

STUDENT MATERIALS

PART 1: THE SCIENCE OF MATH

1. The distance from Earth to the Sun is 1.5×10^8 km. Scientists would like to place a weather station halfway between the Earth and the Sun. How far away from the Earth would the weather station be in scientific notation? Give your answer in scientific notation.

$$1.5 \times 10^8 = 150,000,000$$

$$150,000,000 \div 1.5 = 100,000,000$$

$$1.5 \times 10^8 - 5,000,000 = 100,000,000$$

2. A bacteria sample contains 2.1×10^3 bacteria and doubles every hour. What is the size of the bacterial population after 2 hours? Give your answer in scientific notation.

$$2.1 \times 10^3 = 2100$$

$$2100 \times 2 = 4200$$

$$4200 \times 2 = 8400$$

OR

$$2100 \times 4 = 8400$$

Since 2.1×10^3 is 2100, we know that we can multiply that product by 4 since the population doubles every hour & it's been 2 hours. ($2 \times 2 = 4$)

PART 2: SCIENTIFIC NOTATION IN THE SOUTH OF AFRICA

3. There are two countries, Lesotho and Eswatini, located within South Africa. Eswatini has a population of 1.192×10^6 . Lesotho has a population of 2,281,000. What is the total population of these two countries in scientific notation?

$$1.192 \times 10^6 = 1,192,000$$

$$2,281,000 + 1,192,000 = 3,473,000$$

$$1.192 \times 10^6 + 2.281 \times 10^6 = 3.473 \times 10^6$$

4. Population density is a measurement of population per unit of land area. Eswatini has a land area of 6,704 miles². With a population of 1.192×10^6 , what is the approximate population density (people per square mile) of Eswatini?

$$1.192 \times 10^6 = 1,192,000$$

$$6,704 \times 10^2 = 670,400$$

$$1,192,000 \div 670,400 = 1.773568...$$

PART 2: SCIENTIFIC NOTATION IN THE SOUTH OF AFRICA

5. South Africa has a land area of 470,900 miles². With a population of 6.601×10^7 , what is the approximate population density (people per square mile) of South Africa?

$$470,900 \times 10^2 = 47,090,000$$

$$6.601 \times 10^7 = 66,010,000$$

$$47,090,000 \div 66,010,000 = 3.1084109...$$

6. In the problems 4 and 5, you explored the population density of Eswatini and South Africa. What do you think the challenges are for each country based on their size and population density?

The challenges for these countries could be the fact that they may be overpopulated, and might not be able to meet the demands of residents.