## Unit 1 Lesson 14: Alternate Interior Angles

### 1 Angle Pairs (Warm up)

#### Student Task Statement

1. Find the measure of angle $JGH$.  Explain or show your reasoning.
* 
1. Find and label a second $30^{∘}$ degree angle in the diagram. Find and label an angle congruent to angle $JGH$.

### 2 Cutting Parallel Lines with a Transversal

#### Images for Launch



#### Student Task Statement

Lines $AC$ and $DF$ are parallel. They are cut by **transversal** $HJ$.



1. With your partner, find the seven unknown angle measures in the diagram. Explain your reasoning.
2. What do you notice about the angles with vertex $B$ and the angles with vertex $E$?
3. Using what you noticed, find the measures of the four angles at point $B$ in the second diagram. Lines $AC$ and $DF$ are parallel.
* 
1. The next diagram resembles the first one, but the lines form slightly different angles. Work with your partner to find the six unknown angles with vertices at points $B$ and $E$.
* 
1. What do you notice about the angles in this diagram as compared to the earlier diagram? How are the two diagrams different? How are they the same?

### 3 Alternate Interior Angles Are Congruent

#### Student Task Statement

1. Lines $ℓ$ and $k$ are parallel and $t$ is a transversal. Point $M$ is the midpoint of segment $PQ$.
* 
* Find a rigid transformation showing that angles $MPA$ and $MQB$ are congruent.
1. In this picture, lines $ℓ$ and $k$ are no longer parallel. $M$ is still the midpoint of segment $PQ$.
* 
* Does your argument in the earlier problem apply in this situation? Explain.

#### Images for Activity Synthesis





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