Australian Curriculum Content

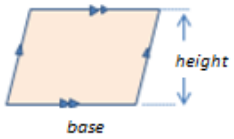
Year 7: **Measurement and Geometry: Using units of measurement** Establish the formulas for areas of rectangles, triangles and parallelograms and use these in problem solving

Year 8: **Measurement and Geometry: Using units of measurement** Find perimeters and areas of parallelograms, trapeziums, rhombuses and kites

1

Before transformation: Sample Year 8 task

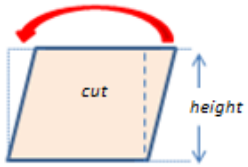
PARALLELOGRAMS



The area of a parallelogram is the

base x height

Try this yourself by cutting out a paper parallelogram and snipping off the triangle as shown in the figure below. Notice that the parallelogram becomes a rectangle but the total area obviously hasn't changed. This rectangle has the same base and height as the original parallelogram.



Find the area of:

Area = base x height

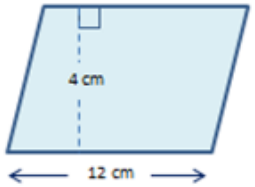
A = b x h

so **A = 7cm x 5cm**

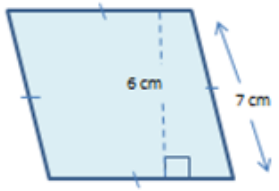
so **A = 35 cm²**

Find the areas of the following parallelograms:

a



b



What's possible?

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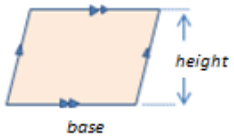

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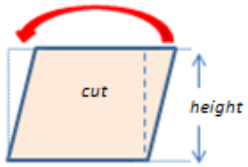

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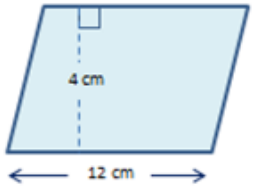
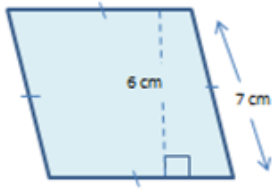


b



Transformed task: Getting the students doing the thinking

Ask students:

- ***Which is bigger – The area of the parallelogram or the area of the rectangle?***

If students recognise the areas of the rectangle/parallelogram pairs to be equal, then say:

- ***Prove it to me/convince me!***

If students don't recognise the areas of the rectangle/parallelogram pairs to be equal, then say:

- ***I think they are the same as each other.***

Students can prove you right or prove you wrong. Either way, they are proving their thinking.

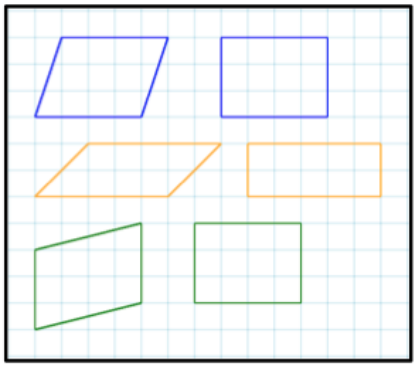


Figure 1

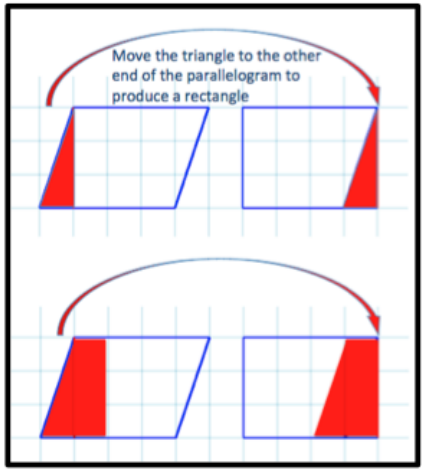


Figure 2

Encourage students to find the simplest way to rearrange the parallelogram to form its partner rectangle.

Figure 2 shows that it's possible to make a vertical cut and move that piece of the parallelogram to the opposite end of the shape to form a rectangle.

We can create opportunities for students to generalise, by asking:

- ***Is there a rule** that you could use to describe a way to work out the area of a parallelogram?*
- ***What if** you change the size of the parallelogram.....does your rule work for any size?*

Conceptual Narrative: Using units of measurement Year 7 (& 8)

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Annotations: How has the task been changed?

What did the teacher do?	Why?
Asked students to compare the area of the two shapes.	So students could establish a relationship between the area of the two shapes.
Asked students to try their own ideas rather than the teacher or textbook modelling what to do.	So students could explore and evaluate possible approaches for calculating area themselves.
Asked students to build a convincing argument about the relative areas of the two shapes.	So students could use dialogue to reflect on their ideas, clarify their reasoning and construct their own understanding.
Asked students to establish a rule that would describe a way to work out the area of any parallelogram, and challenged them to see if their rule continued to work under different conditions.	So students learn to make generalisations and experience the use of algebra in an authentic context.

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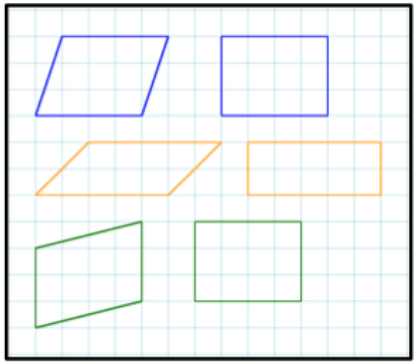

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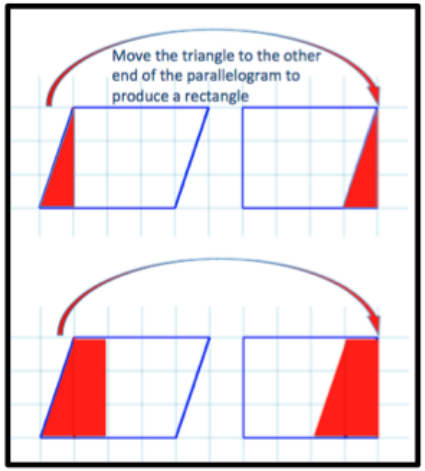

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From: Conceptual Narrative: Using units of measurement Year 8