

## 1D Place Value & Rounding.doc

Prealgebra

Name: \_\_\_\_\_

Due Date: \_\_\_\_\_

**WHY:** The news is full of large numbers, but it is often difficult to get a sense of how large these numbers really are. For example, the national debt is nearly 10 trillion dollars. We can better understand how large this number is by comparing it to the population of the U.S. and calculating the amount of federal debt per person. In this activity we will continue to use rounding and “mental math” to answer questions involving multiplication and division of large numbers. Understanding and operating with large numbers is crucial to mathematical literacy in today’s world.

### LEARNING OBJECTIVES:

- 1) Use rounding and place value to answer realistic questions.
- 2) Use “mental math” to perform multiplication and division with rounded numbers.
- 3) Read a table of numerical information and use the information to answer questions.
- 4) Communicate your reasoning clearly, accurately, and logically.

### WARM-UP:

- 1) Calculate the following using a calculator:

$10 \times 100$

$300 \times 400$

$2,000 \times 8,000$

$20 \times 1,000$

$500 \times 10,000$

$3,000 \times 900,000$

- 2) Look for patterns in the problems above. How could you predict the answers without using a calculator? Why does your method work?

- 3) Calculate the following using a calculator:

$100 \div 100$

$4,000 \div 2,000$

$20,000 \div 5,000$

$200 \div 10$

$5,000 \div 500$

$540,000 \div 6,000$

- 4) Look for patterns in the problems above. How could you predict the answers without using a calculator? Why does your method work?

### ACTIVITIES:

- 1) The national debt as of January 22, 2009 was \$10,633,387,638,402.

a) Round the debt to the nearest trillion.

b) The estimated population of the U.S. was 305,508,750. Round the U.S. population to the nearest hundred million.

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- c) If we paid off the debt on January 19, 2004, **estimate** how much each person in the U.S. would have owed. Show your work or record how you used your calculator.
- 2) The national debt grew on average over 3 billion 370 million dollars each day since September 28, 2007.
- a) Write this number in standard notation.
- b) How fast was the debt growing each hour? Show your work or record how you used your calculator.
- 3) The table gives the top nine countries in arms exports in 1999.

Country	Arms Exports (millions of dollars)
United States	33,000
United Kingdom	5,200
Russia	3,100
France	2,900
Germany	1,900
Sweden	675
Israel	600
Australia	550
Canada	550

- a) Write the dollar amount for the arms exports for the U.S. in 1999. Write this number in words.
- b) In 1999 roughly how many times greater were U.S. arms exports than arms exported by Great Britain? Show your work or record how you used your calculator.
- c) For every dollar in arms exports from Russia, how many dollars in arms exports came from the U.S.? Show your work or record how you used your calculator.
- 4) In 2002 the Center For Defense Information published a Military Almanac. According to the Almanac, the estimated expenditure for national defense was \$329 billion and the estimated cost of other military spending by the U.S. was \$519 billion.
- a) Write the dollar amount for the combined spending on national defense and military spending.
- b) The population in the U.S. in 2002 was approximately 282,082,000. Approximately how much did the U.S. spend on national defense and the military per person? Show how you arrived at your estimate.

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- 5) According to recent estimates, there are approximately four babies born each second in the world. Approximately how much will the world's population increase in a year if estimates suggest that 56 million people die each year? Document your calculator use or show your work.
- 6) In 2001 UNICEF spent \$1,353,134 on fundraising, \$15,182,591 on program expenses, and \$2,260,743 on administration expenses.
- Estimate UNICEF's total expenses
  - Estimate the amount UNICEF spends on programs for each dollar spent on administrative costs.
  - Estimate UNICEF's expenses for 2001-2010.
- 7) Research has shown that eliminating the estate tax would have a significant negative impact on giving to charitable organizations. For the nation as a whole, elimination of the estate tax would have reduced charitable giving in 2001 by an estimated \$10 billion.
- Write this number in standard notation.
  - Using only "mental math", estimate how much charitable giving in the state of California would have been reduced if the estate tax had been eliminated in 2001. Do you think your estimate is an overestimate or an underestimate? Explain.