Constructing Intersecting Lines

**GOAL** Investigate methods of constructing lines that intersect at 30°, 45°, and 60°, using angle properties.

**Explore the Math**
Colin is using angle properties to explore methods of constructing intersecting lines.

**How can you construct lines that intersect at 30°, 45°, or 60°?**

A. Draw line AB. Use a protractor to construct an angle with the measure 30º at point A. Mark point C on the angle. Extend CA to cross line AB.

B. Measure the other angles at the point of intersection. Record the measure on each angle. What do you notice about the angle measures?

C. Use a method similar to step A to construct lines that intersect at 60º. Measure the angles. What do you notice?

D. Use a method similar to step A to construct lines that intersect at 45º. Measure the angles. What do you notice?

E. Use a protractor to construct lines that intersect at 60º. Bisect an angle that measures 60º. Measure the angles formed by the angle bisector. Why does this make sense?

F. Use a method of your choice to construct perpendicular lines. Use a protractor to construct an angle of 30º at the point of intersection. What are all the angle measures?

G. Use a method of your choice to construct perpendicular lines. Suppose you bisected one of the angles formed by the perpendicular lines. Predict the angle measure of each angle formed by the angle bisector. Check your prediction.

**Reflecting**

1. Why can you use the method in step E to construct lines that intersect at 30º?
2. Why can you use the method in step F to construct lines that intersect at 60º?
3. Why can you use the method in step G to construct lines that intersect at 45º?
4. When you turn the paper to change the orientation of intersecting lines, do the angle measures change? Why or why not?