

## STUDENT MATERIALS

### PART 1: THE SCIENCE OF MATH

1. The distance from Earth to the Sun is  $1.5 \times 10^8$  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.

$$\begin{array}{r}
 75,000,000 \text{ km} \\
 1.5 \times 10^8 = 150,000,000 \\
 \div 2 \\
 \hline
 75,000,000 \\
 7.5 \times 10^7 = 75,000,000
 \end{array}$$

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

$$8,400$$

$$\begin{array}{l}
 2.1 \times 10^3 = 2,100 \times 2 \times 2 = 8,400 \\
 8.4 \times 10^3 = 8,400 \leftarrow
 \end{array}$$

## 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  $1.192 \times 10^6$ . Lesotho has a population of 2,281,000. What is the total population of these two countries in scientific notation?

$$\begin{array}{l}
 \downarrow \\
 1.192 \times 10^6 = 1,192,000 \\
 \begin{array}{r}
 2,281,000 \\
 + 1,192,000 \\
 \hline
 3,473,000
 \end{array} \\
 \downarrow \\
 3.473 \times 10^6
 \end{array}$$

6 times

4. Population density is a measurement of population per unit of land area. Eswatini has a land area of 6,704 miles<sup>2</sup>. With a population of  $1.192 \times 10^6$ , what is the approximate population density (people per square mile) of Eswatini?

$$\begin{array}{r}
 1,192,000 \\
 \div 6,704 \\
 \hline
 178
 \end{array}$$

178 people  
per square mile.

## PART 2: SCIENTIFIC NOTATION IN THE SOUTH OF AFRICA

5. South Africa has a land area of 470,900 miles<sup>2</sup>. With a population of  $6.601 \times 10^7$ , what is the approximate population density (people per square mile) of South Africa?

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

$$\div 470,900$$


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140 people  
per square mile

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?

There is a lot of people but there
is also a lot of space for the people
So it's somewhat even & out but I
still think there is a little too many people