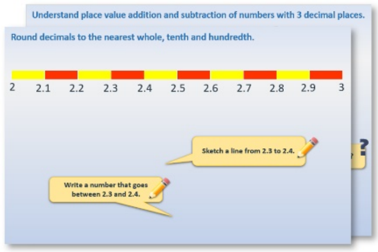
Year 6: Week 3, Day 3
Scaling: ‘similar’ shapes

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by carefully reading through the **Learning Reminders**.
   Print a copy of the ‘Similar shapes’ resource sheet first (*see next page*).



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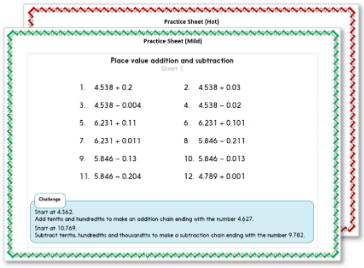
2. Tackle the questions on the **Practice Sheet**.
   There might be a choice of either Mild (easier) or Hot (harder)!
   Check the answers.



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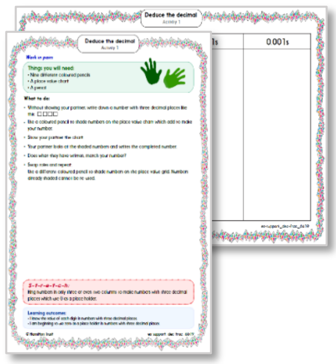
3. Finding it tricky? That’s OK… have a go with a grown-up at **A Bit Stuck?**



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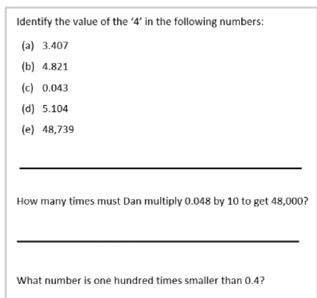
4. Have I mastered the topic? A few questions to **Check your understanding**.
   Fold the page to hide the answers!


Identify the value of the ‘4’ in the following numbers:
(a) 3.407
(b) 4.821
(c) 0.043
(d) 5.104
(e) 48,739

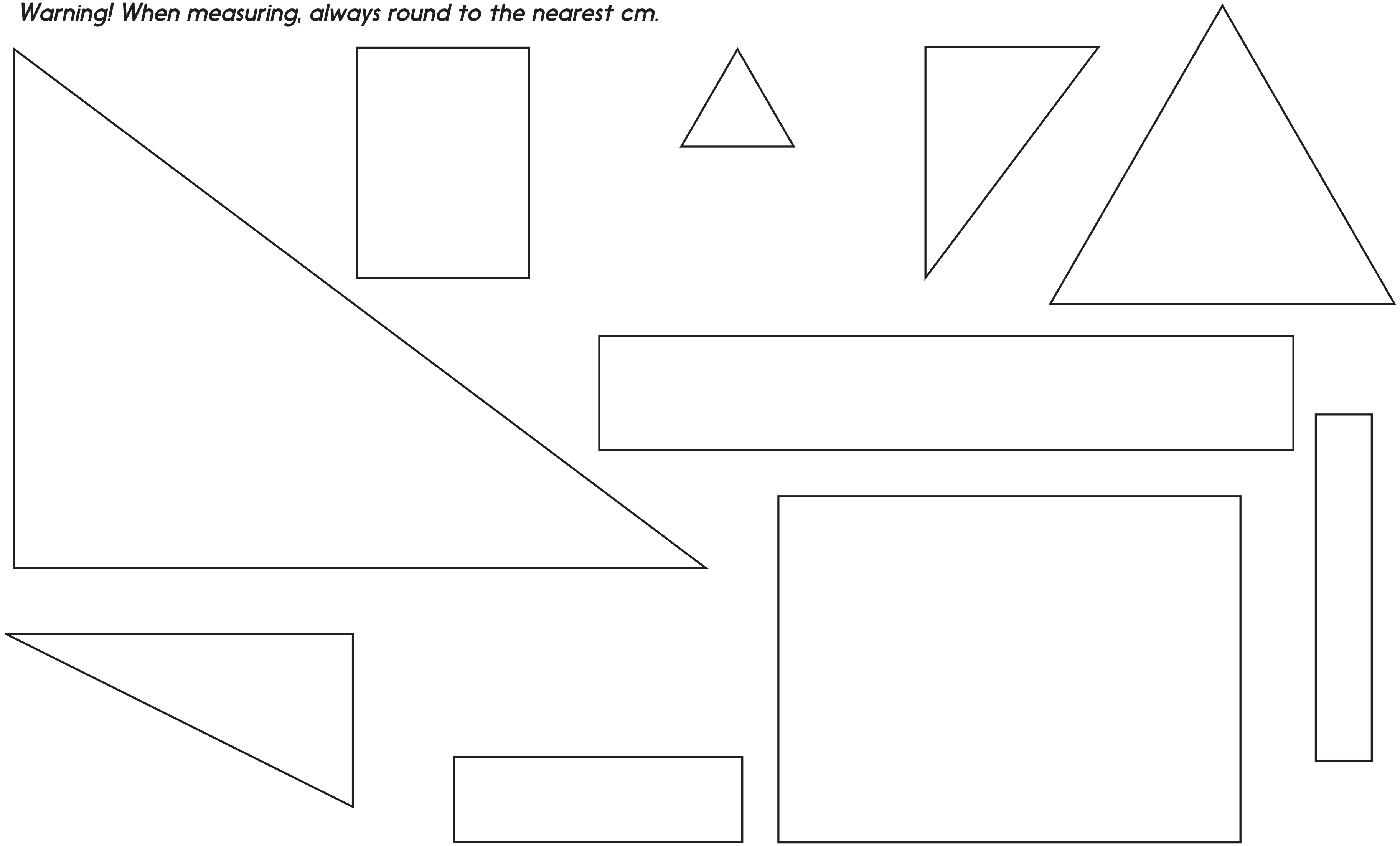
How many times must Dan multiply 0.048 by 10 to get 48,000?

What number is one hundred times smaller than 0.4?

Resource

Similar shapes

Warning! When measuring, always round to the nearest cm.

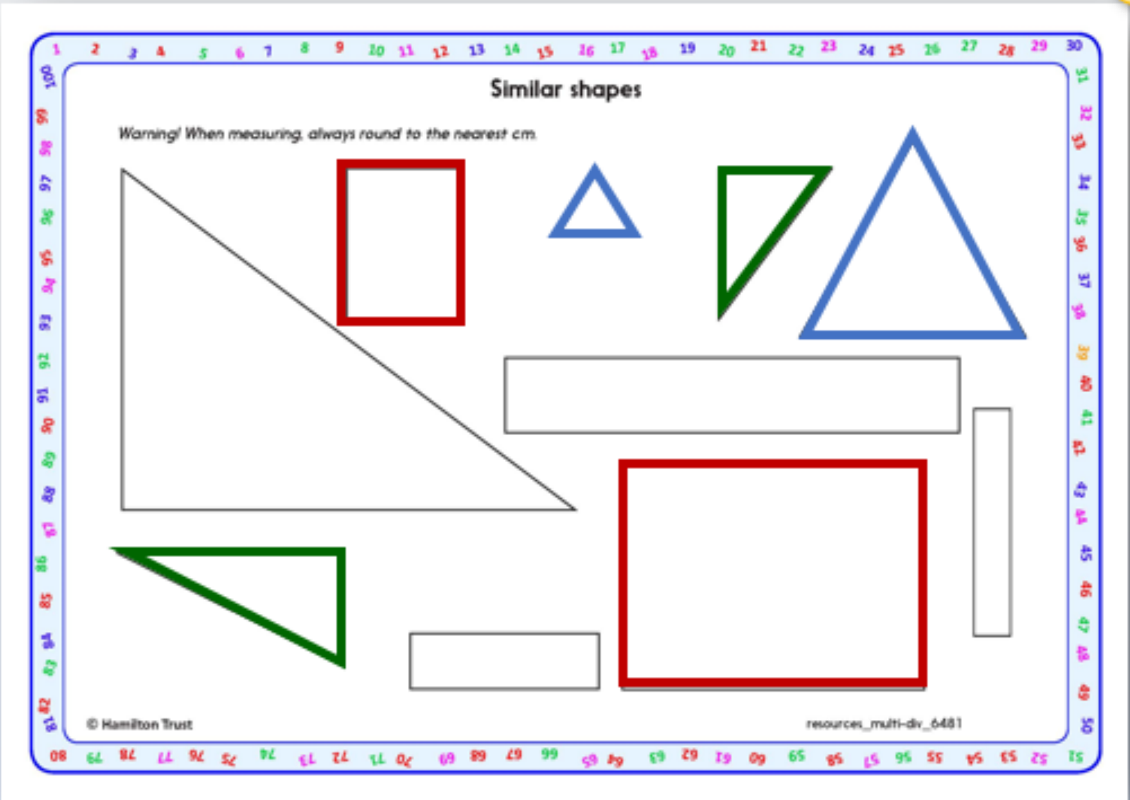


Learning Reminders

Scaling: similar shapes.

Similar shapes are identical in shape, but not in size.

So, all circles, squares and other *regular* shapes are similar, but rectangles might not be.



Step 1
On your resource sheet, find the two rectangles shown here in red. Measure the sides of each.

Calculate the scale factor, i.e. the number we need to multiply the side length of the first shape by to get the larger shape.

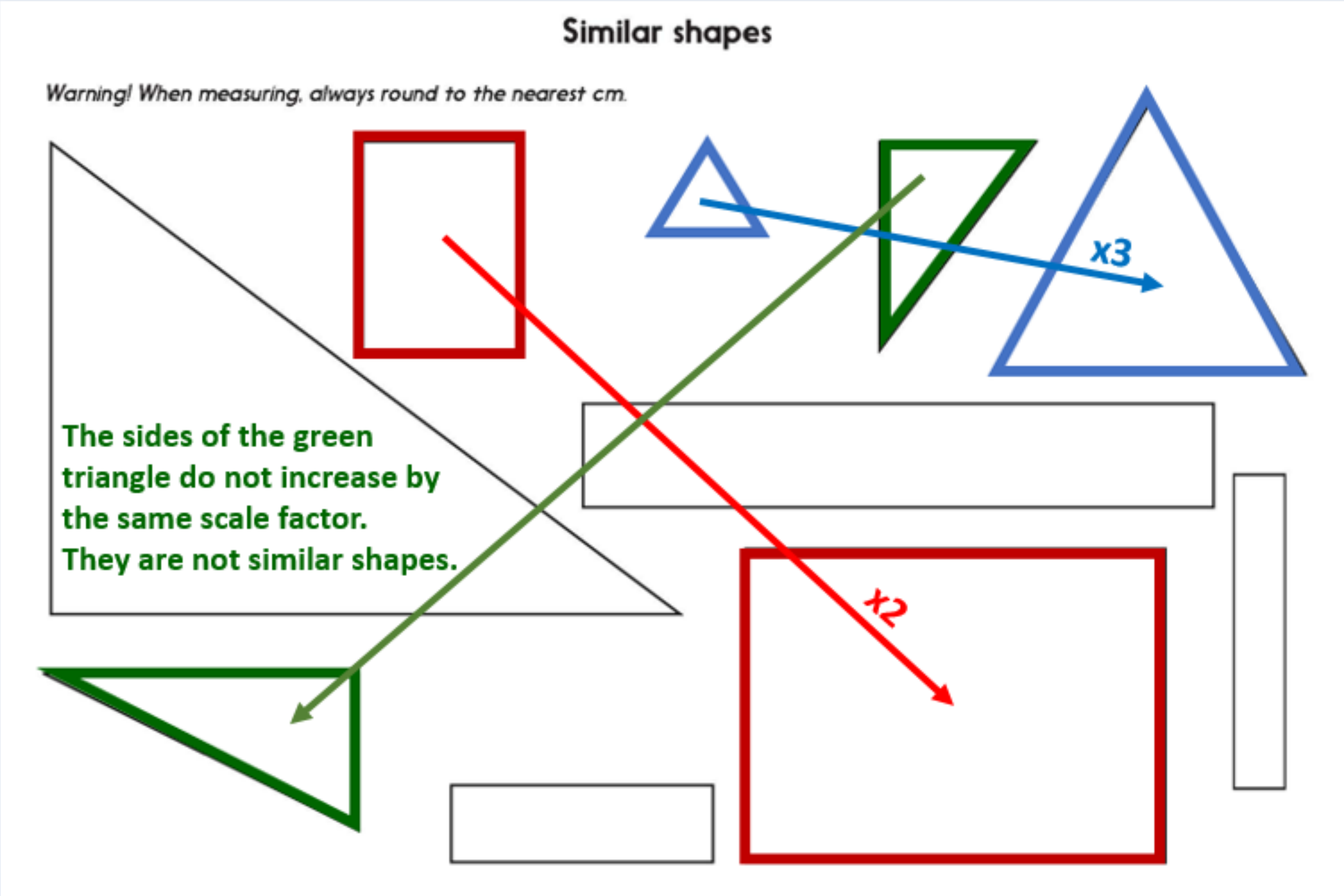
Step 2
Repeat for the blue triangles.

Step 3
Repeat for the green triangles.

It is useful to use a scale factor when producing a scale drawing of plans for a building or a model. The drawing would have the same *proportions* as the real building or model.

Learning Reminders

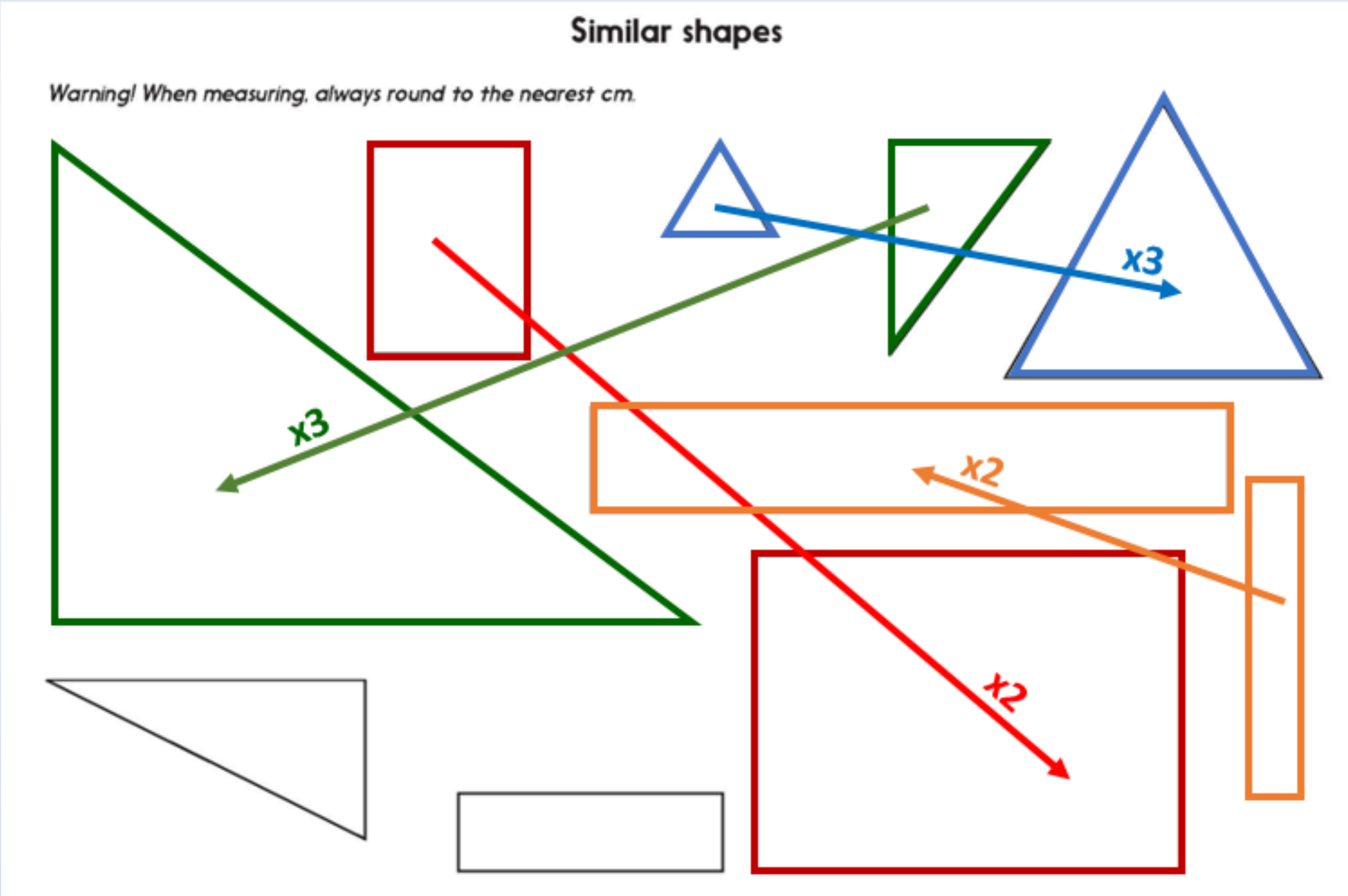
Scaling: similar shapes.



So, can you identify all pairs of similar shapes on the sheet before checking the final Learning Reminder?

Learning Reminders

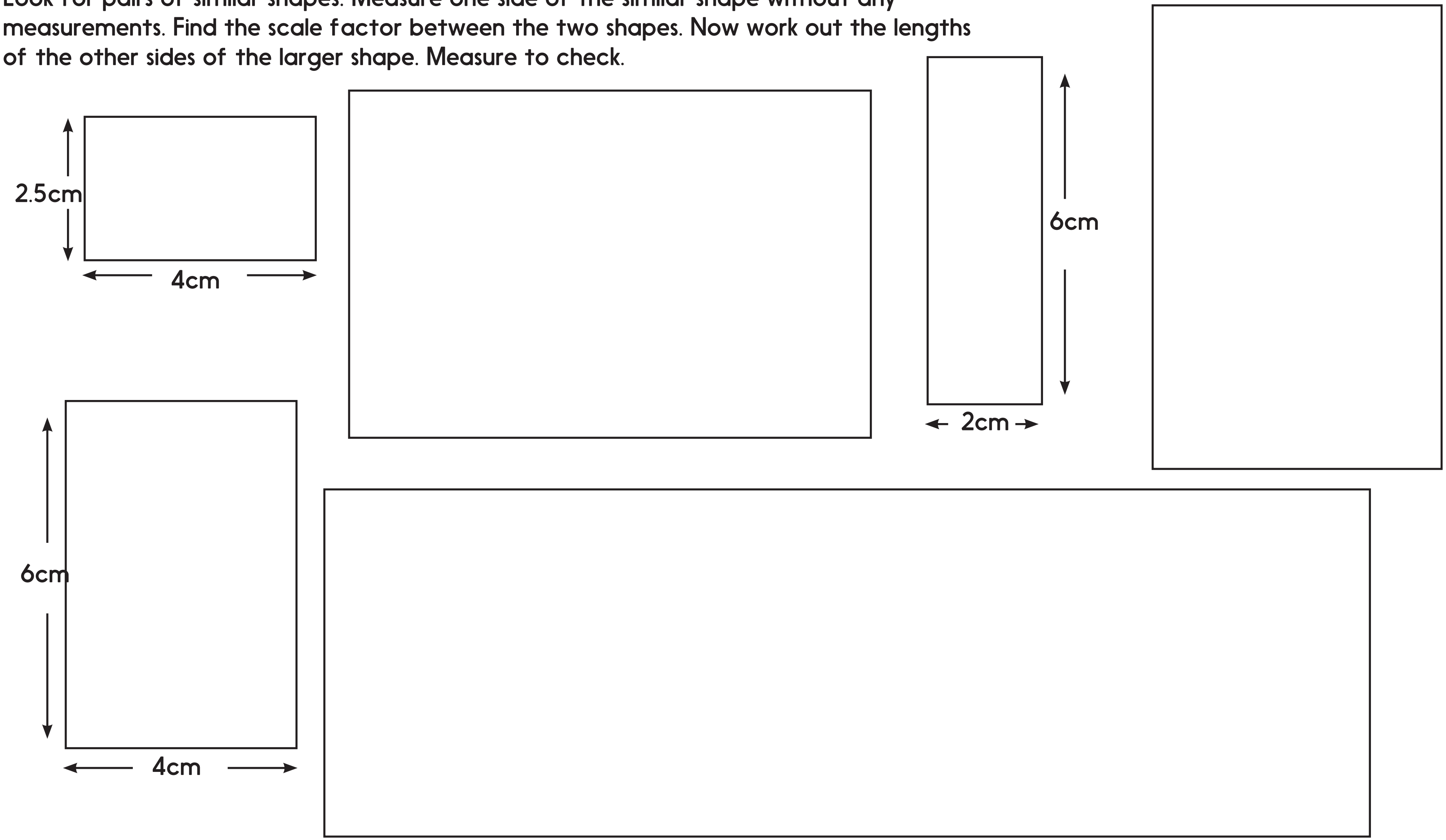
Scaling: similar shapes.



Practice Sheet Mild

Similar shapes – rectangles

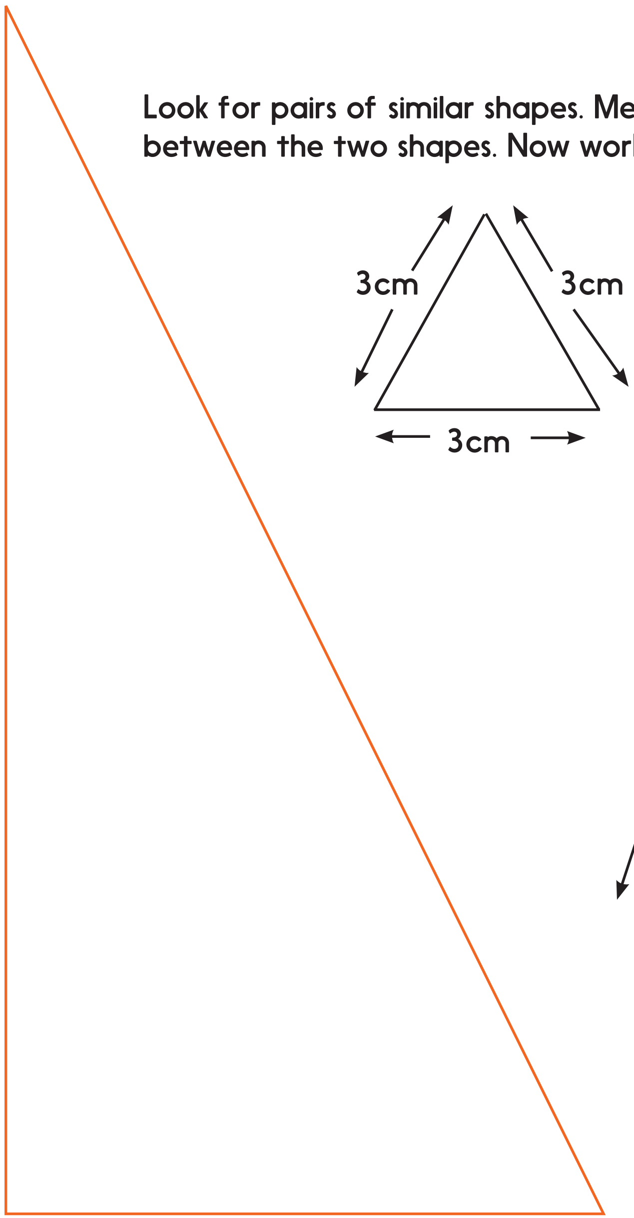
Look for pairs of similar shapes. Measure one side of the similar shape without any measurements. Find the scale factor between the two shapes. Now work out the lengths of the other sides of the larger shape. Measure to check.

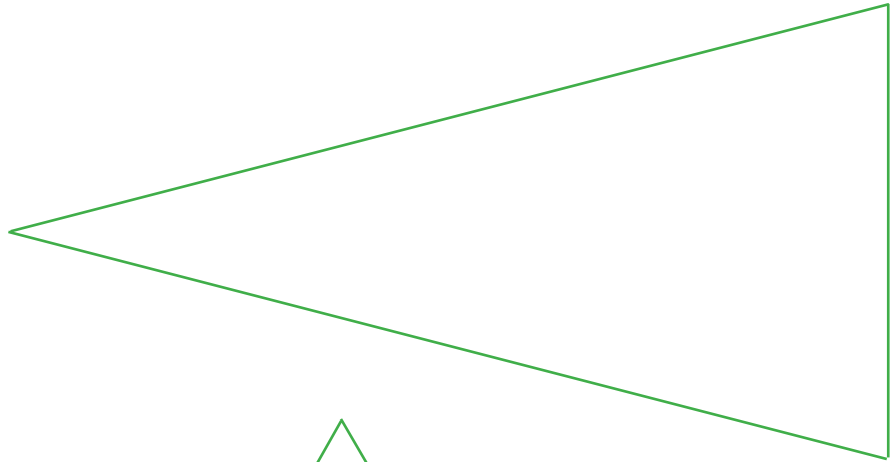


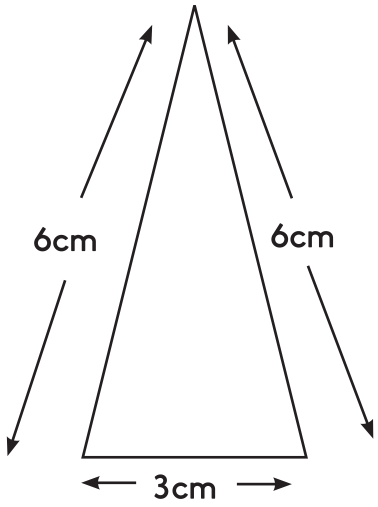
Practice Sheet Hot

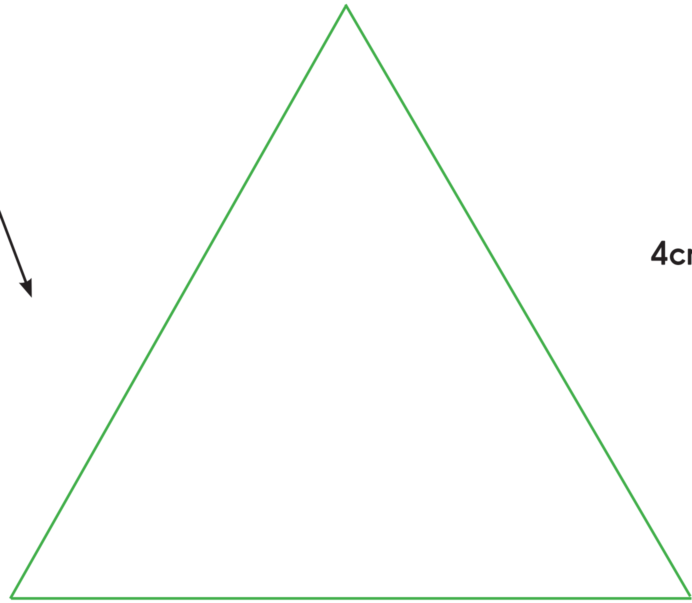
Similar shapes – triangles

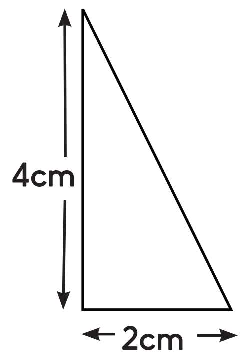
Look for pairs of similar shapes. Measure one side of the similar shape without any measurements. Find the scale factor between the two shapes. Now work out the lengths of the other sides of the larger shape. Measure to check.





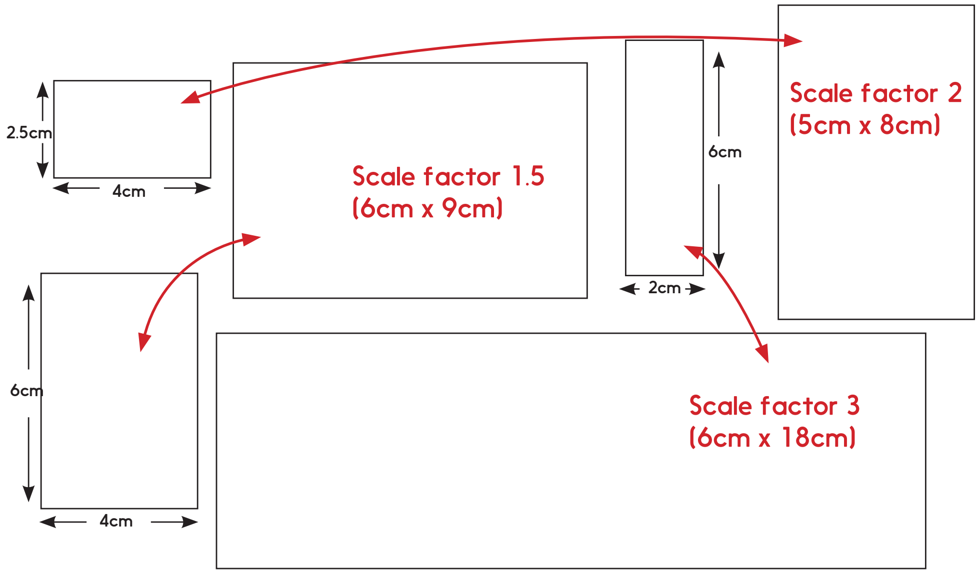




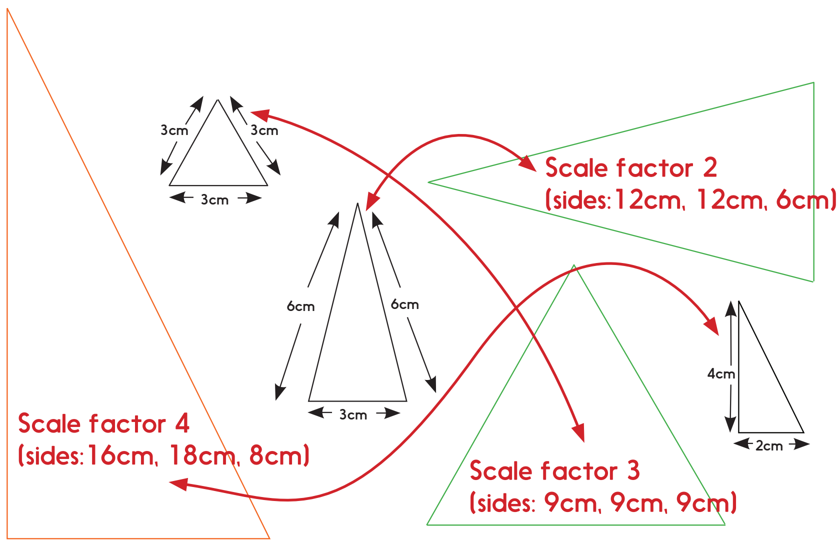


Practice Sheets Answers

Similar shapes – rectangles (mild)

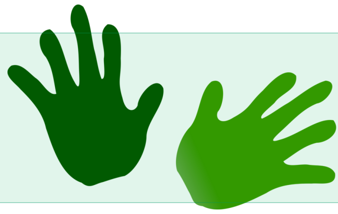


Similar shapes – triangles (hot)



A Bit Stuck?
Factors and Multiples Game 2

Things you will need:
- 1-100 grids



What to do:

Print several copies of the 1-100 game grid.

1. This is a game for two players. The first player chooses an even number <50, and crosses it out on the 1-100 grid, e.g. 22.

2. The second player must then cross out a number which is a factor or multiple of the first number, e.g. 1, 2 or 11 (factors of 22), or 44, 66 or 88 (multiples of 22).

3. Players continue to take it in turns to cross out numbers, at each stage choosing a number that is a factor or multiple of the number just crossed out by the other player.

4. The first person who is unable to cross out a number loses that round.

S-t-r-e-t-c-h:

Switch the challenge from winning the game to covering as many numbers as possible.

- What is the longest sequence of numbers that can be crossed out?
- Can more than half the numbers be crossed out?

Learning outcomes:

- I can recall factors of 2-digit numbers.
- I can use mental strategies to calculate multiples of 2-digit numbers, up to 100.

A Bit Stuck?
Factors and Multiples Game

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Check your understanding

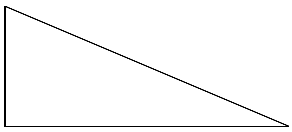
Questions

True or false?

- If one triangle is scaled up to have sides 3 times as long as another, the area is also 3 times as large.
- If two rectangles are similar and the scale factor is 4, then the area of the larger rectangle is 16 times that of the smaller rectangle.

Calculate the area of the triangle whose sides are half the length of this one.
Compare the two areas. What do you notice?

6cm



8cm

Explain why the area of the smaller has this relation to the area of the larger.

Fold here to hide answers

Check your understanding

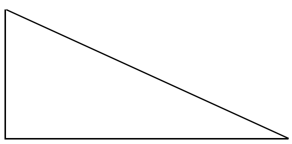
Answers

True or false

- If one triangle is scaled up to have sides 3 times as long as another, the area is also 3 times as large. False – it will be 9x as large.
  This can best be modelled with a right-angled triangle. If the base and height are 3cm and 4cm, the area will be 6cm^2 (half base x height). If the sides were 3 times longer, i.e. 9cm and 12cm, the area will be 54cm^2.
- If two rectangles are similar and the scale factor is 4, then the area of the larger is 16 times that of the smaller. True – since the length and height are **both** 4 times larger, the area increases 16 times (4 x 4).

Calculate the area of the triangle whose sides are half the length of this one. Compare the two areas. What do you notice?

6cm



8cm

Explain why the area of the smaller has this relation to the area of the larger.
The area of this triangle is 24cm^2. (Half of 6 x 8).
If the sides are halved, the area will be 6cm^2. (Half of 3 x 4).
As the lengths have been halved, the area of the smaller triangle is a quarter of the original (half x half).