Lesson 5-2
Mental Math:
Estimate Quotients

Objective:

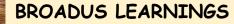We we will use compatible numbers to estimate quotients.

Standard:

NC.4.NBT.6 Find whole-number quotients and remainders with up to three-digit dividends and one-digit divisors with place value understanding using rectangular arrays, area models, repeated subtraction, partial quotients, properties of operations, and/or the relationship between multiplication and division.

BROADUS LEARNINGS

I Can Statement:

- I can make sense of quantities and use mental math and place-value strategies to divide.

Essential Question:

- How can you divide mentally?

VOCABULARY

dividend	the number to be divided up into smaller groups EX: **10** ÷ 5 = 2; **10** is the **dividend.**
divisor	tells how many groups to make from the dividend EX: **10** ÷ **5** = 2; **5** is the **divisor.**
quotient	the answer to a division problem. X: **10** ÷ 5 = 2; **2** is the **quotient.**
division	an operation that tells how many equal groups there are or how many are in each group.
estimate	to give an approximate value rather than an exact answer.

On yesterday, we used basic facts and boxed zeros to divide numbers. We found quotients to problems like 150 ÷ 3 = 50.

There will be some division problems that won't be as simple. Let's look at 147 ÷ 3?

We can **estimate** to find an approximate quotient. Let's think of a number that we can easily divide by 3 **mentally**.

There will be some division problems that won't be as simple. Let's look at 147 ÷ 3?

147 ÷ 3

Think of the previous problem and how we are able to easily solve 150 ÷ 3. Note that 15 and 3 are **compatible numbers**. It makes it easier to divide. 14 is closer to 15 using fact families.

147 ÷ 3

150 ÷ 3 = 50

The estimate shows us 147 ÷ 3 is ABOUT 50.

365 ÷ 5

Multiples....Hmm! Let's look at some multiples of 5:
5, 10, 15, 20, 25, 30, **35, 40**....
Now add a zero to 30 or 35 to help with the estimate. What do you think will be a good choice?

To estimate $365 \div 5$, let's use

$$350 \div 5 =$$

or

$$400 \div 5 =$$

Work it out to find the two estimates.

$$350 \div 5 = 70$$

or

$$400 \div 5 = 80$$

70 or 80 are reasonable estimates.

THINKING

Think of multiples of the divisor to help with estimation and then add a zero to find the reasonable quotient.

287 ÷ 8

8, 16, 24, 32... or 80, 160, 240, 320

What's your reasonable choice?

287 ÷ 8 =

or

240 ÷ 8 = 30

ESTIMATE

30 is a reasonable estimate.

315 ÷ 9 =

Estimate the quotient.

$$315 \div 9 =$$

or

$$360 \div 9 = 40$$

40 is a reasonable estimate.

ESTIMATE

Jayden is in charge of 161 dirt bikes for the racing event. He has to sort the bikes into 7 garages. About how many bikes will be in each garage.

Think about the multiples of 7!

ESTIMATE

161 ÷ 7 =

or

140 ÷ 7 = 20

20 is a reasonable estimate.

ESTIMATE

Grisel made 348 cupcakes for the county fair. She has 4 baskets to carry the cupcakes to the show. About how many cupcakes can she put in each baskets.

Think about the multiples of 4!

ESTIMATE

348 ÷ 4 =
360 ÷ 4 = 90

ESTIMATE

There are about 90 cupcakes in each basket.

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INDEPENDENT PRACTICE

BROADUS LEARNINGS