** Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Period\_\_\_\_**

**Learning to Think Globally**

There is a popular bumper sticker slogan which advises us to 'Think Globally, Act Locally'. But what does it really mean to 'think globally'? One meaning could be to try to estimate the global consequences of the things you do. Here is one way to go about this. For this exercise we don’t need a precise answer because what we will calculate is not something that will happen (exactly one billion people doing exactly the same thing exactly once a week for exactly one year). Therefore we will estimate the value by keeping only one significant figure for each of the numbers in the problem. For example, a year will have 50 weeks, rather than 52 weeks. A GMC Yukon sport utility vehicle weighs 6000 or 7000 pounds, rather than the 6300-6800 pounds listed in the vehicle specifications. For most liquid weights, remember 'a pint’s a pound the world around.'

**Here are a few examples:**

**A SHORT DRIVE:** Recently, it was raining pretty hard, so you decided to drive the one-half mile to get somewhere, rather than walk or ride a bicycle. The drive was 1 mile total, there and back, and if we assume the car gets 30 miles per gallon of gasoline, it used 1/30 (.033) of a gallon of gas.

1.  If 1 billion people made this decision once a week for a year, about how much would they would use?

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show calculation:

This is certainly a lot of gasoline, but how much gas is this really?

2.  How far could you drive a typical car (30 miles/gallon) on this?

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 We could also put this number into the context of another fuel use. Although gasoline used in a car and fuel oil used in a home furnace are not exactly the same (gasoline is more refined, and will have a somewhat different energy content per gallon than fuel oil), for estimating purposes we may consider them to be equivalent.

  3.  Assuming 2000 gallons of fuel oil can heat a house for a year, how many homes could this gasoline heat for a year?

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show calculations:

**A LITTLE WATER:** Suppose your kitchen faucet drips at a rate that filled a 1 quart (0.25 gallon) pot with water in one hour.

4.  Suppose 1 billion people wasted this much water once a week for one year.  How much is this?

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show calculations:

**AN HOUR OF LIGHT:** Suppose you left a light on for one hour when you didn’t need it. Light bulbs are rated by power (watts, W) or rate of energy use. A typical light bulb is a 60W bulb (60 watt). In one hour it will use 60 watts x 1 hour = 60 watt-hours of energy. Electric utility companies base their billing on kilowatt-hours, where 1 kilowatt = 1000 watts and 1 kilowatt-hour = 1000 watt-hours, so our bulb used 0.06 kilowatt-hours of energy (0.06 60 ÷1000).

5.  Now have a billion people do this once a week for a year.  How much will they consume?

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show calculations:

A typical house might use 2000 kilowatt-hours of electricity a month, or about   
20,000 kilowatt-hours of electricity in a year.

6.  How many homes would this unnecessary lighting power for a year?

Answer \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Show calculations: