Summer Solutions.

Minutes a Day-Mastery for a Lifetime!

Level 2

Problem Solving

Help Pages

Help Pages

Operations	
addition	The values of two or more numbers are joined together in addition. The sign "+" means add. The answer to an addition problem is called the **sum**. Example: Put the values of 5 and 2 together; the sum is 7. 5 + 2 = 7
subtraction	A value is taken away from another in subtraction. The sign "–" means subtract. The answer to a subtraction problem is called the **difference**. Example: Take 1 away from 5, the difference is 4. 5 – 1 = 4
multiplication	A value is added to itself repeatedly in multiplication. The sign "x" means multiply. The answer to a multiplication problem is called the **product**. Example: When 5 is added to itself 3 times, the product is 15; 5 + 5 + 5 is the same as 3 x 5 = 15.
division	A value is shared equally in division. The sign "÷" means divide. The answer to a division problem is called the **quotient**. Example: When 8 is shared equally between 2, the quotient is 4. 8 ÷ 2 = 4

Vocabulary	
2-dimensional	has length and width
3-dimensional	has length, width, and height
arrange	put in a certain order
congruent	figures with the same shape and the same size
data	information
double	two of the same amount added together; 4 doubled = 4 + 4 = 8
height	how high something is
length	how long something is
line of symmetry	a line along which a figure can be folded so that the two halves match exactly

Help Pages

Vocabulary (continued)	
pattern	an idea that repeats
sort	put into groups
strategy	a plan
table	a chart with rows and columns
task	a job
width	how wide something is

2-Dimensional Shapes			
circle		ellipse	(oval)
triangle	any shape with 3 sides	quadrilateral	any shape with 4 sides
parallelogram		rectangle	
square		rhombus	(diamond)
trapezoid		pentagon	any shape with 5 sides
hexagon	any shape with 6 sides	octagon	any shape with 8 sides

3-Dimensional Shapes			
pyramid		cone	
rectangular Prism		cube	
sphere		cylinder	

Help Pages

<table>
<tr><th colspan="2">Measurement—Relationships</th></tr>
<tr><th>Time</th><th>Distance</th></tr>
<tr><td rowspan="3">60 minutes = 1 hour
24 hours = 1 day
365 days = 1 year</td><td>12 inches = 1 foot</td></tr>
<tr><td>Volume</td></tr>
<tr><td>4 quarts = 1 gallon</td></tr>
</table>

Whole Numbers

Thousands	Hundreds	Tens	Ones
1,	4	0	5

The number above is read: one thousand, four hundred five.

There are **even numbers** and **odd numbers**. A number is **even** if it ends in 0, 2, 4, 6, or 8. A number is **odd** if it ends in 1, 3, 5, 7, or 9.

Examples: 46 is an even number because it ends in 6.

11 is an odd number because it ends in 1.

A **fact family** is a set of related facts using addition, subtraction, and the same three numbers.

Example: Write a fact family using 3, 4, and 7.

3 + 4 = 7 7 – 3 = 4

4 + 3 = 7 7 – 4 = 3

Numbers can be compared by saying one is **greater than** another or one is **less than** another.

The symbol ">" means greater than. The symbol "<" means less than.

Hint: The open part of the sign is near the bigger number.

Examples: 10 < 18 → 10 is less than 18.

27 > 13 → 27 is greater than 13.

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Whole Numbers (continued)

When **adding or subtracting whole numbers**, the numbers must first be lined-up from the right. Starting with the ones place, add (or subtract) the numbers. When adding, if the answer has two digits, write the ones digit and regroup the tens digit. For subtraction, it may also be necessary to regroup first. Then, add (or subtract) the numbers in the tens place. Continue with the hundreds, etc.

Look at these **addition** examples.

Examples: Find the sum of 314 and 12.

$$\begin{array}{r} 314 \\ +\ 12 \\ \hline 326 \end{array}$$

1. Line up the numbers on the right.
2. Beginning with the ones place, add. Regroup if necessary.
3. Repeat with the tens place.
4. Continue this process with the hundreds place, etc.

Add 648 and 236.

$$\begin{array}{r} {\scriptstyle 1} \\ 648 \\ +236 \\ \hline 884 \end{array}$$

Look at these **subtraction** examples.

Example: Subtract 37 from 93.

$$\begin{array}{r} {\scriptstyle 8\ 13} \\ 9\not{3} \\ -\ 37 \\ \hline 56 \end{array}$$

1. Begin with the ones place. Since 7 is larger than 3, regroup to 8 tens and 13 ones.
2. Now look at the tens place. Since 3 is less than 8, the regrouping is complete.
3. Subtract each place value beginning with the ones.

Example: Find the difference of 425 and 233.

$$\begin{array}{r} {\scriptstyle 3\ 12} \\ 4\not{2}5 \\ -233 \\ \hline 192 \end{array}$$

1. Begin with the ones place. Since 3 is less than 5, do not regroup.
2. Now look at the tens place. Since 3 is larger than 2, regroup to 3 hundreds and 12 tens.
3. Now look at the hundreds place. Notice 2 is less than 3; the regrouping is complete.
4. Subtract each place value beginning with the ones.

Help Pages

Whole Numbers (continued)

When **subtracting from zero**, always regroup.

Example: Subtract 38 from 60.

$$\begin{array}{r} {}^{5}\not{6}\,{}^{10}\not{0} \\ -\ 3\,8 \\ \hline 2\,2 \end{array}$$

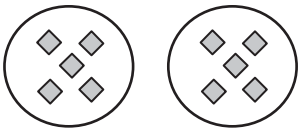
1. Begin with the ones place. Since 8 is less than 0, regroup.
2. Regroup to 5 tens and 10 ones.
3. Then, subtract each place value beginning with the ones.

Example: Find the difference between 500 and 261.

$$\begin{array}{r} {}^{4}\not{5}\,{}^{9}{}^{10}\not{0}\,{}^{10}\not{0} \\ -\ 2\,6\,1 \\ \hline 2\,3\,9 \end{array}$$

Multiplication is a quick way to add groups of numbers. The sign "×" for multiplication is read times. The answer to a multiplication problem is called the product. Use the pictures below to understand multiplication.

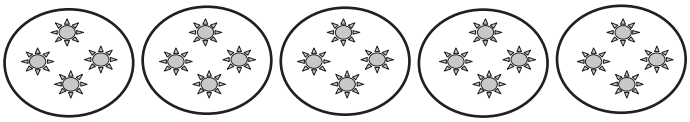
Example: 2 × 5 is read "two times five." It means 2 groups of 5 or 5 + 5.



2 × 5 = 5 + 5 = 10

The product of 2 × 5 = 10.

Example: 5 × 4 is read "five times four." It means 5 groups of 4 or 4 + 4 + 4 + 4 + 4.



5 × 4 = 4 + 4 + 4 + 4 + 4 = 20

The product of 5 × 4 = 20.

It is very important to memorize **multiplication facts**. This table will help.

To use this table, choose a number in the top gray box and multiply it by a number in the left gray box. Follow both with your fingers (down and across) until they meet. The number in that box is the product.

An example is shown: 2 × 5 = 10.

×	0	1	2	5	10
0	0	0	0	0	0
1	0	1	2	5	10
2	0	2	4	10	20
5	0	5	10	25	50
10	0	10	20	50	100

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Whole Numbers (continued)

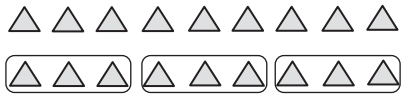
Division is the opposite of multiplication. The sign "÷" for division is read divided by. The answer to a division problem is called the quotient.

Remember that multiplication is a way of adding groups to get their total. Think of division as the opposite of this. In division, the total and the number in each group are given. Find the number of groups. Study the examples below.

Example: What is 9 ÷ 3? (9 items divided into groups of 3.)

The total number is 9.

Each group contains 3.



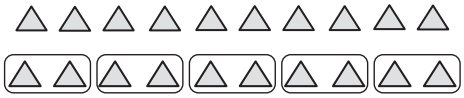
How many groups are there? There are 3 groups.

9 ÷ 3 = 3

Example: Divide 10 by 2. (10 items divided into groups of 2.)

The total number is 10.

Each group contains 2.

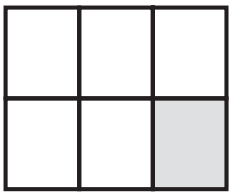


How many groups are there? There are 5 groups.

10 ÷ 2 = 5

Fractions

A **fraction** is used to represent part of a whole. The top number in a fraction is the part. The bottom number in a fraction is the whole.



The whole rectangle has 6 sections.
Only 1 section is shaded.
This can be shown as the fraction $\frac{1}{6}$.

$\frac{1}{6}$ $\frac{\text{shaded part}}{\text{total part}}$

Help Pages

Problem-Solving Strategies

Strategy: Make a List

Some math problems ask, "How many different ways are there?" Make a list to help you see all your ideas and not repeat any.

Strategy: Guess and Check

Some math problems are like puzzles. To solve a puzzle, you try different pieces. You find the piece that fits. You can do this in math. Guess and check as you use clues to solve a problem.

Strategy: Look for a Pattern

Some math problems ask you to continue a pattern. A pattern is an idea that repeats. There are number patterns and shape patterns. Number patterns grow or shrink. This strategy helps you know how to carry on the pattern.

Strategy: Draw a Picture

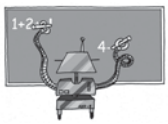
Some math problems seem hard at first. There's a saying: "A picture paints a thousand words." Draw a picture to help you see a problem in an easier way.

Strategy: Make a Table

Some math problems give you two kinds of information, for example, item and cost. A table helps you see a growing pattern. Tables have rows and columns. Labels help too.

Strategy: Write a Number Sentence

Sometimes math problems are in a story. The words can become numbers and math signs (+ − × ÷). These numbers and math signs help you solve the problem.



Strategy: Use Logic

Some math problems ask you to think like a detective. This kind of thinking is called *logic* or *if/then* thinking. *If* this is true, *then* this must be true. Work with one idea at a time. Use logic to work in little bits until you see the whole answer.