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| **Activity 4.1b Graphical Modeling** |



Procedure

1. Using the puzzle part options that you generated during Activity 4.1a Puzzle Cube Combinations, create **two** different puzzle cube designs. One design should be relatively easy to solve and the other more difficult. You will need a total of **two** solutions with ten unique parts. Note that, in general, more interlocking pieces make a puzzle cube more difficult to solve.

For each design, neatly sketch and color code an isometric view of each of the five component parts and show how they fit together in the isometric view of the cube. See your teacher for an example.

1. Choose the best design from the two options. Document the reasons for your choice in your engineering notebook.
2. On orthographic grid paper, create a multi-view drawing of each of your five puzzle pieces for the selected design. Carefully select the best front view and include all object and hidden lines. Show the minimum number of orthographic projections necessary to fully detail the part. **Do not show the joints between individual wooden cubes.**
3. Exchange your multi-view sketches (preferably copies) with a classmate.
4. Review your partner’s sketches. Consider the following questions for the multi-view drawing of each puzzle piece. Record notes on a separate sheet of paper to provide feedback to your partner to help them correct their sketches.
   * Is the chosen front view the BEST front view?
   * Has the designer used the minimum number of orthographic projections needed to represent the part? That is, could fewer orthographic projections be used to adequately represent the part?
   * Are the orthographic views properly shown based on the orientation of the isometric sketch of each piece?
   * Are the orthographic projections properly oriented to each other?
   * Are all object lines shown properly (thick and dark)?
   * Are all hidden surfaces represented with a hidden (dashed) line where necessary?