

Thinking
strategies
to enhance skills
of analysis,
creativity,
and problem
solving.

TEACHER BENCH FOR THE PLAYGROUND

Brief Description of the Lesson: Lunch and recess time are often the only times during the school day that a teacher gets to sit down. Students work in pairs or small groups to design a bench for a few teachers to sit on during recess. A 4x8 ft. piece of plywood will be donated by a local home building store for each bench. The store will make cuts to the wood for free, so that a carpenter could quickly and easily put it together. The only requirement is that the bench must be made from the single 4x8 ft. sheet of plywood.

SOL/POS Objective: (List number and specific objective.)

Math 5.1.3

Students will use problem solving approaches to understand concepts and skills. Students pose problems; solve routine, non-routine and multi-step problems.

5.1.3.1

Develop and apply operations and strategies (e.g., act it out, build a model, draw a picture or diagram, guess and check, make a chart or table, make a list, make a graph, use a pattern, use logical reasoning, solve a simpler problem, work backward) to solve a wide variety of routine and non-routine problems.

5.1.3.8

Share and explain (verbalize/ record) thinking during and after solving a problem. Verify and interpret results with respect to the original problem situation to determine if answers are reasonable.

Math 5.3

Solve problems involving measurement.

Math 5.3.1.3

Estimate and measure mass (ounces, pounds, tons, grams, and kilograms) and capacity (cups, pint, quarts, gallons, liters, milliliters, and cubic centimeters) (Sol 5.11b, 5.11c)

Math 5.3.2

Students develop and apply procedures and formulas to solve measurement problems.

Math 5.3.2.5

Develop formulas for perimeter and area.

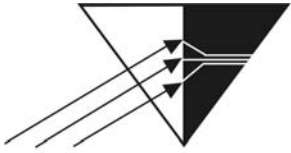
Instructional Strategy :

Generating and Testing Hypotheses- Students apply their understanding of perimeter and area to design a bench for teachers.

Materials: Pencil, white paper, large drawing paper or large construction paper; pencil, eraser, scissors; tape and/or glue; heavy paper; ruler.

Enduring Understanding:

- There are many different ways to view and interpret the world.
- Personal experiences may impact one's perspective.
- An individual's perspective may affect his or her actions.
- Asking questions and listening is the key to understanding others.



*Thinking
strategies
to enhance skills
of analysis,
creativity,
and problem
solving.*

Introduction/Essential Questions: (*What influences your reaction to an issue or a problem?*)

- How is what we see influenced by what we want to see?
- How do individual perspectives help or hinder the problem solving process?
- How do differing perspectives cause conflicts?
- How can those conflicts be resolved?
- How can you ever know what someone else is thinking?

Teach and Explore Strategy: (*Steps in teaching the process and exploring applications*)

Prior to teaching this lesson, be sure to have taught or reviewed the introductory thinking process lesson. Help focus students' thinking by reminding them of the metacognitive component of this lesson.

- Discuss the assignment with the class. Tell the students that they will have to experiment with the pattern, design and shape of the bench.
- Ask students to draw their pattern of the bench on an 8 cm x 16 cm rectangle, and then construct the bench using tape or glue. Students' model should proportionately reflect the life-size bench. Students will have to convert the metric pattern to standard measurement, while working with their scale drawing.
- Ask:
 - What is the perimeter of the sheet of plywood? (in. ft.)
 - What is the area of the sheet of plywood? (in. sq. ft.)
 - What is the area of the bench seat?
 - How high is the top of the bench?
 - How long is the bench?
 - What is the area of the backrest?
 - How will you label the pieces with their full-size dimensions?
- When students have a design and pattern that will work, have them transfer their pattern to heavy paper and construct the model of the bench, Students should have a pattern on the rectangle and a heavy paper model when completed.

Assessment Evidence: (Discussion, teacher observation, completed product, student reflection...)

- Teacher observations
- Class and small group discussion
- Completed products and sharing

Metacognition:

- How do perspective and thinking about your decisions and outcomes synergistically support each other?
- How do decisions and outcomes produce more or less than I expected?

Extensions:

- Create a more complex bench system from the same sheet size of plywood.

8 cm

16 cm



2 cm = 1 ft