137			
	Inequalities on a Number Line	138			
	Solve Linear Inequalities	139			
Ratio	Fibonacci Sequences	141			
	Compound Units	142			
Geometry	Similar Shapes	144			
	Tangents, Arcs, Sectors and Segments	149			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 3	Mathswatch clip	Green	Amber	Red
Number	Multiplying Decimals	66			
	Dividing Decimals	67			
	Four Rules of Negatives - Adding and Subtracting	68a			
	Four Rules of Negatives - Multiplying and Dividing	68b			
	Listing Strategies	69			
	Comparing Fractions	70			
	Adding and Subtracting Fractions - A Standard Method	71a			
	Adding and Subtracting Fractions - An Alternative Method	71b			
	Finding a Fraction of an Amount	72			
	Multiplying Fractions	73			
	Dividing Fractions	74			
	BODMAS/BIDMAS	75			
	Reciprocals	76			
	Calculator Questions	77			
	Product of Primes	78			
	Highest Common Factor (HCF)	79			
	Lowest Common Multiple (LCM)	80			
	Squares, Cubes and Roots	81			
	Working with Indices	82			
	Standard Form	83			
	Decimals and Fractions	84			
	Fractions, Percentages, Decimals	85			
	Percentage of an Amount (Calc.)	86			
	Percentage of an Amount (Non-Calc.)	87			
Change to a Percentage (Calc.)	88				
Change to a Percentage (Non-Calc.)	89				
Rounding to Significant Figures	90				
Estimating Answers	91				
Using Place Value	92				
Algebra	Expanding Brackets	93			
	Simple Factorisation	94			
	Substitution	95			
	Solving Equations using Flowcharts	100			
	Subject of a Formula using Flowcharts	101			
	Generating a Sequence from the nth Term	102			
	Finding the nth Term	103			
Special Sequences	104				
Ratio	Exchanging Money	105			
	Sharing using Ratio	106			
	Ratios, Fractions and Graphs	107			
	Increase/Decrease by a Percentage	108			
	Percentage Change	109			
	Reverse Percentage Problems	110			
Simple Interest	111				

Geometry	Metric conversions	112			
	Problems on Coordinate Axes	113			
	Surface Area of a Prism - Cuboids	114a			
	Surface Area of a Prism - Triangular Prisms	114b			
	Volume of a Cuboid	115			
	Circle Definitions	116			
	Area of a Circle	117			
	Circumference of a Circle	118			
	Volume of a Prism	119			
	Angles and Parallel Lines	120			
	Angles in a Triangle	121			
	Properties of Special Triangles	122			
	Angle Sum of Polygons	123			
Probability	Experimental Probabilities	125			
	Possibility Spaces	126			
	Venn Diagrams - Introduction	127a			
	Venn Diagrams - Notation	127b			
	Representing Data - Pie Charts	128a			
	Representing Data - Stem and Leaf Diagrams	128b			
	Averages from a table - Basics	130a			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 2	Mathswatch clip	Green	Amber	Red
Number	Adding Integers and Decimals	17			
	Subtracting Integers and Decimals	18			
	Multiplying Integers	19			
	Dividing Integers	20			
	Inverse Operations	21			
	Money Questions - Non-Calculator Questions	22a			
	Money Questions - Calculator Questions	22b			
	Negatives in Real Life	23			
	Introduction to Fractions	24			
	Equivalent Fractions	25			
	Simplifying Fractions	26			
	Half-Way Values	27			
	Factors, Multiples and Primes	28			
	Introduction to Powers/Indices	29			
	Multiplying and Dividing by Powers of 10	30			
	Rounding to the Nearest 10, 100, 1000	31			
Rounding to Decimal places	32				
Algebra	Simplifying - Addition and Subtraction	33			
	Simplifying - Multiplication	34			
	Simplifying - Division	35			
	Function Machines	36			
	Generating a Sequence - Term to Term	37			
Ratio	Introduction to Ratio	38			
	Using Ratio for Recipe Questions	39			
	Introduction to Percentages	40			
	Value for Money	41			
	Simple Proportion	42			
Geometry	Properties of Solids	43			
	Nets	44			
	Angles on a Line and at a Point	45			
	Measuring and drawing Angles - Measuring	46a			
	Measuring and drawing Angles - Drawing	46b			
	Drawing a Triangle Using a Protractor	47			
	Perimeters	52			
	Area of a Rectangle	53			
	Area of a Triangle	54			
	Area of a Parallelogram	55			
Area of a Trapezium	56				
Probability	Listing Outcomes	58			
	Calculating Probabilities	59			
	Mutually Exclusive Events	60			
	Two-Way Tables	61			
	Averages and the Range	62			
	Data - Discrete and Continuous	63			
	Vertical Line Charts	64			
	Frequency Tables and Diagrams	65			

Mathswatch Grade Descriptors

Use the grid below to identify the topics you need to work on

	Grade 1	Mathswatch clip	Green	Amber	Red
Number	Place Value	1			
	Ordering Integers	2			
	Ordering Decimals	3			
	Reading Scales	4			
	Simple Mathematical Notation	5			
	Interpreting Real-Life Tables - Time	6a			
	Interpreting Real-Life Tables - Timetables and Distance Tables	6b			
Algebra	Introduction to Algebraic Conventions	7			
	Coordinates	8			
Geometry	Simple Geometric Definitions	9			
	Polygons	10			
	Symmetries	11			
	Tessellations and Congruency - Tessellations	12a			
	Tessellations and Congruency - Congruent Shapes	12b			
	Names of Angles	13			
Probability	The Probability Scale	14			
	Tally Charts and Bar Charts	15			
	Pictograms	16			

Y8 Maths - Summer

Fractions

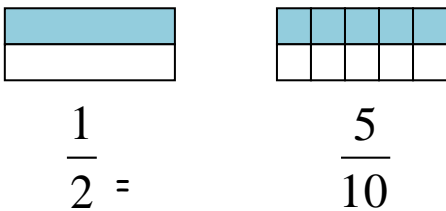
$$\frac{1}{2}$$

← numerator

← denominator

- This means 1 part out of every 2

Example 1



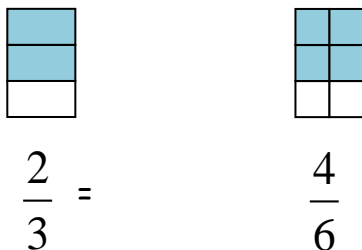
These fractions are all $\frac{1}{2}$

$$\frac{1}{2} \quad \frac{2}{4} \quad \frac{3}{6} \quad \frac{4}{8} \quad \frac{5}{10}$$

Example 2

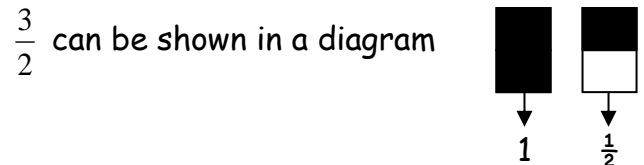
$$\frac{2}{3}$$

- This means 2 part out of every 3



Convert mixed numbers to improper fractions & vice versa

- An improper fraction is top heavy & can be changed into a mixed number



$$\frac{3}{2} = 1\frac{1}{2}$$

Improper fraction Mixed number

- A mixed number can be changed back into an improper fraction

$$1\frac{1}{2} = \frac{3}{2}$$

$$2\frac{3}{4} = \frac{11}{4}$$

Fraction, decimal, percentage equivalents

LEARN THESE:

$$\frac{1}{4} = 0.25 = 25\%$$

$$\frac{1}{2} = 0.5 = 50\%$$

$$\frac{3}{4} = 0.75 = 75\%$$

Cancel a fraction to its lowest terms

See what number divides exactly into both the numerator and denominator

$$\text{e.g. } \frac{8}{12} \xrightarrow{-4} \frac{2}{3}$$

$$\text{e.g. } \frac{15}{40} \xrightarrow{-5} \frac{3}{8}$$

Order of operations

Bracket

Indices

Divide

Multiply

Add

Subtract

} Do these in the order they appear
} Do these in the order they appear

e.g. $3 + 4 \times 6 - 5 = 22$

↑
first

Fraction of quantity with calculator

$\frac{4}{5}$ means $\div 5 \times 4$

e.g. To find $\frac{4}{5}$ of £40

$$£40 \div 5 \times 4 = £40$$

Percentage of quantity with calculator

Change the percentage to a decimal

e.g. 8% of £240	$12 \frac{1}{2}$ % of 80kg
= 0.08×240	= 0.125×80
= <u>£19.20</u>	= <u>10kg</u>

$$\begin{aligned} &80\% \text{ of } 52 \text{ litres} \\ &= 0.8 \times 52 \\ &= \underline{41.6 \text{ litres}} \end{aligned}$$

Negative numbers

Remember the rules:

- When subtracting go down the number line
- When adding go up the number line

- $8 + - 2$ is the same as $8 - 2 = 6$
- $8 - + 2$ is the same as $8 - 2 = 6$
- $8 - - 2$ is the same as $8 + 2 = 10$

Equivalent fractions, decimals & percentages

- **Percentage to decimal to fraction**

$$27\% = 0.27 = \frac{27}{100}$$

$$7\% = 0.07 = \frac{7}{100}$$

$$70\% = 0.7 = \frac{70}{100} = \frac{7}{10}$$

- **Decimal to percentage to fraction**

$$0.3 = 30\% = \frac{3}{10}$$

$$0.03 = 3\% = \frac{3}{100}$$

$$0.39 = 39\% = \frac{39}{100}$$

- **Fraction to decimal to percentage**

$$\frac{4}{5} = \frac{80}{100} = 80\% = 0.8$$



Change to 100

$$\frac{3}{8} = 3 \div 8 = 0.375 = 37.5\%$$

Increase/Decrease by a percentage

- **To increase £12 by 5%**

$$= 1.05 \times £12 \quad (100\% + 5\% = 105\%)$$

OR

$$= £12 + 5\% \text{ of } £12$$

- **To decrease £50 by 15%**

$$= 0.85 \times £50 \quad (100\% - 15\% = 85\%)$$

OR

$$= £50 - 15\% \text{ of } £50$$

Calculate with fractions

• Add & subtract fractions

~Make the denominators the same

e.g. $\frac{1}{5} + \frac{7}{10}$	$\frac{4}{5} - \frac{10}{15}$
$= \frac{2}{10} + \frac{7}{10}$	$= \frac{12}{15} - \frac{10}{15}$
$= \frac{9}{10}$	$= \frac{2}{15}$

• Multiply fractions

~Write 7 as $\frac{7}{1}$

~Multiply numerators & denominators

e.g. $5 \times \frac{2}{3}$	$\frac{4}{5} \times \frac{2}{3}$
$= \frac{5}{1} \times \frac{2}{3}$	$= \frac{8}{15}$
$= \frac{10}{3} = 3\frac{1}{3}$	

• Divide fractions

~Write 7 as $\frac{7}{1}$

~Flip numerator & denominator after ÷

~Multiply numerators & denominators

e.g. $5 \div \frac{2}{3}$	$\frac{4}{5} \div \frac{2}{3}$
$= \frac{5}{1} \times \frac{3}{2}$	$= \frac{4}{5} \times \frac{3}{2}$
$= \frac{15}{2} = 7\frac{1}{2}$	$= \frac{12}{10} = 1\frac{2}{10} = 1\frac{1}{5}$

• Calculate fraction of quantity

To find $\frac{4}{5}$ of a quantity $\div 5 \times 4$

e.g. $\frac{4}{5}$ of £20 = $20 \div 5 \times 4 = \text{£}16$

To find the original quantity

If an amount has been increased by 5%

Original amount = new amount \div 1.05

If an amount has been decreased by 12%

Original amount = new amount \div 0.88

Repeated percentage change

To increase £12 by 5% per year for 4 years

= £12 \times 1.05⁴

To decrease £50 by 12% per year for 4 years

= £50 \times 0.88⁴

Expand and Simplify Algebraic Expressions

~Expand $3(2x + 5)$

~Draw a table if needed

~Multiply each term in the brackets by the one outside the brackets

	2x	+5
3	6x	+15

= 6x + 15

~Expand and simplify $2(y - 6) - 4(3y - 8)$

	y	-6		3y	-8
2	2y	-12			
			-4	-12y	+32

$2y - 12 - 12y + 32$

Simplified = -10y + 20

Expand and Simplify Algebraic Expressions

~Expand and simplify $(x + 7)(x - 5)$

~Draw a grid

	x	+7
x	x^2	$+7x$
-5	$-5x$	-35

Expanded = $x^2 + 7x - 5x - 35$

Simplified = $x^2 + 2x - 35$

~Expand and simplify $(3y - 8)^2$

~ anything² means times by itself

~ $(3y - 8)^2$ becomes $(3y - 8)(3y - 8)$

	3y	-8
3y	$9y^2$	$-24y$
-8	$-24y$	$+64$

Expanded = $y^2 - 24y - 24y + 64$

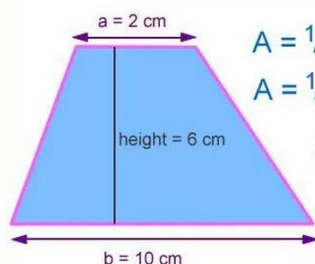
Simplified = $y^2 - 48y + 64$

Area of Geometric Shapes

Area of Trapezium

The area of a Trapezium equals half the sum of the parallel sides, times the height between them.

$$A = \frac{1}{2}(a + b) \times h$$



$$A = \frac{1}{2}(a + b) \times h$$

$$A = \frac{1}{2}(2 + 10) \times 6$$

$$A = 36 \text{ cm}^2$$



$$A = \pi r^2$$

Find the Area

$$A = (3.14)(7)^2$$

$$= (3.14)(49)$$

$$= 153.86 \text{ in}^2$$

$$\pi = 3.14$$

$$r = 7 \text{ in}$$

$$3.14$$

$$\times 49$$

$$153.86$$

Find the Circumference:



$$\pi = 3.14$$

$$r = 3 \text{ in}$$

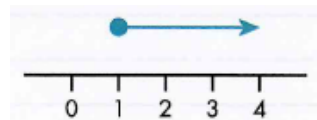
$$C = \pi d \quad C = 2\pi r$$

$$C = 2(3.14)(3)$$

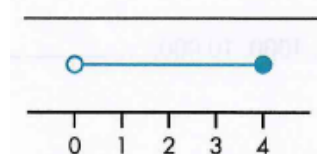
$$C = 18.84 \text{ in}$$

$$\begin{array}{r} 3.14 \\ \times 2 \\ \hline 6.28 \\ \times 3 \\ \hline 18.84 \end{array}$$

Inequalities



$$x \geq 1$$



$$0 < x \leq 4$$

Write down the integers which satisfy the following inequality:

~ $4 < x \leq 7 = 5, 6, 7,$

~ $-3 \leq x < 5 = -3, -2, -1, 0, 1, 2, 3, 4,$

Factorise Algebraic Expressions

~Factorise $x^2 + 6x$

~Find the factors of both terms

x^2	$+6x$
1, 1	1, 6
	2, 3
x, x	x

Now highlight the highest common factors

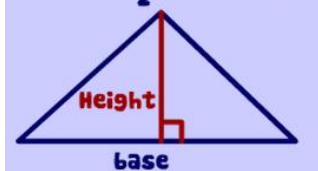
x^2	$+6x$
1, 1	1, 6
	2, 3
x, x	x

~highlighted above are the highest common factor

$$1x(1x + 6) \text{ or } x(x + 6)$$

Area of Geometric Shapes

$$\text{Area} = \frac{1}{2} \text{base} \cdot \text{height}$$



Find the Area:



$$b = 8.6 \text{ m}$$

$$h = 10.3 \text{ m}$$

$$A = bh$$

$$A = 8.6 \cdot 10.3$$

$$A = 88.58 \text{ m}^2$$

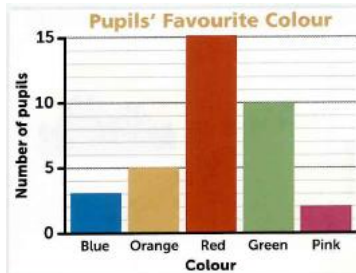
$$10.3$$

$$\times 8.6$$

$$88.58$$

Data Handling

A bar chart can be used to display qualitative and categorical numerical data. Data is represented using different sized bars. When drawing bar charts:



How many pupils' favourite colour is green?

- Give the graph a title
- Always label both axes
- Use equal intervals on the axes
- Leave a gap between each bar

Averages

~LEARN this rhyme

Hey diddle diddle, the median's the middle,
You add and divide for the mean,
The mode is the one that you see the most,
And the range is the difference between.

~Stem and Leaf Diagram

The heights, in centimetres, of 10 students are shown.

168 154 172 167 156
154 163 160 165 158

Show the heights in an ordered stem-and-leaf diagram.

First choose the stem, then write the leaves.

Finally, order the leaves.

15 4 6 4 8	order →	15 4 4 6 8
16 8 7 3 0 5		16 0 3 5 7 8
17 2		17 2

Key: 15 | 4 means 154 cm

Key: 15 | 4 means 154 cm

~Tally Tables

A class has 30 students. Lisa asks each student whether they walk to school (Y) or not (N).

Y N N Y N Y N N Y N
Y N Y Y N N N Y N N
N N N N N Y Y Y N Y

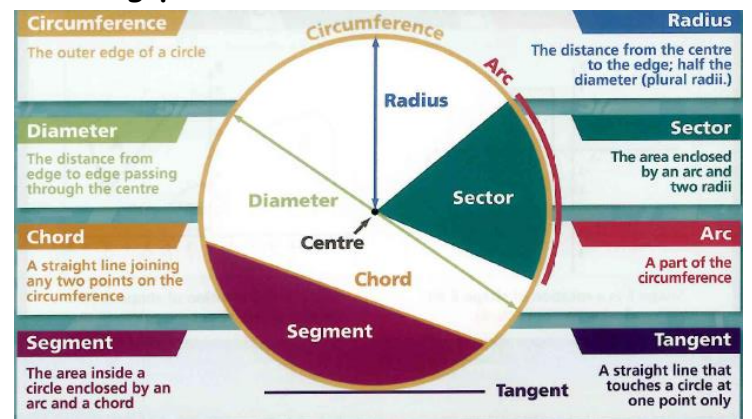
- Complete a data collection sheet (a tally chart).
- Find the proportion of students in the class who walk to school.

a

Do you walk to school?	Tally	Number
Yes		12
No		18

- The proportion of students who walk to school is 12 out of 30.

Labelling parts of a Circle



Ratio

Henry the snake is only 30cm long. George another snake is 90cm long. Express this as a ratio.

Compare the two lengths.

= Henry's length : George's length
= 30 cm : 90 cm
= 30 : 90

Express the ratio 30 : 90 in its simplest form.

$\begin{array}{l} \div 10 \left(\begin{array}{l} 30 : 90 \\ \div 3 \\ = 10 : 30 \end{array} \right) \div 10 \\ \div 3 \left(\begin{array}{l} 10 : 30 \\ \div 3 \\ = 3 : 9 \end{array} \right) \div 3 \\ \div 3 \left(\begin{array}{l} 3 : 9 \\ \div 3 \\ = 1 : 3 \end{array} \right) \div 3 \end{array}$

Sean and Patrick share £355 in the ratio 3:7
How much money do they each receive?

Find the total number of parts of the whole amount.

Total number of parts = 3 + 7 = 10 parts

Find the value of one part.

Each part = £355 ÷ 10 = £35.50

Sean receives 3 parts = 3 × £35.50 = £106.50

Patrick receives 7 parts = 7 × £35.50 = £248.50

Check your answer by adding up all the parts. They should add up to the amount being shared!

£106.50 + £248.50 = £355