Algebra at the Centre of Mathematical Understanding

Education Unlimited

Worksheet 1 Word Problems - Mathematics is a Language

I leave the ability group to the teacher to decide, but this is aimed at a good year 9 or average year 10 class in a State School.

Warm -up starters (mental arithmetic for the whole class)

Activity 1

1. If Joanna has ten more pairs of shoes than her brother Jake, and Joanna has 16 pairs, how many does Jake have?
2. If Wong spends double the number of hours a week studying for his GCSEs that Zoe does, and Zoe studies for 7 hours; How many hours does Wong study each week?
3. If Melvin spends £3.20 on *itunes* each week and Emily's spends a quarter of this; how much does Emily spend?
4. In a football match Raj scores double the number of goals that Ricky scores and one more goal than Jenny scores. If Jenny scores 3 goals, how many goals do they score in total? [1]

[1] Images copyrighted and owned by Microsoft Office.

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Activity 1

Your teacher will give you some Warm -up starters first.

Activity 2

1. Elsie receives double the pocket money of her younger brother, Bobbie. If Elsie receives £x in a week, how much does Bobbie receive? (in terms of x.)

2. Josh has three times the number of friends on Facebook that his younger sister, Rachel, has. If Rachel has y friends, write an expression for how many friends Josh has.

3. (a) Samantha and Biv deliver newspapers in Swindon. Samantha earns one pound less per week than Biv does. If Biv earns £z, how much does Samantha earn in a week?

   (b) Write an expression for the total amount that Samantha and Biv earn in a week.

4. Make up some of your own sentences and try writing them using algebra.

Activity 3

5. Look at the 2×2 grid below. The number in the top left cell has been entered. Using the statements below, find the other numbers are.

4	

   - the sum of the elements in the 4 cells is 32.
   - the bottom right cell is 3 more than the bottom left cell.
   - the numbers in the top left and bottom left cells comes to 13.

6. Look at the grid below, where a is an unknown. Using the statements below, find the numbers in each of the four cells.

a	

   - the sum of the elements in the 4 cells is 42.
   - The number in the top left cell is twice the number in the top right cell.

- the bottom right cell is 2 less than the bottom left cell.
- the top left cell is four times the bottom left cell.

What is the value of a?

7. Make up your own 2×2 number grid and design statements that will enable someone to work out what the numbers are. Test it with your partner.

8. If you feel brave, try making up a 3×3 Number grid with simple statements. Test it on a friend.

Activity 4

9. Imagine you are planning for your 16th birthday party. Your parents give you a budget of £4 per head for food and soft drinks, and your local favourite band costs £120 to play for part of the evening.

How much would a party cost you if you invited 12 friends?

How many friends can you invite if you have £384?

If you write x for the number of friends you invite, can you write an expression for the total cost of the party now?

Activity 5

10. (a) Sarah is planning to sell her songs online when she's in year 11. If she charges £1.50 for each song downloaded in the first 6 months, how many songs does she have to sell to raise £450 to pay for new recording equipment?

As soon as she has reached her target, she buys the equipment.

(b) If she now decides to sell her songs for £x each, and sells 68 songs in the first month, what's her projected income for the next 6 months? Write this in terms of x.