Peering Through Tubes: How Much Can We See?

1. Your group should make a tube to start looking through. It can be any length and diameter, but make sure you can measure both dimensions easily. Record these dimensions in the first table below.

2. Have one person stand some distance from a wall (measure this distance!) and look through the tube. Another person should stand at the wall and find a way to measure the diameter of the viewing area the other person can see. Do this several times with different distances from the wall and enter your results in the first table below.

   Do you see any patterns?

3. Make another tube and repeat steps 1 and 2, entering your results in a different table.

4. Try graphing your data with:
   o *x*-axis: distance from wall
   o *y*-axis: diameter of the viewing

   How does this look?

5. Keep trying different tubes and different distances from the wall until you come up with a conjecture about what's going on. Then try again and check your conjecture.

Tube Length:	Tube Diameter:
Distance to Wall	**Diameter of Viewing Area**

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1. What is your conjecture? Can you write a formula for calculating the viewing area if you are given a tube and told to stand a certain distance away from the wall?

2. How far off was your data? (You can calculate the percentage error by dividing the difference between your data and the conjectured value by the conjectured value and then multiplying by 100.)

3. Why was your data not perfect? What kinds of error were there?