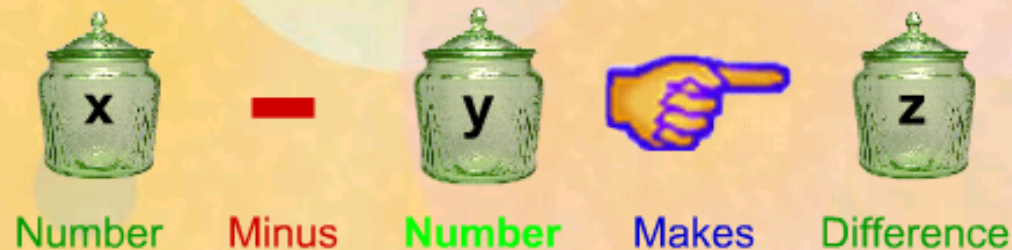


Subtraction

Now let us look at another operation with *natural numbers*: *subtraction*.

Subtracting means *removing*, or *taking away* a portion of a larger number.

When you subtract two numbers, the result is called their *difference*.



LET'S WORK WITH PAIRING NUMBERS TO GET INTO THE HABIT OF LOOKING AT PAIRS OF NUMBERS THAT MAKE TEN:

- | | |
|-------------|-----------|
| • $0+10=10$ | $10-10=0$ |
| • $1+9=10$ | $10-9=1$ |
| • $2+8=10$ | $10-8=2$ |
| • $3+7=10$ | $10-7=3$ |
| • $4+6=10$ | $10-6=4$ |
| • $5+5=10$ | $10-5=5$ |
- AND THE REVERSE OF THE ABOVE LEFT COLUMN FOR ADDITION

DO YOU SEE THE PATTERNS FROM ADDITION TO SUBTRACTION?

- IN FACT, ISN'T SUBTRACTION THE OPPOSITE OF ADDITION?

IT'S EASY TO SUBTRACT NUMBERS AS LONG AS WE ARE SUBTRACTING THE SMALLER NUMBER FROM THE BIGGER NUMBER:

$$\begin{array}{r} 892,376 \\ - \underline{341,253} \\ 551,123 \end{array}$$

HOWEVER, IT IS MORE CHALLENGING WHEN YOU ARE SUBTRACTING A LARGER NUMBER FROM A SMALLER NUMBER.

TURN TO THE NEXT PAGE FOR EASY TO FOLLOW STEPS AND THEN PRACTICE, PRACTICE, PRACTICE.

$$\begin{array}{r}
 \overset{3}{\cancel{4}}\overset{1}{6} \\
 - 8 \\
 \hline
 38
 \end{array}$$

IF WE REALLY CARE ABOUT ACCURACY,
WE CHECK OUR ANSWER BY ADDING THE
ANSWER (CALLED THE DIFFERENCE) TO
THE NUMBER WE SUBTRACTED.

IT MUST EQUAL THE TOP NUMBER.

$$38 + 8 = 46$$

*NOW TRY A LONGER STRING
OF NUMBERS (next page)*

STEP TWO: WE CROSS OUT THE
NUMBER TO THE LEFT OF THE TOP
NUMBER AND SUBTRACT ONE

(here, we cross out the 4 and make
it a 3)

STEP THREE: IF THAT REDUCED
NUMBER IS LARGER THAN THE
NUMBER BELOW IT WE GO TO THE
NEXT PLACE TO SEE IF THE NUMBER
ON TOP IS LARGER OR SMALLER.

STEP FOUR: IF THE TOP NUMBER IS
SMALLER, REPEAT STEPS ONE AND
TWO, UNTIL WE HAVE ANALYZED
THE ENTIRE PROBLEM.

STEP FIVE: THEN WE SIMPLY
SUBTRACT THE NOW SMALLER
NUMBERS FROM THE ABOVE
LARGER NUMBERS TO GET OUR
ANSWER.

STEP ONE : WHEN THE NUMBER ON TOP IS SMALLER THAN THE NUMBER ON THE BOTTOM, WE PUT A LITTLE ONE NEXT TO THE LEFT OF THE TOP NUMBER TO MAKE IT A TEN

STEP TWO: WE CROSS OUT THE NUMBER TO THE LEFT OF THE TOP NUMBER AND SUBTRACT ONE

STEP THREE: IF THAT REDUCED NUMBER IS LARGER THAN THE NUMBER BELOW IT WE GO TO THE NEXT PLACE TO SEE IF THE NUMBER ON TOP IS LARGER OR SMALLER.

STEP FOUR: IF THE TOP NUMBER IS SMALLER, REPEAT STEPS ONE AND TWO, UNTIL WE HAVE ANALYZED THE ENTIRE PROBLEM.

STEP FIVE: THEN WE SIMPLY SUBTRACT THE NOW SMALLER NUMBERS FROM THE ABOVE LARGER NUMBERS TO GET OUR ANSWER.

$$\begin{array}{r} \overset{7}{\cancel{3}}\overset{13}{\cancel{8}}\overset{1}{\cancel{4}}2 \\ - 2483 \\ \hline 1,359 \end{array}$$

notice how the number we subtracted is the reverse of the original number;

when this is the case, the answer always will be a multiple of nine (that means that we can divide nine into the answer)

to prove this, just add up the digits from the answer and if it is a multiple of nine (9, 18, 27,... it is a multiple of nine.

$$\begin{array}{r}
 8584394389 \\
 - 2808065886 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \overset{7}{\cancel{8}}\overset{7}{\cancel{5}}\overset{8}{\cancel{4}}\overset{1}{\cancel{3}}\overset{1}{\cancel{9}}\overset{8}{\cancel{4}}\overset{3}{\cancel{3}}\overset{1}{\cancel{8}}\overset{1}{\cancel{9}} \\
 - 2808065886 \\
 \hline
 5776328503
 \end{array}$$

$$\begin{array}{r}
 20649730909 \\
 - 9093794602 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \overset{1}{\cancel{2}}\overset{5}{\cancel{0}}\overset{8}{\cancel{6}}\overset{1}{\cancel{4}}\overset{1}{\cancel{9}}\overset{8}{\cancel{7}}\overset{1}{\cancel{3}}\overset{1}{\cancel{0}}\overset{1}{\cancel{9}}\overset{1}{\cancel{0}}\overset{2}{\cancel{9}} \\
 - 9093794602 \\
 \hline
 11555936307
 \end{array}$$