Parent-Pupil

MATHS

Information File 1

Number
including Money

for SEAG Entrance Assessment

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- Practice Tests Series 2 (*3 complete tests*)
- Practice Tests Series 3 (*3 complete tests*)

Contents

Introduction

This Information File is a comprehensive revision package in Maths covering all aspects of the **Number** attainment target as required for the SEAG Entrance Assessment (covering Number and Money). The 4 books in the series provide a comprehensive revision guide for parents, and also covers the requirements of the Mathematics and Numeracy Area of Learning of The Northern Ireland Curriculum for the end of Key Stage 2.

It should be understood, however, when using the book that the mathematical processes can often be performed in more than one prescribed method, and for some children the methods outlined within the file might not always 'unlock the door' to understanding.

We recommend that when a child is experiencing difficulty in grasping a specific mathematical process the parent should meet with their child's class teacher to discuss the nature of the problem and possible solutions to it.

The Information File comprises:

- A comprehensive reference file detailing information that children should know for the **Number** attainment target of the mathematics element of the SEAG Entrance Assessment and at the end of Key Stage 2. The content, which should be learnt, is outlined briefly in a number of **NEED TO KNOW** boxes.

- A variety of example questions, with annotated step by step procedures illustrating how answers can be calculated.

- 4 practice tests that mirror the format of the maths element of the SEAG Entrance Assessment.

NEED TO KNOW

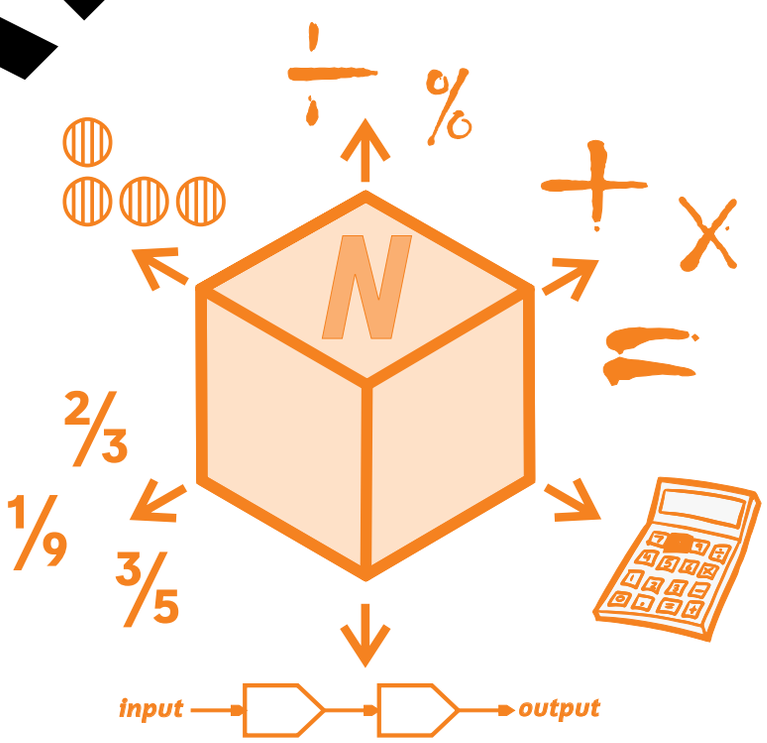
Step 1

Step 2

Step 3

Number

Part 1



Place Value (Whole Numbers)

NEED TO KNOW

Children need to know how to read, order and write whole numbers, and know the value of a digit within a number.

The value of a digit depends on its position within the number.

Whole numbers can be arranged under the following digit value headings:

H Th	T Th	Th	H	T	U
Hundreds of Thousands	Tens of Thousands	Thousands	Hundreds	Tens	Units
2	7	4	1	6	8
2H Th = 2	7T Th = 7	4Th = 4	0	6T = 6	8U = 8

Example

E.G. **What is the value of the circled digit in the number 6 (9) 7 2 8 4 ?**

Step 1 Write digit headings above the number as shown:

H Th	T Th	Th	H	T	U
6	(9)	7	2	8	4
	9 tens of thousands				
	9	**0**	**0**	**0**	**0**

Step 2 9 tens of thousands = **90,000**

Answer: 90 000

4 Jane bought 6 chocolate bars, each costing 64p.

If she gave *a* £5 note to the shopkeeper, how much change did she get back?

Step 1 Change the monetary values in the question to pounds and pence:

64p ⇒ £0.64 £5 ⇒ £5.00

Step 2 Multiply the price of the chocolate bar by 6 to find the total amount spent.

Remember to line up your decimal points— ***see page 15***

```
   £0 . 6 4
 ×       6
 ---------
   3 . 8 4
```

6 bars = £3.84

Step 3 Take the total amount spent away from £5.00 to find how much change was given.

```
   £5 . 0 0
 −  3 . 8 4
 ---------
   1 . 1 6
```

£1.16 change

Answer: £1.16 change

Multiplying by 100

There are 2 common ways of multiplying decimal numbers by 100 as shown in the table below. Children should be able to identify the type of process required to be performed.

Type 1	Type 2
Move the decimal point from where it is 2 places out towards the end of the number (i.e. 2 places to the right).	When it is only possible to move the decimal point out one place you must then: 1. Move the decimal point out one place to the right and then move the decimal point 2. Add a nought (0) to the end of the number.
e.g. 1.33 × 100 ⇒ 133 *or* 133.0 26.33 × 100 ⇒ 2633 *or* 2633.0 1.3366 × 100 ⇒ 133.66	e.g. 4 ⇒ 4 *add 0* ⇒ 40 16. ⇒ 164 *add 0* ⇒ 1640 261.6 ⇒ 2616 *add 0* ⇒ 26160

? *Example question*

2 **Multiply the largest number in the box by 100.**

16.	1.16	1.061	1.61	10.61

Step 1 Identify the largest number:
= 16.1

See page 13— **decimal place value**

Step 2 Multiply 16.1 by 100:
16.1 × 100 = 1610

See Type 2 above

Answer: 1610

Fractions

NEED TO KNOW

Children need to know how to identify and make equivalent (equal) fractions.

Equivalent fractions

Equivalent fractions are fractions that have the same value.

Rule
The top and bottom of a fraction must both be multiplied or divided by the same number to make an equal fraction (see example).

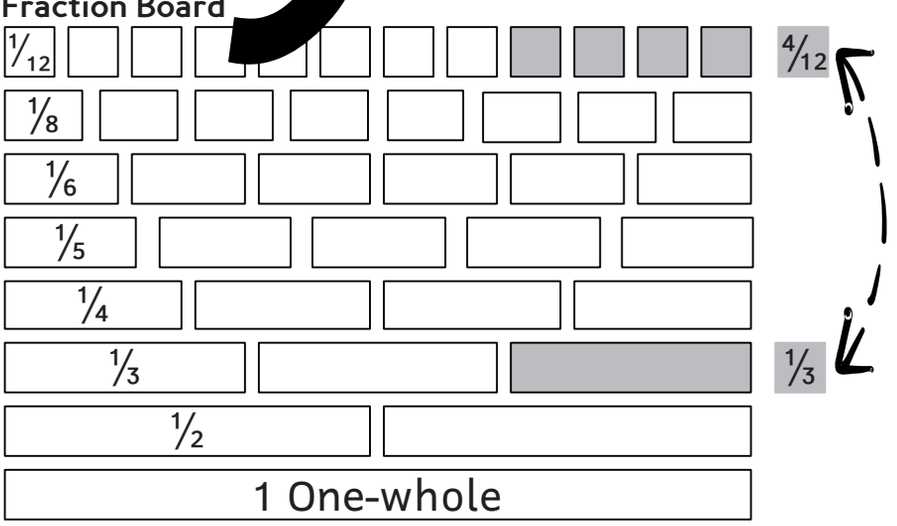
Example

E.G. **Write a number in the box to make the fractions equal.**

Top	2				(×3)	6
	—	=	—	=	—	
Bottom	3	(×3)		3		9

Equivalent fractions can be illustrated in picture form using a fraction board (see below). It may be useful for children on occasions to sketch a little fraction board of their own, as this could be of help in working out an equal fraction.

Fraction Board



The 'fraction board' shows:

$$\frac{1}{3} = \frac{4}{12}$$

Alternative or tricky ways of asking questions on the topic of fractions

Alternative 1

Sometimes children are given a fraction of an amount and are asked to calculate the **whole amount** (see example below).

NEED TO KNOW

Children need to know how to

1. calculate the whole amount of a certain value when only given a fraction of the amount (see Alternative 1), or
2. calculate a mising fraction (see Alternative 2).

Rule for calculating the whole amount

Reverse the normal rule for finding the fraction of a number, i.e. we now divide by the top number of the fraction and multiply our answer by the bottom number of the fraction.

? *Example question*

1 A teacher gave out ⅔ of the sweets as prizes.
240 sweets were given out as prizes.

How many sweets were in the jar to begin with?

Step 1 Write what you know, i.e. ⅔ = 240.

Step 2 Work out what one part or ⅓ is equal to.
If ⅔ = 240 (divide the top part of the fraction into the number,

i.e. $2\overline{)240} = 120$.

Step 3 Multiply your answer by the top of the fraction, i.e. 3

i.e. $3 \times 120 = 360$.

360 sweets were in the jar to begin with.

Answer: 360 sweets

How to calculate percentages of amounts

NEED TO KNOW

Children need to know how to calculate a percentage of a number.

To calculate percentages of numbers you must first change the percentage into a fraction. This can be done by writing the percentage as a fraction (25% = $\frac{25}{100}$), and then writing the fraction in its lowest terms (i.e. $\frac{25}{100} = \frac{1}{4}$). Children should know the relationship between percentages, fractions and decimals, as shown on the table below.

Rule

Change the percentage to a fraction and divide by the bottom digit of the fraction and multiply the answer by the top digit of the fraction.

Example

E.G. **What is 75% of 160?**

See the table below

Step 1 Change the percentage to a fraction.

$$\frac{75}{100} = \frac{3}{4} \quad (\div 25)$$

Step 2 Divide the bottom digit of the fraction into the amount, and multiply the answer by the top digit of the fraction.

$$\frac{3}{4} \text{ of } 160 = 160 \div 4 \times 3 = 120$$

Answer: 120

The relationship between fractions, decimals and percentages

Fraction		Decimal		Percentage
1/10	=	0.1	=	10%
1/4	=	0.25	=	25%
1/3	=	0.33	=	33⅓%
1/2	=	0.5	=	50%
3/4	=	0.75	=	75%
1/1	=	1.00	=	100%

NEED TO KNOW

Children need to know the relationship between fractions, decimals and percentages (as listed in the table).

Number Test 1

Mark: / 28

Children should have **30 minutes** to complete this test.

DATE OF TEST					
Day		Month		Year	

Candidate's Name

You should choose the **best** answer and mark the box beside or below it. Fill the box with a thin horizontal line like this ▭.

1 **What is the smallest number in this list?**

A 17010 ▭ B 17110 ▭ C 17101 ▭ D [illegible]00 ▭ E 17001 ▭

2 **What is the value of the circled digit?**

2[illegible]1[illegible]

▭ A 4 hund[illegible]d
▭ B 4 thousan[illegible]
▭ C [illegible]red
▭ D [illegible]un[illegible]
▭ E 4[illegible]ousand

3 Write the number that is 100 times smaller than 43200?

A 4320 ▭ B 43 ▭ C 4.32 ▭ D 432 ▭ E 43.2 ▭

4 In a survey of 420 people, ⅔ said their favourite colour was red.

How many people in the survey said red was their favourite colour?

A 130 ▭ B 260 ▭ C 210 ▭ D 280 ▭ E 270 ▭

For questions 23–28 you have to **write your answers**, neatly, in the box beside the question.

23 An egg carton can hold 8 eggs.

How many cartons can be filled using 73 eggs?

_____

24 A woman received £4.86 change all in coins.

What is the smallest number of coins she could have been given as change?

_____

25 A boy jumped from a window ledge onto a tra[illegible]oline and bounced back up to ⅔ of the height from which he h[illegible]mped.
The boy bounced to a height of 6.6

What height did he jump fr[illegible]

_____ **m**

26 A piece of fudge weig[illegible]osts £2.40.

How much w[illegible]kg of fu[illegible]cost?

£ _____

27 20 [illegible]en in a [illegible]s passed a science exam.
Th[illegible]fracti[illegible]f ch[illegible]en who passed was ⅘.

How many c[illegible]ren did the exam to begin with?

_____

28 A school trip to the zoo cost £2.50 for children and £3.75 for adults.
10 children and 2 adults went on the trip.

How much did the trip cost in total?

£ _____

END OF TEST

16 A family of 4 consisting of Mum, Dad, Roberto (aged 2) and Sofía (aged 14) booked a week's holiday to Spain for half-term to visit relatives. The table shows the prices for the holiday.

Adult	£375 per person
Children aged 5–18	25% off
Children under 5	FREE!

Based on these holiday prices what would be the total cost of the family holiday?

A £1031.25 **B** £750.00 **C** £656.25 **D** £1312.50 **E** £1181.50

17 **What is the decimal number that is halfway between 3.4 and 3.5?**

A 3.40 **B** 3.50 **C** 3.45 **D** 3.45 **E** 3.44

18 An orange drink was made up of ¾ water and the rest was orange.

What percentage of the drink was orange?

A 15% **B** 25% **C** 20% **D** 30% **E** 40%

19 Three 200g jars of instant coffee cost £8.25.

What would be the cost of ten jars of coffee?

A £26.50 **B** £24.75 **C** £25.00 **D** £27.50 **E** £26.75

For questions 23–28 you have to **write your answers**, neatly, in the box beside the question.

23 A paper boy received a 50% pay rise.
Before his rise he earned £7.50.

How much does he earn now?

£ _____

24 Taliyah is making booklets.
Each booklet must have 34 sheets of paper.
She can buy packets that contain
500 sheets of paper.

How many complete booklets ca[n] Taliyah make from 2 packets of p[a]per?

_____

25 In a sale ev[e]ything was reduced by 33⅓%.

How much would be saved on an item that usually cost €4[5]?

€ _____

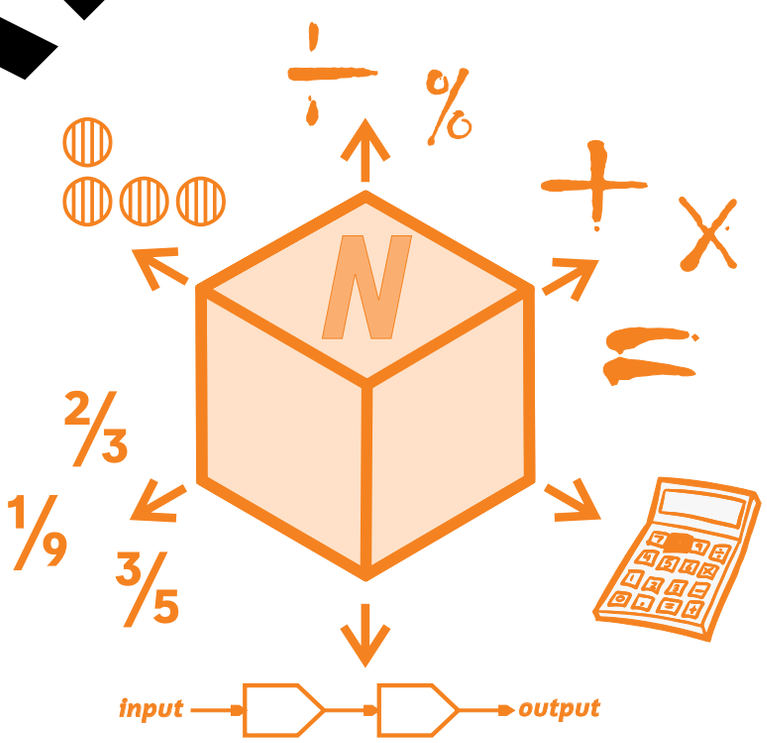
26 A man booked 30 concert tickets for a youth group.
Each ticket cost £17.
There was a booking fee of £4 for the transaction.

How much did he pay in total for the tickets?

£ _____

Number

Part 2



Square numbers

Any number multiplied by itself produces a square number. A number that is to be squared is written with a small 2 after it.

e.g.

1^2	$= 1 \times 1$	$= 1$	6^2	$= 6 \times 6$	$= 36$
2^2	$= 2 \times 2$	$= 4$	7^2	$= 7 \times 7$	$= 49$
3^2	$= 3 \times 3$	$= 9$	8^2	$= 8 \times 8$	$= 64$
4^2	$= 4 \times 4$	$= 16$	9^2	$= 9 \times 9$	$= 81$
5^2	$= 5 \times 5$	$= 25$	10^2	$= 10 \times 10$	$= 100$

Square numbers in pictorial form:

1^2 2^2 4^2

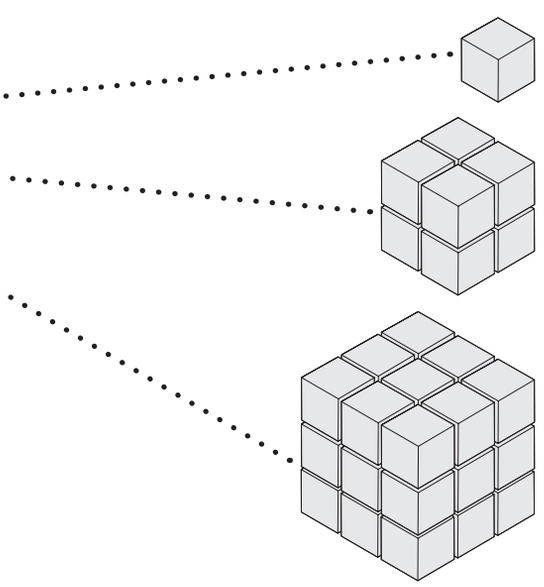
$(1 \times 1) = 1$ $(2 \times 2) =$ $3) = 9$ $(4 \times 4) = 16$

Cubed numbers

Cubed numbers are made by multiplying any number by itself 3 times.
A number to be cubed is written with a little 3 after it.

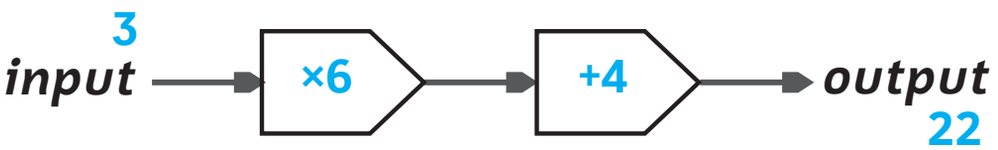
e.g. $5^3 = 5 \times 5 \times 5 = 125$

1^3	$= 1 \times 1 \times 1$	$= 1$
2^3	$= 2 \times 2 \times 2$	$= 8$
3^3	$= 3 \times 3 \times 3$	$= 27$
4^3	$= 4 \times 4 \times 4$	$= 64$
5^3	$= 5 \times 5 \times 5$	$= 125$
...		
10^3	$= 10 \times 10 \times 10$	$= 1000$
...		
20^3	$= 20 \times 20 \times 20$	$= 8000$



and so on...

Another way to show this function machine:



E.G. 2 **Calculating Input Numbers**

Complete the table below:

Input	Rule	Output
4		23
	× 5 + 3	
8		43
6		33
?		48

Rule to follow for calculating a missing input number

To calculate a missing input number as shown in Example 2, reverse the rule given and perform the opposite functions, i.e. instead of ×5 and +3 you do −3 and ÷5

48 − 3 = 45 ⟹ 45 ÷ 5 = 9.

The missing input number = 9

Answer: 9

Understanding inverse (opposite) functions

NEED TO KNOW

Children need to use the fact that multiplication and division are opposite operations to calculate missing numbers or functions.

Multiplication and division are opposite functions, e.g.

$5 \times 9 = 45$ *so* $45 \div 9 = 5$

? *Example questions*

Take the last 2 numbers, reverse them and change the sign

1 **Complete this calculation to make it equal.**

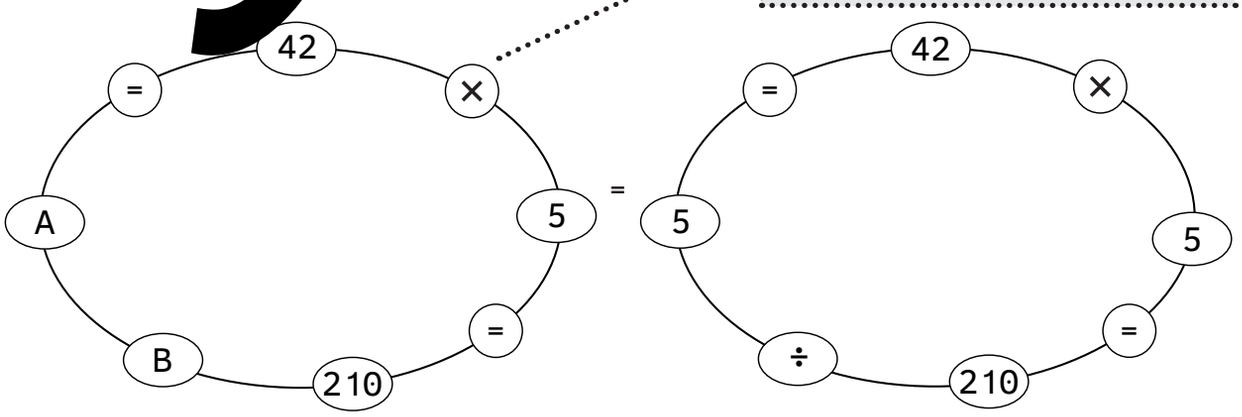
$8 \times$ [4 = 32] *so* [32 ÷ 4] $= 8$

2 **Complete this calculation to make it equal.**

$840 \div$ [10 = 84] *so* [84 × 10] $= 840$

3 **Write the function that should go in the circle marked A and the missing number which should go in circle B.**

Instead of × by 5, we ÷ by 5, i.e. we do the opposite



Answer: A = 5, B = ÷

Solving problems using a given rule

NEED TO KNOW

Children need to know how to use a simple formula or rule to solve a problem (Question 1). They should be able to understand and identify the appropriate calculation required to be performed to solve a problem (Question 2).

? *Example questions*

1 A newspaper used the rule below to work out how many winners they would have in their competition:

"Number of winners = Number of people who entered ÷ 100"

Use this rule to work out how many winners there are in a competition if 24000 people entered.

Step 1 Place the number we have been given in the question into the rule,

i.e. Number of winners = 24000 ÷ (number of people who entered) ÷ 100

Step 2 Divide 24000 by 100

(take away two zeros from 24000)

See page 27 — **dividing by 100**

Answer: Number of winners = 240.

2 A 1½ litre carton of milk can fill 14 plastic cups full to the brim.

Which of the following formulas shows how to calculate the amount of liquid in each cup?

A 1.5 + 14
B 14 × 1.5
C 14 ÷ 1.5
D 1.5 ÷ 14
E 1.5 × 14

Step 1 Write out what you know:

1½ l carton = 14 cups ⟹ 1½ l = 1.5 l

so 1 cup = 1.5 ÷ 14

Answer: **D** 1.5 ÷ 14

Pictorial Sequences

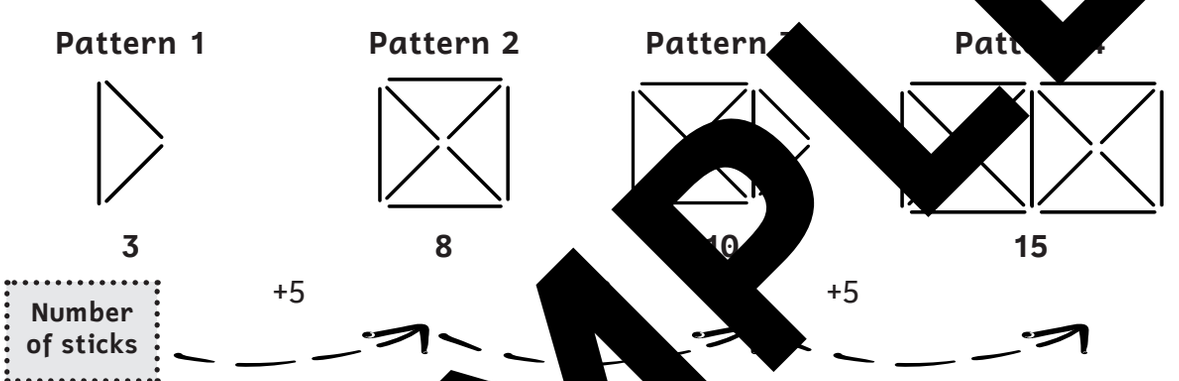
NEED TO KNOW

Children should be be able to follow a pictorial sequence to complete a pattern.

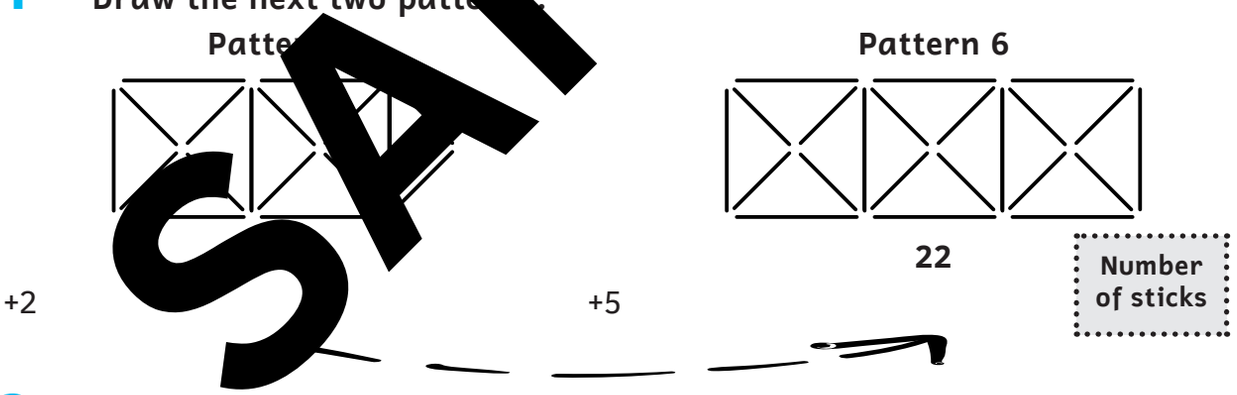
Sequences can be made from picture patterns.

? *Example questions*

Below are the first four patterns in a sequence made from sticks:



1 **Draw the next two patterns.**



2 **How many sticks will there be in pattern 7 ?**

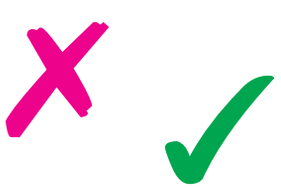
⟹ 24 (see table below to identify the pattern)

Pattern:

Pattern No:	1	2	3	4	5	6	7	8	9	10	11	12
Number of sticks	**3**	**8**	**10**	**15**	**17**	**22**	**24**	**29**	**31**			

+5 +2 +5 +2 +5 +2 +5 +2

Answer Key



Number Test 3 *see page 73*

1. C – 12
2. C – 1.5 ÷ 320
3. B – 24, 88
4. B – $R \div 5$
5. A – 15
6. B – 15
7. E – 5
8. C – Even numbers & Not cubed numbers
9. C – 15 21
10. C – 4
11. C – 8
12. D – Triangular numbers
13. B – 400
14. B – 16
15. C – 64
16. D – 4 16 20 36
17. E – 16
18. C – 512 256
19. C – 64 × 8 = 8 × 64
20. C – 61
21. B – 6
22. B – 16
23. £35.50
24. [illegible] 4 [in any order]
25. [illegible] = ÷, *b*
26. [illegible]
27. 15 21
28. 30 7 *or* 7 30

Number Test 4 *see page 82*

1. A – 9
2. B – 7
3. E – 30000
4. B – 5 m
5. D – 24
6. D – 241 . . . 176
7. B – Not even numbers & Cube[illegible]mbers
8. B – 17 [illegible]
9. C – 368 [illegible]
10. D – 13
11. [illegible]11
12. D – [illegible] 100
13. [illegible] – 26
14. [illegible] 115
15. [illegible] – Box 4
16. E – 20
17. [illegible] – 8
18. E – 310
19. D – 10 – ***m***
20. B – 185
21. E – 20, 100
22. E – 46
23. 405
24. 7
25. 25 miles
26. × 950
27. 2 4 12 36 [in any order]
28. *a* = ×, *b* = 4