### Problem 1– One-point Perspective

Follow these steps to complete the drawing of a rectangular prism in one-point perspective on page 1.5.

- Use the **Segment** tool to draw $\overline{AB}$ and $\overline{AC}$. These two segments are called *vanishing segments* because they connect a point on the figure to the vanishing point.

- Create $\overline{FG}$ such that F is between A and B, G is between A and C, and $\overline{FG} \parallel \overline{BC}$ as shown in the diagram to the right.

  To do this, you will need to use the **Point On**, **Parallel**, **Intersection Point(s)**, **Hide/Show**, and **Segment** tools. Ask your teacher if you need help.

- Hide the vanishing segments, $\overline{AB}$ and $\overline{AC}$, and draw $\overline{BF}$ and $\overline{CG}$. Then drag the vanishing point to the far left or far right. What do you notice?
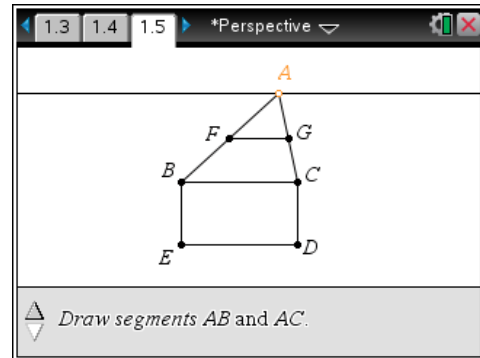
- Draw vanishing segments $\overline{AD}$ and $\overline{AE}$. Then use the **Perpendicular** tool to construct two lines perpendicular to $\overline{FG}$—one through F and the other through G.

- Create $\overline{GH}$ and $\overline{FJ}$ using the **Intersection Point(s)**, **Hide/Show**, and **Segment** tools.

- Hide the vanishing segments, and draw the three remaining edges of the rectangular prism.

Drag the vanishing point and edges or vertices of the rectangular prism. When you finish exploring, you may use the **Hide/Show** or **Attributes** tool to hide or dash the "hidden edges."

Then, use similar steps to construct a triangular prism in one-point perspective on page 1.7.
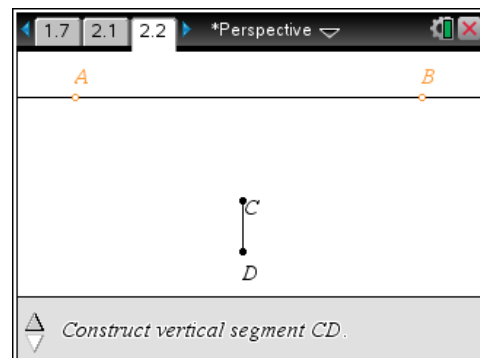
Problem 2 – Two-Point Perspective

On page 2.2, follow these instructions to construct a rectangular prism in two-point perspective.

- Construct a vertical line segment, $\overline{CD}$, as shown in the screenshot to the right.

  To accomplish this, you will use the **Perpendicular**, **Segment**, and **Hide/Show** tools. Ask your teacher if you need help.

- Draw four vanishing segments: $\overline{AC}$, $\overline{AD}$, $\overline{BC}$, and $\overline{BD}$.

- Use the **Point On**, **Parallel**, **Intersection Point(s)**, **Hide/Show**, and **Segment** as you did in Problem 1 to construct two more vertical edges of the prism, $\overline{EF}$ and $\overline{GH}$. Label them such that $\overline{CD}$ is the "middle" edge, with $\overline{EF}$ on its left and $\overline{GH}$ on its right.

- The three vertical segments represent the "side" edges of the left and right faces of the rectangular prism. Draw the four segments that represent the "top" and "bottom" edges of these faces.

- Hide the four vanishing segments, and then draw four more: from *E* and *F* to *B* and from *G* and *H* to *A*. Mark the point of intersection of the upper two vanishing segments as point *J*, and that of the lower two vanishing segments as point *K*, and draw $\overline{JK}$.

- Hide the vanishing segments, and then draw the remaining four edges of the prism.

Drag the vanishing points and edges or vertices of the rectangular prism. When you finish exploring, you may again use the **Hide/Show** or **Attributes** tool to hide or dash the "hidden lines."

In the space below, describe the similarities and differences between drawing in one-point perspective and drawing in two-point perspective. Then advance to Problem 3.

Problem 3 – An Isometric Drawing

On page 3.2, construct an isometric drawing of a rectangular prism by following these steps.

- First, you will construct lines using the **Parallel** tool. Refer to the diagram to the right.

  You should construct two lines though point *D* (one parallel to $\overline{AB}$, the other to $\overline{BC}$) and two lines that are parallel to $\overline{BD}$ (one through point *A*, the other through point *C*).
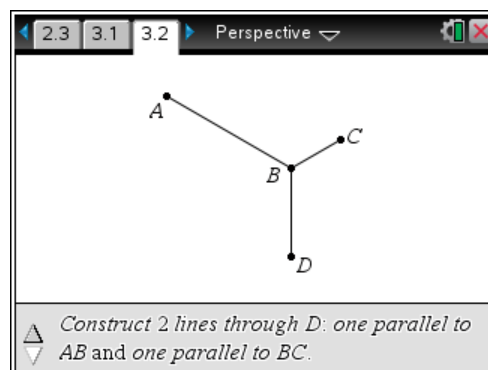
- Use the **Intersection Point(s)** tool to mark the lower left intersection as point *E* and the lower right intersection as point *F.*

- Hide the parallel lines, and use the **Segment** tool to draw $\overline{AE}$, $\overline{CF}$, $\overline{DE}$, and $\overline{DF}$.

- Using the same sequence of tools, construct the remaining edges: $\overline{AG}$, $\overline{CG}$, $\overline{EH}$, $\overline{FH}$, and $\overline{GH}$. (Can you figure out how?)

Grab and drag points *A*, *C*, or *D* to change the dimensions of the rectangular prism. Again, you may change the appearance of the "hidden edges."

In the space below, describe any similarities and differences between an isometric drawing and a perspective drawing.

Extension

On the left side of page 4.2, a vertical line divided into equal segments is shown. A vanishing point is shown on the right side of the page. Use the vanishing point to draw a brick wall in one-point perspective. (The segment shown is the leftmost side of the wall, and each point represents where a new row of bricks begins.)