

CUT & GLUE SORT

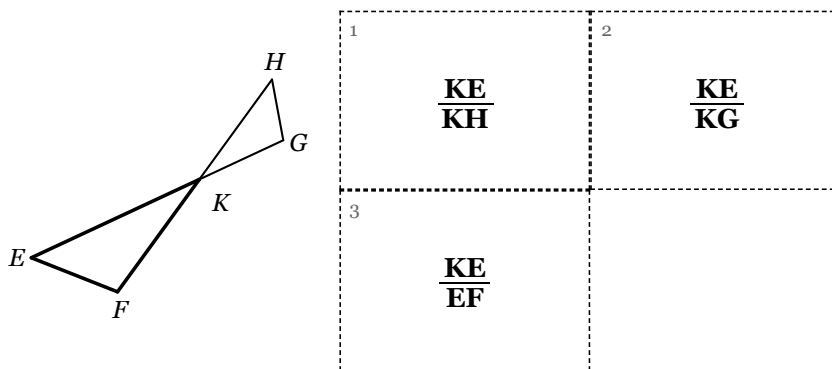


SIMILAR TRIANGLES: CORRESPONDING ANGLES AND SIDES

Scale Factor, Inside One Triangle, or
Neither?

One drawing of two similar triangles · twelve fractions · no measuring

FREE



Row 1. The scale factor. One side of each triangle, and the two sides are partners.

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Row 2. A ratio inside one triangle. Both sides are in the same triangle.

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Row 3. Neither. One side of each triangle, but the two sides are not partners.

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Cut & Glue Sort — how to run it

25 minutes, including the cutting

1. **Hand out pages 3 and 4**, one of each per student, with scissors and glue. Nothing else is needed.
2. **Say this once:** *“Do not measure. For each fraction, ask: are the two sides in one triangle, or in both? If they are in both, are they partners?”*
3. **Check a sheet in ten seconds:** every row gets four pieces.

Student sheets	pages 3 and 4, one of each per student. Page 3 has the drawing and the three rows. Page 4 has the pieces.
Answers	page 5.

The drawing is two triangles that meet at a point. Segments EG and FH cross at K. Triangle KEF is drawn with thick lines and triangle KHG with thin lines, and $\triangle KEF \sim \triangle KHG$. So K goes with K, E with H, and F with G. The partner of KE is KH, on the other line. KE and KG lie on one straight line, but they are not partners.

The sheet practices two different kinds of ratio. A side of one triangle divided by its partner in the other triangle is the scale factor (row 1). Two sides of the same triangle make a ratio inside one triangle (row 2). The two triangles have the same shape, so a ratio inside one triangle equals the matching ratio inside the other. For example, $KE/EF = KH/HG$. Many students know only the first kind and do not see the second at all.

Both directions count as a scale factor here. KH/KE is the scale factor from $\triangle KEF$ to $\triangle KHG$, and KE/KH is the scale factor from $\triangle KHG$ back to $\triangle KEF$. Both go in row 1. Some textbooks use other definitions, so tell the class which ones this sheet uses.

The last row is the most important. It holds a side of one triangle divided by a side of the other that is not its partner, such as KE/KG . That number is not the scale factor, and the two triangles do not share it. Students who pair sides by the look of the drawing, such as two sides on one straight line, put these pieces in row 1. A student who never uses the last row can place at most eight pieces correctly. Ask that student: “Which side of $\triangle KHG$ goes with KE? Is it the one on the bottom of the fraction?” Guessing rules place at most six pieces correctly.



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.
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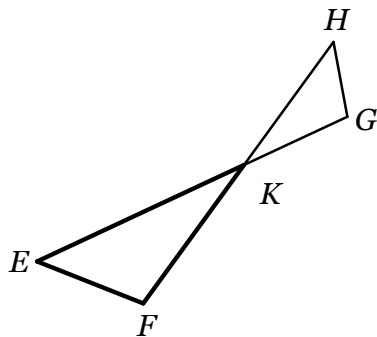
Cut & Glue Sort — what kind of number?

Similar triangles

Name _____

Period _____

Date _____



In this drawing, $\triangle KEF \sim \triangle KHG$. EG and FH cross at K. The thick lines are $\triangle KEF$. The thin lines are $\triangle KHG$.

$\triangle$	K	E	F
$\triangle$	K	H	G

Letters in the same column are partners. So KE goes with KH.

Cut out the twelve pieces on the next page. Each piece is a fraction of two sides. **Do not measure anything. Decide which row the fraction belongs in, and glue it there.**

Row 1. The scale factor. One side of each triangle, and the two sides are partners.

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Row 2. A ratio inside one triangle. Both sides are in the same triangle.

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Row 3. Neither. One side of each triangle, but the two sides are not partners.

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Cut & Glue Sort — the pieces

Cut along the dashed lines

Cut out the twelve pieces. Glue each one in its row on the other sheet. Every fraction uses the drawing where $\triangle KEF \sim \triangle KHG$.

1 $\frac{KE}{KH}$	2 $\frac{KE}{KG}$	3 $\frac{KE}{EF}$	4 $\frac{EF}{KG}$
5 $\frac{GH}{EF}$	6 $\frac{KF}{KE}$	7 $\frac{KG}{KF}$	8 $\frac{KG}{KH}$
9 $\frac{GH}{KF}$	10 $\frac{KE}{KF}$	11 $\frac{KH}{KE}$	12 $\frac{KH}{EF}$



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Cut & Glue Sort — answers

For the teacher

In the drawing, $\triangle KEF \sim \triangle KHG$: K goes with K, E with H, and F with G. Each row holds four pieces.

1 The scale factor. One side of each triangle, and the two sides are partners.

- 1.** KE/KH: KE is in $\triangle KEF$ and KH is in $\triangle KHG$. The statement makes them partners.
 - 5.** GH/EF: GH is in $\triangle KHG$ and EF is in $\triangle KEF$. The statement makes them partners.
 - 7.** KG/KF: KG is in $\triangle KHG$ and KF is in $\triangle KEF$. The statement makes them partners.
 - 11.** KH/KE: KH is in $\triangle KHG$ and KE is in $\triangle KEF$. The statement makes them partners.
-

2 A ratio inside one triangle. Both sides are in the same triangle.

- 3.** KE/EF: KE and EF are both sides of $\triangle KEF$.
 - 6.** KF/KE: KF and KE are both sides of $\triangle KEF$.
 - 8.** KG/KH: KG and KH are both sides of $\triangle KHG$.
 - 10.** KE/KF: KE and KF are both sides of $\triangle KEF$.
-

3 Neither. One side of each triangle, but the two sides are not partners.

- 2.** KE/KG: KE is in $\triangle KEF$ and KG is in $\triangle KHG$, but KE goes with KH, not KG.
 - 4.** EF/KG: EF is in $\triangle KEF$ and KG is in $\triangle KHG$, but EF goes with HG, not KG.
 - 9.** GH/KF: GH is in $\triangle KHG$ and KF is in $\triangle KEF$, but GH goes with FE, not KF.
 - 12.** KH/EF: KH is in $\triangle KHG$ and EF is in $\triangle KEF$, but KH goes with KE, not EF.
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To check a piece with a student, ask two questions. First: are both sides in the same triangle? If yes, it goes in row 2. If no, ask: does the statement make the two sides partners? If yes, it goes in row 1. If no, it goes in row 3.