BATTLESHIP WISCONSIN LESSON PLANS GRADES 6-8

ACTIVITY #1

Objective:
The students will determine the area of the deck of the Battleship Wisconsin by subdividing the deck into rectangles, triangles, and trapezoids.

MATH SOL 6.11: The student will determine if a problem situation involving polygons of four sides or fewer represents the application of perimeter or area and apply the appropriate formula.
B. Calculate the area of plane and irregular polygons.

MATH SOL 7.8: The student, given appropriate dimensions, will estimate and find the area of polygons by subdividing them into rectangles and right triangles.
B. Find the area of polygons by subdividing them into simpler polygons, such as rectangles and right triangles.

Pre-Visit Activity 1:
1. In groups of four, have each student walk ten steps.
2. Measure out the distance traveled to the nearest hundredth of a meter. Example: 7.45 meters
3. Divide by 10. Round to the nearest hundredth. Example: 7.45 meters divided by 10 = 0.745 or 0.75 meters. This is the length of your average step, or "step length"

Pre-Visit Activity 2:
1. Obtain a diagram of the Battleship Wisconsin. Be sure that the diagram does not have any measurements or scales on it. It should have many recognizable landmarks. You can use "Battleship Wisconsin Visitor's Guide" from the Hampton Roads Naval Museum. (call 757-322-2986 to obtain this guide)
2. In groups of two to four, have the students prepare a plan for determining the area of the deck. Use landmarks on the diagram to plan which places need to be measured. Guide the students toward dividing the deck into manageable polygons.
3. Review the formulas for the area of polygons in order to finalize which measurements on the Wisconsin must be taken.
Trapezoid: $A = {}^{1}/_{2}\,(B_1 + B_2)H$; Triangle: $Area = {}^{1}/_{2}BH$, Rectangle: $A=BH$
4. Show students an online example of how the main deck's area can be measured/estimated using appropriate landmarks and linear measurements.

Dividing the Main Deck into Polygons

Field Trip Activity

1. Each member of the group uses their "step length" to measure the appropriate linear distances in the group's plan. The group may want to measure each linear distance twice with different group members and average the results during the post-visit activity.
2. Using mental math, the students will estimate the area of the deck and check their answer with a docent on the ship.

Post-Visit Activities

1. The students will take an average for each measurement of linear distance.
2. The students will calculate the area of the Wisconsin deck using the appropriate polygon formula.
3. The groups will check their answers with the accepted value from printed or online sources.
4. Optional:

A. The students will calculate their percent error.Error = (calculated value - accepted value)/accepted value x 100%
B. Brainstorm reasons why the calculated deck area differs from the accepted value. (Possible reasons: bowing of the deck, the sum of the polygons is only an approximate value for the area of the main deck.)

ACTIVITY #2

Objective:

The students will create a scale model of the Wisconsin on graph paper after collecting data from the ship.

MATH SOL 7.7: The student will use proportions to solve practical problems, including scale drawings, that contain whole numbers, fractions, decimals, and percents.
A. Solve practical problems involving proportions:

- Determine scale factors

- Construct and label scale drawings given the image and a scale factor.

B. Interpret scale drawings using a given scale.
C. Model and solve real life problems such as finding the dimensions of an airplane from a scale model.
D. Reason proportionally with measurements to interpret maps and to construct scale drawings.

Pre-Visit Activities

It is suggested that you do this activity in groups of two to four students.
1. Have each student walk ten steps.
2. Measure out the distance traveled to the nearest hundredth of a meter. Example: 7.45 meters
3. Divide by 10. Round to the nearest hundredth. Example: 7.45 meters divided by 10 = 0.745 or 0.75 meters. This is the length of your average step, or "step length"

Field Trip Activity

It is suggested that you do this activity in groups of two to four students.
1. Each member of the group uses their "step length" to measure the length and width of the ship. They should also make an estimate of the height using the depth markers on the side of the ship.

Post-Visit Activity

1. The students in the group will take an average for each measurement of linear distance on the Wisconsin.
2. Obtain a diagram of the Battleship Wisconsin. Be sure that the diagram does not have any measurements or scales on it. It should have many recognizable landmarks. You can use "Battleship Wisconsin Visitor's Guide" from the Hampton Roads Naval Museum. (call 757-322-2986 to obtain this guide)
3. Each individual in the group will prepare an accurate drawing of the Wisconsin's top and side views.
4. Each student in the group will then write down the length, width and height measurements for the Wisconsin on their scale drawings.
5. Using proportions, the students will calculate the scale for the drawing. For example, 1 cm. = ____meters or 1 cm. = ____ feet.
6. Have students use printed or online sources to check the accuracy of their scale drawings.

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