Wrapping Mom's Lamp

Sarah's mom needs to wrap a lamp she bought for Sarah's birthday. The lamp is 26 inches tall, including the shade and 8 inches across the circular base.

What are the dimensions of the smallest sheet of wrapping paper she will need to wrap the lamp?

Hint:

The lamp is fragile, so you might want to put it in a box before wrapping.

Grade Levels 6 - 8

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Context

This problem can be given to students with knowledge of perimeter and area, but this is not necessary to find a solution. It is open ended in that some students will make allowance for the size of the lampshade and whether or not to use a box with the same dimensions as the lamp.

What This Task Accomplishes

This task will show whether the student has a basic understanding of area and perimeter and can apply it in a practical situation. On a higher level, it will show reasoning, which goes beyond computation with the dimensions that are given.

What the Student Will Do

The student will need to decide what size box to use and consider that the top and bottom must be covered. They may allow for some overlap for neatness or may take literally the directions to find the smallest piece of wrapping paper, which will cover the box. They may consider the width of the shade.

Time Required for Task

45 minutes

This allows time to actually wrap a package before or after recording the solution.

Interdisciplinary Links

Links can be made to the many practical situations which involve surface area and perimeter of a three dimensional figure.

Teaching Tips

This task could be done hands on with wrapping paper and a box. The students should then write an explanation with pictures or diagrams of how the students arrived at their solution, or the actual wrapping could be done after the solution and explanation have been written to test the accuracy of the solution and make corrections as needed.

Suggested Materials

- Rectangular boxes
- Wrapping paper

Possible Solutions

The basic solution is to add eight inches to the height to allow four inches to cover the top from the front and four inches from the back and likewise for the bottom. The length of the paper would thus be 34 inches. The width would be found by multiplying 4 x 8, which is the width of each side of the box. Thus, the dimensions are 34" x 32". Other solutions would be to allow for some overlap in the width or to use a larger box in order to pack the lamp securely. Finally, some students might consider that the shade would probably be wider than the base and could even be packed in a separate box.

Benchmark Descriptors

Novice
The solution shows experience with computing area, but a lack of understanding of when to use it. S/he does not take into consideration that the top and bottom have different dimensions than the sides.

Apprentice
The solution is not clearly explained in written communication or by the picture. While the 42 inches is probably the result of adding eight inches to cover the top and bottom to the height of 26 inches, the student does not explain his/her reasoning for this or the 32 inch width.

Practitioner
The Practitioner shows a broad understanding of the task. The communication is clear and the second picture adds to the understanding of the solution.

Expert
The Expert shows the student has a clear understanding of the task and has taken into consideration the size of the shade. The written communication explains each step clearly and an alternative solution is given. The student uses mathematical language and pictures. The explanation and pictures are easy to read and understand. A real-world application is included.

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