

Family Letter

Dear Student and Family Members,

We are about to begin our study of exponents and extremely large or extremely small numbers. Exponents can be thought of as a shortcut for expressing repeated multiplication: $5 \times 5 \times 5$ is the same as 5^3 . In this example, 3 is the exponent. We will study exponents and roots in greater depth than we have in the past.

We'll also explore relationships that grow (or shrink) exponentially. In this kind of relationship, the amount of change gets larger and larger (or smaller and smaller) each time. Population growth and compound interest are examples of exponential growth. If you deposit \$100 in an account earning 7% interest, the balance will grow exponentially; notice that while the interest percentage is the same, the dollar amount of interest earned increases each year.

Year	Interest Earned	Account Balance
1	\$7.00	\$107.00
2	\$7.49	\$114.49
3	\$8.01	\$122.50
4	\$8.58	\$131.08
5	\$9.18	\$140.26
6	\$9.81	\$150.07

We will also learn to distinguish rational and irrational numbers and develop some strategies for handling irrationals. Rational numbers are defined as those that can be expressed as the quotient of one integer divided by another integer. Irrational numbers are those that neither repeat nor terminate when expressed as a decimal, such as $\sqrt{2}$ and π :

$$\sqrt{2} = 1.414213562 \dots$$

$$\pi = 3.141592654 \dots$$

Vocabulary Along the way, we'll be learning about these new vocabulary terms:

decay factor

rational numbers

growth factor

real numbers

irrational numbers

scientific notation

***n*th root**

square root

radical sign

What can you do at home?

During the next few weeks, your student may show interest in exponential relationships or very large or small numbers. You might help him or her think about common occurrences of these topics, such as compound interest or the depreciation of your car as it ages. If you find examples of extremely large or small numbers in the paper—the national debt is a good example—ask your student to try to express them in both standard and exponential notation.