schoolio

GRADE 8 MATH - NUMBERS

SCHOOLIO ONTARIO CURRICULUM
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Lesson # 1: Scientific Notation

2 Days

Discussion:

Last year, we looked at square numbers. For example, a number like $4^2 = 16$ because it is like writing 4 x 4. Now, we are going to really look at exponents when we are writing in something called scientific notation. Scientific notation is a way of writing very large and very small numbers. You are going to use it moving forward whenever you do algebra, and of course because it's called scientific notation, you will use it in science. All it means is that we take a really big number and we move the decimal point so that we don't have to write out that huge number again and again. For example, if I'm looking at the number 64 000 000 (write this number on a whiteboard or chalkboard), I don't want to have to write that number multiple times. It's long, and if I get one zero wrong, I will make a mistake. What I'm going to do is move the decimal to the left to make a decimal number. Go through the steps below on the whiteboard or paper to show your child how to convert to scientific notation. On day 2, complete the second lesson on a whiteboard or paper to show them how to reverse the process.

To Convert to Scientific Notation:

64 000 000.

Write down your long number. Find the invisible decimal at the end of your number.

Count how many decimal places to the left you need your decimal to slide to make a new number. In this case it's 7.

6.4×10^7

Rewrite your number in Scientific Notation and use the exponent 7 after the 10 to show you would need to move the decimal 7 places to the right to create the big number you just shortened.

Do the prompts below to practice this with your child on the first day of this lesson.

To Convert to standard form:

3.2×10^4

Write down your number with scientific notation.

3.2

Count how many decimal places to the RIGHT you need your decimal to slide to make a new number. In this case it's 4. Sometimes it's helpful to draw loops below to show how many jumps you need to make.

3 2 0 0 0.

Move the decimal to the end of the last loop and place zeroes in where the empty spaces are in the loops.

32000.

Now you have your new number in standard form!

Activity:

Activity 1.1 – Understanding Scientific Notation – Day 1
Activity 1.2 – Understanding Standard Form – Day 2

Activity 1.1 – Understanding Scientific Notation

Write the numbers below in scientific notation:

Standard Form	Scientific Notation
904 300 000	
99 000 000	
7 410 000	
24 900 000	
98410	
650 000	
428.84	

Convert these distances to the sun to their scientific notation:

Planet	Standard Form	Scientific Notation
Mercury	57 000 000	
Venus	108 000 000	
Earth	150 000 000	
Mars	228 000 000	
Jupiter	779 000 000	
Saturn	1 430 000 000	
Uranus	2 880 000 000	
Neptune	4 500 000 000	

Activity 1.2 – Going from Scientific Notation to Standard Form

Write in standard form:

Scientific Notation	Standard Form
6.4×10^4	
7.01×10^8	
5.8497×10^3	
9.2013×10^4	
9.48×10^5	
9.87×10^5	
4.919×10^4	

Convert these rounded world populations from scientific notation to standard form:

Location	Scientific Notation	Standard Form
World	7.8×10^9	
China	1.44×10^9	
India	1.38×10^9	
United States	3.28×10^8	
Indonesia	2.7×10^8	
Pakistan	2.12×10^8	
Brazil	2.10×10^8	

Lesson # 2 – Squares and Square Roots

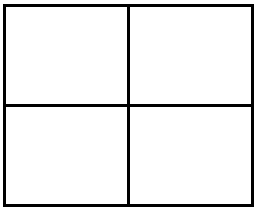
2 Days

Discussion:

Let's review last year's square root ideas. Now that you've learned about exponents, you are going to find this lesson really easy! We are going to use those exponents to calculate the square of a number. Do you remember how you calculated area? (L x W)

When we calculated area and it was a square, we were calculating something that was the same on both sides, right?

This means where one side was 5, the other side was five. Below we have a square. It's 2 x 2. If we found the area, what would it be? (4). Right! So, when we find the square of a number, we are just multiplying the number by itself. For example, 2 x 2 =4. We can also write that as 2^2.



Practice finding the squares of numbers with your child a few times. Try 5^2. Have your child draw what this square would look like, and verify that there are in fact 25 squares.

Try this with 4^2 (16 squares)

Try this with 6^2 (36 squares)

Square Roots:

The square root of a number is really just the number that can be made by multiplying a whole number by itself.

Ask your child if they would be able to find the length of one of the sides if you told them the area was 25. Give them the hint – what number multiplied by itself would make 25 (5). The video found below is excellent for this introduction.
https://www.youtube.com/watch?v=B-Sfvry_h3Q

Activity:

Day 1 Activity 2.1 – Understanding Square Numbers
Day 2 Activity 2.2 – Remembering Common Squares

Activity 2.1 – Understanding Square Numbers

What is the square root of each number below?

1. $\sqrt{900}=$
2. $\sqrt{196}=$
3. $\sqrt{4}\ =$
4. $\sqrt{100}\ =$
5. $\sqrt{1600}=$
6. $\sqrt{1024}=$
7. $\sqrt{676}=$
8. $\sqrt{225}=$
9. $\sqrt{196}=$
10. $\sqrt{1156}=$

What are these numbers squared?

1. $11=$
2. $50=$
3. $28=$
4. $40=$

Activity 2.2 – Remembering Common Squares

What are the values for these commonly used square numbers?

Number	Value
2^2	
3^2	
4^2	
5^2	
6^2	
7^2	
8^2	
9^2	
10^2	
11^2	
12^2	

Find the value of these square roots. Round to the nearest thousandth

Square Root	Value
$\sqrt{55}$	
$\sqrt{146}$	
$\sqrt{163}$	
$\sqrt{7}$	