Dividing by 1-Digit Divisors: Math Hints and Reminders

Dividing Multiples of 10, 100, and 1,000

Once you have a basic division fact down, like $6 \div 3 = 2$, dividing tens and hundreds is just a matter of tacking on the right number of zeros! Take a look at the pattern:

$6 \div 3 = 2$	is	6 ones $\div$ 3 = 2 ones
$60 \div 3 = 20$	is	6 tens $\div$ 3 = 2 tens
$600 \div 3 = 200$	is	6 hundreds $\div$ 3 = 2 hundreds

To find the quotient for $320 \div 4$, find the basic fact ($8 \times 4 = 32$), then count the number of zeros in the dividend and tack them onto the quotient: $32\mathbf{0} \div 4 = 8\mathbf{0}$.
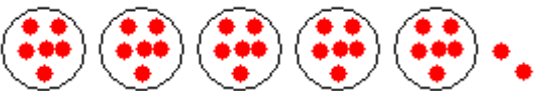
Estimating Quotients

Once you have your basic division facts down, estimating the answers to bigger problems is just a matter of tweaking the dividend, dividing, and tacking on the right number of zeros.

| To estimate the quotient of $436 \div 5$	
Underline the first two numbers in the dividend →	$\underline{43}6 \div 5$
Find the closest number that 5 goes into evenly →	You could choose 40 or 45
Write the basic fact →	$40 \div 5 = 8$ or $45 \div 5 = 9$
Add a 0 to the basic fact for every digit not underlined →	$40\mathbf{0} \div 5 = 8\mathbf{0}$ or $45\mathbf{0} \div 5 = 9\mathbf{0}$
The answer could be either 80 or 90. 80 is less than the exact answer, because 40 is less than 43. 90 is greater than the exact answer, because 45 is greater than 43.	

Exploring Division with Remainders

Numbers don't always divide evenly – sometimes there are leftovers or remainders. To help you get the hang of how division with remainders works, break out the beans, pasta, or pennies, and start counting!

Find $32 \div 5$	
What You See	What You Write
Divvy 32 counters into 5 equal groups. • How many counters are in each group? (6) • How many counters are left over? (2) • The quotient is 6. The remainder is 2.	$\begin{array}{r} 6 \text{ R2} \\ 5\overline{)32} \\ -30 \\ \hline 2 \end{array}$ ← Remainder

Dividing Multidigit Dividends

A flow chart can really help you remember the steps involved in solving a division problem.

Divide → Multiply → Subtract → Compare → Bring Down
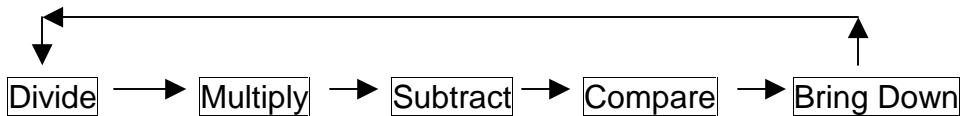
Follow the chart as you divide, pointing to or saying each step as you work. Give this one a try:

Find 67 ÷ 3	

6 is greater than 3, so start dividing in the tens place.
 	
  2
3) 67   Multiply. 3 x 2 = 6
− 6   Subtract. 6 − 6 = 0
  0   Compare the remainder
      with the divisor. 0 < 3
	Bring down the ones and divide.
	
	  22 R1
	3) 67
	−6↓
	 07 Multiply. 3 x 2 = 6
	−6 Subtract. 7 − 6 = 1
	  1 Compare. 1 < 3

If the dividend has more than two numbers, just repeat the steps until there are no more numbers to bring down.

2- or 3-Digit Quotients

Remember, you always start solving a division problem by looking at the number in the greatest place of the dividend and comparing this number to the divisor. If this number is less than the divisor, move over one place to the right and look at the number again. Take 546 ÷ 6 for example:

5 is less than 6, so you would begin dividing in the tens place. Your answer will have 2 digits. Think: How many times does 6 go into 54?

    91
6)**54**6

Zeros in the Quotient

It's time to brush off an old multiplication fact: 0 x any number = 0. This fact will come in handy when you're cruising through a division problem and you run into a number that's less than the divisor.

Find 527 ÷ 5		

Divide the hundreds.
 	
  1__
5)527   Multiply. 5 x 1 = 5
 –5   Subtract. 5 – 5 = 0
  0   Compare. 0 < 5
 	
Bring down the tens and divide… **But wait!** 2 is less than 5.
	There aren't enough tens to divide. So think: 5 goes into 2 how many times? 0 times.
	
	  10
	5)527
	 –5↓
	  02 Multiply. 5 x 0 = 0
	 – 0 Subtract. 2 – 0 = 2
	  2 Compare. 2 < 5
		Bring down the ones and divide.
		
		  105 R2
		5)527
		 –5↓↓
		  02↓
		 – 0↓
		  27 Multiply. 5 x 5 = 25
		 –25 Subtract. 27 – 25 = 2
		  2 Compare. 2 < 5

Exploring Division with Money and Dividing Money Amounts

Dividing money is just like dividing other numbers, but with an added twist! When you're done dividing, "bring up" the dollar sign and the decimal point, and, if necessary, write a 0 between them: **$0.**40
                                          3)$1.20

Finding Averages

To find the mean – or average – of a group of numbers, you need to add all the numbers in the group and then divide that sum by the number of members in the group.

Find the mean of 12, 16, and 8.	

Add: 12
     16
     +8
     36
 	
There are 3 numbers in the group. Their sum is 36.
	12_
	Divide: 3)36
	     3↓
	     06
	     6
	     0
	
	Divide the sum (36) by the number of members in the group (3).

The mean for this set of numbers is 12.	

Exploring Divisibility

When a number can divide another number evenly, without a remainder, it is divisible by that number. Memorizing a few rules about divisibility can really save you time in solving division problems. Here's a table of divisibility rules for you to refer to and memorize.

#	Rule	Example
2	Even numbers – numbers that end in 0, 2, 4, 6, or 8 – are divisible by 2.	398 is divisible by 2 because it's an even number.
3	A number is divisible by 3 when the sum of its digits is divisible by 3.	246 divisible by 3 because 2 + 4 + 6 = 12. And 12 is divisible by 3.
4	A number is divisible by 4 if the number formed by the tens and ones place is divisible by 4.	5<u>32</u> is divisible by 4 because 32 is divisible by 4.
5	A number is divisible by 5 when it ends in 5 or 0.	940 is divisible by 5 because it ends in 0.
6	A number is divisible by 6 if the number is also divisible by 2 and 3.	246. You know it's divisible by 3 (see above). It's also divisible by 2 because it's an even number. So, it's divisible by 6.
9	A number is divisible by 9 when the sum of its digits is divisible by 9.	747 is divisible by 9 because 7 + 4 + 7 = 18. And 18 is divisible by 9.
10	A number is divisible by 10 when it is divisible by both 2 and 5, and ends in a 0.	660 is divisible by 10 because it ends in a 0.