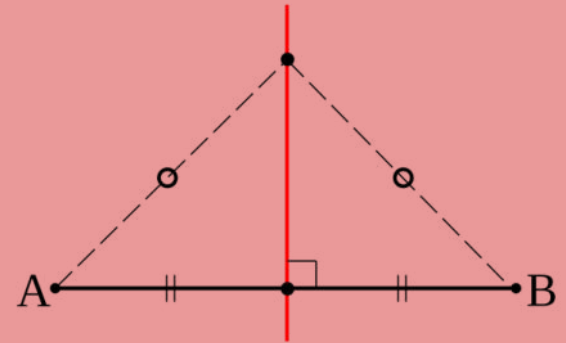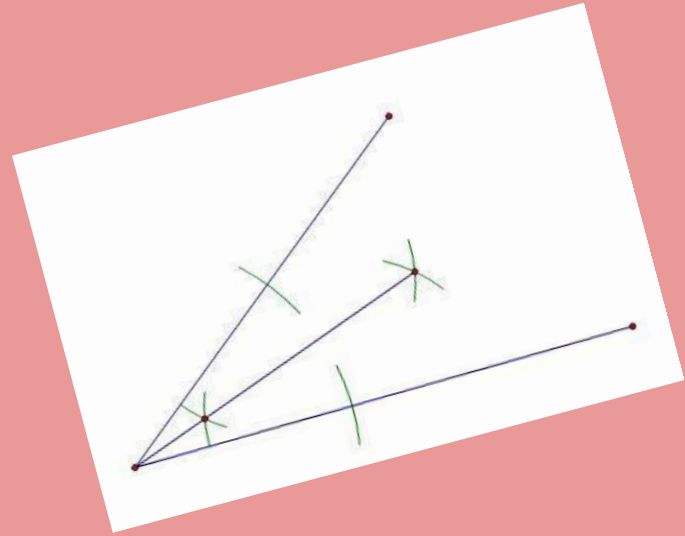# Lesson 3- Construction Techniques 1: Perpendicular Bisectors

Learning Targets

- **I can construct a perpendicular bisector**

- **I understand what is special about the set of points equidistant from two given points.**

3.1 Find All the Points!

Here are 2 points labeled A and B, and a line segment CD:

- Mark 5 points that are a distance CD away from point A. How could you describe all points that are a distance CD away from point A?

- Mark 5 points that are a distance CD away from point B. How could you describe all points that are a distance CD away from point B?

- In a different color, mark all the points that are a distance CD away from both A and B at the same time.

Activity Synthesis:

"Why do all the points create a circle?"

"What do you notice about the points that are the same distance, CD, from both A and B?"

"Could there be 3 points that are all distance CD from A and B?"
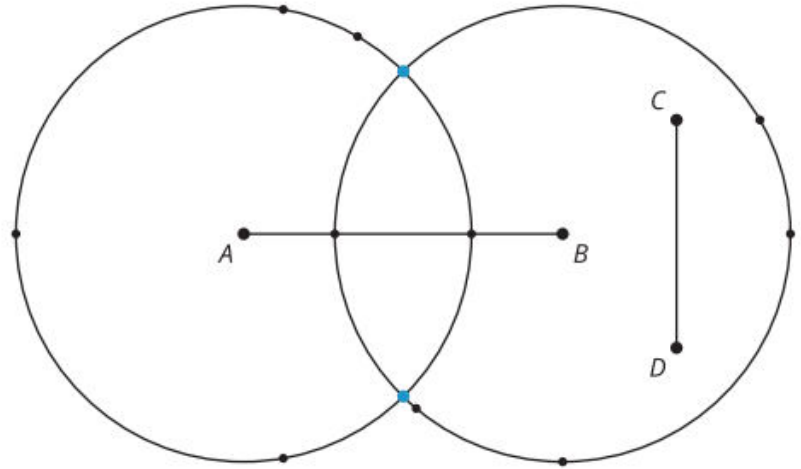
3.2 Human Perpendicular Bisector

Your teacher will mark points A and B on the floor. Decide where to stand so you are the same distance from point A as you are from point B. Think of another place you could stand in case someone has already taken that spot.

After everyone sits down, draw a diagram of what happened.

10:00
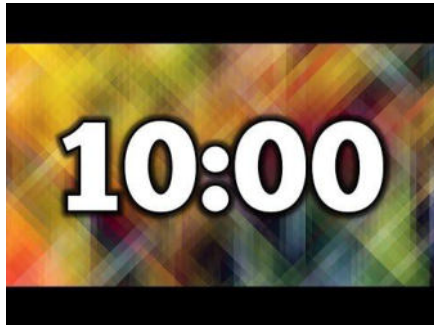
Activity Synthesis

Look at your sketch of points whose distance from A is the same as their distance from B.

- What do you notice about the points?
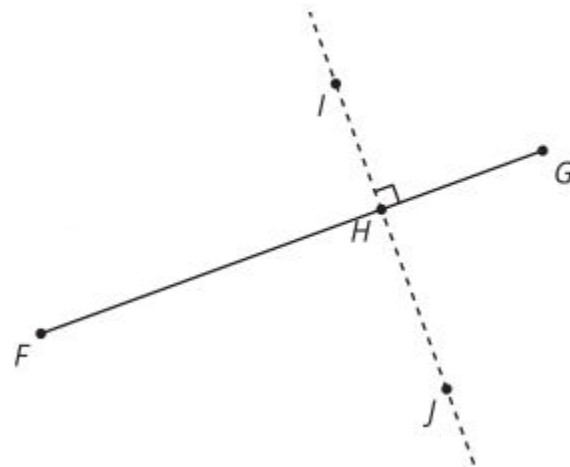
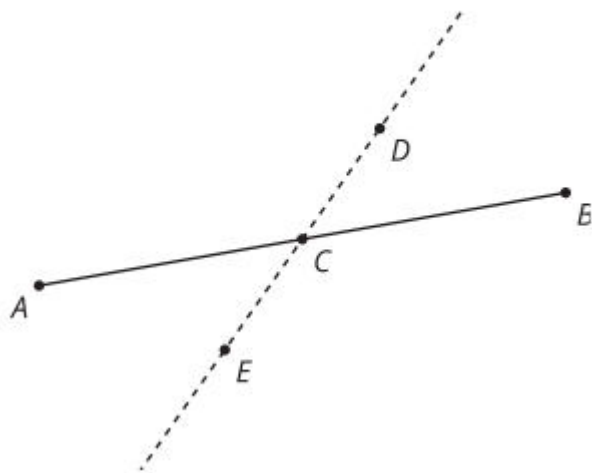- What do you wonder about the points?

3.3 Launch- How Well Can You Slice It?

Perpendicular bisector:

- A line through the midpoint of a segment that is perpendicular to that segment.

3.3 Launch- How Well Can You Slice It?

Why is each dashed line not a perpendicular bisector of the segment it intersects?

3.3 How Well Can You Slice It?

Use the tools available to find the perpendicular bisector of segment PQ

.

After coming up with a method, make a copy of segment PQ on tracing paper and look for another method to find its perpendicular bisector

Activity Synthesis

What are the different methods that were used to find the perpendicular bisector?

What are the pros/cons of each method?

Activity Synthesis

How to check a perpendicular bisector for accuracy:

- measuring to see whether the perpendicular bisector goes through the midpoint of segment PQ and forms a 90 degree angle with segment PQ
- selecting a point on the perpendicular bisector and measuring to see whether it is the same distance from P and Q , repeating for multiple points
- using the compass to see whether points along the perpendicular bisector are the same distance from P and Q•

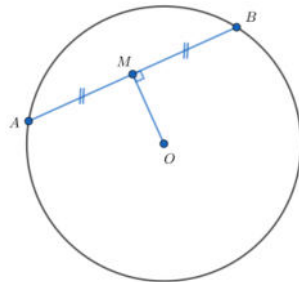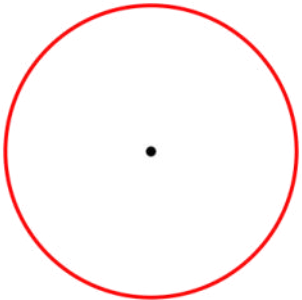# Lesson Synthesis:

$\overline{AB} \perp \overline{CD}, AE = EB$
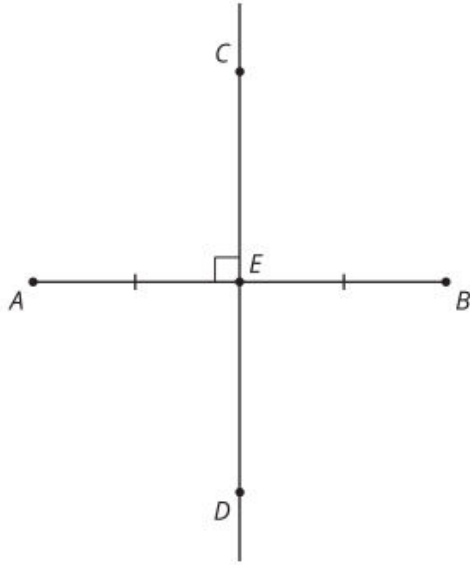
Notation for congruent segments, perpendicular lines, and right angles:

- $\overline{AB} \perp \overline{CD}$

- $m\angle AEC = 90°$

- $AE = EB$

Lesson Synthesis:

Conjecture:

The perpendicular bisector of a segment is the set of points that are the same distance from the endpoints of that segment.

"How did we know that a point was the same distance away from the two given points without measuring with a ruler?"

"What exactly is a circle? How do we use circles to reason about distance without using a ruler?"