Agenda

Homework:

- Exponents Summary
- Exponents WS
- AM

Materials:

- **MATH** Notebook

Do Now:

1. Take out your homework

2. On your DESK:

1. Is -8.54 rational or irrational? Why?
2. Solve the following: $5 \cdot (4-2)^3 - 6 + 1$

1. Is -8.$\overline{54}$ rational or irrational? Why?

2. Solve the following:
$$5 \bullet (4\text{-}2)^3 - 6 + 1$$

Notebook Rubrics

- Tape Rubric to the BACK inside cover of your notebook
- Look over the comments on your rubric
- Look over comments in your notes

Set up Cornell Notes

- **Topic**: Exponents-Positive, Negative, Zero, and One

- **EQ**: Compare and Contrast the effects of a positive, negatives, zero, and one exponent.

What is the goal?

1. $x^3 \cdot x^8 =$

2. $(x^2y^5)^2 =$

2. $(x^3)^2 =$

3. $(4x^3y)^3 =$

3. $6x^5 \cdot 3x =$

4. $\dfrac{9x^8}{12x^5} =$

4. $\dfrac{(4xy^3)^2}{(2x^2y)^4} =$

Why do we use exponents?

- Units for area (squared) and volume (cubed)
- To express REALLY Big and REALLY small #s

World Population Increase

The World's Population is growing at an Exponential Rate. Most of the growth is in developing countries where many people are having many children. How will they all be accommodated?
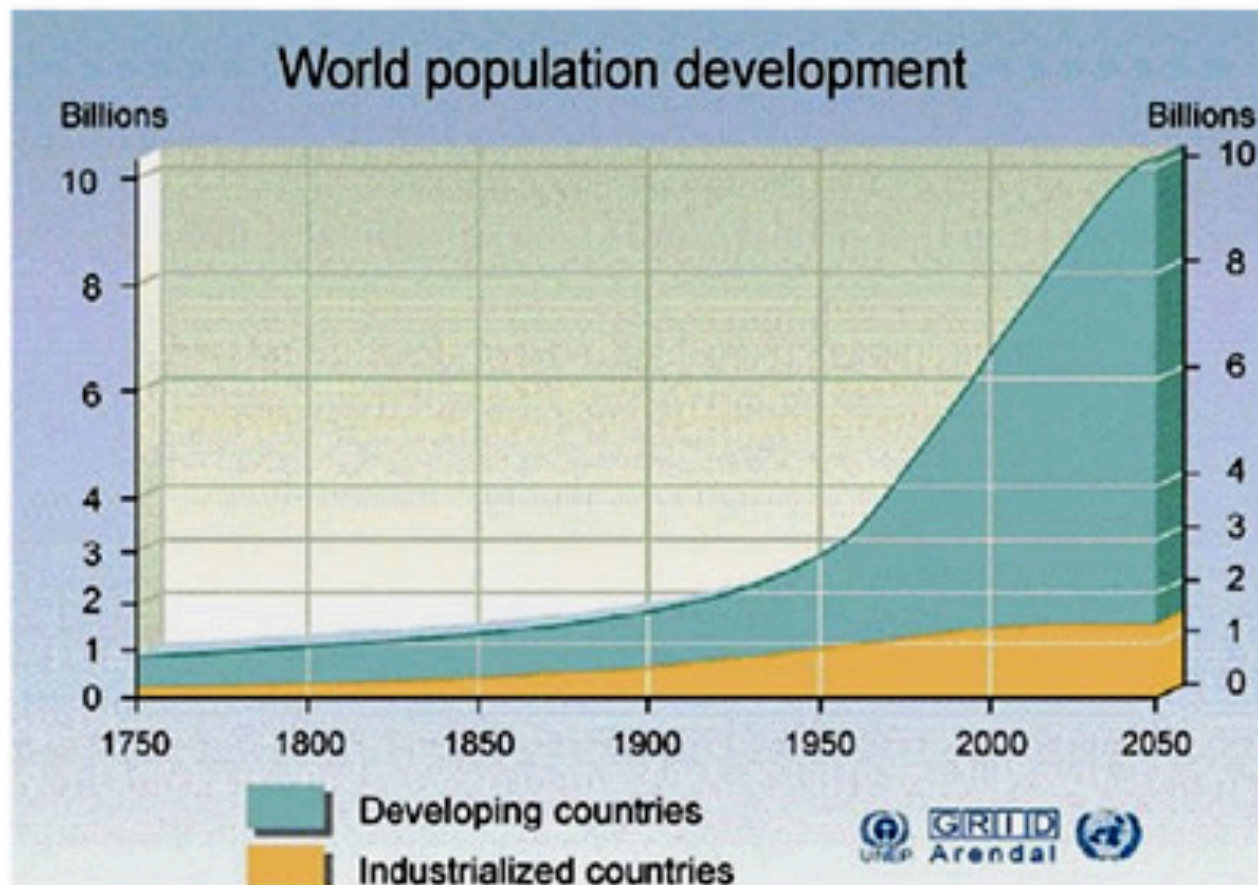
World population development

Legend:
- Developing countries (teal)
- Industrialized countries (orange)

UNEP GRID Arendal

Image Source: http://2.bp.blogspot.com

Compare and contrast <u>exponent</u> and <u>expanded</u> form.

Exponent (index or power)

$$6^3 = 6 \times 6 \times 6$$

Base

EXPONENT Form

EXPANDED Form

Try these ☺! What are the expanded forms of these powers?

- 6^4

- $6 \cdot 6 \cdot 6 \cdot 6$

- $5^3 \cdot 7^2$

- $5 \cdot 5 \cdot 5 \cdot 7 \cdot 7$

- $3^2 \cdot x^4$

- $3 \cdot 3 \cdot x \cdot x \cdot x \cdot x$

- $5^2 \cdot d \cdot x^3$

- $5 \cdot 5 \cdot d \cdot x \cdot x \cdot x$

Try these too ☺ What is the exponent form of the following expressions?

- $4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 \cdot 4 =$

- ½ • ½ • ½ =

- $b \cdot b \cdot b \cdot b =$

- $6 \cdot x \cdot x \cdot 6 \cdot x =$

- 4^6

- $(½)^3$

- B^4

- $6^2 \cdot x^3$

What does the zero and one exponent mean?

- Any # to the power of ONE is itself

- Any # to the power of ZERO is 1

- Why?

Why?

- $2^4 = 16$
  ÷ 2
- $2^3 = 8$
  ÷ 2
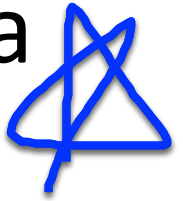- $2^2 = 4$
  ÷ 2
- $2^1 = 2$
  ÷ 2
- $2^0 = 1$

What is the reciprocal of a fraction?

- The reciprocal of a fraction is the result when the numerator and denominator of the fraction are switched

$$\frac{3}{4}$$ Find the Reciprocal

How do you find the reciprocal of a whole number?

- Every whole number can be written as a fraction by putting it over ONE

$$\frac{5}{1}$$

Find the Reciprocal

What does a negative exponent mean?

- $2^3 = 8$
- $2^2 = 4$
- $2^1 = 2$
- $2^0 = 1$
- $2^{-1} = \frac{1}{2}$
- $2^{-2} = \frac{1}{4}$

$\div 2$

$\div 2$

$\div 2$

$\div 2$

$\div 2$

What does a negative exponent mean?

$$5^{-2} = \left(\frac{1}{5}\right)^2 = \frac{1}{25}$$

- The negative in the exponent turns the base into its **RECIPROCAL**

Expansion

① 2^{-1}

② 5^{-3}

③ $\left(\dfrac{2}{4}\right)^{-2}$

④ $\left(-\dfrac{1}{2}\right)^{-4}$

⑤ x^{-5}

Quiz!

- Take out a sheet of folder paper
- Label it with your name, period, and date IN PEN
- Title: Period _____ Quiz Sheet
- Fold the right side of the paper up to the RED MARGIN

MINI QUIZ

Write the following in EXPANDED form and SOLVE.

1) 5^2

Convert the following to EXPONENT form

2) $7 \bullet 7 \bullet c \bullet c \bullet c$

Solve the following:

3) 143^1

4) 98765^0

5)