

Lesson 11: Simultaneous Equations

Aim: Solving Simultaneous Equations, imagining the concept of simultaneous equations using building blocks.

Resources:

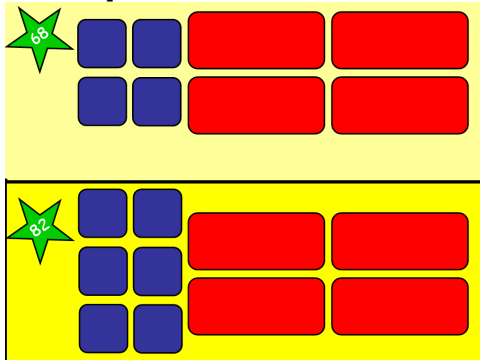
- Simultaneous equations PowerPoint
- Simultaneous equations pairing activity PowerPoint
- Simultaneous equations straight lines PowerPoint
- Coordinate cards
- Simultaneous equations word problems
- Simultaneous equations worksheet

Teacher-led activity

Print out the Simultaneous Equations Pairing Activity so that each slide is separated. You may like to scale down your print outs.

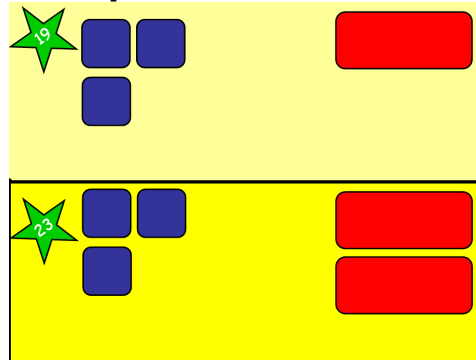
Three examples: encourage the students to think about what is the same and what is different.

Example 1.



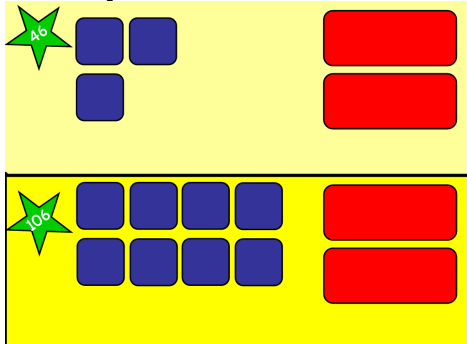
slides 1-4

Example 3



slide 6

Example 2.



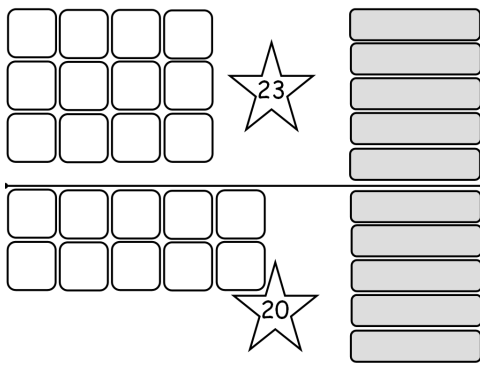
slide 5

Before beginning the pairing exercise students should be able to realise or be prompted to see that in each simultaneous equation the number of blocks are the same for one variable.

Once you reach the 'Matching Exercise' slide hand out the printed out slides.

20 to 30 minutes

Hand out the print outs. Students will match each picture to the steps of its solution, arranging the steps of the solution in the correct order. The second slide demonstrates the correct order for solving the picture on the first slide.



$$2s = 3 \quad \text{eqn 1 - eqn 2}$$

$$r = 1$$

$$s = 1.5 \quad \text{divide by two}$$

$$1 \leftarrow \div 5 \leftarrow -15 \leftarrow 20 \quad \text{write as a flow and then undo}$$

$$r \rightarrow \times 5 \rightarrow +15 \rightarrow 20 \quad \text{write as a flow and then undo}$$

$$12s + 5r = 23 \quad 1$$

$$10s + 5r = 20 \quad 2$$

$$15 + 5r = 20 \quad \text{plug } s = 1.5 \text{ into eqn (2)}$$

10 minutes

Return to the Simultaneous equations PowerPoint to look at examples where the coefficients are all different, and move towards a more formal approach. The slides leading up to this encourage the students to think of the variables as blocks worth different amounts.

Consolidate the formal approach: use the simultaneous equations worksheet or the plenary slide at the end of the presentation (the plenary slide is an open ended task).

Word problems using simultaneous equations – 3 examples using word problems and simultaneous equations. These can be used as the starter for a lesson.

Simultaneous Equations straight line graphs.

Use each graph separately and give each student a card with coordinates. Ask them to stand if they satisfy the equation 1, illustrate that they are points on the blue line. Ask them to sit down, then ask students to stand if they satisfy the equation 2, illustrate that they are points on the red line. One student has stood up twice, question the class as to the significance of this solution in relation to the equations and the graphs.

$$1 \quad y = 2x - 1$$

$$2 \quad y = x + 3$$

