

Name _____

Estimate Quotients Using Multiples

Find two numbers the quotient of $142 \div 5$ is between. Then estimate the quotient.

You can use multiples to estimate. A **multiple** of a number is the product of a number and a counting number.

Step 1 Think: What number multiplied by 5 is about 142? Since 142 is greater than 10×5 , or 50, use counting numbers 10, 20, 30, and so on to find multiples of 5.

Step 2 Multiply 5 by multiples of 10 and make a table.

| | | | | |
|-----------------|----|-----|-----|-----|
| Counting Number | 10 | 20 | 30 | 40 |
| Multiple of 5 | 50 | 100 | 150 | 200 |

Step 3 Use the table to find multiples of 5 closest to 142.

$$20 \times 5 = \underline{100}$$

$$30 \times 5 = \underline{150}$$

← 142 is between 100 and 150.

142 is closest to 150, so $142 \div 5$ is about 30.

Find two numbers the quotient is between. Then estimate the quotient.

1. $136 \div 6$

between _____ and _____

about _____

2. $95 \div 3$

between _____ and _____

about _____

3. $124 \div 9$

between _____ and _____

about _____

4. $238 \div 7$

between _____ and _____

about _____

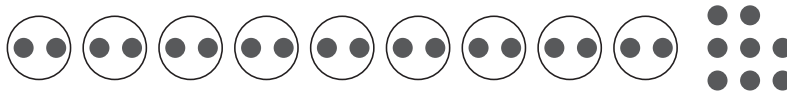
Name _____

Remainders

Use counters to find the quotient and remainder.

$$9 \overline{)26}$$

- Use 26 counters to represent the dividend, 26.
- Since you are dividing 26 by 9, draw 9 circles. Divide the 26 counters into 9 equal-sized groups.



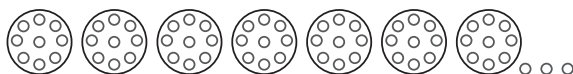
- There are 2 counters in each circle, so the quotient is **2**. There are 8 counters left over, so the remainder is **8**.

$$\begin{array}{r} 2 \text{ r}8 \\ 9 \overline{)26} \end{array}$$

Divide. Draw a quick picture to help.

$$7 \overline{)66}$$

- Use 66 counters to represent the dividend, 66.
- Since you are dividing 66 by 7, draw 7 circles. Divide 66 counters into 7 equal-sized groups.



- There are 9 counters in each circle, so the quotient is **9**. There are 3 counters left over, so the remainder is **3**.

$$\begin{array}{r} 9 \text{ r}3 \\ 7 \overline{)66} \end{array}$$

Use counters to find the quotient and remainder.

1. $6 \overline{)19}$

2. $3 \overline{)14}$

Divide. Draw a quick picture to help.

3. $39 \div 4$

4. $29 \div 3$

Name _____

Interpret the Remainder

When you solve a division problem with a remainder, the way you interpret the remainder depends on the situation and the question.

| | |
|--|---|
| <p>Way 1: Write the remainder as a fraction. Callie has a board that is 60 inches long. She wants to cut 8 shelves of equal length from the board and use the entire board. How long will each shelf be?</p> <p>Divide. $60 \div 8$ <u>7 r4</u></p> <p>The remainder, 4 inches, can be divided into 8 equal parts.</p> <p style="text-align: center;"> $\begin{array}{r} 4 \leftarrow \text{remainder} \\ 8 \leftarrow \text{divisor} \end{array}$ </p> <p>Write the remainder as a fraction.</p> <p>Each shelf will be $\frac{74}{8}$ inches long.</p> | <p>Way 2: Drop the remainder. Callie has 60 beads. She wants to make 8 identical bracelets and use as many beads as possible on each bracelet. How many beads will be on each bracelet?</p> <p>Divide. $60 \div 8$ <u>7 r4</u></p> <p>The remainder is the number of beads left over. Those beads will not be used. Drop the remainder.</p> <p>Callie will use <u>7</u> beads on each bracelet.</p> |
| <p>Way 3: Add 1 to the quotient. Callie has 60 beads. She wants to put 8 beads in each container. How many containers will she need?</p> <p>Divide. $60 \div 8$ <u>7 r4</u></p> <p>The answer shows that Callie can fill 7 containers but will have 4 beads left over. She will need 1 more container for the 4 leftover beads. Add 1 to the quotient.</p> <p>Callie will need <u>8</u> containers.</p> | <p>Way 4: Use only the remainder. Callie has 60 stickers. She wants to give an equal number of stickers to 8 friends. She will give the leftover stickers to her sister. How many stickers will Callie give to her sister?</p> <p>Divide. $60 \div 8$ <u>7 r4</u></p> <p>The remainder is the number of stickers left over. Use the remainder as the answer.</p> <p>Callie will give her sister <u>4</u> stickers.</p> |

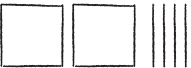
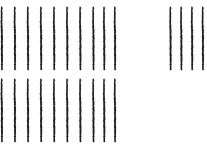
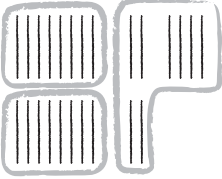
1. There are 35 students going to the zoo. Each van can hold 6 students. How many vans are needed?
2. Sue has 55 inches of ribbon. She wants to cut the ribbon into 6 equal pieces. How long will each piece be?

Name _____

Divide Tens, Hundreds, and Thousands

You can use base-ten blocks, place value, and basic facts to divide.

Divide. $240 \div 3$

| Use base-ten blocks. | Use place value. |
|---|--|
| <p>Step 1 Draw a quick picture to show 240.</p>  | <p>Step 1 Identify the basic fact to use. Use $24 \div 3$.</p> |
| <p>Step 2 You cannot divide 2 hundreds into 3 equal groups. Rename 2 hundreds as tens.</p>  <p>$240 = \underline{24}$ tens</p> | <p>Step 2 Use place value to rewrite 240 as tens.</p> <p>$240 = \underline{24}$ tens</p> |
| <p>Step 3 Separate the tens into 3 equal groups to divide.</p>  <p>There are 3 groups of $\underline{8}$ tens. Write the answer. $240 \div 3 = \underline{80}$</p> | <p>Step 3 Divide.</p> <p>$24 \text{ tens} \div 3 = \underline{8}$ tens $= \underline{80}$</p> <p>Write the answer. $240 \div 3 = \underline{80}$</p> |

Use basic facts and place value to find the quotient.

1. $280 \div 4$

What division fact can you use?

$280 = \underline{\quad}$ tens

$28 \text{ tens} \div 4 = \underline{\quad}$ tens

$280 \div 4 = \underline{\quad}$

3. $560 \div 7 = \underline{\quad}$

5. $1,500 \div 5 = \underline{\quad}$

2. $1,800 \div 9$

What division fact can you use?

$1,800 = \underline{\quad}$ hundreds

$18 \text{ hundreds} \div 9 = \underline{\quad}$ hundreds

$1,800 \div 9 = \underline{\quad}$

4. $180 \div 6 = \underline{\quad}$

6. $3,200 \div 4 = \underline{\quad}$

Name _____

Estimate Quotients Using Compatible Numbers

Compatible numbers are numbers that are easy to compute mentally. In division, one compatible number divides evenly into the other. Think of the multiples of a number to help you find compatible numbers.

Estimate. $6\overline{)216}$

Step 1 Think of these multiples of 6:

6 12 18 24 30 36 42 48 54

Find multiples that are close to the first 2 digits of the dividend.

18 tens and 24 tens are both close to 21 tens. You can use either or both numbers to estimate the quotient.

Step 2 Estimate using compatible numbers.

$$\begin{array}{r} 216 \div 6 \\ \downarrow \\ 180 \div 6 = 30 \end{array} \qquad \begin{array}{r} 216 \div 6 \\ \downarrow \\ 240 \div 6 = 40 \end{array}$$

So, $216 \div 6$ is between 30 and 40.

Step 3 Decide whether the estimate is closer to 30 or 40.

$$216 - 180 = 36 \qquad 240 - 216 = 24$$

216 is closer to 240, so use 40 as the estimate.

Use compatible numbers to estimate the quotient.

1. $3\overline{)252}$

2. $6\overline{)546}$

3. $4\overline{)2,545}$

4. $5\overline{)314}$

5. $2\overline{)1,578}$

6. $8\overline{)289}$

Name _____

Division and the Distributive Property

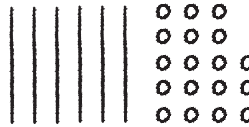
Divide. $78 \div 6$

Use the Distributive Property and quick pictures to break apart numbers to make them easier to divide.

Step 1 Draw a quick picture to show 78.



Step 2 Think about how to break apart 78. You know $6 \text{ tens} \div 6 = 10$, so use $78 = 60 + 18$. Draw a quick picture to show 6 tens and 18 ones.



Step 3 Draw circles to show $6 \text{ tens} \div 6$ and $18 \text{ ones} \div 6$. Your drawing shows the use of the Distributive Property.
 $78 \div 6 = \underline{(60 \div 6)} + \underline{(18 \div 6)}$



Step 4 Add the quotients to find $78 \div 6$.

$$\begin{aligned} 78 \div 6 &= (60 \div 6) + (18 \div 6) \\ &= \underline{10} + \underline{3} \\ &= \underline{13} \end{aligned}$$

Use quick pictures to model the quotient.

1. $84 \div 4 = \underline{\quad}$

2. $54 \div 3 = \underline{\quad}$

3. $68 \div 2 = \underline{\quad}$

4. $65 \div 5 = \underline{\quad}$

5. $96 \div 8 = \underline{\quad}$

6. $90 \div 6 = \underline{\quad}$

Name _____

Divide Using Repeated Subtraction

You can use repeated subtraction to divide. Use repeated subtraction to solve the problem.

Nestor has 27 shells to make bracelets. He needs 4 shells for each bracelet. How many bracelets can he make?

Divide. $27 \div 4$

Write $4 \overline{)27}$.

Step 1

Subtract the divisor until the remainder is less than the divisor. Record a 1 each time you subtract.

$$\begin{array}{r}
 4 \overline{)27} \\
 \underline{-4} \quad 1 \\
 23 \\
 \underline{-4} \quad 1 \\
 19 \\
 \underline{-4} \quad 1 \\
 15 \\
 \underline{-4} \quad 1 \\
 11 \\
 \underline{-4} \quad 1 \\
 7 \\
 \underline{-4} \quad 1 \\
 3
 \end{array}$$

Step 2

Count the number of times you subtracted the divisor, 4.

4 is subtracted six times with 3 left.

$$\begin{array}{r}
 27 \div 4 \\
 \underline{6 \text{ r}3}
 \end{array}$$

So, Nestor can make 6 bracelets. He will have 3 shells left.

Use repeated subtraction to divide.

1. $30 \div 4$

2. $24 \div 5$

3. $47 \div 7$

Name _____

Divide Using Partial Quotients

You can use partial quotients to divide.

Divide. $492 \div 4$

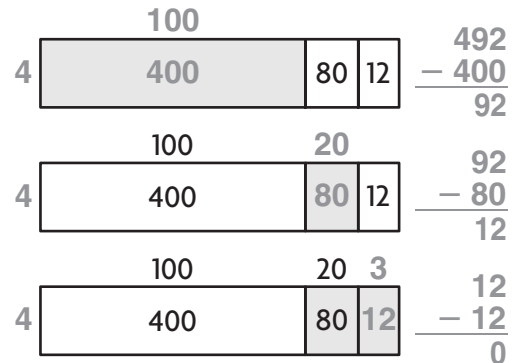
Step 1 Subtract greater multiples of the divisor. Repeat if needed.

Step 2 Subtract lesser multiples of the divisor. Repeat until the remaining number is less than the divisor.

Step 3 Add the partial quotients.

| | | |
|---------------------|----------------------|------------|
| $4 \overline{)492}$ | Partial quotients | |
| $- 400$ | ↓ | 100 × 4 |
| 92 | ↓ | 100 |
| $- 80$ | ↓ | 20 × 4 |
| 12 | ↓ | 20 |
| $- 12$ | ↓ | 3 × 4 |
| 0 | ↓ | + 3 |
| | | <u>123</u> |

Use rectangular models to record partial quotients.



$$\underline{100} + \underline{20} + \underline{3} = \underline{123}$$

Divide. Use partial quotients.

1. $3 \overline{)657}$

| | | | | |
|-------|---------------|-------|-------|-------|
| _____ | 100 × _____ | _____ | 100 | |
| _____ | 100 × _____ | _____ | _____ | |
| _____ | _____ × _____ | _____ | _____ | |
| _____ | _____ × _____ | _____ | + | _____ |

Divide. Use rectangular models to record the partial quotients.

2. $852 \div 6 = \underline{\hspace{2cm}}$

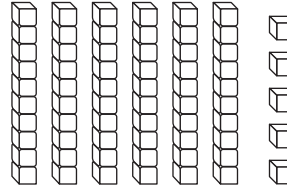
Name _____

Model Division with Regrouping

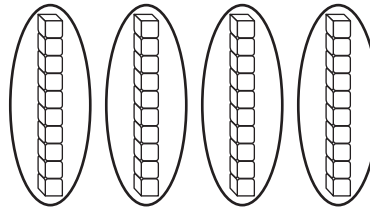
You can use base-ten blocks to model division with regrouping.

Use base-ten blocks to find the quotient $65 \div 4$.

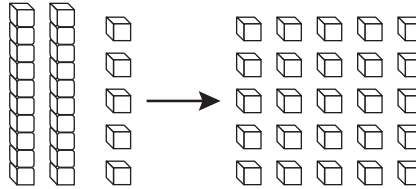
Step 1 Show 65 with base-ten blocks.



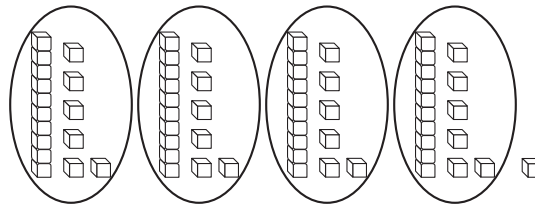
Step 2 Draw 4 circles to represent dividing 65 into 4 equal groups. Share the tens equally among the 4 groups.



Step 3 Regroup leftover tens as ones.



Step 4 Share the ones equally among the 4 groups.



There are 1 ten(s) and 6 one(s) in each group with 1 left over.

So, the quotient is 16 r1.

Divide. Use base-ten blocks.

1. $37 \div 2$

2. $74 \div 3$

3. $66 \div 5$

Name _____

Place the First Digit

Divide. $763 \div 3 = \blacksquare$

Step 1 Estimate. Then divide the hundreds.

Think: 3×1 hundred = 3 hundreds
 3×2 hundreds = 6 hundreds
 3×3 hundreds = 9 hundreds

3×3 hundreds is too large.

Use **2 hundreds** as an estimate.

$$\begin{array}{r} 2 \\ 3 \overline{)763} \\ - 6 \\ \hline 1 \end{array}$$

← Divide 7 hundreds by 3.
 ← Multiply. 3×2 hundreds
 ← Subtract.

Step 2 Bring down the tens digit. Then divide the tens.

$$\begin{array}{r} 2 \\ 3 \overline{)763} \\ - 6 \downarrow \\ \hline 16 \end{array}$$

← Bring down the 6.

$$\begin{array}{r} 25 \\ 3 \overline{)763} \\ - 6 \\ \hline 16 \\ - 15 \\ \hline 1 \end{array}$$

← Divide 16 tens by 3.
 ← Multiply. 3×5 tens
 ← Subtract.

Step 3 Bring down the ones digit. Then divide the ones.

$$\begin{array}{r} 25 \\ 3 \overline{)763} \\ - 6 \\ \hline 16 \\ - 15 \downarrow \\ \hline 13 \end{array}$$

← Bring down the 3.

$$\begin{array}{r} 254 \\ 3 \overline{)763} \\ - 6 \\ \hline 16 \\ - 15 \\ \hline 13 \\ - 12 \\ \hline 1 \end{array}$$

← Divide 13 ones by 3.
 ← Multiply. 3×4 ones
 ← Subtract.

Step 4 Check to make sure that the remainder is less than the divisor. Write the answer.

$$\begin{array}{r} 254 \text{ r}1 \\ 3 \overline{)763} \end{array} \quad 1 < 3$$

Divide.

1. $2 \overline{)531}$

2. $4 \overline{)628}$

3. $9 \overline{)349}$

4. $7 \overline{)794}$

Name _____

Divide by 1-Digit Numbers

Divide. $766 \div 6 = \blacksquare$

Step 1 Use place value to place the first digit.

Think: 7 hundreds can be shared among 6 groups without regrouping.

$$\begin{array}{r} 1 \\ 6 \overline{)766} \end{array}$$

Step 2 Bring down the tens digit. Then divide the tens.

$$\begin{array}{r} 1 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \end{array}$$

← Bring down the 6.

$$\begin{array}{r} 12 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \end{array}$$

← Divide 16 tens by 6.

$$\begin{array}{r} 12 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \\ - 12 \\ \hline 4 \end{array}$$

← Multiply. 6×2 tens
← Subtract.

Step 3 Bring down the ones digit. Then divide the ones.

$$\begin{array}{r} 12 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \\ - 12 \\ \hline 46 \end{array}$$

← Bring down the 6.

$$\begin{array}{r} 127 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \\ - 12 \\ \hline 46 \end{array}$$

← Divide 46 ones by 6.

$$\begin{array}{r} 127 \\ 6 \overline{)766} \\ - 6 \\ \hline 16 \\ - 12 \\ \hline 46 \\ - 42 \\ \hline 4 \end{array}$$

← Multiply. 6×7 ones
← Subtract.

Step 4 Check to make sure that the remainder is less than the divisor. Write the answer.

$$\begin{array}{r} 127 \text{ r}4 \\ 6 \overline{)766} \end{array} \quad 4 < 6$$

Step 5 Use multiplication and addition to check your answer.

$$\begin{array}{r} 127 \\ \times 6 \\ \hline 762 \\ + 4 \\ \hline 766 \end{array}$$

Divide and check.

1. $4 \overline{)868}$

2. $2 \overline{)657}$

3. $7 \overline{)8,473}$

Name _____

Problem Solving • Multistep Division Problems

There are 72 third graders and 84 fourth graders going on a field trip. An equal number of students will ride on each of 4 buses. How many students will ride on each bus?

| Read the Problem | Solve the Problem | | | | |
|--|--|-----------|-----------|-----------|-----------|
| <p>What do I need to find?</p> <p>I need to find the number of <u>students</u> who will ride on each bus.</p> | <p>I can model the number of students in all using a bar diagram.</p> <table border="1"> <tr> <td style="text-align: center;">72</td> <td style="text-align: center;">84</td> </tr> </table> | 72 | 84 | | |
| 72 | 84 | | | | |
| <p>What information do I need to use?</p> <p>There are <u>72</u> third graders and <u>84</u> fourth graders. There will be <u>4</u> buses.</p> | <p style="text-align: center;"><u>156</u></p> <p>I can model the number of buses and divide to find the number of students on each bus.</p> <table border="1"> <tr> <td style="text-align: center;"><u>39</u></td> <td style="text-align: center;"><u>39</u></td> <td style="text-align: center;"><u>39</u></td> <td style="text-align: center;"><u>39</u></td> </tr> </table> | <u>39</u> | <u>39</u> | <u>39</u> | <u>39</u> |
| <u>39</u> | <u>39</u> | <u>39</u> | <u>39</u> | | |
| <p>How will I use the information?</p> <p>I will make a bar diagram for each step. I will add <u>72 and 84</u> to find the total number of students. I will divide by <u>4</u> to find how many students will ride on each bus.</p> | <p style="text-align: center;"><u>156</u></p> <p>So, <u>39</u> students will ride on each bus.</p> | | | | |

- Miranda has 180 beads for making jewelry. She buys 240 more beads. She wants to store the beads in a case with 6 sections. She wants to put the same number of beads in each section. How many beads should Miranda put in each section?

- All 203 students at Polk School eat lunch at the same time. One day 19 students were absent. If 8 students sit at each table in the lunchroom, how many tables were used that day at lunch?