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Date: 3/5/13
Block: 1

Saving the World with Circular Measurements

This link will be needed throughout today's lesson: <http://tinyurl.com/richmondzombies>

Part I Directions: Answer these questions as we are completing the whole class portion of the assignment.

1. Define Radius: A straight line from the center of a circle to any point on the edge of the circle.
2. Define Diameter: The length of the line through the center of a circle that touches two points on the edge of the circle.
3. Define Circumference: The distance around or perimeter of a circle.
4. How far from the center of Richmond the barricade be located? Show your work.

18.5 mi. (work on back)

Part II Directions: Using the provided materials and the instructions of your teacher, measure the circumference and diameter of three circular objects in the classroom. Record your measurements in the chart below. Once you have completed your measurements, enter your measurements into the Google Form using the following link. After entering your measurements for one object, click "submit another response" and complete the form for your next object. Do this for all three objects.

<http://tinyurl.com/zombiemeasurements>

measure in inches

Object Name	Circumference	Diameter
IB sign	24 in.	7 in.
bottom of mug	8 in.	2.4 in.
cap of hand sanitizer	2 1/4 in.	3/4 in.

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Part III Directions: Use the following link to view the measurements of the entire class and respond to the following questions: <http://tinyurl.com/zombiemeasurementresults>

1. Explain the relationship between the circumference and diameter of these measured objects in this spreadsheet (use the listed numbers AND the graph to the side to help you).

As the circumference becomes larger so does the diameter.

2. Take the circumference of one of the objects and divide it by the diameter. Record your work and your results. Now choose two more objects and complete the same process. What do you notice?

IB sign - 3.4	Bottom of mug - $3.\bar{3}$	Desk leg - 2.3
$\begin{array}{r} 3.42 \\ 7 \overline{)24} \end{array}$	$\begin{array}{r} 3.3\bar{3} \\ 2.4 \overline{)8} \end{array}$	$\begin{array}{r} 2.25 \\ 2 \overline{)4.5} \end{array}$

- If you multiply the diameter by 3, you will get around the c.

3. This ratio that you just created in question 2 has a special name - Pi. Based on what you have learned, create a mathematical definition for Pi.

The ratio of a circumference over the diameter

ex. $\frac{c}{d}$

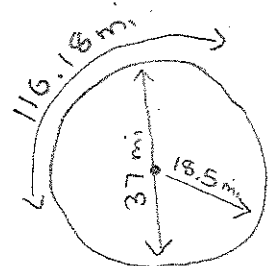
4. Teacher's definition of Pi -

The ratio of the circumference of a circle to its diameter.

5. Now, going back to the problem of the Zombies... Thinking about what you have just learned, create a formula to represent how to find the perimeter (circumference) of our barricade. What is the total mileage of our barricade? Show your work.

$$P_i = \frac{C}{d} \text{ so } P_i = \frac{C}{37} \times 37$$

$$37 \times 3.14 = c = 116.18$$



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Part IV Directions: This is your report to the President. In this section, create a written explanation for the President and explain how many supplies/personnel you need in order to man the zombie barricade. Make sure to explain HOW you determined your final calculations.

And remember, your barricade needs:

- Policemen and Military Personnel: 100 per mile of the barricade
- Tanks: 9 for every 5 miles of the barricade
- Airplanes and Helicopters: 3 for every 2 miles of the barricade

6. Create a written explanation for the President to explain how many policemen and military personnel you will need to man the zombie barricade. Explain how you calculated this number.

We need 11,616 policemen and military personal. I figured this out by \times the circumference by 100.

$$\begin{array}{r} 116.16 \\ \times 100.00 \\ \hline 11,616 \end{array}$$

7. Create a written explanation for the President to explain how many tanks you will need to man the zombie barricade. Explain how you calculated this number.

We need 209 tanks to man the zombie barricade. I figured this out by \div the circumference by 5. Then, I \times the quotient by 9.

8. Create a written explanation for the President to explain how many helicopters and airplanes you will need to man the zombie barricade. Explain how you calculated this number.

We need 174 Airplanes and Helicopters. I figured this out by \div the circumference by 2, and then I \times the quotient by 3.

Extra Credit – Use an infographic creator such as ingogr.am or easel.ly in order to create a visual report to turn in to the President. Your infographic should include a visual representation of the personnel and equipment necessary in order to man the zombie barricade.

- none -

$$4. \frac{11 \text{ mi.}}{60 \text{ min.}} = \frac{x}{90}$$

$$\frac{60x}{60} = \frac{990}{60} \rightarrow 16.5 \text{ mi in } 90 \text{ minutes}$$