

Welcome!

We will explore lots of exciting topics in math and examine applications of the concepts learned in real world settings. So, let's begin with the basics, and then see how we apply them to actual math problems that are encountered in every day math.

Whole Number Addition Properties, Estimation, and Problem Solving

We begin by looking at addition properties. The addition properties help organize multi-step math problems. By following the properties, problems may be reordered and regrouped to solve mentally.

Sometimes a quick estimate of an amount is all that is needed. We'll look at a problem where all that is needed is a close number rather than the actual number.

Basic computations begin with adding whole numbers. Lining up place value is crucial to adding whole numbers correctly. Estimate first to find an approximate answer and then add to find the actual answer.

To solve a word problem read it through carefully. It helps to read it through more than once. Look for key words that are clues for solving the problem.

Mental Addition Using Properties

Estimation

Whole Number Addition

Problem Solving

Mental Addition Using Properties

Commutative Property

The numbers may be added in any order giving the same sum.

$$6 + 7 = 7 + 6$$
$$13 = 13$$

Identity Property

The sum of any 0 and any number equals the number.

$$0 + 9 = 9 \quad 9 + 0 = 9$$

Associative Property

The way the numbers are grouped to add does not change the sum.

$$(5 + 2) + 3 = 5 + (2 + 3)$$
$$7 + 3 = 5 + 5$$
$$10 = 10$$

Use the commutative, associative, and identity properties to simplify.

Look for sums that add up to multiples of ten.

Steps

$$31 + 0 + (66 + 9)$$

$$31 + (66 + 9)$$

$$31 + (9 + 66)$$

$$(31 + 9) + 66$$

$$40 + 66$$

$$106$$

Reasons

Identity Property $31 + 0 = 31$

Commutative Property $66 + 9 = 9 + 66$

Associative Property

Add $31 + 9$ first

Add on 66

Estimation

The principal wants an estimate of how many students are in the middle school. The secretary gives him these numbers.

Grade	Boys	Girls
6 th	124	175
7 th	210	187
8 th	105	94

As the principal looks over the numbers he decides to round them to the nearest 100 to get a quick estimate. He looks at the hundreds place, then the number to the right (tens place). He remembers that if the number is 5 or higher, round up.

Grade	Boys	Girls
6 th	<u>1</u> 24 rounds to 100	<u>1</u> 75 rounds to 200
7 th	<u>2</u> 10 rounds to 200	<u>1</u> 87 rounds to 200
8 th	<u>1</u> 05 rounds to 100	94 (think of 94 as <u>0</u> 94) rounds to 100

The principal estimates there are approximately **900** students in his school. (100 + 200 + 200 + 200 + 100 + 100)

Whole Number Addition

Estimate the sum, and then solve: $245 + 378 + 2995$

Estimation:

$$300 + 400 + 3000 = 3700$$

The estimated answer is 3700.

Solution:

Line up the numbers from right to left so that all place values are in line.

Add the ones

$$\begin{array}{r} 1 \\ 245 \\ 378 \\ + 2995 \\ \hline 8 \end{array}$$

18 ones makes
1 ten 8 ones. Put
down an 8 in ones
place, carry the 1.

Add the tens

$$\begin{array}{r} 2 \\ 245 \\ 378 \\ + 2995 \\ \hline 18 \end{array}$$

21 tens, 21 x 10, or
210, makes
2 hundreds 1 ten.
Put down a 1 in tens
place, carry the 2.

Add the hundreds

$$\begin{array}{r} 1 \\ 245 \\ 378 \\ + 2995 \\ \hline 618 \end{array}$$

16 hundreds, 16 x 100, or 1600,
makes 1 thousand 6 hundreds.
Put down a 6 in hundreds place,
carry a 1.

Add the thousands

$$\begin{array}{r} 1 \\ 245 \\ 378 \\ + 2995 \\ \hline 3618 \end{array}$$

2000 + 1000 makes
3000 or add the 1
and 2 and put down
a 3 in thousands
place.

Answer:

$$245 + 378 + 2995 = 3618$$

Check:
3618.

The estimated answer, 3700, is close to

Problem Solving - Addition

Read through this problem and solve. Look for key words that aid in determining the correct method for solving.

The 4-H club mowed lawns to earn money for a trip to the baseball park. On Monday they earned \$150, on Tuesday they earned \$126, and on Wednesday they earned \$100. What is the **total** earnings?

The key word is total – this is an **addition** problem because all of the money is being **put together**.

$$150 + 126 + 100 = \$376$$