

CUT & GLUE SORT

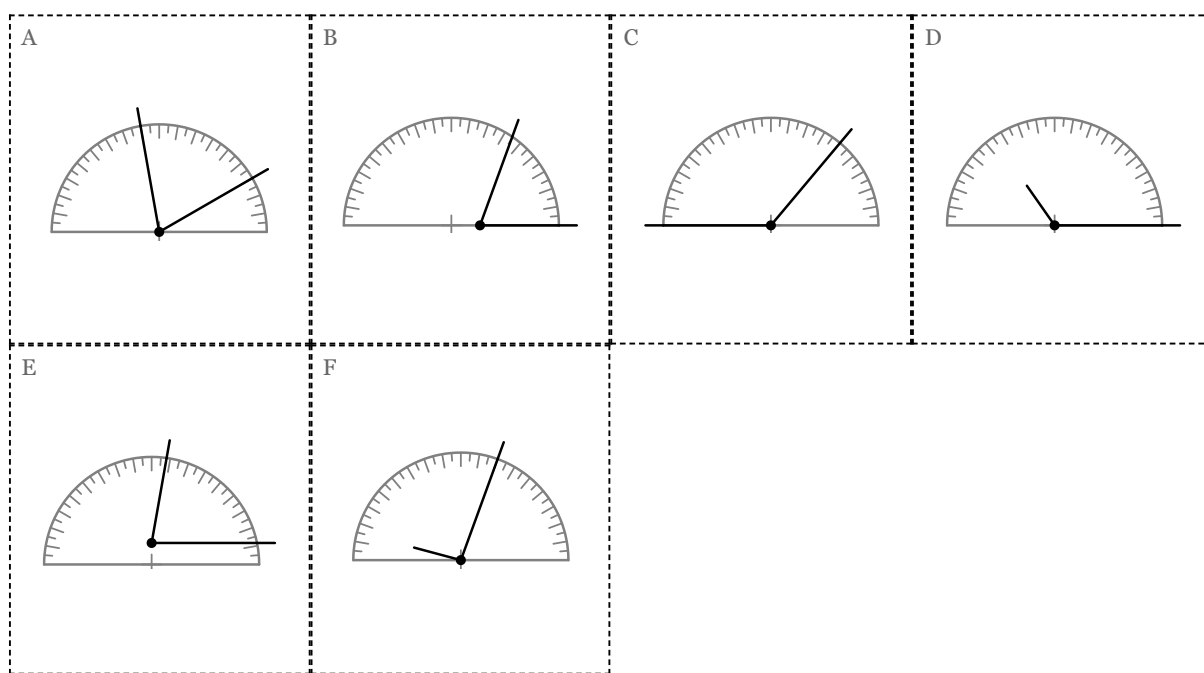


MEASURING AND CLASSIFYING ANGLES

Placing a Protractor: Can It Be Read?

One reading · two readings and a difference · or move the protractor

FREE



Cut & Glue Sort — how to run it

25 minutes, including the cutting

1. **Hand out pages 3 and 4**, one of each per student, and scissors and glue. No protractors are needed.
2. **Say this once:** *“A protractor reads an angle only when the vertex is on the center mark. If one arm is on O , read the other arm. If neither arm is on O , read both arms and subtract. You can always extend a short arm.”*
3. **Mark it in ten seconds: every row gets 4.** That is on this page only. If it were on the student's sheet, they could fill the last row by counting instead of sorting.

Student sheets	pages 3 and 4, one of each per student. The center mark and the flat edge are named on the first as a picture.
Answers	page 5.

What the students sort. Each piece shows a protractor placed on an angle. Students do not read any number. They decide how the angle would be read, or whether it can be read at all. The protractors on the pieces have no numbers, because the pieces are too small to print them.

The third row is the hard one. A protractor gives the measure of an angle only when the vertex is on the center mark. If the protractor is slid along the flat edge, or the vertex is above it, the numbers the arms cross are wrong. Subtracting does not fix them. The student has to move the protractor.

Where students go wrong. Three pieces have an arm too short to reach the scale, one in every row. A short arm never makes an angle impossible to read. The student only has to extend it. Two pieces in the third row have an arm along the flat edge, but the vertex is not on the center mark. A student who sorts only by “an arm lies along the flat edge” gets only eight of the twelve pieces right. A student who checks that the vertex is on the flat edge, but not that it is on the center mark, gets only nine.



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.

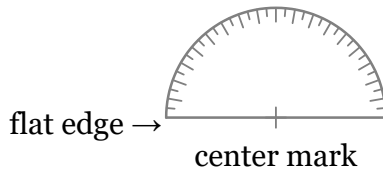
Can this protractor be read? How?

Placing a protractor

Name _____

Period _____

Date _____



Cut out the twelve pieces on the next page. Glue each one into its row.
First look at the vertex. Is it on the center mark? Then look at the arms. Does one lie along the flat edge? If an arm is too short to reach the scale, it does not change the row. Extend it with a ruler. The sides of an angle are rays. You do not need to read any number.

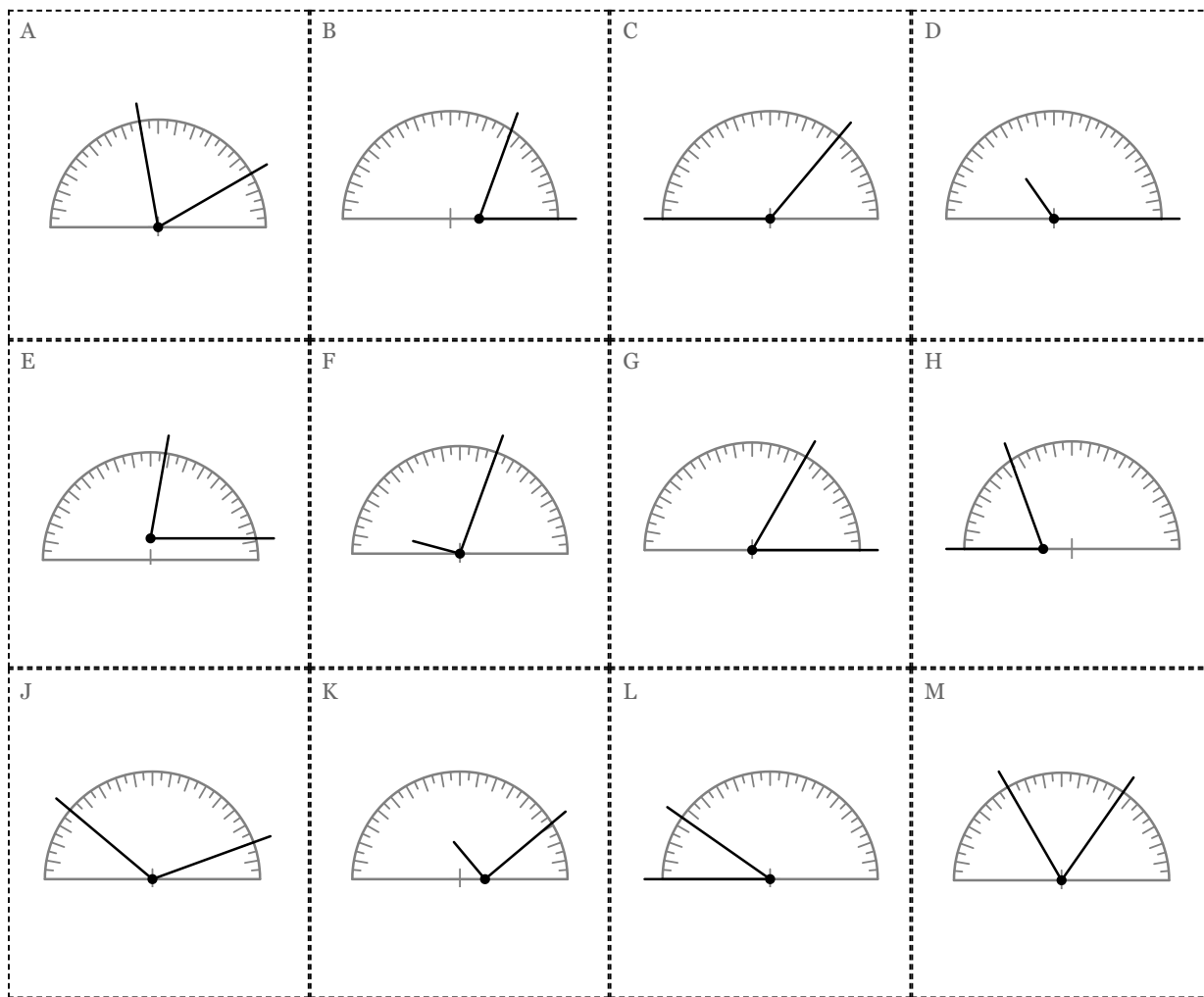
ONE ARM ON A ZERO. *The vertex is on the center mark. One arm lies along the flat edge. Read the other arm on the scale that starts at 0.*

NEITHER ARM ON A ZERO. *The vertex is on the center mark. Neither arm lies along the flat edge. Read both arms on one scale. Then subtract.*

THIS CANNOT BE READ. *The vertex is not on the center mark. No number on the scale is this angle. Move the protractor.*

The twelve pieces

Cut along the dotted lines



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

Cut & Glue Sort — answers

For the teacher

Row	Pieces	What each piece shows
ONE ARM ON A ZERO	C D G L	C: One arm lies on the left-hand zero. D: One arm lies on a zero. The other arm is short. G: One arm lies on the right-hand zero. L: One arm lies on the left-hand zero. The angle is small.
NEITHER ARM ON A ZERO	A F J M	A: Neither arm lies along the flat edge. F: Neither arm lies on a zero. One arm is short. J: One arm is close to the flat edge, but not on it. M: Neither arm lies along the flat edge.
THIS CANNOT BE READ	B E H K	B: The protractor is slid along the flat edge. One arm lies along the edge. E: The vertex is above the center mark. H: The protractor is slid along the flat edge. One arm lies along the edge. K: The protractor is slid along the flat edge. One arm is short.

Every row holds four pieces. To place a piece, look first at the vertex. If it is not on the center mark, the piece goes in the third row. If it is, look at the arms. If one arm lies along the flat edge, the piece goes in the first row. If not, it goes in the second row. A short arm never changes the row.