

Reviewing What We Have Learned about Population Density

Population density tells you how crowded a population is over a particular area. It shows the relationship between the population and the area. 500 people at the Department of Motor Vehicles would be really crowded, but a football stadium with 500 people would seem empty. This is because the area of a football stadium is much larger than the DMV's offices.

The *population density* of foxes in the state park is a measure of how crowded the park is with foxes. To find out the population density of foxes, we imagine the foxes spread around the park and distributed equally in each square mile.

We can divide the total number of foxes by the total area to find the population density.

54 foxes divided by 18 square miles equals 3 foxes per square mile.

Also written as:

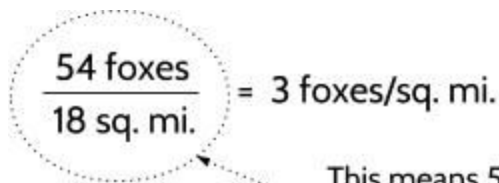
Population divided by area equals population density.

You can write this as a formula:

$$\frac{\text{population}}{\text{area}} = \text{population density}$$

or $\frac{p}{a} = d$

If you insert numbers, you get:


$$\frac{54 \text{ foxes}}{18 \text{ sq. mi.}} = 3 \text{ foxes/sq. mi.}$$

This means 54 divided by 18. The horizontal line means the top number is divided by the bottom number, so the whole equation means $54 \div 18 = 3$.

This calculation confirms that 3 foxes would live in each square mile if they were distributed evenly around the park. (Of course, this is not how foxes actually live, but it's a way for us to understand how crowded the state park is with foxes.)

Sometimes the population can't be divided evenly by the area. In that case, your answer will have a decimal remainder.

$$\frac{63 \text{ foxes}}{18 \text{ sq. mi.}} = 3.5 \text{ foxes/sq. mi.}$$

You can find the population density by dividing the population (number of people, animals, plants or things) by the area.

If you know the population and the population density, you can find out the area by dividing the population by the density: $\frac{p}{d} = a$

A population of 2,000 people with a population density of 200 people per square mile means that the area is _____ square miles.

$$\frac{2000 \text{ people}}{200 \text{ people/sq. mi.}} = ? \text{ sq. mi.}$$

There must be a total of 10 square miles, because 2,000 divided by 10 equals 200.

And if you know the area and the population density, you can find out the population by multiplying the area by the density: $a \times d = p$

An area of 7 square miles with a density of 5,000 people per square mile means that the total population is _____ people.

$$\frac{? \text{ people}}{7 \text{ sq. mi.}} = 5000 \text{ people/sq. mi.}$$

There must be a total of 35,000 people, because 35,000 divided by 7 equals 5,000.