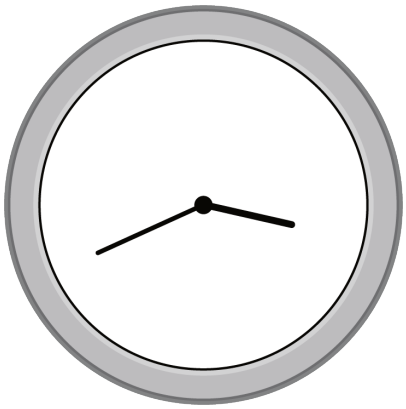
Lesson 11: Use a Protractor to Draw Angles

- Let's draw some angles.

Warm-up: Estimation Exploration: Long Hand and Short Hand

How many degrees is the angle formed by the long hand and the short hand of the clock?



Make an estimate that is:

too low	about right	too high

11.1: Draw These Angles

1. Draw a line that is neither vertical nor horizontal. Put a point somewhere on that line. Use your protractor to draw a perpendicular line through that point. Be as precise as possible. (No folding this time!)

2. Here is a ray that starts at point M.

Use a protractor to draw:

a. A ray starting at point M to create a 40° angle.

b. Another ray starting at point M to create a 20° angle.

c. One more ray starting at point M to create a 95° angle. Label each angle with its measurement.

3. In your drawing, there should be one angle that is not labeled with a measurement and is larger than 180°. Label the angle with an arc. How many degrees is this angle? Be prepared to explain how you know.

11.2: Angles Made to Order

Your teacher will give you some blank cards. Label them a–d.

1. On each card, draw an angle that meets one requirement. Use a ruler and a protractor.
    a. an angle that is less than 35°
    b. an angle that is between 35° and 80°
    c. an angle that is greater than 80° but less than 120°
    d. an angle that is greater than 120° but less than 180°
2. Trade cards with your partner.
    a. Measure and record each angle your partner drew. Check to make sure each angle meets the requirement.
    b. If a requirement is not met, return it to your partner so it can be corrected. Save the cards for the next lesson.

If you have time:

1. Create a drawing that shows several angles. Then, write some descriptions of your drawing. Be as specific as possible.
2. Ask a partner to recreate the drawing based on your descriptions. Does their drawing turn out as you had drawn? If not, adjust your descriptions and ask them to try again.

Section Summary

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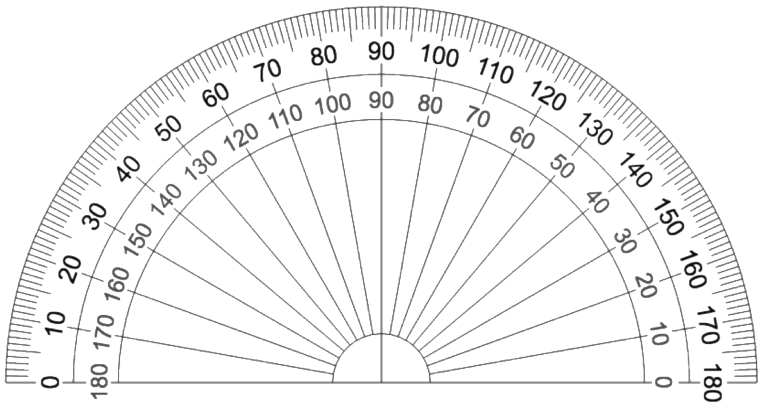
In this section, we learned about ways to describe and measure the size of angles.

We used clocks to describe angles as a turn of one away from the other. We learned that a degree is a measure of the turn around a circle and that 1 degree is $\frac{1}{360}$ of a full turn of a ray through a circle.

Finally, we learned that a **protractor** is a tool used to measure angles and can also be used to create angles of a certain measure.



A protractor has two sets of numbers and that either set of numbers could be used, but it is helpful to use the set that counts up from 0 rather than count down from 180. We used a protractor to measure and draw different angles.