**Maths**

When you start in Year 7, you will be introduced to an exciting piece of software called 'Grid Algebra'! Through this, you will build upon your knowledge of times tables to read, write and work with different expressions.

**What's Algebra All About?**

You might have heard your teacher or another adult talk about 'algebra'. If you have tackled problems where there were missing numbers then chances are you'll have been doing some algebraic thinking. If you have tried challenges which involved noticing a pattern, continuing it and finding out a general rule, then you'll have been some algebraic thinking. The activities below will give you chances to use this kind of thinking and get better at it.

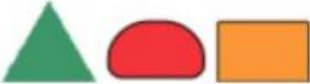**The Answers are at the end  so don't look at them until you have tried all 4 puzzles!**

Puzzle 1:      **SUPER SHAPES**

Each of the following shapes has a value:

▲ = 7     ▬ = 17

The value of the red shapes changes in each of the following problems.

Can you discover its value in each problem below, if the values of the shapes are being added together?

(a) ▲ ⬤ ▬ = 25

(b) ▬ ▲ ▲ ⬤ = 51

(c) ▲ ▲ ⬟ ⬟ ▬ ▬ : = 136

(d) ◣ ◣ ◣ = 48

(e) ▲ ▮ ▲ ▬ ▲ ▮ ▲ = 100

Puzzle 2:

**SHAPE TIMES SHAPE**

The coloured shapes stand for eleven of the numbers from 0 to 12. Each shape is a different number.

Can you work out what they are from the multiplications below?

☐ x ☐ x ☐ = ◖        ▮ x ▮ = ✳

☐ x ⬭ = ◖        ☐ x ★ = ⬡

▮ x ⬭ = ⬤        ▮ x ◇ = ▮

▮ x ☐ = ▲        ◇ x ⬢ = ⬡

▲ x ☐ = ⬤        ☐ x ▼ = ▼

☐ x ☐ = ⬭        ▼ x ◖ = ▼

Puzzle 3:    **PLENTY OF PENS**

Amy went into her local stationery shop. Her mum had given her £2.50 to spend.

Amy liked the look of some luminous pens, which cost 15p each, and some fancy pencils, which cost 10p each.



She bought four times as many pens as pencils and was given 40p change.

How many of each did she buy?

Puzzle 4:    **HOW MANY EGGS?**

Peter, Melanie, Amil and Jack received a total of 38 chocolate eggs.

Jack had one less than Peter.

Peter had 5 less than Melanie.

Amil had half as many as Melanie.

Peter had 2 more than Amil.

How many eggs did each person have?

**ANSWERS!!!**

Puzzle 1:

    (a)      Instead of writing 'red shape' , use the letter R

       So   $17 + R + 7 = 25$     and then find R = ?

       This can be rearranged as:      $25 - (17+7) = R$

$$25 - 24 = R$$

$$1 = R \qquad R = 1$$

    (b)    $17 + 7 + 7 + R = 51$ then R = ?

$$51 - (17 + 7 + 7) = R$$

$$51 - 31 = R$$

$$20 = R$$

    (c)   $7 + 7 + 17 + 17 + R + R = 136$ then R = ?

$$48 + 2R = 136$$

$$2R = 136 - 48$$

$$2R = 88$$

$$R = 44$$

    (d)   $R + R + R = 48$   then R = ?

$$3R = 48$$

$$R = 48/3$$

$$R = 16$$

(e)  7 + R + 7 + 17 + 7 + R + 7 = 100   then  R = ?

$$28 + 17 + 2R = 100$$

$$45 + 2R = 100$$
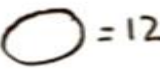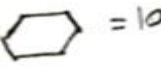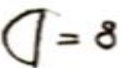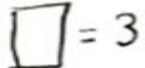
$$2R = 100 - 45$$

$$2R = 55$$

$$R = 27.5$$

Puzzle 2:



Key

□ = 2     △ = 6

○ = 12     ⬡ = 10

◖ = 8     ▭ = 3

⬭ = 4     ▽ = 0

✳ = 9     ◇ = 1

10 and 11 Where not used

Answers

1: 2×2×2 = 8       7: 3×1 = 3
2: 2+4 = 8        8: 2×5 = 10
3: 3×4 = 12       9: 3×1 = 3
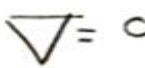4: 3×2 = 6        10: 1×10 = 10
5: 6×2 = 12       11: 2×0 = 0
6: 2×2 = 4        12: 0×8 = 0

Puzzle 3:

We work this out by taking 40p from £2.50 which is £2.10, then we use trial and error.

It is easy because there aren't many low numbers in the 4 times table.

The answer is 12 pens which equals £1.80. 12 divided by 4 = 3 so there are 3 pencils which equals 30p.

£1.80 + 30p = £2.10


Puzzle 3:

Amil – 7 eggs

Jack – 8 eggs

Peter – 9 eggs

Melaine – 14 eggs (lucky girl!)