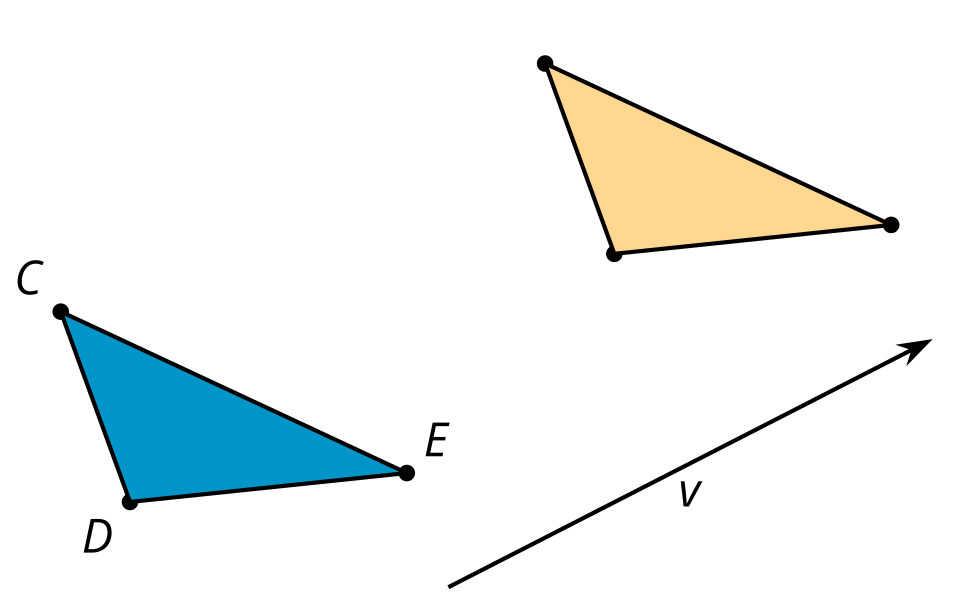
## Lesson 12: Defining Translations

* Let’s translate some figures.

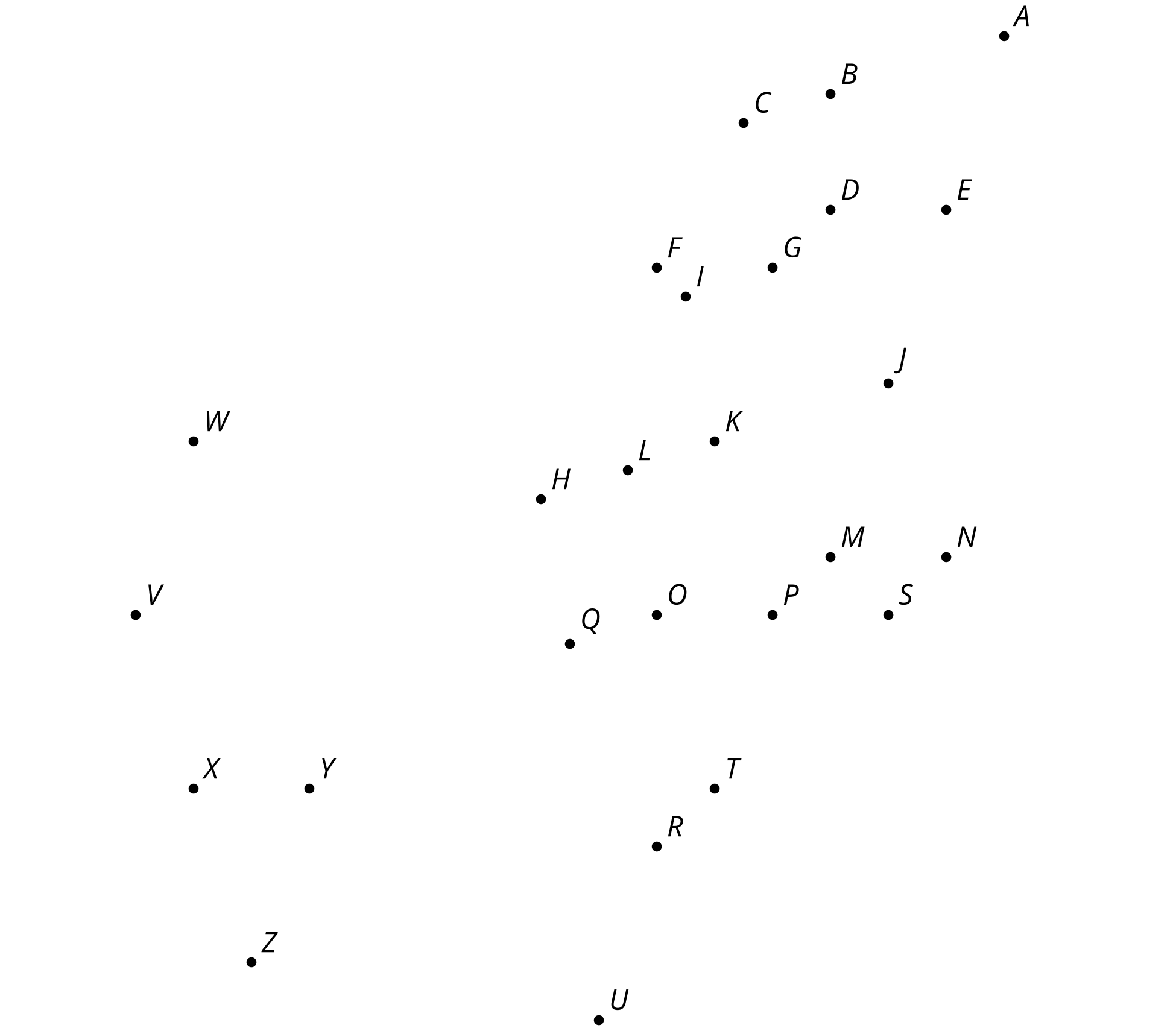
### 12.1: Notice and Wonder: Two Triangles and an Arrow

What do you notice? What do you wonder?

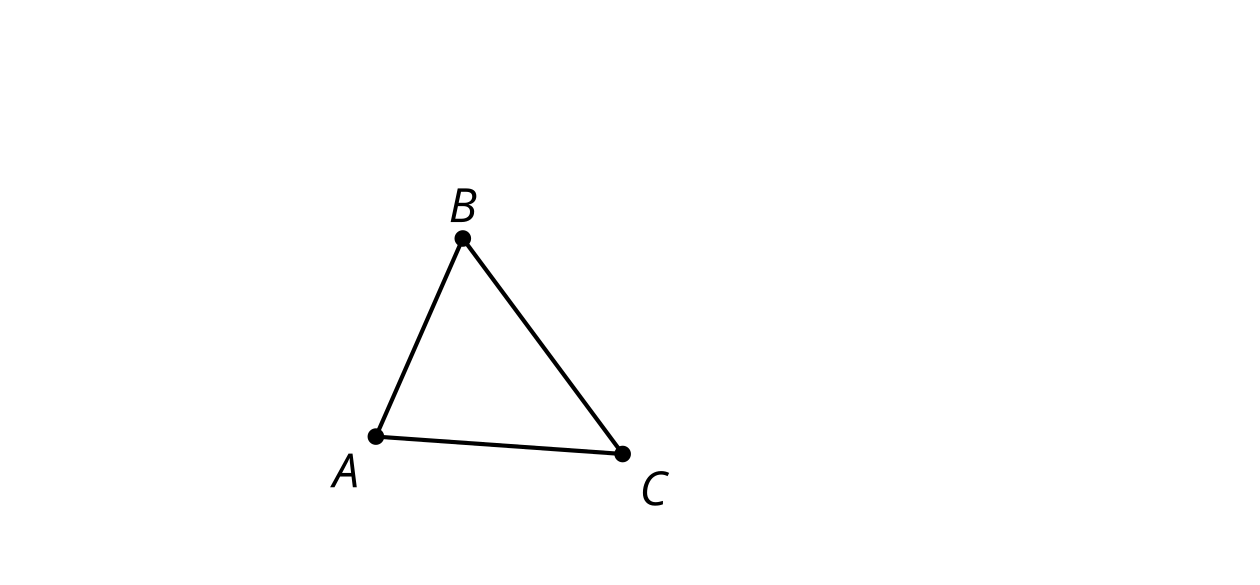


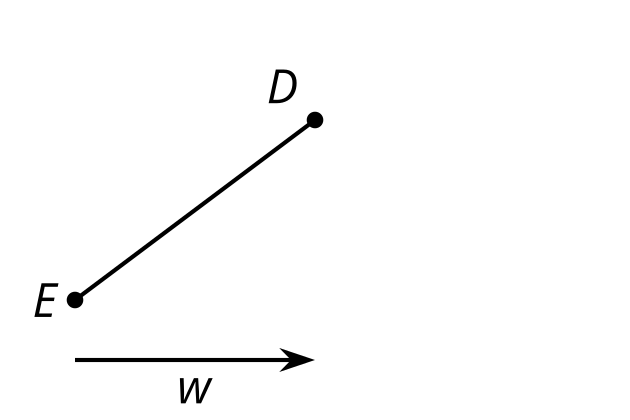
### 12.2: What’s the Point: Translations

1. After a translation, the image of is . Find at least 3 other points that are taken to a labeled point by that translation.
2. Write at least 1 conjecture about translations.
3. In a new translation, the image of is . Find at least 3 other points that are taken to a labeled point by the new translation.
4. Are your conjectures still true for the new translation?



### 12.3: Translating Triangles





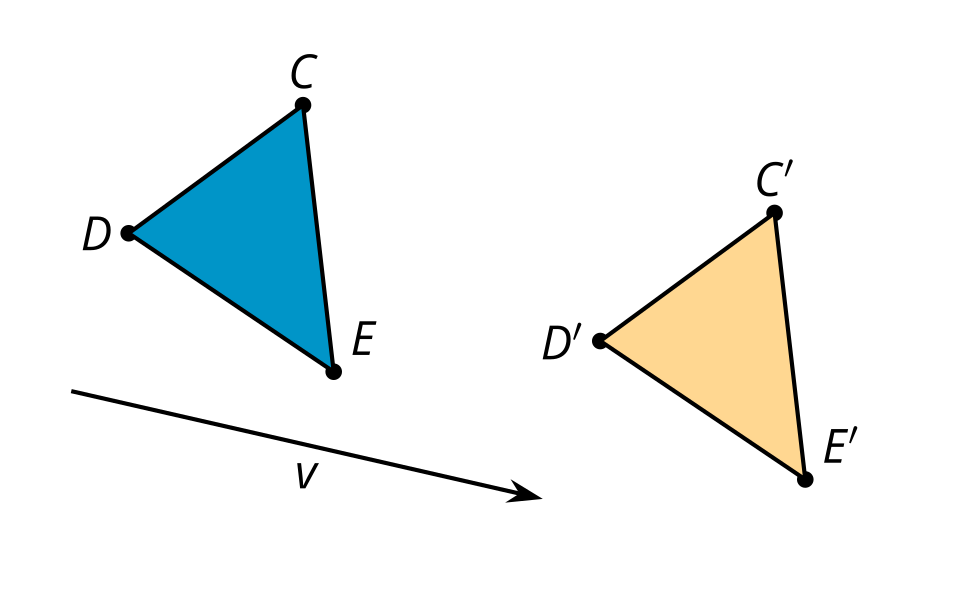
1. Translate triangle by the **directed line segment** from to .
   1. What is the relationship between line and line ? Explain your reasoning.
   2. How does the length of segment  compare to the length of segment ? Explain your reasoning.
2. Translate segment by directed line segment . Label the new endpoints and .
   1. Connect to and to .
   2. What kind of shape did you draw? What properties does it have? Explain your reasoning.

#### Are you ready for more?

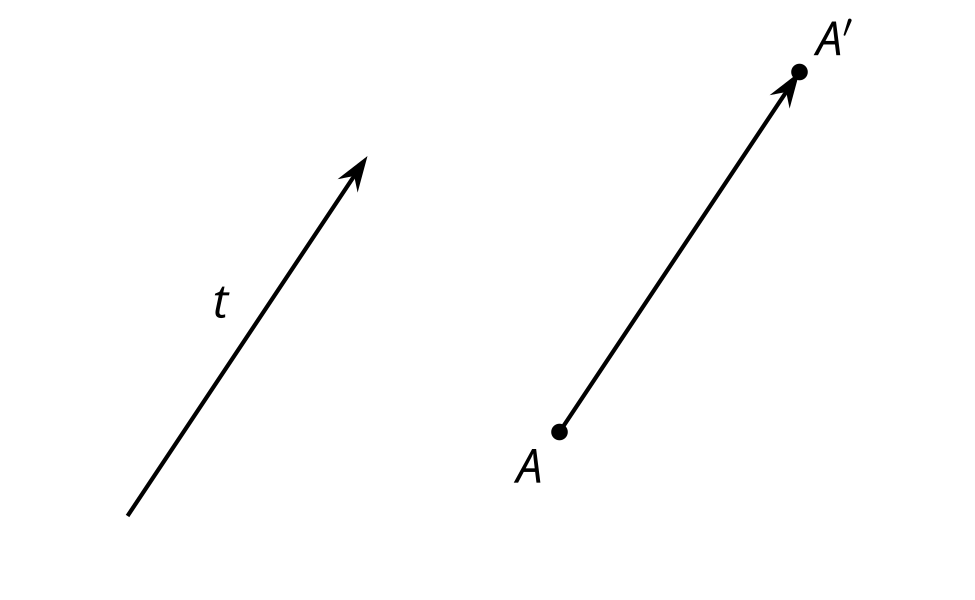
1. On triangle in the task, use a straightedge and compass to construct the line which passes through and is perpendicular to . Label it . Then, construct the perpendicular bisector of and label it . Draw the reflection of across the line . Since the label  is used already, label it instead.
2. What is the reflection of across the line ?
3. Explain why this is cool.

### Lesson 12 Summary

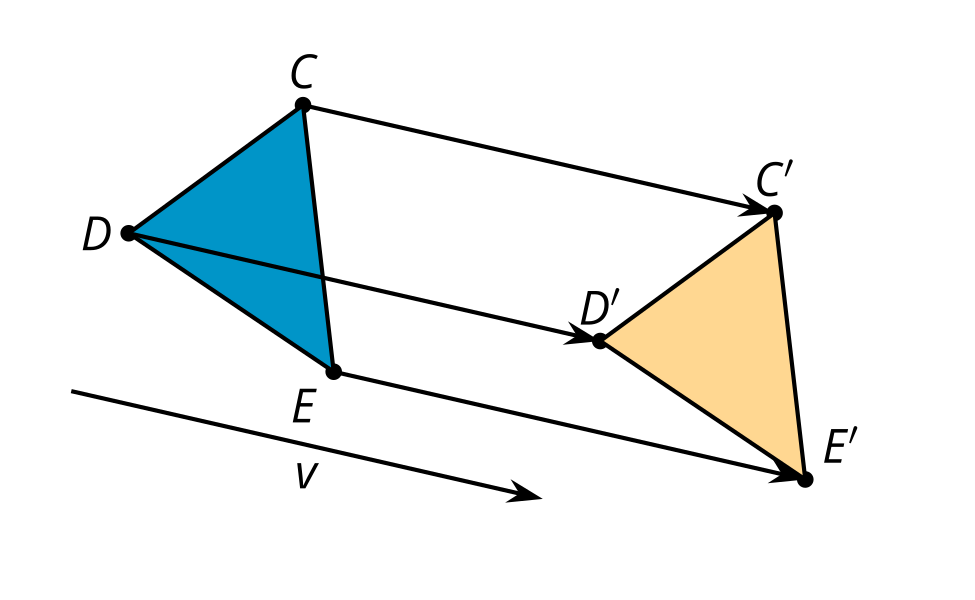
A translation slides a figure in a given direction for a given distance with no rotation. The distance and direction is given by a **directed line segment**. The arrow of the directed line segment specifies the direction of the translation, and the length of the directed line segment specifies how far the figure gets translated.



More precisely, a **translation** of a point along a directed line segment is a transformation that takes to so that the directed line segment is parallel to , goes in the same direction as , and is the same length as .



Here is a translation of 3 points. Notice that the directed line segments , , and are each parallel to , going in the same direction as , and the same length as .





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