

CUT & GLUE SORT

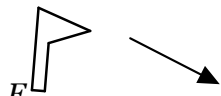


TRANSLATIONS

Does It Name a Translation?

One translation · not a translation · not enough

FREE

1	2	3	4
Slide F 5 cm, without turning it.	 Flip F over the line this arrow lies on.	 Move F by this arrow.	Move every point of F 3 cm straight away from point O.

1. **Hand out pages 3 and 4**, one of each per student, and scissors and glue.
2. **Say this once:** *“A translation needs two things: how far, and which way. Say both and you have named one. Say only one and you have not. If the points do not all move the same way, it is not a translation at all.”*
3. **Every row gets 4.** A row with more or fewer has a piece in the wrong place. (This is on your page only, not the student's.)

Student sheets pages 3 and 4, one of each per student.

Answers page 5.

The third row is the hardest. Its pieces (1, 5, 8, 11) describe a translation but do not say which one. One gives a distance but no direction. One gives a direction but no distance. One says how far to move along line m , but not which way along it. One shows a segment with no arrowhead. Many students think “move it to the right” or “move it four” describes a translation. It does not, and tests take points off for this.

The first two rows hold the common mistakes. Piece 3 has its arrow in a corner, far from the flag, and it still names a translation. Many students believe the arrow must touch the figure. It does not have to. Piece 2 has the same kind of arrow, but it says to flip F over the arrow's line. That is a reflection. Reading the arrow as a mirror line is the most serious mistake in this lesson. Piece 7 moves every point to the right, but not by the same distance, so it is not a translation. Piece 4 moves every point 3 cm, but each point goes in its own direction. Piece 10 slides and then turns, so the flag ends up turned.

Guessing does not work. A student who sorts by clues such as the words “turn” or “flip”, or whether a piece has a drawing, gets at most six of the twelve pieces right.



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.

chooseyourlesson.com — 135 free geometry lessons.

One translation, not one, or not enough?

Describing a translation

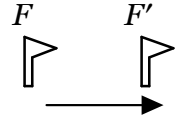
Name _____

Period _____

Date _____

Cut out the twelve pieces on the next page. Each one describes a way of moving flag F. **For each piece, decide: is it one translation, is it not a translation, or is it not enough to tell?** Glue each into its row. **A translation moves every point of the plane the same distance in the same direction. To name one, you have to say both.**


the arrow from A to B
how far: its length · which way: its head


F' is the image of F
every point moved by the arrow. Same size, same way round

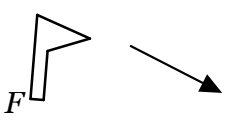
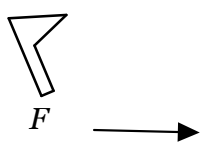
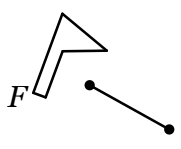
ONE TRANSLATION — *it says where every point goes*

NOT A TRANSLATION — *the points do not all move the same way*

NOT ENOUGH — *a translation, but the words do not say which one*

The twelve pieces

Cut along the dotted lines

1	2	3	4
Slide F 5 cm, without turning it.	 Flip F over the line this arrow lies on.	 Move F by this arrow.	Move every point of F 3 cm straight away from point O.
5	6	7	8
Move every point of F in the direction from A to B.	Slide every point of F as far as A is from B. Move it the way the arrow from A to B points.	Every point of F moves to the right: points on the pole 2 cm, the tip of the pennant 3 cm.	 Move F along this segment, as far as it is long.
9	10	11	12
Slide F so that its corner P lands on point Q.	Slide F 4 cm to the right, then turn it a quarter turn about its corner P.	Slide every point of F along line m , as far as A is from B.	Move every point of F 3 cm straight up the page, without turning it.



135 free geometry lessons — worksheets, worked answers and lesson plans.
chooseyourlesson.com

Cut & Glue Sort — answers

For the teacher

ONE TRANSLATION	3 — The arrow gives how far and which way. It does not have to touch F.	6 — It says the arrow from A to B in words.	9 — One point and its image give the arrow from P to Q.	12 — It says how far (3 cm) and which way (up the page).
NOT A TRANSLATION	2 — It is a reflection. The arrow is used as a mirror line.	4 — Every point moves 3 cm, but each in its own direction.	7 — All points go right, but not the same distance.	10 — A slide and then a turn leaves the flag turned.
NOT ENOUGH	1 — It says how far, but not which way.	5 — It says which way, but not how far.	8 — There is no arrowhead, so it could go either way.	11 — It says how far and along line m, but not which way along it.

How each piece was sorted. Think of every motion the words or the drawing could mean. If they all give the same translation, the piece is in the first row. If none of them is a translation, it is in the second row. If they are all translations but not the same one, it is in the third row. No piece fits two rows.