Math 3

PD = number of ppl / Land area

6.8 Density

Unit 6

SWBAT find the population density and apply it to real-life situations.

1. A 4800 sq.ft. school was opened up in a small town. At the time of the school's opening, the population density of the school was only 0.046 students/ft². Over the years, the town has seen an increase in residents, and now, it is time to decide if there should be a new school built or not. The principal determined that if population density of the school reached a level greater than 0.1 students/ft², then an additional school would need to be built. How many students were enrolled when the school first opened? If 176 new students have enrolled since the school was first opened, what can be said about the need for building a new school?

$0.046 = \frac{x}{4800}$

$x = 221$ students

$PD = \frac{397}{4800} = 0.083$ Do not need a new school yet

2. There is an island located off the coast of South America that is approximately 4500 sq. miles and contains 608,000 inhabitants. According to the previous year's hospital records 11,275 children were born last year, but 9850 inhabitants died. The local government of the island believes that they can support a population that is as dense as 135 people per square mile. Given last year's medical records can the government support the new population?

608000 + 11275 − 9850 = 609425

$PD = \frac{609425}{4500}$

PD = 135.43 pp/sq mi

The gov. cannot support the new population.

3. A skating rink in the shape of a circle has a diameter of 160 ft. The owner of the rink realized there were more injuries on the rink floor when the population density increased. On any given Saturday, he found that at 2 PM the population density was at 0.0096 people/ft², and at 6 PM, there were 265 people out in the rink. Was it more dangerous to be on the rink at 2PM or at 6 PM? How do you know? (Use 3.14 for π).

$A = (3.14)(80)^2$

$A = 20096$

$PD_6 = \frac{265}{20096} = 0.013$

$PD_2 = 0.0096$

$PD_6 = 0.013$ ← Higher

more dangerous at 6 pm

Fill in the appropriate dimensions for the boxes with question marks in the chart below. Be sure to include units as part of your final answer. Round all answers to the nearest hundredth and use 3.14 for π. Formula: $d = \frac{m}{V}$

	Object	Length	Width or Diameter	Height	Mass	Volume	Density
4.	Cube of Paper	5 cm	5 cm	5 cm	90 g	125 cm³	0.72 g/(cm³)
5.	Pencil		0.06 cm	N/A*	4 g	0.05 cm³	80 g/(cm³)
6.	Square Pyramid	27.5 ft	27.5 ft	455 ft	110,000 kg	172046.88 ft³	0.64 kg/ft³
7.	Ice Cream Cone	N/A*	r = 3.53 d = 7.06	14 cm	42 g	182.61	0.23 g/(cm³)
8.	Baseball	N/A*	r = 4 d = 8	N/A*	363 g	267.9 cm³	1.35 g/cm³

*N/A means not applicable. You cannot find this value for the specified *object*.