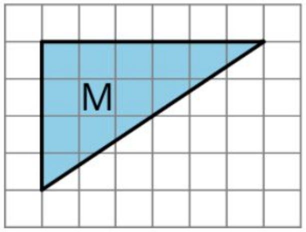
1-8: Learning Goals

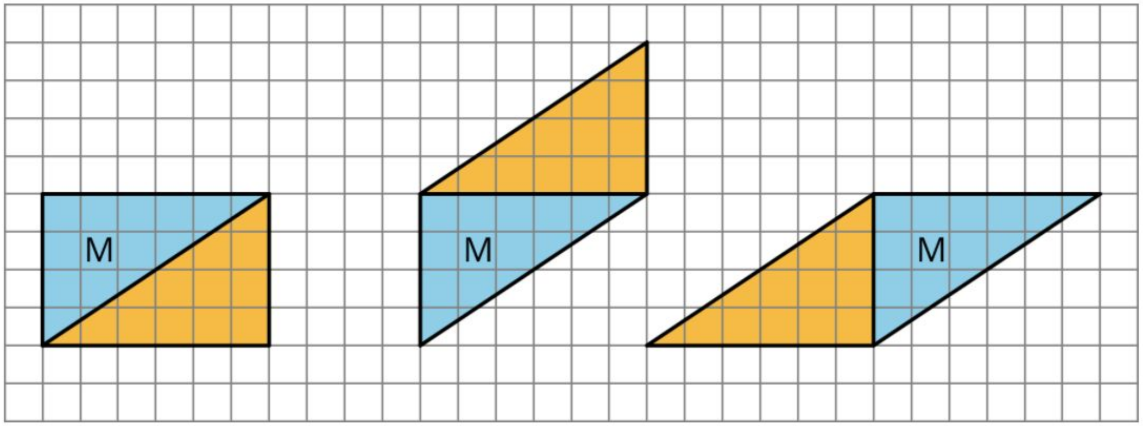
- Let's use what we know about parallelograms to find the area of triangles.

1-8-1: Composing Parallelograms

Here is Triangle M.

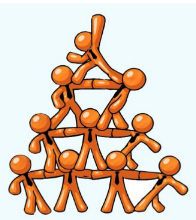


Han made a copy of Triangle M and composed three different parallelograms using the original M and the copy, as shown here.



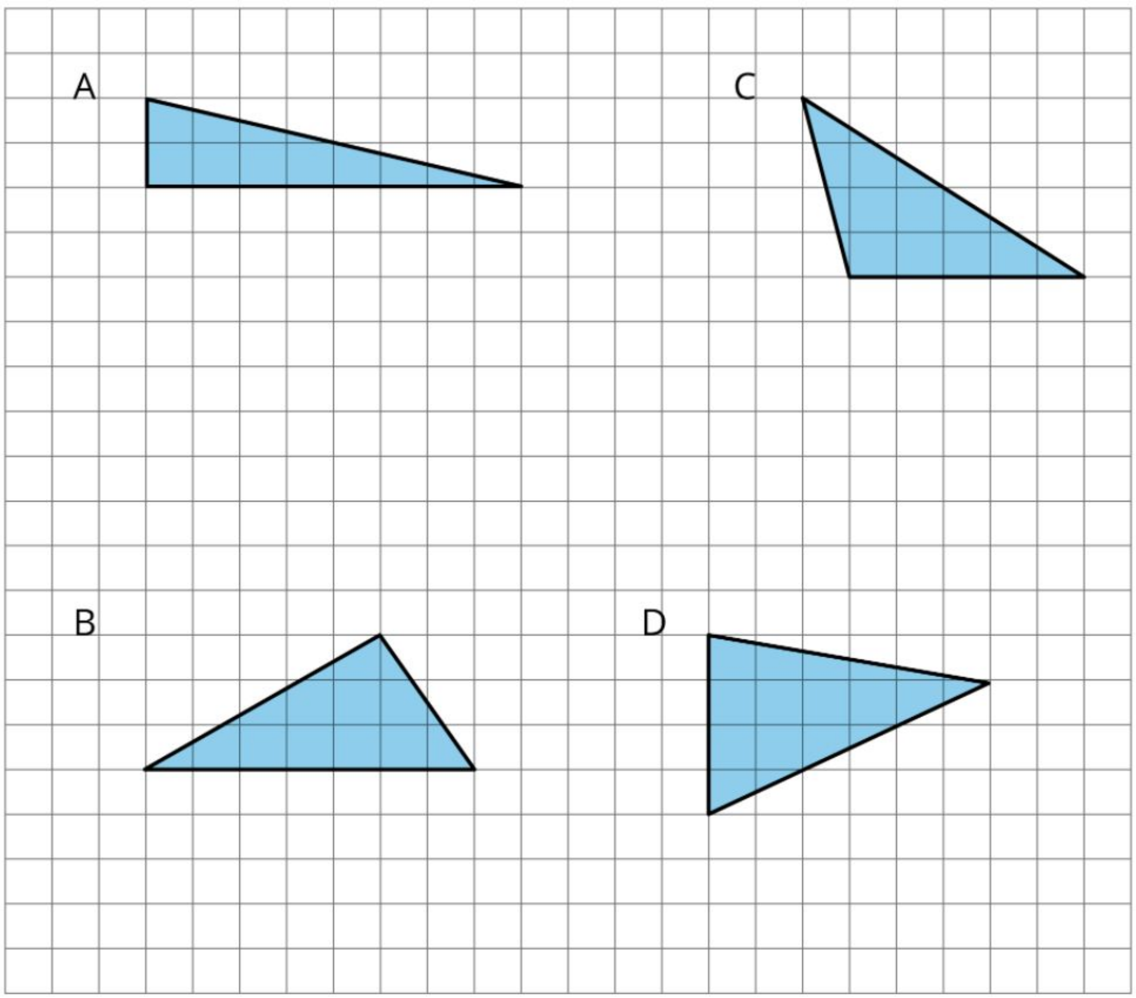
1. For each parallelogram Han composed, identify a base and a corresponding height, and write the measurements on the drawing.

2. Find the area of each parallelogram Han composed. Show your reasoning.



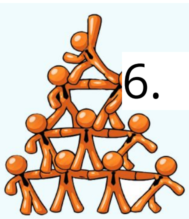
1-8-2: More Triangles

Find the areas of at least two of the triangles below. Show your reasoning.



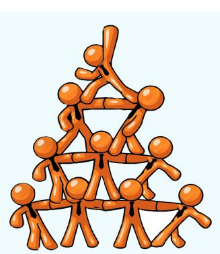
1-8-3: Decomposing a Parallelogram

1. Your teacher will give you two copies of a parallelogram. Glue or tape *one* copy of your parallelogram here and find its area. Show your reasoning.
2. Decompose the second copy of your parallelogram by cutting along the dotted lines. Take *only* the small triangle and the trapezoid, and rearrange these two pieces into a different parallelogram. Glue or tape the newly composed parallelogram on your paper.
3. Find the area of the new parallelogram you composed. Show your reasoning.
4. What do you notice about the relationship between the area of this new parallelogram and the original one?
5. How do you think the area of the large triangle compares to that of the new parallelogram: Is it larger, the same, or smaller? Why is that?
6. Glue or tape the remaining large triangle below. Use any part of the work above to help you find its area. Show your reasoning.



1-8: Lesson Synthesis

- What can we say about the area of a triangle and that of a parallelogram with the same height?
- In the second activity, we cut a triangle along a line that goes through the midpoints of two sides and rearranged the pieces into a parallelogram. What did we notice about the area and the height of the resulting parallelogram?
- How might we start finding the area of any triangle, in general?



1-8: Learning Targets

- I can use what I know about parallelograms to reason about the area of triangles.

1-8-4: An Area of 14

Elena, Lin, and Noah all found the area of Triangle Q to be 14 square units but reasoned about it differently, as shown in the diagrams. Explain *at least one* student's way of thinking and why his or her answer is correct.