Objectives:
- Students will divide positive integers using long division, as evidenced by their completion of a homework assignment where they do so.
- Students will memorize the multiplication table, as evidenced by them passing "minute quizzes."

Student Materials on Desk Corner:
- Homework #1-12
- Homework Checker
- Readiness Checker

Student Materials for Later:
- Homework Log
- Binder Paper
- Pencils

Teacher Materials:
- "Minute Quiz 1-13"
- "Homework 1-12" answer key and grading roster for TA
- "Homework 1-13" handout

Homework:
- Homework 1-13
- Comprehensive Test Next Friday 10/3
- Last day to turn in corrections Friday 10/3

Time	Activity
Before Bell	**DO NOW** As students enter the classroom, shake hands and remind them that there is a minute quiz. So students need to be seated quietly with a pencil when the bell rings. Write the following "Do Now" on the board: • Take out a pencil and *quietly* wait for the minute quiz.
5 min	**MINUTE QUIZ** When the bell rings, quickly go around and put the **minute quiz** on each student's desk, facedown. Then, start everyone on the quiz at the same time and give everyone one minute. While students are working on the quiz, stamp the **readiness checkers** of students who were ready when the bell rang and had their readiness checkers out. Instruct the TA go around and collect **homework** and stamp **homework checkers**. Give the TA the answer key and have them grade the homework they collected.
44 min	**ALEKS** Students should continue with **ALEKS**. Put up **ALEKS Time** transparency that shows how much time students currently have on ALEKS. Use this student work time to **return graded homework**.
1 min	**STRETCH BREAK** Before transitioning to the lecture, lead the students through some exercises to refresh them.
30 min	**LESSON: LONG DIVISION** **Notes** Lecture according to "mathisfun.com" printout on long division. **Homework** Pass out the ""Homework #13" handout and have students write down the assignment on their homework logs. Remind students that there is a comprehensive test on Friday, and it is also the last day for them to turn in corrections for homework assignments.

Numeracy
Minute Quiz 1-13A

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

9 • 5 =	8 • 8 =	4 • 9 =
1 • 6 =	1 • 1 =	11 • 1 =
12 • 11 =	9 • 7 =	2 • 9 =
10 • 1 =	5 • 6 =	5 • 9 =

Numeracy
Minute Quiz 1-13A

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

9 • 5 =	8 • 8 =	4 • 9 =
1 • 6 =	1 • 1 =	11 • 1 =
12 • 11 =	9 • 7 =	2 • 9 =
10 • 1 =	5 • 6 =	5 • 9 =

Numeracy
Minute Quiz 1-13A

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

9 • 5 =	8 • 8 =	4 • 9 =
1 • 6 =	1 • 1 =	11 • 1 =
12 • 11 =	9 • 7 =	2 • 9 =
10 • 1 =	5 • 6 =	5 • 9 =

Numeracy
Minute Quiz 1-13B

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

8 • 1 =	9 • 12 =	10 • 1 =
11 • 3 =	12 • 9 =	8 • 2 =
4 • 11 =	9 • 2 =	1 • 3 =
2 • 3 =	5 • 3 =	9 • 9 =

Numeracy
Minute Quiz 1-13B

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

8 • 1 =	9 • 12 =	10 • 1 =
11 • 3 =	12 • 9 =	8 • 2 =
4 • 11 =	9 • 2 =	1 • 3 =
2 • 3 =	5 • 3 =	9 • 9 =

Numeracy
Minute Quiz 1-13B

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

8 • 1 =	9 • 12 =	10 • 1 =
11 • 3 =	12 • 9 =	8 • 2 =
4 • 11 =	9 • 2 =	1 • 3 =
2 • 3 =	5 • 3 =	9 • 9 =

Numeracy
Minute Quiz 1-13C

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

11 • 9 =	9 • 3 =	3 • 9 =
8 • 5 =	12 • 7 =	4 • 7 =
7 • 12 =	12 • 2 =	8 • 12 =
5 • 7 =	11 • 7 =	5 • 12 =

Numeracy
Minute Quiz 1-13C

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

11 • 9 =	9 • 3 =	3 • 9 =
8 • 5 =	12 • 7 =	4 • 7 =
7 • 12 =	12 • 2 =	8 • 12 =
5 • 7 =	11 • 7 =	5 • 12 =

Numeracy
Minute Quiz 1-13C

Name:
Date: Period:

Solve the following multiplication problems. You have exactly one minute!

11 • 9 =	9 • 3 =	3 • 9 =
8 • 5 =	12 • 7 =	4 • 7 =
7 • 12 =	12 • 2 =	8 • 12 =
5 • 7 =	11 • 7 =	5 • 12 =

Numeracy
Long Division Diagnostics

Name:
Date: Period:

Solve the following division problems using long division. If you get at least two problems correct, you can work on ALEKS instead of take notes.

1) 4923 ÷ 32 2) 19283 ÷ 7 3) 1234 ÷ 5

Numeracy
Long Division Diagnostics

Name:
Date: Period:

Solve the following division problems using long division. If you get at least two problems correct, you can work on ALEKS instead of take notes.

1) 4923 ÷ 32 2) 19283 ÷ 7 3) 1234 ÷ 5

Numeracy
Long Division Diagnostics

Name:
Date: Period:

Solve the following division problems using long division. If you get at least two problems correct, you can work on ALEKS instead of take notes.

1) 4923 ÷ 32 2) 19283 ÷ 7 3) 1234 ÷ 5


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Long Division - Why and How

Long Division troubled me when I was at School - it was just plain confusing !

Until I realised it was just *some way to get an answer.* Not the only way, but one that works well if followed well. In other words, just follow the steps and **magic** it works!

So, what is it trying to solve? Answer: Difficult division problems !

Division vs Long Division

We don't need it for **42 ÷ 6** Which is 7 of course. Because 6 x 7 = 42 (look up your times tables if you don't believe me!)

But what is **462 ÷ 6** ? Hmmm, not so easy.

We could try guessing ... Is it 100? ... 100 x 6 = 600. No too big.

Is it 50? ... 50 x 6 = 300. Too small ... somewhere in between

Is it 75? ... 75 x 6 = 450. Close! Nearly 462. Let us try creeping up

Is it 76? ... 76 x 6 = 456. No, not yet ...

Is it 77? ... 77 x 6 = 462. BINGO!

But what if the problem is even more difficult, say **7,698 ÷ 6 ?** That is going to take a LONG time to guess, so along comes Long Division to help us ...

Onto: Long Division - Organised Guessing >>>

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Long Division - Organised Guessing

So, how does Long Division work? It works by breaking up the big number and solving it a section at a time.

Thousands, Hundreds, ...

To illustrate, let us try guessing the answer to **7,698 ÷ 6**, but following a special method.

We will start at the thousands, then move to the hundreds, then tens, then units.

OK, starting at the thousands: How many 6 lots of a thousand can we fit into **7,698** ? Well, just one, really. Two would be too much:

1,000 x 6 = 6,000	too small
2,000 x 6 = 12,000	too big

We have made progress of sorts. We can guess that the answer is between 1,000 and 2,000.

Now let's move onto the hundreds. Let's add a hundred at a time:

1,**1**00 x 6 = 6,600	too small
1,**2**00 x 6 = 7,200	too small
1,**3**00 x 6 = 7,800	too big

So, somewhere between 1,200 and 1,300. Let's move on to the tens:

1,2**1**0 x 6 = 7,260	too small
1,2**2**0 x 6 = 7,320	too small
1,2**3**0 x 6 = ...	

Stop! It is getting to be very tedious doing all this long multiplying ...

...there should be a simpler way

Backtrack:

We already know that 1,200 lots of 6 is close, so why don't we just reduce **7,698** by that:

7,698 - 6 × 1,200 = 7,698 - 7,200 = **498 left to solve**

That's better, the problem gets easier the more you work at it!

So, where were we? That's right, working on the tens, but aiming for **498** now:

10 x 6 = 60	too small
20 x 6 = 120	too small
...	
80 x 6 = 480	too small
90 x 6 = 540	too big

So, 8 lots of ten.

We can now further reduce the problem:

498 - 480 **= 18 left to solve**

Aiming for 18 now:

1 x 6 = 6	too small
2 x 6 = 12	too small
3 x 6 = 18	BINGO!

We did it. Now we had 1 lot of a thousand, 2 hundreds, 8 tens and 3 units = 1,283.

Better just test it out:

1,283 x 6 = 7,698 ... **YES!**

So the moral of the story is:

Don't work on the entire number every time,
just work on whatever is left to guess.

Let's try that again, neatly:

Start with **7,698**

Thousands	1,000 x 6 = 6,000	too small
	2,000 x 6 = 12,000	too big

So the answer for thousands is **1,000 x 6**.

7,698 - 1,000 x 6 = **1,698** left to figure out:

Hundreds	100 x 6 = 600	too small
	200 x 6 = 1,200	too small
	300 x 6 = 1,800	too big

So the answer for hundreds is **200 x 6**.

1,698 - 200 x 6 = 1,698 - 1,200 = **498** left to figure out

Tens	80 x 6 = 480	too small
	90 x 6 = 540	too big

So the answer for tens is **80 x 6**

---

498 - 80 x 6 = 498 - 480 **= 18** left to figure out

Units 3 x 6 = 18 perfect!

So the answer for units is **3 x 6**

Our Answer: **1,000** x 6 + **200** x 6 + **80** x 6 + **3** x 6 = 7,698, and the answer is 1,283 !

But instead of using all those words, we write it down like this:

What We Did:		**Should be Written:**
1,283		1,283
6) 7,698		6) 7,698
-6,000		6
1,698		16
-1,200	→	12
498		49
-480		48
18		18
-18		18
0		0

Onto: Long Division >>>

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Long Division

Below is the process written out in full. (It is what is called an "algorithmic process"). You will often see other versions. These are generally just a shortened version of the process below.

Let's see how it is done with:

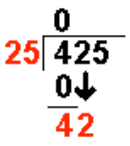
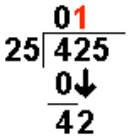
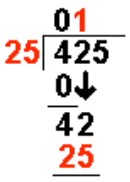
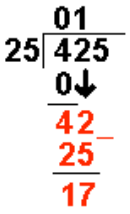
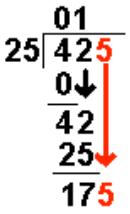
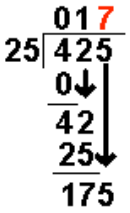
425 ÷ 25

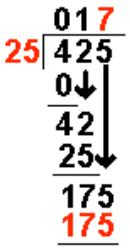
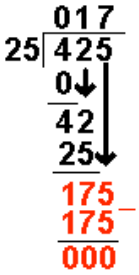
There are two definitions we must make first.

- the number to be divided into is known as the **dividend** (425 from above)
- The number which divides the other number is known as the **divisor** (25 from above)

Note: You can also see this done in Long Division Animation

25⟌425	4 ÷ 25 = 0 remainder 4	The first number of the dividend is **divided** by the divisor.
0 25⟌425		The whole number result is placed at the top. Any remainders are ignored at this point.
0 25⟌425 0	25 × 0 = 0	The answer from the first operation is **multiplied** by the divisor. The result is placed under the number divided into.
0 25⟌425 0 4	4 − 0 = 4	Now we **subtract** the bottom number from the top number.
0 25⟌425 0↓ 42		Bring down the next number of the dividend.

	42 ÷ 25 = 1 remainder 17	**Divide** this number by the divisor.
		The whole number result is placed at the top. Any remainders are ignored at this point.
	25 × 1 = 25	The answer from the above operation is **multiplied** by the divisor. The result is placed under the last number divided into.
	42 – 25 = 17	Now we **subtract** the bottom number from the top number.
		Bring down the next number of the dividend.
	175 ÷ 25 = 7 remainder 0	**Divide** this number by the divisor.
		The whole number result is placed at the top. Any remainders are ignored at this point.

	25 × 7 = 175	The answer from the above operation is **multiplied** by the divisor. The result is placed under the number divided into.
	175 – 175 = 0	Now we **subtract** the bottom number from the top number.
		There are no more numbers to bring down. The answer must be 17

- Long Division With Remainders
- Long Division To Decimal Places
- Division
- Long Division - Why and How
- Long Division Worksheets

Numeracy Name:
Homework 1-13 – Long Division Date: Period:

Evaluate the following problems using long division. You must show your work for credit.

1) 48 ÷ 4 = _____ with remainder _____

2) 682 ÷ 2 = _____ with remainder _____

3) 968 ÷ 3 = _____ with remainder _____

4) 845 ÷ 2 = _____ with remainder _____

5) 246 ÷ 6 = _____ with remainder _____

6) 189 ÷ 6 = _____ with remainder _____

7) 356 ÷ 4 = _____ with remainder _____

8) 932 ÷ 7 = _____ with remainder _____

9) 7283 ÷ 70 = _____ with remainder ____

10) 3829 ÷ 92 = _____ with remainder ___

11) 4392 ÷ 25 = _____ with remainder ___

12) 49382 ÷ 272 = ____ with remainder __