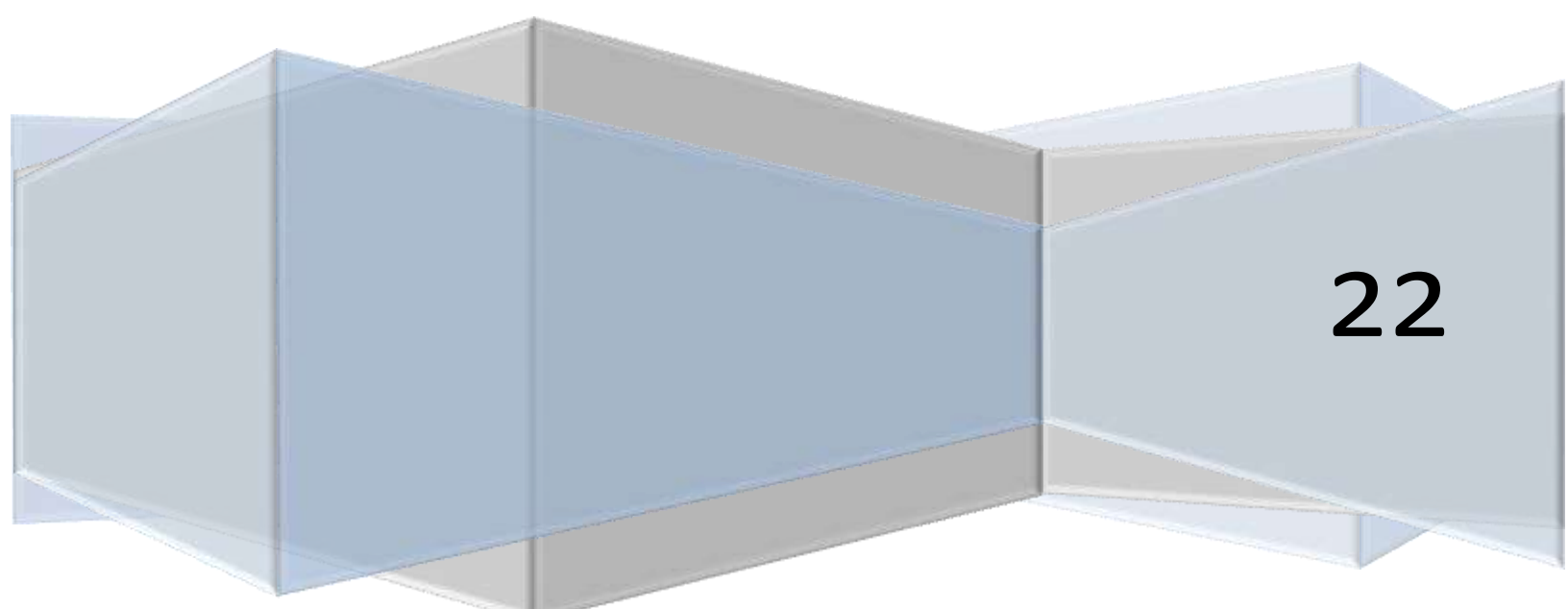


Class 3

Mathematics Prerequisite



22

Mathematics

KNOWLEDGE

Comparing numbers

Ali has white sweets and Sara has blue sweets, we might want to know who has more sweets.



We can simply **count** the number of white and blue sweets.

White sweets are 4 and blue sweet is 1, so Ali has more sweets.

We can also **estimate** by looking at the sweets that the number of white sweets is more than the number of blue sweets.

The other way is to represent the blue and white sweets using shapes.



Look at the shape! It has four parts for white sweets and one part for blue sweets. Hence, there are more white sweets than blue sweets.



Look at this shape! It has a bigger part for white sweets and a smaller part for blue sweets. Hence, there are more white sweets than blue sweets.

Addition



$$\begin{array}{l} 1+1=2 \\ 2+2=4 \\ 4+4=8 \end{array}$$

Addition is ...

... bringing two or more numbers (or things) together to make a new total.

Here 1 ball is added
to 1 ball
to make 2 balls:



Using Numerals it is:

$$1 + 1 = 2$$

And in words it is: "One plus one equals two"

Example: When we add 2 and 3 we get 5.

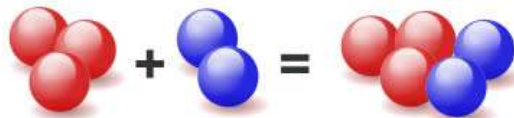
We can write it like this: $2 + 3 = 5$

Swapping Places

Swapping the position of the numbers we are adding still gets the same result!

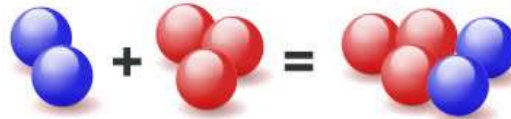
$$3 + 2 = 5$$

... also ...



$$2 + 3 = 5$$

More examples:



$$5 + 1 = 1 + 5 = 6$$

$$4 + 100 = 100 + 4 = 104$$

Larger Numbers: Use addition in columns

We can do addition by writing one number below the other and then add **one column at a time**, like this:

Example 1:

$$\begin{array}{r} + 13 \\ 23 \\ \hline \end{array} \rightarrow \begin{array}{r} + 13 \\ 23 \\ \hline 6 \end{array} \rightarrow \begin{array}{r} + 13 \\ 23 \\ \hline 36 \end{array}$$

Example 2:

$$\begin{array}{r} + 16 \\ 16 \\ \hline \end{array} \rightarrow \begin{array}{r} + 16 \\ 16 \\ \hline 12 \end{array} \rightarrow \begin{array}{r} + 16 \\ 16 \\ \hline 32 \end{array}$$

tens ones
1 2

The same method works with numbers in the hundreds, thousands and so on.

Vocabulary words for addition

Together, increase, more, and, sum, total, add, plus.

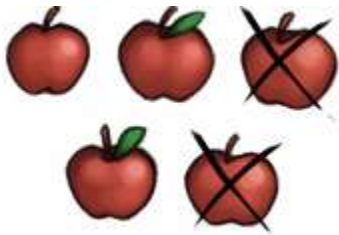
Subtraction



$$\begin{aligned}4 - 0 &= 4 \\4 - 1 &= 3 \\4 - 2 &= 2 \\4 - 3 &= 1 \\4 - 4 &= 0\end{aligned}$$

Subtraction is ...

... taking one number away from another.



Start with 5 apples,
then subtract 2,
we are left with 3 apples.



This can be written: $5 - 2 = 3$

To subtract numbers with more than one digit:

Example 1: $47 - 12$

$$\begin{array}{r}47 \\-12 \\ \hline 5\end{array}$$

$7 - 2 = 5$

$$\begin{array}{r}47 \\-12 \\ \hline 35\end{array}$$

$4 - 1 = 3$

So $47 - 12 = 35$

Example 2: 32 - 17

Make sure that you line up the tens and ones columns, so that the 3 in "32" is directly above the 1 in "17" and that the 2 in "32" is directly above the "7" in 17.

$$\begin{array}{r} 32 \\ - 17 \\ \hline \end{array}$$

Subtract the number in the ones column of the bottom number from the number in the ones column of the top number. Now, this can get a little bit tricky when the bottom number is larger than the top number. In this case, 7 is larger than 2. Here's what you need to do:

You'll need to "borrow" from the 3 in "32" (also known as regrouping), in order to turn that 2 into a 12.

Cross off the 3 in "32" and make it a 2, while making the 2 a 12.

Now, you have 12 - 7, which is equal to 5.

Write a 5 below the two numbers you subtracted, so it lines up with the ones column in a new row.

$$\begin{array}{r} \cancel{3}^2 2 \\ - 17 \\ \hline 5 \end{array}$$

Subtract the number in the tens column of the bottom number from the number in the tens column of the top number.

Remember that your 3 is now a 2.

Now, subtract the 1 in 17 from the 2 above it to get (2-1) 1.

Write 1 below the numbers in the tens columns, to the left of the 5 in the ones column of the answer.

You should have written 15. This means that $32 - 17 = 15$.

$$\begin{array}{r} 2 \cancel{3}^2 2 \\ - 17 \\ \hline 15 \end{array}$$

If you want to be sure that you correctly subtracted the two numbers, then all you have to do is to add the answer to the smaller number to make sure that you get the larger number.

In this case, you should add your answer, 15, to the smaller number in the subtraction number, 17.

$15 + 17 = 32$, so you've done your work correctly.

$$15 + 17 = 32$$

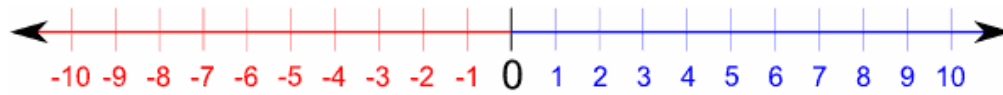
$$\boxed{32 - 17 = 15}$$

Using the same method you can subtract three-digit numbers.

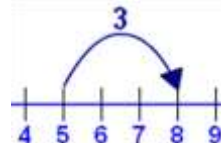
Vocabulary words for subtraction

Fewer, decrease, take from, difference between, reduce, take away, subtract, minus.

Using the Number Line

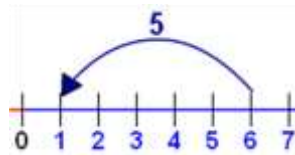


We can use the number line to help us add.
We always move to the right to add.



$$5 + 3 = 8$$

We can also use the number line to help us subtract.
We always move to the left to subtract.



$$6 - 5 = 1$$

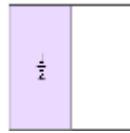
Fraction



Fold a piece
of paper in
half



These are two
equal parts



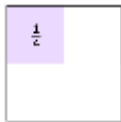
Here is a half



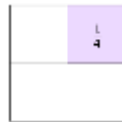
Fold the paper
again



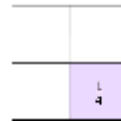
Here are four
equal parts



Here is a
quarter



This is a
quarter too

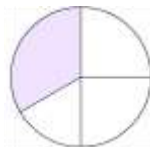


So is this



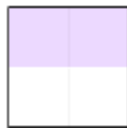
And this

This is not a quarter as the
parts are of different sizes.



This is 2 quarters.

It is the same as $\frac{1}{2}$.



This is 3 quarters.

We write it as $\frac{3}{4}$.

