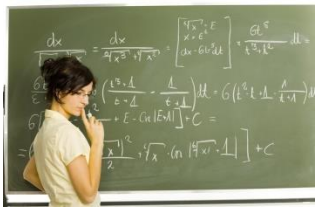
Name: _____ Date: _____

Whole and Decimal Number Estimation



What is the purpose of estimation?

To get a value close to the exact number more easily or with mental math

Estimating Sums and Differences

When estimating sums, try to round to the lowest place value that easiest for you. If you round and can't do the addition mentally, try rounding the number(s) to a higher place value.

Example 1: Estimate the sum of 56 and 222.

56 ≈ 60

222 ≈ 220 or 200

60 + 220 = 280 or

OR 60 + 200 = 260

Example 2: Estimate 6441.8 + 683.005

≈ 6400 + 700 ≈ 7100

≈ 6000 680

When estimating differences, it's typically easier to round both numbers to higher place values, such as the hundreds or thousands place.

Example 3: Estimate the difference of 745 and 278.

750 - 300

= 450

≈ 750 280

≈ 700 300

Example 4: Estimate 8407.13 – 5094.7

≈ 8400 - 5100

8000 - 5000

≈ 3300 or 3000

Estimating Products and Quotients

*When estimating products, you will typically round the numbers to the place value of their **leading digits**. The leading digit of a whole number is the first digit at the left.*

Example 5: Estimate the product of 271 and 44.

271 ≈ 300

44 ≈ 40

300 × 40

2 + 1 = 3

12,000

Example 6: Estimate 902.75 × 528.4

900 × 500

2 + 2 = 4

= 450,000

*When estimating quotients, look for **compatible numbers**, which are numbers that will make the calculation easier. Knowing your multiplication and division facts will help make this estimation easy!*

Example 7: Estimate the quotient of 587 ÷ 49.

Round divisor first!

600 ÷ 50

1 - 1 = 0

= 12

Example 8: Estimate 4301 ÷ 37.

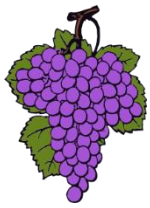
4000 ÷ 40 = 100

2 - 1 = 1

or

44000 ÷ 40 = 110

2 - 1 = 1



Cluster Estimation

Cluster estimation can be used to estimate sums and products when the numbers you are adding or multiplying cluster near or is close in value to a single number

Example 1: Estimate 699 + 710 + 695 + 705 + 694 + 715

Carefully examine all the numbers above. You should notice that they all cluster around 700. Therefore, 700 + 700 + 700 + 700 + 700 + 700 *will give us a good estimate for the answer.*

Instead of adding 700 six times, just do 6 × 700. 700 × 6 = 4,200 *is a good estimate of the sum!*

In fact, the real answer 699 + 710 + 695 + 705 + 694 + 715 = 4,218. *Thus 4,200 is indeed close to the real answer!*

Now you try! Estimate 257 + 247 + 255 + 245 + 243 + 254.

all ≈ 250 250 × 6 = 1500

1 + 0 = 1

Example 2: Estimate 23 × 18 × 22 × 17.

This time, you are estimating a multiplication problem. However, you will still use cluster estimation to estimate the product. Just notice that all numbers above cluster around 20. Therefore, 20 × 20 × 20 × 20 *will give us a good estimate for the answer.*

Multiply the 2s to get 16. Then, just put four zeros after 16 to get 160,000

The real answer is 23 × 18 × 22 × 17 = 154,836.

Now you try! Estimate 8 × 11 × 12.