

**Problem of the Week: Week 6 (Summer 2): Year 8: ratio and proportion Compound measures and conversions**

- Use compound measure such as speed, unit pricing and density to solve problems
- Use scale factors, scale diagrams and maps
- Change freely between related standard units

**Problem**

Choose three items, for example, a mobile phone, reading book, pencil. Half the dimensions of each object and draw them using these measurements, so that they fit onto a piece of A4 paper, without overlapping the diagrams. Record the following information:

- Original measurements
- New measurements

What if the scale was 1 to 3, what would the measurements be?

**Solution**

Object	Original measurements		Scales measurements	
	length(cm)	width(cm)	length(cm)	width(cm)
Mobile phone	14	7	7	3.5
Book	19.5	13	9.75 (9.8)	6.5
Pencil	15	0.6	7.5	0.3

Using scale 1 to 3

Object	Original measurements		Scales measurements	
	length(cm)	width(cm)	length(cm)	width(cm)
Mobile phone	14	7	$4\frac{2}{3}$	$2\frac{1}{3}$
Book	19.5	13	6.5	$4\frac{1}{3}$
Pencil	15	0.6	5	0.2

**Problem**

A rectangular room measures 6 metres by 4 metres. I want a scale drawing, with 1cm = 0.25m.

What will the dimensions of my scale drawing be?

Would this be a suitable scale for a room measuring 20m by 15m? Explain your answer.

<https://www.ncetm.org.uk/resources/47230> (secondary assessment materials)

**Solution**

Length is  $6 \div 0.25 = 24\text{cm}$

Width is  $4 \div 0.25 = 16\text{cm}$

If a room measures 20m by 15m, a scale of 1cm = 0.25m would not be suitable. The measurements would be:

Length is  $20 \div 0.25 = 80\text{cm}$

Width is  $15 \div 0.25 = 60\text{cm}$

These are too large to fit onto an A4 or A3 piece of paper.

**Problem**

Here are three offers for a computer.

**Tablet World**  
Usual price £170  
20% off

**IT Supplies**  
Usual price £180  
 $\frac{1}{4}$  off

**PC Heaven**  
Special offer  
Pay £23 each month  
for 6 months

Which offer is the cheapest?

Exampro: AQA GCSE 8300

**Solution**

**Tablet world:**  
New price is found by  
 $170 \times 0.8 = \text{£}136$

**IT supplies:**  
New price is found by  
 $180 \times \frac{3}{4} = \text{£}135$

**PC Heaven:**  
New price is found by  
 $23 \times 6 = \text{£}138$

The computer from IT supplies is the cheapest

