

FINISHING YOUR BEDROOM

Performance Standard (7C/7A).E

Measure and compute the actual measurements of the room using a scale drawing and determine the perimeter and area of this irregular shape:

- *Mathematical knowledge*: convert measurements of scale drawing into actual measurements and determine perimeter and area of irregular shapes;
- *Strategic knowledge*: measure the scale drawing correctly, make appropriate conversions;
- *Explanation*: explain what was done and why it was done.

Procedures

1. *In order to select and use appropriate technology, instruments, and formulas to solve problems, interpret results, and communicate findings and (7C), measure and compare quantities using appropriate units (7A)*, students should experience sufficient learning opportunities to develop the following:
 - Develop and discuss strategies for determining area and perimeter of irregular shapes.
 - Read and interpret a scale drawing.
2. The teacher needs to set the stage by telling the students to imagine they are about to move into a new house. “Your bedroom is rectangular with a square walk-in closet. The closet has a triangular corner cupboard for storage. Your bedroom also has a bay window.”
3. Pass out the scale drawing of the bedroom.
4. “This is a scale drawing of your new bedroom. $\frac{1}{4}$ inch on the drawing equals one foot of measure in the actual room. You need to measure each line segment of the scale drawing, label the line segment with both your measure-to the nearest $\frac{1}{4}$ inch-and measure converted to feet.”
5. The next set of directions can be written out and given to the students, but the directions should also be given orally to allow for questions. You will probably need to discuss what molding is and that it goes around the perimeter of a room. The carpet covers the area of the room. They will have computed the area in square feet. Carpet is usually purchased by the square yard. Some students may want to try and figure the square yards of carpet but that would be exceeding the goal of the assessment. “After you have completed all the measuring and labeled your drawing, develop a strategy for finding the perimeter and area of the room so that the correct amount of baseboard molding and carpet can be purchased and installed.”
6. A student would receive all 4s by measuring as accurately as possible to the nearest $\frac{1}{4}$ of an inch and labeling each line segment correctly. That student would also convert the scale measurements accurately to room size measures and once again label correctly. The student would find the area of the right triangle (the corner cupboard in the closet) and subtract it from the total area. Depending on the strategy the student uses, s/he might subtract the area of that triangle from the area of the square closet and then add the remaining area of the closet to the rest of the area. Either way, that triangular space will not need carpet. A strategy that might be used for computing the area of the bay window is to draw a line across the opening to make the bedroom rectangular and then draw perpendicular lines from the corners of the window to that line to form right triangles and another rectangle. Accuracy would be important. Some students may know how to figure the area of a trapezoid and would not need to use triangles and rectangles. This would also exceed the goal of this assessment. The student would also exceed the standard with a detailed, logical explanation of the steps and computation s/he used in completing this task. This explanation needs to be in writing on the scale drawing sheet provided. If the student is unable to write this explanation, it may be dictated to the teacher and written by the teacher on the scale drawing sheet.

Examples of Student Work not available

Resources

Time Requirements

- One class period

- A ruler that measures in increments of at least one-quarter inch for each student
- Copies of the scale drawing
- Calculator (optional)
- Mathematics Rubric

ASSESSMENT (7C/7A).E