

# Leckie & Leckie Secondary Maths Dictionary Teachers' Resources

## Worksheets

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# Worksheet 1

## Dictionary skills (1)

Name .....

Date .....

Class .....

### A. Dictionaries

These questions are about why we use dictionaries.

1. Why is this dictionary different from the dictionary you use in English lessons?

.....

2. Do you use dictionaries in any other lessons? Which lessons?

.....

3. List the dictionaries you use.

.....

4. Why do you need to use a dictionary? Finish these sentences.

(a) Dictionaries help you .....

(b) Dictionaries show you .....

(c) Dictionaries tell you .....

(d) Dictionaries give you .....

### B. Using your Leckie & Leckie Secondary Maths Dictionary

We are now going to look in more detail at the information that your Leckie & Leckie Secondary Maths Dictionary provides.

1. It gives you the meaning of words. What is the meaning of **factorise**?

.....

2. It shows you how to spell words. Write down the headword of the entry that follows **factorise**, making sure you spell it correctly.

.....

3. It gives you an example of each word being used. Write down an example of **denominator** as used in a sentence.

.....

4. It tells you what part of speech each word is. What part of speech is the word **hypotenuse**?

.....

5. It tells you unusual forms of the word. Write down the plural of the word **radius**.

.....

6. It tells you if a word can be represented by a symbol or abbreviation. What is the symbol for **cube root**?

.....

7. It tells you what topic area each word belongs to. What topic area does **population pyramid** belong to?

.....

8. It lists related words that you may like to look up. List the words that are related to **index notation**.

.....

# Worksheet 2

## Dictionary skills (2)

Name .....

Date .....

Class .....

### A. Alphabetical order

All the words in a dictionary are in alphabetical order. This means that they are in the same order as the letters in the alphabet. (The alphabet is listed down the side of each page of the Leckie & Leckie Secondary Maths Dictionary.)

If words start with the same letter, they are in order of the *second* letter.

If the second letter is the same, then the *third* letter gives the order, and so on.

For example:

- (1) day, month, year
- (2) mass, mean, mode
- (2) pack, pair, part
- (3) percentage, perimeter, perpendicular

Can you put the following words in alphabetical order?

**polyhedron cylinder pyramid prism icosahedron cuboid cube dodecahedron**

- 1. ....
- 2. ....
- 3. ....
- 4. ....
- 5. ....
- 6. ....
- 7. ....
- 8. ....

### B. Using the guide words

The pairs of words at the very top left or top right of each page are called 'guide words' because they help you find out quickly which page contains the word you are looking for. The first guide word tells you the first word listed on the page, and the second guide word tells you the last word listed on the page.

On which page of your Leckie & Leckie Secondary Maths Dictionary would you find each of the 8 words listed below? You need to match them up with the 8 pairs of guide words that have also been given. The first one has been done for you.

- |                  |                                |
|------------------|--------------------------------|
| 1. consumer      | pie chart – plot               |
| 2. change        | per – pictograph               |
| 3. prism         | complement – concentric        |
| 4. cross-section | previously – probable          |
| 5. plane         | conclude – continuous data     |
| 6. pi            | portion – pressure             |
| 7. concave       | cosine – cube                  |
| 8. predict       | centre of enlargement – charge |

# Worksheet 3

Name .....

Date .....

Class .....

## Dictionary skills (3)

To make best use of a dictionary you must know how alphabetical order works. Here are some activities to help you practise your alphabet skills. Check your answers in your Leckie & Leckie Secondary Maths Dictionary when you have finished.

### A. First in order

Look at the words below and write next to each list the word that comes **first** in alphabetical order.

1. rough, ruler, rhombus .....
2. exact, equal, equidistant .....
3. Celsius, chance, census .....
4. interpret, inverse, intercept .....
5. litre, likely, limit .....
6. property, probability, proportion .....


### B. Out of order

The words in the following lists are listed in alphabetical order, but one word is out of place. Underline the word in each list that is **not** in alphabetical order.

1. analyse, angle, average, approximate, arithmetic
2. calculation, calculator, cancel, category, cash
3. finite, first, flat, format, fifty-fifty
4. millennium, millimetre, milligram, minimum, minus
5. transfer, transform, translation, trapezoid, trapezium


### C. Arrange the words

The words in each of the boxes below relate to a particular topic area, but they have been jumbled up. Arrange the words in alphabetical order beneath the boxes.



polygon                      plan  
polyhedron  
pint                              plane

1. ....
2. ....
3. ....
4. ....
5. ....



example                      exception  
exhaustive  
examine                      experiment

1. ....
2. ....
3. ....
4. ....
5. ....

Name .....

Date .....

Class .....

# 1 2 3 4 +√x-÷ Worksheet 4

## Number skills

### A. Vocabulary

Here are some words you need to know before you start working with numbers.

**approximate billion calculate decrease equals information number bond pair**

Complete the following statements. Then look up each word in your Leckie & Leckie Secondary Maths Dictionary to check what you have written.

1. Approximate means .....
2. A billion is .....
3. To calculate is to .....
4. A decrease is .....
5. If one amount equals another, .....
6. Information is .....
7. A number bond is .....
8. A pair .....

### B. Pairs of words

Show that you understand the meaning of each pair of words below by completing the statements. Then check that you are right by looking up the words in your Leckie & Leckie Secondary Maths Dictionary.

1. **Addition** is .....  
whereas **subtraction** is .....
2. The **greatest** means .....  
but the **least** means .....
3. A **cardinal** number is .....  
and an **ordinal** number is .....
4. **Negative** means .....  
whereas **positive** means .....
5. A **factor** is .....  
but a **multiple** is .....
6. A **digit** is .....  
and an **integer** is .....

### C. Prefixes

What do these prefixes tell you? Use your Leckie & Leckie Secondary Maths Dictionary to find a word that begins with each prefix, then give the meaning of the prefix. The first one has been done for you.

Prefix	Dictionary word	What does the prefix mean?
1. tri-	triangle	3
2. tetra-	.....	.....
3. penta-	.....	.....
4. hexa-	.....	.....
5. hepta-	.....	.....
6. octa-	.....	.....
7. nona-	.....	.....
8. deca-	.....	.....

Name .....

Date .....

Class .....

# 1 2 3 4 + √ × − ÷ Worksheet 5

## Fractions

### A. Types of fractions

Complete these statements about fractions. Then look up words in **bold** in your Leckie & Leckie Secondary Maths Dictionary to check that you understand their meaning.

1. The **numerator** is the ..... of a fraction.
2. The **denominator** is the ..... of a fraction.
3. If the numerator is s..... than the denominator, it is called a **proper fraction**.
4. If the numerator is l..... than the denominator, it is called an **improper fraction**.
5. An example of a **mixed fraction** is .....

### B. Working with fractions

Using your Leckie & Leckie Secondary Maths Dictionary, check that you know how to use the four operations addition, subtraction, multiplication and division which are used with fractions.

Now draw a line to connect the operation with the correct method.

- |                          |   |
|--------------------------|---|
| 1. <b>addition</b>       | Turn second fraction upside down and multiply.                                    |
| 2. <b>subtraction</b>    | The product of the numerators over the product of the denominators.               |
| 3. <b>multiplication</b> | Find the lowest common denominator, change to equivalent fractions and add.       |
| 4. <b>division</b>       | Find the lowest common denominator, change to equivalent fractions and take away. |

### C. Fractions of a quantity

Use words for fractions to fill the gaps. The first one has been done for you.

1. 50 centimetres is half of 1 metre.
2. 250 grams is q..... of 1 kilogram.
3. 40 pence is t..... fi..... of 1 pound.
4. 45 minutes is th..... q..... of 1 hour.
5. 1 foot is a th..... of 1 yard.
6. 180 degrees is h..... of a revolution.
7. A weekend is t..... se..... of a week.
8. A month is o..... tw..... of a year.

Name .....

Date .....

Class .....

# 1 2 3 4 +√x-÷ Worksheet 6

## Powers, roots and ratios

### A. Vocabulary

Complete these sentences. Then look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary to see if you are correct.

1. A **power** or **index** tells you .....
2. When you **square** a number you .....
3. A **cube** number is .....
4. A **square root** has the symbol .....

Now try to work these out.

5. 27 is the cube of .....
6. .... is the square root of 16.
7. The ..... of 5 is 25.
8. The ..... of 2 is 8.

### B. Index law and notation

Use your Leckie & Leckie Secondary Maths Dictionary to find the answers to the following questions.

1. What is the plural of **index**? .....
2. There are 2 other words used for **index**. They are synonyms (words that mean the same). What are they? .....
3. Learn the index law and notation and then fill in the results below.

$a^2 \times a^3 =$  .....

$a^4 \div a^2 =$  .....

$(a^2)^3 =$  .....

$\frac{1}{a^2} =$  .....

$a \times a \times a =$  .....

$a^0 =$  .....

$a^{\frac{1}{2}} =$  .....

### C. Ratio and proportion

Complete the following table. The first one has been done for you.

	Ratio	First amount as a proportion of £1
1. 20p to 80p	1:4	1 out of 5
2. 10p to 50p	.....	.....
3. 25p to 75p	.....	.....
4. 5p to 75p	.....	.....

Name .....

Date .....

Class .....

# 1 2 3 4 + √ × − ÷ Worksheet 7

## Number skills

### A. Roman numerals

Complete the statement below. Look up the entry **Roman numerals** in your Leckie & Leckie Secondary Maths Dictionary if you need help.

Roman numerals are .....

Now fill in the gaps in the table below. The first one has been done for you.

1. MMII	2002
2. ....	350
3. ....	11
4. XXXV	.....
5. DXXV	.....
6. ....	606
7. ....	1150

### B. Missing words

Use your Leckie & Leckie Secondary Maths Dictionary to look up the meanings of these words.

**ascending descending index root loss profit false true palindrome reciprocal**

Now fill each gap in the sentences below with one of these words.

- The numbers 2, 4, 6... are in ..... order. The numbers 9, 7, 5... are in ..... order.
- The square ..... of 9 is 3, and 32 is 2 to the ..... of 2.
- We managed to make 20p ..... on each ruler, but the sale of pens made a .....
- It is ..... that 4 cubed is 64, but it is ..... that 50 is 7 squared.
- The ..... of 4 is  $\frac{1}{4}$ , but 414 is a .....

### C. Symbols

Complete the table below, giving the meaning of each symbol and an example of its use in a number sentence. (You may have to look up **number sentence** in your Leckie & Leckie Secondary Maths Dictionary.) The first one has been done for you.

	Symbol	Meaning	Number sentence
1.	+	addition	$4 + 3 = 7$
2.	-	.....	.....
3.	÷	.....	.....
4.	×	.....	.....
5.	<	.....	.....
6.	>	.....	.....
7.	$\sqrt{\quad} =$	.....	.....
8.		.....	.....

Name .....

Date .....

Class .....

# 1 2 3 4 + √ × − ÷ Worksheet 8

## Fractions, decimals and percentages

### A. Decimals

Complete these definitions. Then use your Leckie & Leckie Secondary Maths Dictionary to check that you are right.

1. The part of the decimal number to the right of the decimal p..... is the decimal f.....
2. The position of the digit after the decimal p..... is its decimal p.....
3. A rec..... decimal has digits in a continuous pattern.
4. A ter..... decimal has a finite number of digits.

### B. Conversion

Draw a line to connect the conversion to the correct method. The first one has been done for you.

Conversion	Method
1. fraction → decimal	multiply by 100
2. decimal → fraction	divide numerator by denominator
3. decimal → percentage	percentage over 100
4. percentage → decimal	multiply by 100
5. fraction → percentage	divide by 100
6. percentage → fraction	numerator is decimal without decimal point; denominator is 10 <sup>n</sup> where n is number of decimal places in original number

### C. Place value

Look up the entry **place value** in your Leckie & Leckie Secondary Maths Dictionary.

Now write the numbers below in decimal form. Remember the decimal point. The first one has been done for you.

1. fifteen and twenty-three thousandths 15.023
2. one and five tenths .....
3. fifteen hundredths .....
4. one hundred and thirty and a half .....
5. one thousand and five .....

Name .....

Date .....

Class .....

# 1 2 3 4 +√x-÷ Worksheet 9

## Powers, roots and ratios

### A. Related words

In many entries in your Leckie & Leckie Secondary Maths Dictionary, after the definition and example you will be directed to entries of related words by the icon ➡. Look up the headwords in the list below, and write the related words alongside them. One has been done for you.

Headwords	Related words
1. direct proportion	.....
2. increase	..decrease.....
3. index notation	.....
4. inverse proportion	.....
5. precise	.....
6. root	.....

### B. Choose the word

In each of the following sentences, underline the correct word from the brackets. Check if you are right by looking up key words in your Leckie & Leckie Secondary Maths Dictionary.

- Describe the unitary method used in (ratio, percentage, decimal) problems.
- The (square, cube) root of 125 is 5.
- The value of 352 to the index (0, 1, 10) equals 1.
- A person's weight usually increases with height in (direct, inverse) proportion.

### C. Topics

These words are used in different sections of Number work.

cancel cardinal direct factor index inverse lowest terms  
multiple ordinal point recurring root VAT

Write each word next to the topic below to which they belong. You may need to write more than one word next to each topic.

- number .....
- fractions .....
- decimals .....
- percentages .....
- ratio and proportion .....
- powers .....

# 1 2 3 4 + √ × − ÷ Worksheet 10

Name .....

Date .....

Class .....

## Number skills

### A. Word square

Find the hidden words. They are all in your Leckie & Leckie Secondary Maths Dictionary, and all are connected with number skills.

You should be able to find 18 words.

R	E	G	U	L	A	R	J	A	L
E	D	M	I	L	O	N	G	B	E
C	I	N	F	I	N	I	T	Y	A
I	E	E	D	N	I	N	E	C	S
P	I	G	R	E	A	T	E	S	T
R	Y	A	A	A	X	E	Q	Z	E
O	A	T	D	R	E	R	U	E	L
C	D	I	I	N	B	I	A	R	A
A	O	V	A	L	U	O	L	O	C
L	T	E	L	O	C	R	S	X	S

### B. True or false?

Are these statements true or false? You may find it useful to look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary.

- The **square root** of 36 is less than the **cube root** of 27.  
true  false
- The number 5.2301 equals 5.23 when corrected to **3 significant figures**.  
true  false
- Compound interest** is calculated after adding the interest each year.  
true  false
- The image and object are the same size after **reflection**.  
true  false
- $23 \times 10^6$  is in **standard index form**.  
true  false

### C. Examination terms

Underline the word or phrase that tells you what to do in the following questions. Explain to your partner what each of these words means. Then use your Leckie & Leckie Secondary Maths Dictionary to check that you are right.

- Estimate the height of the door in centimetres.
- Raise  $a^2$  to the power 3.
- Find the approximate answer to  $915 \times 189$ .
- Simplify  $2(5 + 3) - 3(7 - 3)$ .
- Calculate  $81 - 22$ .
- Complete the sequence of square numbers starting with 1.
- Define a prime factor.
- Prove that 125 is a cube number.

Name .....

Date .....

Class .....

# 1 2 3 4 + √ × − ÷ Worksheet 11

## Fractions, decimals and percentages

### A. Missing words

Fill in the missing words in the sentences below.

1. Seventy-five pence is th..... q..... of one pound.
2. Two thirds of a metre equals si..... si..... and two thirds per cent of a metre.
3. V..... A..... T..... is charged at seventeen and a half per cent on the total bill.
4. Per cent means out of a h.....
5. A percentage can be written as a fraction with a den..... of a hundred.

### B. Increase / decrease

Complete these statements.

An increase is .....

A decrease is .....

Look up **increase** and **decrease** in your Leckie & Leckie Secondary Maths Dictionary and see if you are correct.

Now write either **increase** or **decrease** in the following statements so that they are correct.

1. 85% is a/an..... of 15% from the whole amount.
2. 125% is a/an..... of 25% from the whole amount.
3. 103% is a/an..... of 3% from the whole amount.
4. 90% is a/an..... of 10% from the whole amount.
5. 105% is a/an..... of 5% from the whole amount.
6. 80% is a/an..... of 20% from the whole amount.
7. 130% is a/an..... of 30% from the whole amount.
8. 88% is a/an..... of 12% from the whole amount.

### C. Conversion

Draw a line to connect each item in the left-hand column to its correct conversion in the right-hand column. The first one has been done for you.

$\frac{1}{4}$		$\frac{1}{3}$
$33\frac{1}{3}\%$		0.666...
0.75		0.4
0.125		0.111...
$\frac{2}{3}$		0.25
40%		$\frac{1}{8}$
$\frac{1}{9}$		1
100%		$\frac{3}{4}$

Name .....

Date .....

Class .....

# 1 2 3 4 +√x-÷ Worksheet 12

## Powers, roots and ratios

### A. True or false?

Are these statements true or false? You may need to look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary. The instruction book for your calculator may also be useful.

- |  |                               |                                |
|--|-------------------------------|--------------------------------|
| 1. There are two <b>square roots</b> of a positive integer.            | true <input type="checkbox"/> | false <input type="checkbox"/> |
| 2. Both of the <b>square roots</b> in question 1 are positive.         | true <input type="checkbox"/> | false <input type="checkbox"/> |
| 3. The <b>cube root</b> of a positive number is positive.              | true <input type="checkbox"/> | false <input type="checkbox"/> |
| 4. The <b>cube root</b> of a negative number is positive.              | true <input type="checkbox"/> | false <input type="checkbox"/> |
| 5. The calculator button $x^y$ calculates <b>powers</b> .              | true <input type="checkbox"/> | false <input type="checkbox"/> |
| 6. The calculator button $\sqrt{\quad}$ calculates <b>cube roots</b> . | true <input type="checkbox"/> | false <input type="checkbox"/> |

### B. Relationships

Complete the following statements. You may need to look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary.

- When numbers change in **direct proportion**, the ratio .....
- Inverse proportion** shows that .....
- A **ratio** of 1:2:3 has ..... parts.
- A **ratio** c ..... quantities.
- The **ratio** of the sides of the ..... figures is 2:3.

### C. Information

Look up these words in the Leckie & Leckie Secondary Maths Dictionary. You will find some interesting information about each word. Write down what you find.

- per cent .....
- salary .....
- interest .....
- zero .....
- decimal point .....

# $x = a^2$ Worksheet 13

Name .....
Date .....
Class .....

## Sequences

### A. Vocabulary

Here are some words used with number patterns:

**consecutive finite generate  $n$ th term sequence term**

Complete the following statements. Then look up each word in your Leckie & Leckie Secondary Maths Dictionary to check if you are correct.

1. A **sequence** is a .....
2. The next 2 **terms** in the sequence 1, 5, 9, 13... are .....
3. In the sequence 7, 14, 21, 28...  $7n$  is the .....
4. **Consecutive** means .....
5. To **generate** is .....
6. A **finite** sequence is .....

### B. Rules for the $n$ th term

Complete the following definition:

The  $n$ th term is the .....

Now look up  **$n$ th term** in your Leckie & Leckie Secondary Maths Dictionary to check that you are right.

Express in words the  $n$ th term of the following sequences. The first one has been done for you.

1. The  $n$ th term of the sequence 7, 14, 21, 28, 35... is *seven times  $n$*  .....
2. The  $n$ th term of the sequence 6, 11, 16, 21, 26... is .....
3. The  $n$ th term of the sequence 9, 19, 29, 39, 49... is .....
4. The  $n$ th term of the sequence 40, 30, 20, 10, 0... is .....
5. The  $n$ th term of the sequence 5, 9, 13, 17, 21... is .....
6. The  $n$ th term of the sequence 1, 3, 5, 7, 9... is .....
7. The  $n$ th term of the sequence 5, 8, 11, 14, 17... is .....
8. The  $n$ th term of the sequence 5, 10, 15, 20, 25... is .....

Space for working

# $x = a^2$ Worksheet 14

Name .....

Date .....

Class .....

## Equations and formulae

### A. Vocabulary

Here are some words used in algebra:

**brackets equation expression formula solution term unknown value variable**

Complete the following statements to show that you understand the meaning of these words. Then check their meaning in your Leckie & Leckie Secondary Maths Dictionary.

1. An **unknown** is .....
2. A **variable** is .....
3. The difference between an **equation** and an **expression** is .....
4. A **formula** is .....
5. In algebra, **brackets** are .....
6. Another word for **solution** is .....
7. You find the **value** of the formula when you .....
8. A **term** is a .....

### B. Expressions

This is an expression:  $n + 3$

We can write this in words as: Add three to a number.

Now write the following expressions in words.

1.  $5 - n$  .....
2.  $n + 1$  .....
3.  $2n - 3$  .....
4.  $6 - 2n$  .....
5.  $n \div 3$  .....
6.  $4(n + 1)$  .....
7.  $n^2$  .....
8.  $2n^3$  .....

### C. Inverse

Your Leckie & Leckie Secondary Maths Dictionary will help you find the meaning of **inverse**.

Does it have any synonyms (words that mean the same)? Write them here:

The words on the right are all operations used in algebra. Write the inverse operation alongside each term. The first one has been done for you.

Operation	Inverse operation
1. addition	<i>subtraction</i>
2. division	.....
3. factorise	.....
4. multiplication	.....
5. multiply out brackets	.....
6. square	.....
7. square root	.....
8. subtraction	.....

# $x = a^2$ Worksheet 15

Name .....
Date .....
Class .....

## Graphs

### A. Vocabulary

Here are some words you need to know before you start to draw graphs:

**axis    coordinates    graph    intercept    origin    plot**

Complete the following statements about these words. Then look them up in your Leckie & Leckie Secondary Maths Dictionary to see if you are correct.

1. A **graph** is a way of .....
2. An **axis** is .....
3. The **origin** is the .....
4. **Coordinates** are .....  
They are given in the form .....
5. To **plot** points for a graph means .....
6. An **intercept** is the .....

### B. Straight-line graphs

Complete the following statements about straight-line graphs. Then use your Leckie & Leckie Secondary Maths Dictionary to check that you are right.

1. A ..... graph has a general equation  $y = mx + c$ .
2. The slope of a straight-line graph is the g.....
3. In the equation  $y = mx + c$ , 'm' represents the .....
4. In the equation  $y = mx + c$ , 'c' represents the .....

Give the values of 'm' and 'c' in these equations:

5.  $y = 6x + 1$                        $m =$  .....                       $c =$  .....
6.  $y = 2x - 5$                          $m =$  .....                         $c =$  .....
7.  $y = 3 - x$                            $m =$  .....                           $c =$  .....

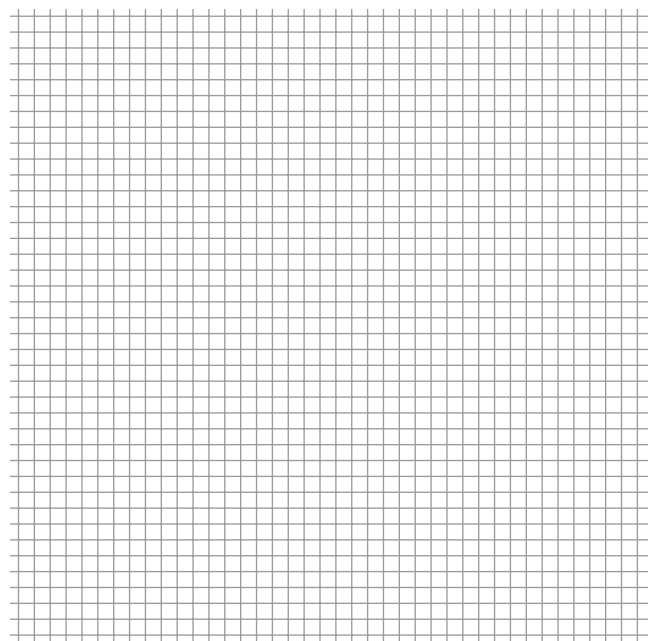
### C. Coordinates

Check the meaning of **coordinates** in your Leckie & Leckie Secondary Maths Dictionary. A table of coordinates gives the values needed to plot points for a graph.

Fill in the table of coordinates below for the graph of  $y = 3x - 2$ . The first pair of coordinates has been done for you.

x	-1	0	1	2	3	4	5
3x	-3						
-2	-2						
y	-5						

Now draw the axes, plot these points and draw the line of  $y = 3x - 2$  on the graph paper on the right.



# $x = a^2$ Worksheet 16

Name .....

Date .....

Class .....

## Sequences

### A. Pascal's triangle

Answer the following questions about Pascal and Pascal's triangle. You may need to look up the entry in your Leckie & Leckie Secondary Maths Dictionary.

1. Who was Pascal? .....
2. What is Pascal's triangle used for? .....
3. Write down Pascal's triangle in the box on the right until you reach a row of 10 numbers.
4. Find the sum of each row.  
.....
5. What do you notice about these amounts? Are they connected in any way?  
.....  
.....  
.....  
.....

### B. Fibonacci sequence

Answer the following questions about Fibonacci and the Fibonacci sequence. You may need to look up the entry in your Leckie & Leckie Secondary Maths Dictionary.

1. Who was Fibonacci? .....
2. How did Fibonacci generate his sequence? .....
3. Write down the Fibonacci sequence until you reach the 10th term.  
.....

### C. Codes

Complete the following definition. Then look up **code** in your Leckie & Leckie Secondary Maths Dictionary to see if you are correct.

A code is .....

In a code that changes numbers to letters, each letter of the alphabet is replaced by the number of its position. For example, D is replaced by 4.

Here are three words in code. Can you translate them? They are all connected with sequences.

1. 3, 15, 14, 19, 5, 3, 21, 20, 9, 22, 5 .....
2. 6, 9, 14, 9, 20, 5 .....

Now can you translate these three words into number code?

3. INCREASE .....
4. PATTERN .....

Name .....

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# $x = a^2$ Worksheet 17

## Equations and formulae

### A. Solutions

What does **solution** mean? Complete the following definition, then check it in your Leckie & Leckie Secondary Maths Dictionary.

A **solution** is .....

To find the solution of this number puzzle, you need to translate the words into numbers and symbols to form an equation. This example has been done for you.

Think of a number. Multiply it by 7, take away 3 and you will get 11.

What is the original number?

Solution:

Let the number be  $x$ .

$$7x - 3 = 11$$

$$7x = 14$$

$\therefore$  The original number is 2.

Now find the solution of these 2 puzzles. Write them out as number equations, as in the example above.

- 2 numbers added together make 14. The difference between the 2 numbers is 2. What are the 2 numbers?

.....

.....

.....

.....

- My lawn is rectangular. The length is twice the width. The perimeter is 66 m. What is the width of my lawn?

.....

.....

.....

.....

### B. Brackets

Check the meaning of **bracket** and **multiply out** in your Leckie & Leckie Secondary Maths Dictionary. Now solve the following equations. The first has been done for you.

- $3(2x - 5) = 21$        $6x - 15 = 21, \therefore 6x = 36, \text{ giving } x = 6$

- $y + (y + 5) = 75$       .....

- $2(a - 1) = 8$       .....

- $3(b + 2) - 2 = 19$       .....

- $7 - 2(y + 1) = 5$       .....

# $x = a^2$ Worksheet 18

Name .....

Date .....

Class .....

## Graphs

### A. On a slope

The words below are all similar but are used in different contexts. There is one word for a ratio connecting all of them. Write this word in the space.



How do you work out the ratio of a slope?

Draw a line with a positive ratio.

Draw a line with a negative ratio.



### B. Define and illustrate

Write definitions of the following words, and add an illustration as an example. Make sure you choose the appropriate definition for graphs. Then check the entries in your Leckie & Leckie Secondary Maths Dictionary.

Headword	Definition	Illustration
1. axis	.....	
2. coordinate	.....	
3. intercept	.....	
4. linear graph	.....	
5. plot	.....	
6. quadrant	.....	
7. straight-line graph	.....	

Name .....

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# $x = a^2$ Worksheet 19

## Sequences

### A. Quadratic sequences

Complete the following definition. Then look up **quadratic sequence** in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

A quadratic sequence is based on comparing a sequence with s..... numbers.

Now answer these questions.

- Continue this sequence until the 10th term: 1, 4, 9... ..
- Complete the following procedure for generating a quadratic sequence by filling in the gaps.

1	2	3	4	5	$n$	(number of term)
$1^2$	$2^2$	.....	.....	.....	.....	(square numbers)
3	6	11	18	27	.....	(quadratic sequence)
$2 + 1^2$	$2 + 2^2$	.....	.....	.....	.....	(compare sequence with squares)

- Continue this sequence of cubes until the 10th term: 1, 8, 27...  
.....  
.....  
.....
- Are the sequences in the previous questions **ascending** or **descending**? You may need to look up these words in your Leckie & Leckie Secondary Maths Dictionary.  
.....
- Give one example of an ascending sequence and one of a descending sequence.  
.....  
.....

### B. Rules

Each sequence follows a **rule**. The following sentences show you how to find the rule. Fill in the gaps in the sentences. You may need to use your Leckie & Leckie Secondary Maths Dictionary to check definitions.

- Find the diff..... between terms.
- Is there a connection between con..... terms?
- Number the position of each term in the se.....
- Compare each t..... with the number of its position.
- If there is no common diff..... between t....., compare with the s..... of sq..... numbers.

Name .....

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# $x = a^2$ Worksheet 20

## Equations and formulae

### A. Formula

Answer the following questions, filling in the missing words where required. Then use your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

1. A **formula** is .....
2. What is the plural of formula? .....
3. Why are the temperature scales called F ..... and C ..... ?  
.....
4. An important formula is used to convert temperature from F ..... to C ..... What is the formula used for the conversion? .....
5. Use this formula to change a temperature of 82°F to °C. Round it to the nearest degree. What do you notice about the two temperatures?  
.....

### B. Pairs of words

Show that you understand the meaning of each pair of words below by completing the definitions. Then check that you are right by looking up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary.

1. An **equation** is ....., whereas an **inequality** is .....
2. A **linear expression** has ....., but a **quadratic expression** has .....
3. The **square** of  $n$  means ....., whereas the **cube** of  $n$  means .....
4. A **formula** is ....., but a **function** is .....
5. A **factor** is ....., but a **common factor** is the .....

### C. Simultaneous equations

1. Complete the following definition. Check by looking in your English dictionary.  
**Simultaneous** means .....
2. Complete the following definition. Check by looking in your Leckie & Leckie Secondary Maths Dictionary.  
An **equation** is .....
3. Write down a possible reason why **simultaneous equations** have been given this name.  
.....
4. Form simultaneous equations from the following sentences:  
In 3 years' time Alisha's mother will be twice as old as Alisha. ....  
In 10 years' time, the difference between their ages will be 18. ....  
Work out how old Alisha is now. ....

# $x = a^2$ Worksheet 21

Name .....
Date .....
Class .....

## Graphs

### A. Curves

In your Leckie & Leckie Secondary Maths Dictionary, look up the definitions of the words in **bold**. You will then be able to answer the questions.

- |  |   |
|--|---|
| <p>1. What is the connection between the words <b>parabola</b> and <b>quadratic function</b>?</p> <p>.....</p> <p>.....</p> <p>.....</p> | <p>2. Sketch a parabola with a <b>maximum point</b>.</p>      |
| <p>3. What is the difference between a <b>quadratic function</b> and a <b>cubic function</b>?</p> <p>.....</p> <p>.....</p> <p>.....</p> | <p>4. Sketch a cubic function with a <b>minimum point</b></p> |

### B. Cub-

How many words beginning with **cub** are there in your Leckie & Leckie Secondary Maths Dictionary? .....

Make two lists of these words below, writing the meaning alongside each word.

List A (words connected to algebra)

- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....

List B (all other words)

- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....
- Word: ..... . Meaning: .....

What is the connection between all these words?

.....

### C. Inequalities

Underline the correct word in brackets in each of the following statements.

- Inequalities are shown by the (symbols, points)  $<$ ,  $\leq$ ,  $\geq$ ,  $>$ .
- Simplify an inequality before (operating, solving) it.
- Inequalities have a range of (results, solutions).
- This range has both maximum and minimum (qualities, values).



# Worksheet 22

Name .....

Date .....

Class .....

## Angles, triangles and solids

### A. Angles

Draw an example of each type of angle listed below. Then look them up in your Leckie & Leckie Secondary Maths Dictionary to see if you are correct.

- 1. acute angle
- 2. obtuse angle
- 3. reflex angle
  
- 4. right angle
- 5. angles at a point
- 6. angles on a straight line

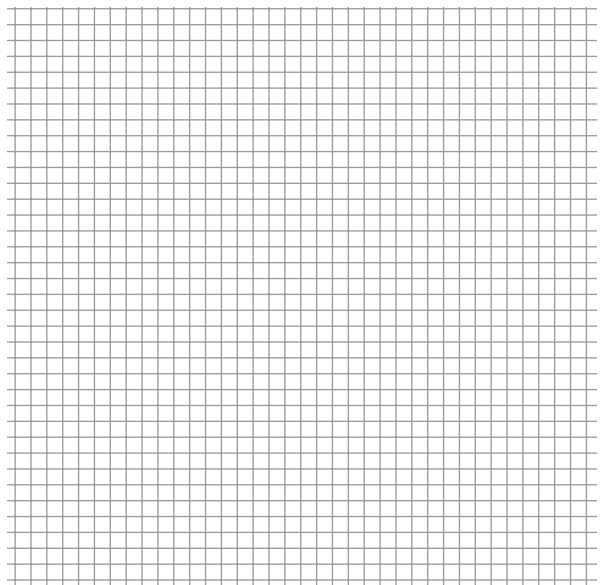
### B. Triangles

Draw a line connecting the name of each triangle to its description. The first one has been done for you. Then look up these terms in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

Triangle	Description
1. acute triangle	one right angle
2. equilateral triangle	three different sides
3. isosceles triangle	one obtuse angle
4. obtuse triangle	three equal sides
5. right-angled triangle	two equal sides
6. scalene triangle	three acute angles

### C. Nets

- 1. Complete this statement:  
A net is a .....
- 2. Underline the solids in the list below that can be made from a net:  
**cube cuboid**  
**sphere tetrahedron**  
You may need to check the definitions in your Leckie & Leckie Secondary Maths Dictionary.
- 3. Choose one of the solids in the list above and draw the net on the squared paper on the right.





# Worksheet 23

Name .....

Date .....

Class .....

## Polygons and polyhedrons

### A. Quadrilaterals

Fill in gaps in these sentences, which describe the features of some quadrilaterals. If you need help, look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary. Note that the first gap in each sentence is a number.

1. A **square** has ..... equal sides and 4 r..... a.....
2. A **rectangle** has ..... pairs of equal p..... sides.
3. A **rhombus** has ..... e..... sides.
4. A **kite** has ..... pairs of equal ad..... sides.
5. A **trapezium** has ..... pair of p..... sides.
6. An **isosceles trapezium** has ..... pair of e..... sides.
7. An **arrowhead** has ..... pairs of e..... ad..... sides.
8. A **parallelogram** has ..... pairs of op....., e..... and p..... sides.

### B. Solids

Join each **solid** to the correct number of faces. You will find the answers in your Leckie & Leckie Secondary Maths Dictionary. The first one has been done for you.

- |                 |    |
|-----------------|----|
| 1. cube         | 20 |
| 2. cuboid       | 12 |
| 3. tetrahedron  | 5  |
| 4. pentahedron  | 6  |
| 5. decahedron   | 4  |
| 6. dodecahedron | 6  |
| 7. icosahedron  | 10 |

### C. Spelling

In each of the following sets of words, one word is spelt incorrectly. Circle it and then write the correct spelling in the space provided. Use your Leckie & Leckie Secondary Maths Dictionary to check that you are right.

1. base, hieght, line .....
2. conkave, convex, curve .....
3. horisontle, perpendicular, vertical .....
4. cube, cuboid, silinder .....
5. prizum, pyramid, sphere .....
6. object, image, reflecshon .....



# Worksheet 24

Name .....

Date .....

Class .....

## Area, volume and measure

### A. Different meanings

Here is a list of pairs of words that are close to each other in the Leckie & Leckie Secondary Maths Dictionary. Write one sentence explaining what the difference is in their meaning. The first one has been done for you.

- centigram/centigrade *A centigram is a measure of weight, but centigrade is a measure of temperature.*
- cube/cuboid .....
- kilometre/kilogram .....
- millilitre/millimetre .....
- minute/millennium .....
- prism/pyramid .....

### B. Missing words

Fill in the missing words. Then look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

- The area of a **rectangle** is  $l$  times  $b$ .
- The **v** of a **cuboid** is length times breadth times  $h$ .
- A **tetrahedron** has 4 **t** faces.
- A **hemisphere** is half a **s**.
- The **perpendicular** height is drawn at **r** a to the base.
- The plural of **vertex** is **v**.

### C. Abbreviations

Join each measure to its abbreviation with a line. The first one has been done for you. Check the entries in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

- |                      |                 |
|----------------------|-----------------|
| 1. millimetre        | g               |
| 2. gram              | km <sup>2</sup> |
| 3. centilitre        | cm <sup>2</sup> |
| 4. square kilometre  | mm              |
| 5. litre             | kg              |
| 6. square centimetre | min             |
| 7. minute            | l               |
| 8. kilogram          | cl              |



# Worksheet 25

Name .....

Date .....

Class .....

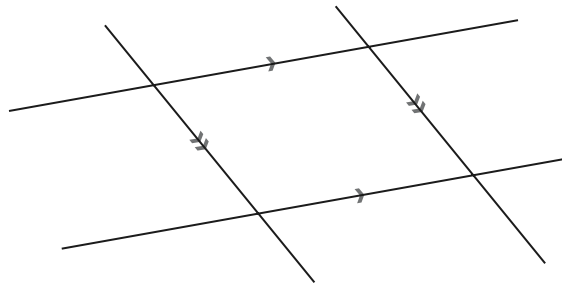
## Constructing

### A. Angles on parallel lines

Use your Leckie & Leckie Secondary Maths Dictionary to find out about these angles:

alternate angles    corresponding angles    interior angles    vertically opposite angles

Mark a pair of each type of angle on these parallel lines:



### B. Bisect

Make sure you know what **bisect** and **bisector** mean by looking them up in your Leckie & Leckie Secondary Maths Dictionary. Then complete the following statements.

1. When an angle of  $64^\circ$  is bisected, the result is two angles of .....
2. The bisector of a line measuring 4.8 cm forms 2 line segments of ..... cm each.
3. The bisector passes through the ..... of the line.
4. The perpendicular bisector of the base of an isosceles triangle forms 2 equal smaller triangles. These are congruent.

### C. Word crosses

Two words with the same middle letter can be arranged in the form of a cross. For example:

```

A
N
R I G H T
L
E
    
```

Form a word cross from each of the pairs of definitions below. Note that the words do not have to be the same length.

- |  |  |  |
|--|--|--|
| <p>1. An angle between zero and ninety degrees + a word meaning identical.</p> | <p>2. A triangle with three different sides + an instrument for drawing a straight line.</p> | <p>3. A word meaning a figure + another word for a reflection.</p> |
|--|--|--|



# Worksheet 26

Name .....

Date .....

Class .....

## Polygons and polyhedrons

### A. Polygons

Complete these words to form the name of a polygon. Then write down the number of sides for each polygon. The first one has been done for you. If you need help, look in your Leckie & Leckie Secondary Maths Dictionary.

- |                    |           |
|--------------------|-----------|
| 1. quadrilateral 4 | 5. octa   |
| 2. penta           | 6. nona   |
| 3. hexa            | 7. deca   |
| 4. hepta           | 8. dodeca |

### B. All mixed up

Sort out these words to make sense, and write out the sentences. If you need help, look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary.

- Five has vertices a **pentagon**.
- A pattern is polygons of a **tessellation**.
- A has pair of angles a opposite equal **kite**.
- A is quadrilateral shape almost a **delta**.
- Two parallel pairs of a **rhombus** has sides.
- Dimensions a three **solid** has.
- Shape vertices of a **diagonal** joins two a.
- Supplementary** polygon interior angle the angle exterior are a and of.

### C. Sketch these words

Draw a small sketch to illustrate each of these words. Then compare them with the diagrams in your Leckie & Leckie Secondary Maths Dictionary.

- |                        |               |            |
|------------------------|---------------|------------|
| 1. arrowhead           | 2. set square | 3. cuboid  |
| 4. hemisphere          | 5. hexagon    | 6. kite    |
| 7. isosceles trapezium | 8. cube       | 9. rhombus |



# Worksheet 27

Name .....

Date .....

Class .....

## Measures and measuring

### A. Missing measures

Fill in the missing words in the sentences below. Use your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

1. Bearings are measured in d.....
2. Area can be measured in h.....
3. A tonne measures .....
4. Measure time in s....., m..... and h.....
5. There are three f..... in a yard.
6. A year has ..... days, ..... weeks and ..... months.

### B. Choosing words

Underline the correct word from the words in the brackets.

1. The man was 6 (inches, feet, yards) tall.
2. Measure bearings in a (clockwise, anticlockwise) direction from (north, south, east, west).
3. Jack lives 400 (millimetres, centimetres, metres) from his school.
4. Jenny took 20 (seconds, minutes, hours) to walk across town.
5. She bought a 500 (litre, millilitre, centilitre) carton of milk at the supermarket.
6. The field measured 50 (square metres, square centimetres, hectares).

### C. Abbreviations

Join the measure to its correct abbreviation with a line. The first one has been done for you. Check the words in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

- |                     |                 |
|---------------------|-----------------|
| 1. cubic millimetre | lb              |
| 2. ounce            | gal             |
| 3. pound            | pt              |
| 4. foot             | m <sup>3</sup>  |
| 5. cubic centimetre | mm <sup>3</sup> |
| 6. pint             | oz              |
| 7. cubic metre      | cm <sup>3</sup> |
| 8. gallon           | ft              |



# Worksheet 28

Name .....

Date .....

Class .....

## Angles and triangles

### A. Right angles

You may need to check the definitions of the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary before you start this sheet.

1. Draw a **right-angled triangle** in the box opposite.
2. Mark the **right angle** in the correct way.
3. Label the **hypotenuse**.
4. Mark another angle. Label the sides **adjacent** and **opposite** to this angle.

### B. Pythagoras' theorem

1. Complete the definition of Pythagoras' theorem below. Look up this theorem in your Leckie & Leckie Secondary Maths Dictionary to check that you are right.

In a r..... triangle, the sq..... on the h..... is equal to the s..... of the sq..... on the other t..... sides.

2. Copy the diagram in the Dictionary on the right.

### C. Trigonometry

Can you remember the trigonometry ratios? If not, look up **SOHCAHTOA** in your Leckie & Leckie Secondary Maths Dictionary.

Now complete these ratios, using the words **opposite**, **adjacent** and **hypotenuse**:

1. sine =
2. cosine =
3. tangent =

### D. Applying what you know

Now solve these problems using the facts that you have learnt on this worksheet.

1. DEF is a right-angled triangle with  $\angle F = 90^\circ$ . Find the missing side if  $EF = 3$  cm and  $FD = 4$  cm.
2. XYZ is a right-angled triangle with  $\angle Z = 90^\circ$ ,  $\angle X = 73^\circ$  and  $XY = 8.5$  cm. Find YZ.
3. PQR is a right-angled triangle with  $\angle Q = 90^\circ$ , the hypotenuse is 18 cm and  $PQ = 14$  cm. Find QR.



# Worksheet 29

Name .....

Date .....

Class .....

## Constructing and transforming figures

### A. Transformations

Complete the following definitions. Then look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

1. An **enlargement** is .....
2. **Reflection** is .....
3. **Rotation** is .....
4. **Translation** is .....

### B. Constructions

When you are asked to **construct** a figure, what do you have to do? If you cannot remember, check the definition in your Leckie & Leckie Secondary Maths Dictionary.

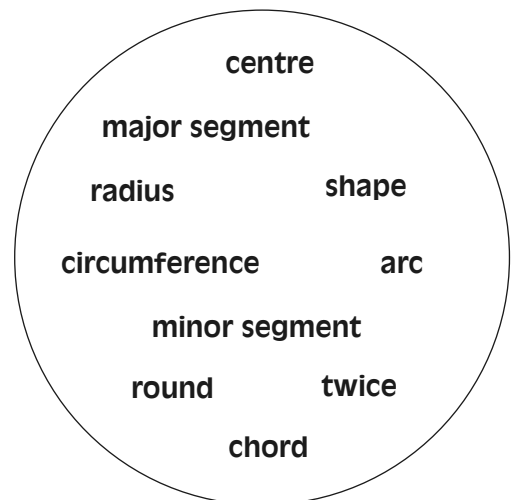
The words below are names of pieces of equipment you may need to construct a figure, but the letters are jumbled up. Write the correctly spelt words in the spaces. The first one has been done for you.

1. euler                    ruler
2. nciple                    .....
3. pesasoscm                    .....
4. ractorprot                    .....
5. epn                    .....
6. burbre                    .....
7. est arsqueu                    .....
8. rashpreen                    .....

### C. Circle

Complete this description by writing the correct word from the circle in the gaps provided.

A circle is a ..... The distance from the ..... to the circumference is the ..... The diameter is ..... the radius. A ..... is a straight line joining the ends of an ..... It divides the circle into a ..... and a ..... The ..... of a circle is found from the formula  $C = 2\pi r$ .





# Worksheet 30

Name .....

Date .....

Class .....

## Area, volume and measure

### A. Cross-sections

Complete the definitions of these solids, then check them in your Leckie & Leckie Secondary Maths Dictionary.

1. The uniform cross-section of a **triangular prism** is a t.....
2. The uniform cross-section of a **cube** is a s.....
3. The uniform cross-section of a **sphere** is a c.....
4. The uniform cross-section of a **cylinder** is a c.....
5. The uniform cross-section of a **cuboid** is a r.....

### B. Compound measures

Fill in the gaps in the following statements with the correct measures. You may need to look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary.

1. **Average speed** is total d..... per total t.....
2. **Density** is m..... per unit v.....
3. **Pressure** is f..... per unit a.....
4. A car's fuel consumption is **miles per g**..... or l..... per k.....

### C. Find the word

Find the hidden words. All are in your Leckie & Leckie Secondary Maths Dictionary and all are connected with shape, space and measures.

B	R	E	A	D	T	H	Z	U	Q
A	E	D	E	E	P	S	B	O	U
S	R	F	X	N	H	I	E	S	J
E	U	O	E	S	T	G	A	S	A
V	S	R	T	I	D	H	R	A	R
O	S	C	R	T	I	T	I	M	E
L	E	E	E	Y	W	K	N	U	A
U	R	B	V	L	E	N	G	T	H
M	P	E	R	I	M	E	T	E	R
E	B	E	C	N	A	T	S	I	D

You should be able to find 18 words.



# Worksheet 31

Name .....

Date .....

Class .....

## Data and averages

### A. Vocabulary

Here are some words that you need to use when you collect and analyse data:

data experiment frequency information questionnaire  
statistics survey table tally

Complete the following statements about these words. You may need to look up the entries in your Leckie & Leckie Secondary Maths Dictionary.

1. **Information** is another word for .....
2. A **survey** is a way of .....
3. A **questionnaire** is useful because .....
4. An **experiment** is a .....
5. **Statistics** is a word describing .....
6. A **table** is used for .....
7. When you **tally**, you .....
8. The **frequency** is the .....

### B. Averages

Complete this definition:

An **average** value is .....

Now look this word up in your Leckie & Leckie Secondary Maths Dictionary. At the end of the entry you are referred to three other entries. What are they?

1. ....
2. ....
3. ....

When you are analysing data, you will use these three different averages for different situations. Look up the separate entries and write down the definitions. The definitions should include the methods used to calculate each average.

1. Name of average: ..... Definition: .....
2. Name of average: ..... Definition: .....
3. Name of average: ..... Definition: .....

### C. Words

Open your Leckie & Leckie Secondary Maths Dictionary at any page. Count 100 words. Record the number of words of each length in the table below.

No. of letters	1	2	3	4	5	6	7	8	9	10	11	12
No. of words												
Total letters												

Now work out the average number of letters in a word on the page you have opened. Which average will you use?



# Worksheet 32

Name .....

Date .....

Class .....

## Tables and charts

### A. Representing data

Put 'chart', 'graph', 'polygon' or 'table' after the following words to give 8 different ways of representing data. There are 3 entries for 'frequency'; it is not a mistake! Refer to your Leckie & Leckie Secondary Maths Dictionary if you need help.

- 1. tally .....
- 2. bar .....
- 3. bar-line .....
- 4. frequency .....
- 5. frequency .....
- 6. frequency .....
- 7. pie .....
- 8. picto .....

### B. Tallying

Use your Leckie & Leckie Secondary Maths Dictionary to help you answer the following questions.

- 1. What is the meaning of **tally**? .....
- 2. Which language does the word **tally** come from? .....
- 3. What is the history of the word **tally**? .....
- 4. ....

This table shows tally marks and numbers. Fill in the gaps.

Tally	Number
	.....
.....	25
.....	12
###	.....
.....	31

### C. Drawing bar charts

Look up **bar chart** and **bar-line graph** in your Leckie & Leckie Secondary Maths Dictionary. Sketch the following charts. Label the axes and give a title to each one.

**1. A horizontal bar chart**

**2. A vertical bar chart**

**3. A bar-line graph**



# Worksheet 33

Name .....

Date .....

Class .....

## Probability

### A. Opposites

There are a number of words used in probability that are made into their opposites by adding a prefix. Add a prefix to each headword below to form the opposite. You will find your Leckie & Leckie Secondary Maths Dictionary useful for checking. The first one has been done for you.

(Opposite words are also called **antonyms**.)

Headword	+	Prefix	=	Opposite
1. certain	+	<u>un</u>	=	<u>uncertain</u>
2. likely	+	.....	=	.....
3. possible	+	.....	=	.....
4. fair	+	.....	=	.....
5. biased	+	.....	=	.....

### B. Probability

Look up **probability** in your Leckie & Leckie Secondary Maths Dictionary, then complete the following statements. You may have to look up additional words.

- The probability of an event occurring is .....
- Probability can be given in three forms: .....
- Probability is found by .....
- The symbol used for probability is .....
- A probability scale is .....
- If an event is certain, its probability equals .....
- If an event is impossible, its probability equals .....

### C. Outcomes

Outcomes can be **certain, likely, unlikely, impossible**.

Check the meanings of these words in your Leckie & Leckie Secondary Maths Dictionary and then match them to the following statements.

- I will get a score of 15 when I throw 2 dice. ....
- You will eat an apple today. ....
- Monday will follow Sunday next week. ....
- He will score 4 goals in the next match. ....
- I will pick a red queen from the pack of cards. ....
- The sun will set in the west tomorrow. ....



# Worksheet 34

Name .....
Date .....
Class .....

## Gathering data

### A. Types of data

The words in the left-hand column below all relate to handling data. Their meanings have been given in the right-hand column, but in the wrong order. Draw a line from each term to connect it to the correct meaning. Then use your Leckie & Leckie Secondary Maths Dictionary to check if you are right.

- |                   |                                  |
|-------------------|----------------------------------|
| 1. sample         | the limits of a group            |
| 2. hypothesis     | arranged in groups with no gaps  |
| 3. discrete data  | information organised in groups  |
| 4. continuous     | a group of observations          |
| 5. grouped data   | a theory tested by investigation |
| 6. class interval | separate items or groups of data |

### B. Sources

Complete this statement, then look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

A **primary source** of data is .....,  
 whereas a **secondary source** of data is found .....

An example of a secondary source is a reference book.  
 List 5 more secondary sources below.

1. ....
2. ....
3. ....
4. ....
5. ....

### C. Questionnaires

When you design a questionnaire, you should remember the following points:

1. Make your questions short and give a choice of answers.
2. Questions should not be too complicated.
3. Questions should have a definite answer; they should not be too open.
4. Do not give your opinion; that would be a leading question.
5. Questions should be in a logical order.

Design a questionnaire to survey how useful students find the Leckie & Leckie Secondary Maths Dictionary. Include at least 5 questions.



# Worksheet 35

Name .....

Date .....

Class .....

## Tables and charts

### A. Representing data

Put **chart**, **diagram**, **graph**, **pyramid** or **table** after the following words to give 8 different ways of representing data. Refer to your Leckie & Leckie Secondary Maths Dictionary if you need help.

1. distance–time .....
2. line .....
3. population .....
4. scatter .....
5. stem-and-leaf .....
6. two-way .....
7. picto.....
8. pie .....

### B. Illustrating data

Choose 4 of the methods in section A. Look them up in your Leckie & Leckie Secondary Maths Dictionary.

Draw an illustration of each of them, making sure that you label the axes and give them a title.

1.

2.

3.

4.

### C. Charts

Which chart would you use to represent data in each of the following activities? Look up the words in section A in your Leckie & Leckie Secondary Maths Dictionary if you need help.

1. Illustrate a survey of cars. ....
2. Compare the different breads sold in the supermarket. ....
3. Compare English and French examination marks. ....
4. Illustrate a train journey. ....
5. Compare the population of two cities. ....



# Worksheet 36

Name .....

Date .....

Class .....

## Probability

### A. Chance

Complete this statement: Chance is another word for p.....

Check your answer in your Leckie & Leckie Secondary Maths Dictionary.

Now answer the following questions.

1. If the probability equals zero, what do you know about the event? .....
2. What would the opposite situation be? .....
3. If there is a poor chance of something happening, what is the range of probability?  
.....
4. What is the probability of an even chance? .....
5. What does the term 'fifty-fifty chance' mean? .....

### B. Probability

Open your Leckie & Leckie Secondary Maths Dictionary at any page. Count 100 words. Record the number of words of each length in the table below.

No. of letters	1	2	3	4	5	6	7	8	9	10	11	12
No. of words												

Work out the probabilities of words of a particular length occurring on that page. For example, if there were 11 words with 5 letters in your sample, the probability of a 5-letter word occurring would be 11/100.

- |                          |                           |
|--------------------------|---------------------------|
| P(2 letter word) = ..... | P(8 letter word) = .....  |
| P(3 letter word) = ..... | P(9 letter word) = .....  |
| P(4 letter word) = ..... | P(10 letter word) = ..... |
| P(5 letter word) = ..... | P(11 letter word) = ..... |
| P(6 letter word) = ..... | P(12 letter word) = ..... |
| P(7 letter word) = ..... |                           |

### C. Experimental and theoretical probability

Complete these statements, then check them against the relevant entries in your Leckie & Leckie Secondary Maths Dictionary.

**Experimental probability** is found by .....

**Theoretical probability** is found by .....

The National Lottery draw uses balls numbered 1 to 49. The theoretical probability of the first ball being an even number is 24/49. What is the theoretical probability of the first ball being each of the following?

- |                             |                                |
|-----------------------------|--------------------------------|
| 1. P(odd number) = .....    | 3. P(prime number) = .....     |
| 2. P(multiple of 3) = ..... | 4. P(includes digit 0) = ..... |

How would you do an experiment to test these probabilities?

.....

.....



# Worksheet 37

Name .....

Date .....

Class .....

## Data and sampling

### A. Recording data

Use each of the following words or phrases in a sentence to show the meaning clearly. Your Leckie & Leckie Secondary Maths Dictionary will help you if necessary.

analyse    database    data collection sheet    questionnaire    raw data

1. ....
2. ....
3. ....
4. ....
5. ....

You have been asked to conduct a survey into which sports people play or follow in their leisure time.

What different aspects of sport will you need to mention in your questionnaire?

.....

.....

.....

### B. Sampling

Complete the following statements on sampling and answer the questions. Your Leckie & Leckie Secondary Maths Dictionary will help you.

1. You should select a ra..... sample. Why? .....
2. It should be a rep..... sample. Why? .....
3. You must make sure your sample is not bi..... . Why? .....
4. There is a sample of the pop..... taken every..... years called a c..... . Why might this be useful? .....

### C. Sources

Below are some different kinds of secondary sources, but the letters in each word are jumbled up. Can you unscramble them? To help you, the capital letter marks the beginning of each word.

1. dEpcyenoclai .....
2. tenternl .....
3. cRenefeer skobo .....
4. sCrodM .....
5. weaNsprsep .....
6. dePtrin bleats .....



# Worksheet 38

Name .....

Date .....

Class .....

## Tables and charts

### A. Analysing data

Fill in the missing words in the statements below. Then check them in your Leckie & Leckie Secondary Maths Dictionary.

1. All data collected is shown in a t.....
2. Represent the data in a g....., c..... or d.....
3. These can be drawn or generated on a co.....
4. To compare results from two different surveys use fr.....  
p.....
5. To compare two variables draw a sc..... g.....
6. When all points have been plotted, draw a l..... of b.....  
f.....
7. The variables are connected by cor.....
8. Grouped data is sometimes represented in a cu..... fr.....  
g.....

### B. Cumulative frequency

1. Complete the following definition. Check by looking in your English dictionary.  
**Cumulative** means .....
2. Complete the following definition. Check by looking in your Leckie & Leckie Secondary Maths Dictionary.  
The **frequency** is .....
3. Write down a possible reason why **cumulative frequency** has been given this name.  
.....

If you are going to draw a **cumulative frequency graph**, you need to know what the following words mean. Look them up in your Leckie & Leckie Secondary Maths Dictionary.

**interquartile range   lower quartile   median   ogive   quartile   upper quartile**

4. Sketch a cumulative frequency graph below and label the **quartiles** and **median**.

Now complete these 2 statements:

5. You calculate the **interquartile range** by .....
6. **Ogive** is a special name for .....



# Worksheet 39

Name .....
Date .....
Class .....

## Probability

### A. Events

Complete the following definitions. Then look up the words in **bold** in your Leckie & Leckie Secondary Maths Dictionary to check if you are right.

- 1. Mutually exclusive** events are .....
- 2. Independent** events are .....
- We use the '**or**' rule for ..... events.
- We use the '**and**' rule for ..... events.

State whether you would use the 'and' rule or the 'or' rule to calculate the probability of each of these 2 events:

- Find the probability of picking a red or blue ball from a bag containing 4 blue, 7 red and 2 green balls.  
I'd use the ..... rule.
- Find the probability of picking a red ball and then putting it back, before picking a blue ball from a bag containing 4 blue, 7 red and 2 green balls.  
I'd use the ..... rule.

Now work out the probabilities.

### B. Relative frequency

Complete these statements, then check the entry in your Leckie & Leckie Secondary Maths Dictionary to see if you are right.

- 1. Relative frequency** is a way of .....
- The formula for relative frequency is .....

Now work out the following:

- How many times would you get heads when you toss a coin 10 times?  
.....
- How many times would you get heads when you toss a coin 2000 times?  
.....

### C. Tree diagrams

- Complete these sentences about tree diagrams.  
A tree diagram is a way of ..... It is used when more than one event is taking place. It has br ..... like a tree. Each pair of branches is used to show P(event) and P(~~event~~). Remember that  $P(\text{event}) = 1 - P(\text{event})$ .
- Look up **tree diagram** in your Leckie & Leckie Secondary Maths Dictionary and copy the diagram below.

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