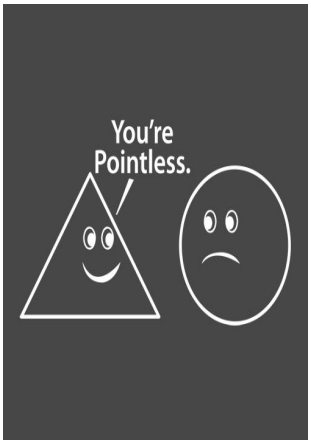

Agenda:

1) Bell Ringer: turn in p. 58, fill out BINGO (p. 63/64)

2) Lesson: Scientific Notation Word Problems
Which operation to use?? p.66-67

3) Practice: pgs 68-69

4) Homework: p. 70

Sep 10-9:19 AM

1) $(x^6)^3$

2) $\frac{m^{12}}{m^{10}} =$

3) Write in sci. not. : 3,426

4) $\frac{6.3 \times 10^4}{3 \times 10^6}$

5) $(m^{10})^2 =$

6) $(2.3 \times 10^{-2})(2 \times 10^{-1})$

7) Write in standard form: $.0000000612$

8) $(x^5)(x^2)$

9) $(1.2 \times 10^5)(2 \times 10^4)$

10) $(y^8)^2$

Oct 11-10:27 AM

Regents Questions – Scientific Notation – Mult/Div

1. What is the product of 8.4×10^8 and 4.2×10^3 written in scientific notation?

A] 2.0×10^5 ~~B] 35.28×10^{11}~~ ~~C] 12.6×10^{11}~~ D] 3.528×10^{12}

8.4
4.2
35.28

$10^8 \times 10^3 = 10^{11+1}$

35,28

2. What is the quotient of 8.05×10^6 and 3.5×10^2?

A] 2.3×10^8 B] 2.3×10 C] 2.3×10^{12} D] 2.3×10^4

$3.5 \overline{)8.05}$ → 2.3, −70, 105

$\frac{10^6}{10^2} = 10^4$

2.3×10^4

Oct 19-11:22 AM

3. What is the product of 12 and 4.2×10^6 expressed in scientific notation?

12
4.2
50,4

~~A) 50.4×10^6~~ ~~B) 50.4×10^7~~ C) 5.04×10^6 D) 5.04×10^7

$10^0 \times 10^6 = 10^{6+1}$

4. If 3.85×10^6 is divided by 385×10^4, the result is

~~A] 3.85×10^4~~ B] 0.01 C] 1 ~~D] 3.85×10^{10}~~

$385 \overline{)3.85}$ → 0.01

$\frac{10^6}{10^4} = 10^2$

$.01 \times 10^{2-2}$

.01 → 1

$.01 \times 10^{2-2}$

1×10^0

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5. What is the value of $\frac{6.3 \times 10^8}{3 \times 10^4}$ in scientific notation?

A] 2.1×10^{-4} B] 2.1×10^2 C] 2.1×10^{-2} D] 2.1×10^4

$3\overline{)6.3}$ $\frac{10^8}{10^4} = 10^{8-4} = 10^4$

6. If the mass of a proton is 1.67×10^{-24} grams, what is the mass of 1,000 protons?

A] 1.67×10^{22} B] 1.67×10^{23} C] 1.67×10^{21} D] 1.67×10^{27}

① multiply

② $1000 \rightarrow 1 \times 10^3$ (sci. Not)

③ Multiply $(1.67 \times 10^{24}) \times (1 \times 10^3)$

1.67×10^{27}

Oct 19-11:23 AM

Scientific Notation Practice

1. A light year is approximately 9, 500, 000, 000, 000 km. Write this number in scientific notation.

2. I a film, the image of each picture remains on the screen for approximately 6×10^{-2} seconds. Write this number in ordinary notation.

Oct 13-11:45 AM

Find the new exponent.

3. $4.3 \times 10^4 = .43 \times 10^{\_\_}$

4. $2.75 \times 10^{-3} = 27.5 \times 10^{\_\_}$

5. $6.02 \times 10^{23} = 602 \times 10^{\_\_}$

Oct 13-11:45 AM

The United State purchased Alaska from Russia for $7,200,000 in 1867. If Alaska's total area is about 3.78×10^8. What is the approximate cost of one acre?

7. Japan has a population of 124 million and an area of 3.7×10^5 square kilometers. What is the population density of Japan?

Oct 13-11:45 AM

8. The United States is about 297 million and an area of 9×10^6 square miles. What is the population density of the US?

9. The speed of light is approximately 3×10^5 km/sec. The distance from the Earth to the sun is approximately 1.5×10^8 km. About how long does is take light from the sun to reach the Earth?

Oct 13-11:45 AM

I can:

- ✓ Solve real world problems involving very large or very small numbers (8.EE.4)
- ✓ Solve real-world problems when numbers are given in scientific notation (8.EE.4)

p. 66

Strategy:

1) Read each question carefully.

2) Decide which operation(s) to use. +, −, ×, ÷

3) Solve the problem.

- convert to sci. notation
- For +/−, exponents must be the same.

4) Check to make sure that the answer makes sense.

- For ×, mult. digits, add exponents
- For ÷, divide digits, subtract exponents.

Oct 19-11:22 AM

Example 1 : A rectangular section of the Adirondack Park is being set aside for a new campground. Its dimensions are 4.2×10^3 meters by 6.0×10^5 meters. Find the area of the land in square meters.

multiplication

area

$l \times w$

$(4.2\times10^3)(6.0\times10^5)$

Step 1

$4.2 \times 6.0 = 25.2$

Step 2

$10^3 \times 10^5 = 10^8$

25.2×10^8

2.52×10^9 meters^2

Oct 19-11:22 AM

Example 2: One microgram is equal to 1×10^{-6} gram. If the mass of a substance is 5.6×10^8 micrograms, what is its mass in grams?

multiplication

$(1\times10^{-6})(5.6\times10^8)$

Step 1

$1 \times 5.6 = 5.6$

Step 2

$10^{-6} \times 10^8 = 10^2$

5.6×10^2 grams

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2500

3) A box contains 2.5×10^{3} pieces of Styrofoam. If the mass of each piece of Styrofoam is 3×10^{-4} kilograms, what is the total mass of the Styrofoam in the box?

multiplication

$(2.5\times10^{3})(3\times10^{-4})$

Step 1

2.5
×3
7.5

Step 2

$10^{3}\times10^{-4}=10^{-1}$

7.5×10^{-1} kg

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1.9×10^{7}

4) New York State has approximately 19,000,000 people living in it. If the population of the United States is approximately 3×10^{8}, how many times greater is the population of the United States than the population of New York State?

US / NY Division

19,000,000 = 1.9×10^{7}

$\frac{3\times10^{8}}{1.9\times10^{7}}$

1.57894737...

19 | 30.00
−19
110
−95
150
133
170
152
180
−171
90

$1.5789...\times10^{1}$

About 1.6×10^{1} times greater

or 16 times greater

Oct 19-11:28 AM

PRACTICE PROBLEMS: WORD PROBLEMS WITH SCIENTIFIC NOTATION

For the following problems:

1. Use scientific notation.
2. Don't forget UNITS!
3. Show your work.

1. The body of a 150 lb person contains 2.3×10^{-4} lb of copper. How much copper is contained in the bodies of 1200 such people?

multiplication

Oct 5-9:12 AM

2. The speed of light is approximately 3×10^{8} m/s. How far does light travel in 6.0×10^{1} seconds?

multiplication

Oct 19-11:21 AM

3 A computer can perform 4.66×10^8 calculations per second. How many calculations can this computer perform in one minute?

multiplication

Oct 19-11:21 AM

4. The size of the Indian Ocean is 2.7×10^7 square miles. The Arctic Ocean is 1/5 the size of the Indian Ocean. How big is the Arctic Ocean?

.2= 1/5

Divide by .2

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5. The speed of light is 3×10^8 m/s. If the sun is 1.5×10^{11} meters from earth, how many seconds does it take light to reach the earth?

Division

Oct 19-11:27 AM

6. A liter is equal to 1×10^6 mm^3. There are roughly 5×10^6 red blood cells in 1 mm^3 of human blood. How many red blood cells are there in a liter of human blood?

multiplication

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7. Lake Superior has roughly 25 times the volume of Lake Erie. If the volume of Lake Superior is approximately 1.22×10^4 km^3, what is the approximate volume of Lake Erie?

Division

$S = 25E$

$\frac{1.22 \times 10^4}{25} = \frac{25E}{25}$

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Scientific Notation Word Problems

1. The particle of dust has a mass of 7.53×10^{-10} kilograms. Find the weight of 5 billion dust particles.

2. The distance from the sun to the Andromeda galaxy is 1.2×10^{19} miles. Light travels at a speed of 5.88×10^{12} miles per year (called a light-year). How long does it take light to travel from the sun to the Andromeda galaxy?

Oct 19-11:24 AM

3. The mass of the sun is 1.989×10^{30} kilograms. The mass of the earth is 5.98×10^{24} kilograms. How many times bigger is the sun than the earth?

Oct 19-11:25 AM

4. Total health care costs in the United States in 2003 was $1.7 trillion. The U.S. population was 290.9 million. What was the average amount spent per person on health care?

Oct 19-11:25 AM

5. The population of Mathville is 5.6×10^3 The population of Algeville is 1.3×10^4. How many more people are there in Algeville?

Oct 19-11:25 AM

6. There are 3.4×10^9 particles of dust per cubic meter. How many particles are there in a room that is 1200 cubic meters?

Oct 19-11:26 AM

7. There are approximately 3.1×10^8 people in the United States. If on average each person has 4.1×10^1 coins lying around on dressers, in pockets, in cars, etc., how many total coins do all the people in the U.S. have?

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8. By area, the former U.S.S.R. was the largest country, having 8.649×10^6 square miles of land. At this time Canada was the second largest country in the world. Canada has 4.797×10^6 square miles less area than the former U.S.S.R. How big is Canada in terms of land area?

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9. If a computer can perform an addition operation in 1.5×10^{-6} seconds, in how much time can it perform 1500 addition operations?

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Scientific Notation Word Problems

Solve the following word problems.

1. An analysis was done on one quart of pond water from the local park to see if it was safe for swimming. Dr. Andropolis counted 1.3×10^6 bacteria in the one quart. Express this in standard notation.

2. Using the scientific notation number in problem one, write the same number times 1,000 in scientific notation.

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3. Jeff Greenly is an asparagus farmer. In one year, Mr. Greenly harvested 82,300 pounds of asparagus. Express this number in scientific notation.

4. Using the pounds of asparagus harvested in problem number three, express in scientific notation how many pounds would be harvested in ten years, if Mr. Greenly harvested about the same number of pounds each year.

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5. The thickness of one pixie wing is 4.5×10^{-2} inches. Express this as a conventional number.

6. Planet Zorton is 88,820,000 miles from planet Aerbon. Express this distance in scientific notation.

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7. For one bottle of perfume, the perfume manufacturer needs 7,350 pounds of flower blossoms. Express this amount in scientific notation.

8. If the same manufacturer of perfume in problem seven made 10,000 bottles of perfume, how many pounds of flowers blossoms would be required? Express your answer in scientific notation.

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9. The thickness of one grain of pepper is 2.3×10^{-2} inches. Express the thickness of one grain of pepper as a conventional number.

10. It takes 210,000 seedlings a year to replace the trees harvested by the Perfect Papermill Company. Express this number in scientific notation.

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11. The Earth moves around the sun at 6.7×10^4 miles per hour. How many miles does the Earth travel after 2.4×10^3 hours (or 100 days)?

12. There are 3.949×10^5 miles of roads in the United States, If, on average, 1.2×10^2 cars went over each mile of road per day, how many miles would be driven each day in the United States?

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