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Step 2: Open your interactive resource using Adobe Acrobat Reader DC.

If you are a PC/Mac user and your downloaded PDF resource does not open using Acrobat Reader by default, simply right-click your PDF file, go to 'Open with' and select Adobe Acrobat Reader DC from the drop-down list.

Step 3: Complete the resource!

For PC/Mac users: To fill in the resource, click the text fields and type your answers as needed. Check boxes and radio buttons can simply be clicked on to make the selection of your choice and for anything else you will see the question mark icon (which, upon being clicked, will reveal specific instructions) that you respond to the corresponding question or activity. When you are finished with the resource, go to File > Save As... and save your file in a memorable location.

For smart device users: To fill in the resource, follow the same process as described above. When you are finished, simply press the back button in the top left of the appscreen and your PDF will save automatically.

Remember: Saving your PDF will overwrite the original file, so be sure to create a copy before starting if you wish to keep a blank copy of the resource on your device.

We hope you have found this information useful. If you experience any problems in following the instructions above, please contact the Beyond team at [beyond@regentstudies.com](#) and we will do our best to help with your query.

Your Turn

1. Make
- u
- the subject of
- $v = u + 2$

$$u = v - 2$$

2. Make
- x
- the subject of
- $y = x - 7$

$$x = y + 7$$

3. Make
- z
- the subject of
- $e = z + 5$

$$z = e - 5$$

4. Make
- y
- the subject of
- $2x = y - 7$

$$y = 2x + 7$$

5. Make
- g
- the subject of
- $f = 2g$

$$g = \frac{f}{2}$$

6. Make
- z
- the subject of
- $h = 5z$

$$z = \frac{h}{5}$$

7. Make
- x
- the subject of
- $y = 2x + 4$

$$y - 4 = 2x$$

$$x = \frac{y - 4}{2}$$

8. Make
- a
- the subject of
- $p = 5a + 6$

$$p - 6 = 5a$$

$$a = \frac{p - 6}{5}$$

9. Make
- b
- the subject of
- $v = \frac{b}{6}$

$$b = 6v$$

10. Make
- x
- the subject of
- $y = \frac{2x}{5}$

$$5y = 2x$$

$$x = \frac{5y}{2}$$

11. Rearrange the formula
- $d = 4t + 8$
- to make
- t
- the subject.

$$d - 8 = 4t$$

$$t = \frac{d - 8}{4}$$

12. A rectangle has a perimeter (
- P
-) given by the formula
- $P = 2l + 2w$
- . Make
- l
- the subject of the formula.

$$P - 2w = 2l$$

$$l = \frac{P - 2w}{2}$$

Challenge

- a. Rearrange
- $x = \frac{y}{3} - 4$
- to make
- y
- the subject of the formula.

$$x + 4 = \frac{y}{3}$$

$$3(x + 4) = y$$

$$y = 3(x + 4) \text{ or } y = 3x + 12$$

- b. The volume (
- V
-) of a cylinder is given by the formula
- $V = \pi r^2 h$
- . Make
- r
- the subject of this formula.

$$\frac{V}{\pi h} = r^2$$

$$r = \sqrt{\frac{V}{\pi h}}$$

Rearranging Formulae

Prior Knowledge:

Before attempting this sheet, students should be confident using BIDMAS and solving linear equations.

The **subject** of a formula is the **letter on its own** on one side of the = .

E.g. x is the subject of $x = 2y + 3z$

Rearranging formulae or **changing the subject of a formula** means making a different letter the **subject**.

Example 1:

x is currently the subject of $x = y + 3$

Make y the subject of the formula.

You can use the same methods that you use for **solving equations**.

1. You must always do the **same thing** to **both sides of the equation**.
2. To 'move' something, do the opposite (use its inverse).
 - The inverse of + is - and the inverse of - is +.
 - The inverse of \times is \div and the inverse of \div is \times .
3. Finally, you must keep going until you have the letter you want as the subject **on its own**.

The inverse of (+ 3) is (- 3) so we must subtract 3 from both sides of the equation.

It's a good idea to write down what you're doing at every stage - put it in brackets next to the equation to help you see the calculations you are doing.

$$\begin{array}{l} (-3) \quad x = y + 3 \quad (-3) \\ x - 3 = y \end{array}$$

You have now made y the subject of the formula.

Answer: $y = x - 3$

Example 2:

Rearrange $x = 6y - 15$ to make y the subject of the formula.

Start by adding 15 to both sides of the equation:

$$\begin{array}{l} (+15) \quad x = 6y - 15 \quad (+15) \\ x + 15 = 6y \end{array}$$

Now, you need to divide both sides of the equation by 6:

$$\begin{array}{l} (\div 6) \quad x + 15 = 6y \quad (\div 6) \end{array}$$

When dividing, write the answer as a fraction:

$$\frac{x + 15}{6} = y$$

$$\text{So, } y = \frac{x + 15}{6}$$

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- $y = x - 7$

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- l
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- a. Rearrange
- $x = \frac{y}{3} - 4$
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Answer: $y = x - 3$

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Start by adding 15 to both sides of the equation:

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When dividing, write the answer as a fraction:

$$\frac{x + 15}{6} = y$$

$$\text{So, } y = \frac{x + 15}{6}$$

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6. Make z the subject of $h = 5z$

7. Make x the subject of $y = 2x + 4$

8. Make a the subject of $p = 5a + 6$

9. Make b the subject of $v = \frac{b}{6}$

10. Make x the subject of $y = \frac{2x}{5}$

11. Rearrange the formula $d = 4t + 8$ to make t the subject.

12. A rectangle has a perimeter (P) given by the formula $P = 2l + 2w$. Make l the subject of the formula.

Challenge

a. Rearrange $x = \frac{y}{3} - 4$ to make y the subject of the formula.

b. The volume (V) of a cylinder is given by the formula $V = \pi r^2 h$. Make r the subject of this formula.
