

6 YEAR STARTER PACK

How to use

1



This Year's Content

- Uses content from the Quick Curriculum Guides for Parents & Teachers, based on the Australian Curriculum
- Take a look at what to do over the coming school year
- Pay extra attention to the items with a star ★, they're very important!

2



Last Year's Content

- With weeks of holidays behind them, students will have forgotten a little bit. Using the first few weeks of class to refresh students on this content is a good time investment.
- Take a quick look over last year's content. Recommendation: spend a little bit more time looking back at the items with a star ★.

3

Review / Assessment and Year Planning

- Review the starred ★ concepts that were in the previous year's Quick Curriculum Guide with your students.
- We have included 1 assessment item based on an important concept to help get you started at the back of this booklet.

4



More Help

- Get some helpful tips on planning - from the full year right down to the individual lesson. See the booklet "A Guide to Teacher Planning"
- Free download at www.drpaulswan.com.au/planning

These materials are provided as-is and intended as assistance tools only.

Quick Curriculum Guide (Year Six)

We understand that children as well as parents of children that are home from school may be feeling a bit stressed at the current time. Our aim is to try to make mathematics a little more accessible for you. We have put together a simple overview of some of the Australian Mathematics Curriculum, for each year level from Foundation to Year 6. Please note, most States and territories have made some adjustments to the Curriculum.

About Year 6:

- In Year 6 children do far more work with fractions, decimals and percentages, making application of them within their work - in particular they're now doing calculations with them.
- Year 6 is the first time children do operations ($+$ - \div \times) with decimal numbers.
- Probability and Statistics take a far more prevalent role.

For Teachers:

- You are welcome to send home these cards and activities to parents. A great way of organising your term might be cutting up the cards and adding to the activities ideas.
- Please note, some states and territories do not 100% match the national Curriculum in their state curriculums.

For Parents:

- Keep in mind this is what children learn over the **whole year**, not just in one term.
- All children are different, so expectations will vary even between children within the same year level.
- For the listed activities, we think these are all worth trying / could be managed in a home setting even for those inexperienced with teaching at home. We have tried to avoid specialty equipment.
- Even if you're not too sure about teaching, just introducing the idea and some related vocabulary can be a great help.
- Regular routines are beneficial for children. Many of these activities can be repeated, which will help the children retain what they learn. You can do the activity the same way or make slight changes to keep it interesting. **It is better to pick one or two activities and repeat them than it is to try them all once!**

#1 Year Six (Number)

The Australian National Curriculum Says:

Identify and describe properties of prime, composite numbers ...

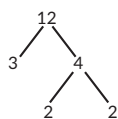
What this means

A prime number has only 2 factors, itself and 1; e.g. 2, 3, 5, 7, 11, 13, ...

A composite number has 3 or more factors; e.g. 12 has four factors (numbers that exactly divide into it: 1, 2, 3, 4, 6 & 12.)

Activity Idea

Make Factor Trees.



Teaching at Home - Quick Guide

www.drpaulswan.com.au



A sample card

Note the features of these cards:

- The text from the Australian Curriculum
- The star in the top right
 - Filled in: this means this is a topic that in our opinion is vital, perhaps as a building block to concepts in later years.
 - Not filled in: while still important, we consider this secondary.
- A simplified explanation of what the curriculum is describing
- A single activity or game idea. Some will reference free games and downloadables that you can find on www.drpaulswan.com.au. The vast majority of these activity ideas can be done at home.

Note: Although we have put the entries of the Australian Curriculum in one box each, they are not equal in terms of their importance or the amount of time needed to provide an understanding. Some entries will only need one of two learning sessions. Others will benefit from more, and need re-visiting a number of times throughout the year. Some entries, after an initial learning session, can be given incidental mention as the occasion arises. Teachers will use their professional judgements when deciding how long to allow for each of the entries; often combining some of them within one or more learning sessions.

The full Australian Curriculum: Mathematics can be found at www.australiancurriculum.edu.au/f-10-curriculum/mathematics/
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Acknowledgement to Linda Marshall for her assistance developing these notes.



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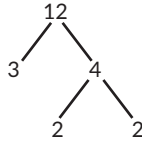
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What this means

A prime number has only 2 factors, itself and 1; e.g. 2, 3, 5, 7, 11, 13, ...

A composite number has 3 or more factors; e.g. 12 has six factors (numbers that exactly divide into it: 1, 2, 3, 4, 6 & 12.)



Activity Idea

Make Factor Trees.



#2 Year Six (Number)



The Australian National Curriculum Says:

Identify and describe properties of ... square and triangular numbers

What this means

A square number is obtained by multiplying a number by itself; e.g. 9 is a square number as $3 \times 3 = 9$.

Triangular numbers can be represented by symbols arranged in a triangle; e.g.



Activity Idea

Use counters or draw diagrams to represent all square numbers from 1 to 25. Predict the next 3 numbers in the series.



#3 Year Six (Number)



The Australian National Curriculum Says:

Select and apply efficient mental and written strategies and appropriate digital technologies to solve problems using all four operations with whole numbers.

What this means

- **Efficient strategies:** Does not get bogged down in too many steps or forget where they're up to (for example counting in ones for large amounts).
- Four operations: +, -, \div , \times
- **Written strategies:** There is no one standard strategy used across Australia for this. We would favour methods that involve an understanding of Place Value and avoid reliance on 'tricks'.



#4 Year Six (Number)



The Australian National Curriculum Says:

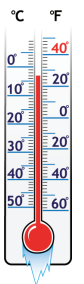
Investigate everyday situations that use integers. Locate and represent these numbers on a number line.

What this means

Integers are the set of counting numbers, their opposites and zero, i.e. ... -2, -1, 0, 1, 2, ...

Activity Idea

Looking at temperatures in different climates is a good way to use negative numbers; e.g. it was -3°C in Canberra yesterday.



#5 Year Six (Number)



The Australian National Curriculum Says:

Solve problems involving addition and subtraction of fractions with the same or related denominators

What this means

- The denominator is the bottom number; it indicates the fraction name; e.g. in $\frac{1}{3}$, the denominator is 3 which tells us that the whole has been divided into 3 equal parts, and each part is called one third.

Related denominators:

- Halves, Fourths & Eighths
- Halves, Thirds & Sixths



#6 Year Six (Number)



The Australian National Curriculum Says:

Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies

What this means

- Simple fractions would be halves, thirds, quarters (fourths), fifths, sixths, eighths and tenths.
- Example: $\frac{1}{3}$ of 24 = 8

Activity Idea

Play any of the following free games from www.drpaulswan.com.au: "Halving Games set", "Quarter Games set", "One Tenth Games set", "One Eighth Games set"



#7 Year Six (Number)



The Australian National Curriculum Says:

Add and subtract decimals, with and without digital technologies, and use estimation and rounding to check the reasonableness of answers.

What this means

If doing a written calculation, it is important to line up the decimal places, e.g. Add 3.51 and 12.07

$$\begin{array}{r} 3.51 \\ 12.07 \\ = 15.58 \end{array}$$

Activity Idea

Try to find real-life examples, e.g. the edges of a rectangle are 2.7m and 1.45 m, what is its perimeter?

Teaching at Home - Quick Guide

www.drpaulswan.com.au



#8 Year Six (Number)



The Australian National Curriculum Says:

Multiply decimals by whole numbers and perform divisions by non-zero whole numbers where the results are terminating decimals with and without digital technologies.

What this means

A terminating decimal has a finite number after the decimal point, e.g. $\frac{1}{4} = 0.25$. In a recurring decimal, there is no end to the numbers after the decimal point, e.g. $\frac{1}{3} = 0.33333 \dots$

Activity Idea

Money is a good context for this, e.g. "five bottles of juice at \$3.45 a bottle" or "I spent \$2.85 on 3 chocolate bars, how much did one bar cost?"

Teaching at Home - Quick Guide

www.drpaulswan.com.au



#9 Year Six (Number)



The Australian National Curriculum Says:

Multiply and divide decimals by powers of 10

What this means

Powers of ten are:

$$\begin{array}{ll} 10^0 \text{ (equals 1),} & 10^1 = 10, \\ 10^2 \text{ (} 10 \times 10 = 100\text{),} & 10^3 \text{ (} 10 \times 10 \times 10 = 1000\text{),} \\ \text{etc.} & \end{array}$$

Activity Idea

Converting from metres to centimetres (and vice versa) involves multiplication/division by 100 (10^2).
Converting kg to g involves multiplying by 1000 (10^3).

Teaching at Home - Quick Guide

www.drpaulswan.com.au



#10 Year Six (Number)



The Australian National Curriculum Says:

Make connections between equivalent fractions, decimals and percentages

What this means

- Understand that 'one quarter' can be represented as $\frac{1}{4}$, 0.25 and 25%.

Activity Idea

Play "Fraction Decimal Percentage Match" from www.drpaulswan.com.au

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www.drpaulswan.com.au



#11 Year Six (Number)



The Australian National Curriculum Says:

Investigate and calculate percentage discounts of 10%, 25% and 50% on sale items, with and without digital technologies.

What this means

- For example: 10% of \$200 is \$20, the discount is \$20, the amount paid would be \$180.
- This is an application of Card #6, *Fractions of a Quantity* and related to Card #10.

Activity Idea

Calculate the percentage discount used in shopping catalogues.

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#12 Year Six (Measurement)



The Australian National Curriculum Says:

Connect decimal representations to the metric system

What this means

- Simply recognise that two measurements are equivalent such as 1 metre and 100 centimetres.
- Basis for converting (as per Cards #9 and #13)

Activity Idea

Measure a length with a tape measure, record it in both metres and centimetres.

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www.drpaulswan.com.au



#13 Year Six (Measurement)



The Australian National Curriculum Says:

Convert between common metric units of length, mass and capacity

What this means

Length: 1000 millimetres = 1 metre

Mass: 1000 grams = 1 kilogram

Capacity: 1000 millilitres = 1 litre

- See also Card #9 on multiplying and dividing by powers of 10.

Activity Idea

Observe the scale when measuring:

e.g. 1000 mL = 1L



#14 Year Six (Measurement)



The Australian National Curriculum Says:

Solve problems involving the comparison of lengths and areas using appropriate units

What this means

- From this investigation of comparing lengths and areas the student should conclude there is no direct relationship between the two.

Activity Idea

Try the "Chicken Pen" problem: The farmer has enough wire to fence a perimeter of 36 metres.

What are the different areas that can be fenced?

Download grid paper from drpaulswan.com.au



#15 Year Six (Measurement)



The Australian National Curriculum Says:

Connect volume and capacity and their units of measurement

What this means

- The **volume** of an object is the total space occupied by it. The **capacity** of a container is the amount it can hold. They are not always the same (e.g. your fridge's capacity!)
- 1 L of water has an equivalent volume of 1000 cubic centimetres. This could fit in a container that is 10 cm x 10 cm x 10 cm or 20 cm x 5 cm x 10 cm, etc.

Activity Idea

Pour 1 litre of water into different sized containers.



#16 Year Six (Measurement)



The Australian National Curriculum Says:

Interpret and use timetables

What this means

- Use both 12 and 24-hour timetables.

Activity Idea

Google timetables for train, buses or flights.

Play pretend, planning a simple holiday or outing.



#17 Year Six (Geometry)

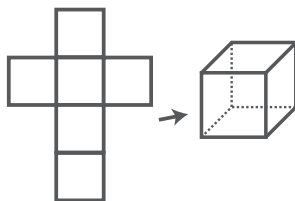


The Australian National Curriculum Says:

Construct simple prisms and pyramids

What this means

- A net is a flat 2D pattern that can be cut out and folded to make a 3D shape.



Activity Ideas

- Make 3D Objects using blu-tack and toothpicks.
- Make 3D Objects from paper/card nets.
- Cut up boxes and see how they fit together (nets).



#18 Year Six (Geometry)



The Australian National Curriculum Says:

Investigate combinations of translations, reflections and rotations with and without the use of digital technologies

What this means

- Translations, reflections and rotations do not change the shape or size of an object. A translation is a slide that changes position in a particular direction. It remains the same way up. A reflection is a flip that gives a mirror image. A rotation is a turn around a fixed point through a given angle.

Activity Idea

Play Tetris online (translations - across, rotations)



#19 Year Six (Geometry)

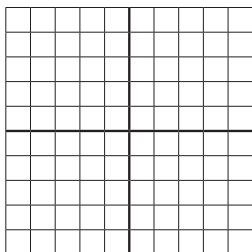


The Australian National Curriculum Says:

Introduce the cartesian coordinate system using all four quadrants

What this means

- In Year 6 we use all four quadrants with 0, 0 at the centre. It has positive and negative numbers.
- Read horizontally then vertically.



Activity Idea

Play Battleships from the "Dr Paul Swan Game Pack (Year 7)" free download .



#20 Year Six (Geometry)

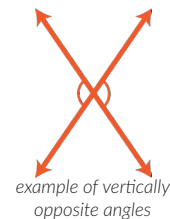


The Australian National Curriculum Says:

Investigate, with and without digital technologies, angles on a straight line, angles at a point and vertically opposite angles. Use results to find unknown angles.

What this means

- Angle on a straight line is (sum to 180°).
- Angles at a point (sum to 360°).
- Vertically opposite angles (equal).



Activity Idea

Try the angles program at www.visnos.com/demos/basic-angles



#21 Year Six (Stats & Probability)

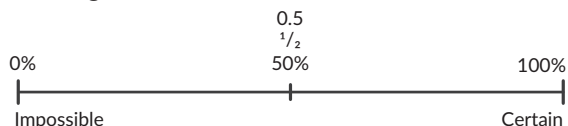


The Australian National Curriculum Says:

Describe probabilities using fractions, decimals and percentages

What this means

- No probability at all (impossible) is a 0 chance. Absolute certain probability is 1. An equal chance (tossing a head on a coin) is $\frac{1}{2}$ or 50%.



Activity Idea

What's the probability of getting a 6 on a ten-sided dice: $\frac{1}{10}$ or 0.1 or 10%.



#22 Year Six (Stats & Probability)



The Australian National Curriculum Says:

Conduct chance experiments with both small and large numbers of trials using appropriate digital technologies

What this means

There can be a lot of variance in results when only conducting a few trials (e.g. tossing a coin). The more trials conducted, the more likely the result will be close to the theoretical probability (in this case 50% heads, 50% tails).

Activity Idea

Try the adjustable spinner www.nctm.org/adjustablespinner



#23 Year Six (Stats & Probability)



The Australian National Curriculum Says:

Compare observed frequencies across experiments with expected frequencies

What this means

- See Card #22

Activity Idea

In an experiment tossing a coin the *expected frequencies* are 50% heads and 50% tails. Compare this with what you got when you did the experiment (*observed frequencies*).



#24 Year Six (Stats & Probability)



The Australian National Curriculum Says:

Interpret and compare a range of data displays, including side-by-side column graphs for two categorical variables

What this means

A categorical variable is one whose categories are separate or distinct; e.g. with a mobile phone, looking at texts vs calls.

Activity Idea

Compare standard water/power/phone bills that show a this-year vs. last-year comparison. Has the usage increased or decreased?



#25 Year Six (Stats & Probability)



The Australian National Curriculum Says:

Interpret secondary data presented in digital media and elsewhere

What this means

Secondary data is where someone else has collected it. Sports results are often shown in graphical form. Special consideration should also be given to identifying and investigating misleading graphs such as those missing an axis.

Activity Idea

Look at newspaper graphs/tables and compare with the article/headline.

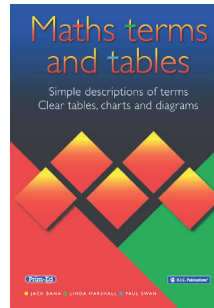
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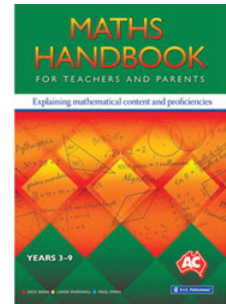
Further Support

Maths Terms and Tables



Definitions of mathematical terms

Maths Handbook for Teachers and Parents



Explains mathematical content

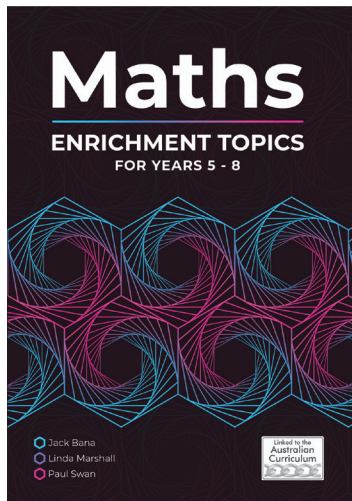
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Further Support: Enrichment

Extend students' thinking using Maths Enrichment topics for Years 5 - 8 written by Jack Bana, Linda Marshall and Paul Swan.



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Free Further Support: Fraction Games

Fraction Decimal Percentage Match

50%	0.25	62.5%	$\frac{40}{100}$	0.20	$33\frac{1}{3}\%$
20%	0.4	$66\frac{2}{3}\%$	0.75	0.5	$\frac{10}{100}$
0.33	0.75	50%	0.25	0.10	0.625
0.1	25%	75%	0.66	62.5%	40%
$66\frac{2}{3}\%$	$\frac{5}{50}$	$\frac{75}{100}$	0.2	$33\frac{1}{3}\%$	0.625
25%	$\frac{4}{10}$	0.33	10%	0.66	$\frac{20}{100}$

Fraction Decimal Percentage Match
A game for two players.
Aim: To be the first player to place their counter on the board.
Materials required: 10 numbered counters, 10 of one colour and 10 of another colour.
How to play: Each player places a counter on the board that is equivalent to the fraction, decimal or the percentage.
When a counter is placed on the board, the player who placed it must place another counter on the board, in a row, column or diagonal.
Winning: The first row, column or diagonal to be a 'straight line' wins.

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Download these free year 6 fraction games from www.drpaulswan.com.au

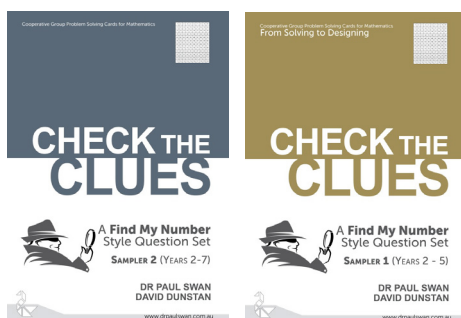
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Free Further Support: Problem Solving

The Check the Clues Samplers booklets feature co-operative group problem solving cards. These two free sample booklets focus on Number problems.



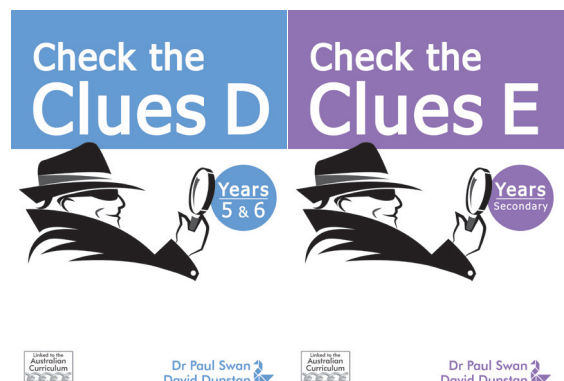
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These Check the Clues books are part of a whole school series on problem solving that range from Foundation level up to Secondary. They cover a variety of topics.



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Quick Curriculum Guide (Year Five)

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About Year 5:

- Year 5 becomes a lot more formal. As a result, not every card can have a quick, suitable at-home activity.
- Because of this Year 5 represents the transition to more “paper and pencil” type work.

For Teachers:

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#1 Year Five (Number)



The Australian National Curriculum Says:

Identify and describe factors and multiples of whole numbers and use them to solve problems

What this means

- The factor of a number is any counting number that divides into it without a remainder, e.g. the factors of 6 are 1, 2, 3 and 6. The multiple of a number is any number into which it will divide without a remainder, e.g. the multiples of 6 are 6, 12, 18, 24, ...

Activity Idea

do 'Fill in the gap' activities; e.g. the multiples of 6 are: 6, 12, _____, 24, 30, ...

Teaching at Home - Quick Guide

www.drpaulswan.com.au



A sample card

Note the features of these cards:

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- The star in the top right
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Activity Idea

do 'Fill in the gap' activities; e.g. the multiples of 6 are: 6, 12, _____, 24, 30, ...



#2 Year Five (Number)



The Australian National Curriculum Says:

Use estimating and rounding to check the reasonableness of answers to calculations

What this means

- When doing any calculation, the child should estimate what the answer will look like. So, if they are using a calculator to work out, e.g. 28×42 , it will be about 30×40 which is 1200.

Activity Idea

Ask them to estimate answers such as the above calculation 28×42 .



#3 Year Five (Number)



The Australian National Curriculum Says:

Solve problems involving multiplication of large numbers by one or two-digit numbers using efficient mental, written and appropriate digital technologies

What this means

- This can be done mentally, on paper or using a calculator.

Activity Idea

Try to find real-life examples, e.g;

- 5 movie tickets at \$22 per ticket. (Mental)
- 8 movie tickets at \$22.79 (Paper or calculator or rounding)



#4 Year Five (Number)



The Australian National Curriculum Says:

Solve problems involving division by a one digit number, including those that result in a remainder

What this means

$50 \div 5 = 10$ (no remainder)

$50 \div 4 = 12 \text{ r } 2$ (12 remainder 2) or 12.5

Activity Idea

Try to find real-life examples, e.g. a \$240 shared between five people will give each person \$48 ($240 \div 5$). If it is to be shared between nine people, each person will get about \$26.65 ($249 \div 9$).



#5 Year Five (Number)

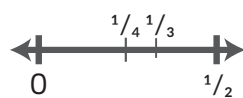


The Australian National Curriculum Says:

Compare and order common unit fractions and locate and represent them on a number line

What this means

- Unit fractions have a numerator (top number) of 1, e.g. $\frac{1}{2}$, $\frac{1}{3}$ & $\frac{1}{4}$, etc.



Activity Idea

Locate $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{6}$, $\frac{1}{8}$, $\frac{1}{10}$ on the number line



#6 Year Five (Number)



The Australian National Curriculum Says:

Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominators

What this means

- The denominator in a fraction is the bottom number; it indicates the fraction name; e.g. with $\frac{1}{5}$, the denominator is 5 which tells us that the whole has been divided into 5 equal parts, and each part is called one fifth.
- Same denominators:** This is asking you to do calculations like $\frac{1}{5} + \frac{2}{5}$ and $\frac{5}{8} - \frac{2}{8}$.



#7 Year Five (Number)



The Australian National Curriculum Says:

Recognise that the place value system can be extended beyond hundredths

What this means

- In our decimal place value system, the value of a digit depends on its position in a numeral. To the left, the numbers increase ten-fold; to the right they decrease by powers of ten.

2.165
↑ tenths
↑ hundredths
↑ thousandths

Activity Idea

Split (partition) numbers like the above example. See Year 4 Quick Guide for more information.



#8 Year Five (Number)



The Australian National Curriculum Says:

Compare, order and represent decimals

What this means

- Compare:** Compare the size of two decimals
- Order:** 3 or more decimals.
- Represent:** Best done on a number line.
- Watch for the common misconception that the longer decimal is larger. For example, some students at first believe that 4.106 is larger than 4.2. This may stem from them incorrectly reading the number as "four point one-hundred and six."



#9 Year Five (Number)



The Australian National Curriculum Says:

Create simple financial plans

What this means

A financial plan may look at costs (expenses or expenditure) and profits (money left over). Or at savings and expenditure.

Activity Idea

Have the child plan a simple meal and work out the cost of the ingredients. If they are given \$50, what will they get as change?



#10 Year Five (Measurement)



The Australian National Curriculum Says:

Choose appropriate units of measurement for length, area, volume, capacity and mass.

What this means

- The key word here is 'Choose'. The child thinks about which unit is appropriate. For example, we would not work out the mass (weight) of an egg using kilograms; grams would be more appropriate.

Activity Idea

Make up a fictional recipe.



#11 Year Five (Measurement)

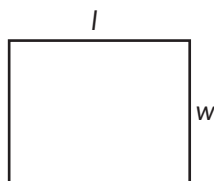


The Australian National Curriculum Says:

Calculate perimeter and area of rectangles using familiar metric units

What this means

- The perimeter of a rectangle is the distance around the outside of it. It is calculated using $l + w + l + w$ or $2 \times l + 2 \times w$
- The area of a rectangle is the inside of it. It is calculated using $l \times w$.



#12 Year Five (Measurement)



The Australian National Curriculum Says:

Compare 12- and 24-hour time and convert between them

What this means

- This is useful when reading bus or plane timetables.

Activity Idea

Play "POP 12 Hour to 24 Hour" 1 and 2 (free games from www.drpaulswan.com.au)



#13 Year Five (Geometry)

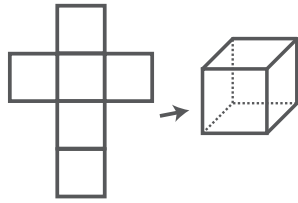


The Australian National Curriculum Says:

Connect three-dimensional objects with their nets and other two-dimensional representations

What this means

- A net is a 2D pattern which can be folded to make a model of a 3D object.



Activity Idea

Play "POP 3D Objects Nets" (free game from www.drpaulswan.com.au)

Make some nets from card and fold.



#14 Year Five (Geometry)



The Australian National Curriculum Says:

Use a grid reference system to describe locations. Describe routes using landmarks and directional language

What this means

- See image. The landmark in this case would be at D2.
- Always read horizontally then vertically.
- Describe with directional language (e.g. left, right)

6						
5						
4						
3						
2				X		
1						
	A	B	C	D	E	F

Activity Idea

Make a grid reference map of your bedroom.



#15 Year Five (Geometry)

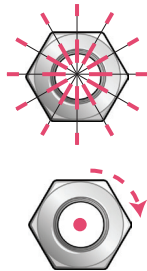


The Australian National Curriculum Says:

Describe translations, reflections and rotations of two-dimensional shapes. Identify line and rotational symmetries.

What this means

- Translation: a.k.a 'sliding'
- Reflection
- Rotation: a.k.a 'turning'
- Line symmetry: see image 1
- Rotational symmetry: see image 2



Activity Idea

Start with a shape and do a translation, reflection, etc.



#16 Year Five (Geometry)



The Australian National Curriculum Says:

Apply the enlargement transformation to familiar two dimensional shapes and explore the properties of the resulting image compared with the original.

What this means

- With an enlargement transformation, the object or figure is made larger by a certain factor (e.g. doubled or trebled), but the same shape is maintained.

Activity Idea

On grid paper, scale up a simple shape (e.g. a rectangle) by doubling its side lengths.



#17 Year Five (Geometry)



The Australian National Curriculum Says:

Estimate, measure and compare angles using degrees. Construct angles using a protractor

What this means

- The most common angle we refer to is the right angle (90°). Other types of angles are compared to this, e.g. an acute angle is less than 90° , an obtuse angle is between 90° and 180° (two right angles), etc. See <https://www.youtube.com/watch?v=852yX-5-N4>
- While most protractors are 180 degrees we prefer the 360 degree (full circle) protractors because many students confuse the double scale on the 180 degree protractor.



#18 Year Five (Stats & Probability)



The Australian National Curriculum Says:

List outcomes of chance experiments involving equally likely outcomes and represent probabilities of these outcomes using fractions

What this means

- When a dice is thrown, there is an equal chance of getting a 1, or a 2, or a 3, etc. When a coin is tossed, there is an equal chance of getting a Head or a Tail.

Activity Idea

Flip a coin 50 times and record results.



#19 Year Five (Stats & Probability)

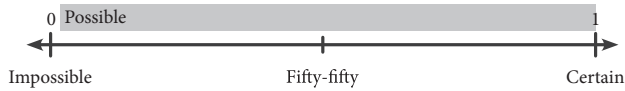


The Australian National Curriculum Says:

Recognise that probabilities range from 0 to 1

What this means

- No probability at all (impossible) is a 0 chance. Absolute certain probability is 1.



Activity Idea

Write chance words onto a probability number line e.g. "likely", "unlikely", "maybe", "once in a blue moon" etc.

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#20 Year Five (Stats & Probability)



The Australian National Curriculum Says:

Pose questions and collect categorical or numerical data by observation or survey

What this means

- e.g. "Which colour car passes the window the most?" Collect data to answer the question.

Activity Idea

Collect data and make a table/graph.

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#21 Year Five (Stats & Probability)



The Australian National Curriculum Says:

Construct displays, including column graphs, dot plots and tables appropriate for data type, with and without digital technologies

What this means

- Data displays = a graph or table.
- Dot plot is new at this year level, students will have encountered column graphs in Year 4.

Activity Idea

Explore making a graph in a Microsoft Excel spreadsheet or similar program.

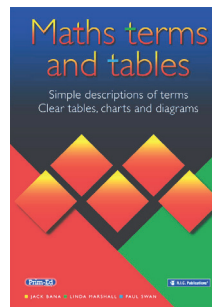
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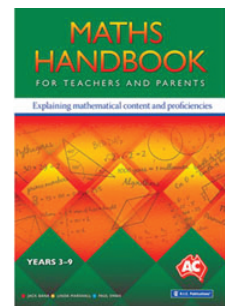
Further Support

Maths Terms and Tables



Definitions of mathematical terms

Maths Handbook for Teachers and Parents



Explains mathematical content

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Further Support: Games

The Multispin and Spindiv games are perfect for practising the multiplication ($2x - 9x$) and division ($\div 2 - \div 9$) facts.



Purchase from www.drpaulswan.com.au/shop

Free games for fractions and downloadable pages for grids can be downloaded from www.drpaulswan.com.au

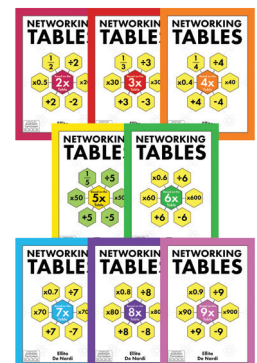
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Further Support: Tables

The **Networking Tables** series of books is available for ebook download



Available from www.drpaulswan.com.au/shop

You can buy the full set at a discount.

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Mental Computation Test - Review for Year 6's

Background

The test was used as part of a research study carried out by McIntosh, Bana and Farrell (1995).

This test was originally given to Year 5 students (mid-year). It makes for an excellent review tool for new Year 6 students.

The test consists of 30 items. The test is repeated on a different day using the same items, but visually instead of orally.

All items were given devoid of any context, thereby eliminating the need for students to decide from the context which operation to use.

Items were given one at a time at 20 second intervals, which the authors recognise as being generous for some students but enough time for students to at least attempt them.

The answers are to be written onto an answer sheet where there is only room to write the answer. Students should be instructed not to write anything down but the answer.

The data for students in Western Australian Schools has been provided so that teachers can 'benchmark' their students against these previous results. This is one of the few Mental Computation tests available. Note the Westwood One Minute Basic Fact Test used by many schools assesses basic facts only, whereas this test goes beyond basic facts. Over time a school or a group of schools will collect enough data for comparisons to be made.

Instructions for Administering the test

To the administrator of the test

- The test will be conducted twice - first orally, then at a later date by showing the questions visually.
- 1st test (oral) question procedure: Read twice with a brief pause of 2 – 3 seconds between readings, followed by a 20 second wait time. No further repetitions are provided.
- 2nd test (visual) question procedure: Show on screen for 20 seconds. We have created a PPT slide show with a 20 second timing that you are welcome to download from www.drpaulswan.com.au.

Explain to the students:

- Do the calculations in your head
- Do not copy the numbers down
- Write the answer on paper, nothing else.
- The question will be stated once and repeated 3 seconds later.
- You will be shown the question for 20 seconds.



Mental Computation Test - Review for Year 6's

Statistical Data

Year 5 range 0 – 29, Mean 13.69 SD 8.03

Results

In the Year 3 test there was a significance difference in performance between oral and written presentation, with performance overall on the oral test being much better. For this test the manner of presentation (visual/ oral) did not matter overall, but there were a few questions where mode of presentation made a difference. I have included tables so you can make comparisons.

Generally for the majority of addition items students performed better when they were presented visually, except for $\frac{1}{2} + \frac{1}{4}$ in Year 5 where almost three times as many students were correct with the oral presentation compared with the visual presentation. The same thing occurred for the item, $\frac{3}{4} - \frac{1}{2}$.

Order of Difficulty of items. Percentage Correct

#	Item	Oral	Visual	Average
16	60 + 80	85	88	87
7	Double 26	80	79	80
2	68 + 32	68	89	79
1	58 + 34	66	88	77
20	140 – 60	77	67	72
10	Half of 52	74	67	71
17	79 + 26	59	73	66
19	74 – 30	64	45	55
4	80 – 24	55	53	54
5	100 – 68	54	53	53
25	300 ÷ 5	56	48	52
3	165 + 99	46	54	50
23	100 x 35	44	52	48
21	105 – 97	52	40	46
6	105 – 26	46	38	42
27	150 ÷ 25	42	39	40
14	$\frac{3}{4} - \frac{1}{2}$	59	17	38
9	7 x 25	34	40	37
13	$\frac{1}{2} + \frac{1}{4}$	55	19	37
15	6.2 + 4.9	35	38	37
18	182 + 97	21	51	36
28	$\frac{1}{2} + \frac{3}{4}$	36	29	33
29	1 – $\frac{1}{3}$	27	38	33
22	60 x 70	19	41	30
11	3500 ÷ 35	2	36	29
26	4200 ÷ 60	20	20	20
8	300 x 40	21	17	19
12	450 ÷ 15	17	15	16
30	0.5 + 0.75	12	13	13
24	38 x 50	6	9	7

Order by Question Number

#	Item	Oral	Visual	Average
1	58 + 34	66	88	77
2	68 + 32	68	89	79
3	165 + 99	46	54	50
4	80 – 24	55	53	54
5	100 – 68	54	53	53
6	105 – 26	46	38	42
7	Double 26	80	79	80
8	300 x 40	21	17	19
9	7 x 25	34	40	37
10	Half of 52	74	67	71
11	3500 ÷ 35	2	36	29
12	450 ÷ 15	17	15	16
13	$\frac{1}{2} + \frac{1}{4}$	55	19	37
14	$\frac{3}{4} - \frac{1}{2}$	59	17	38
15	6.2 + 4.9	35	38	37
16	60 + 80	85	88	87
17	79 + 26	59	73	66
18	182 + 97	21	51	36
19	74 – 30	64	45	55
20	140 – 60	77	67	72
21	105 – 97	52	40	46
22	60 x 70	19	41	30
23	100 x 35	44	52	48
24	38 x 50	6	9	7
25	300 ÷ 5	56	48	52
26	4200 ÷ 60	20	20	20
27	150 ÷ 25	42	39	40
28	$\frac{1}{2} + \frac{3}{4}$	36	29	33
29	1 – $\frac{1}{3}$	27	38	33
30	0.5 + 0.75	12	13	13

based on data from 163 students



Mental Computation Student Review

Use this sheet for reading out questions to students.

Remember: read once, wait 3 seconds, read again. Allow 20 seconds for students to work out an answer

- | | | | |
|-----|----------------------------------|-----|---------------------------------|
| 1. | 58 and 34 | 16. | 60 and 80 |
| 2. | 68 and 32 | 17. | 79 and 26 |
| 3. | 165 and 99 | 18. | 182 and 97 |
| 4. | 80 take 24 | 19. | 74 take 30 |
| 5. | 100 take 68 | 20. | 140 take 60 |
| 6. | 105 take 26 | 21. | 105 take 97 |
| 7. | What is double 26? | 22. | 60 times 70 |
| 8. | 300 times 40 | 23. | 100 times 35 |
| 9. | 7 times 25 | 24. | 38 times 50 |
| 10. | What is half of 52? | 25. | 300 divided by 5 |
| 11. | 3500 divided by 35 | 26. | 4200 divided by 60 |
| 12. | 450 divided by 15 | 27. | 150 divided by 25 |
| 13. | $\frac{1}{2}$ and $\frac{1}{4}$ | 28. | $\frac{1}{2}$ and $\frac{3}{4}$ |
| 14. | $\frac{3}{4}$ take $\frac{1}{2}$ | 29. | 1 take $\frac{1}{3}$ |
| 15. | 6.2 and 4.9 | 30. | 0.5 and 0.75 |



Mental Computation Student Review

Name _____

Date _____

1. _____

16. _____

2. _____

17. _____

3. _____

18. _____

4. _____

19. _____

5. _____

20. _____

6. _____

21. _____

7. _____

22. _____

8. _____

23. _____

9. _____

24. _____

10. _____

25. _____

11. _____

26. _____

12. _____

27. _____

13. _____

28. _____

14. _____

29. _____

15. _____

30. _____