Math 3

Classwork 3

WARM-UP

1 Write down as a number expression and calculate.

Six more than 17 _____

Five less than 25 _____

Seven increased by 5 _____

The product of eight and 6_____

Three times as large as 5 _____

Five times as large as 8 _____

Four times the sum of 5 and 6 _____

2 Skip-count by 2s from 14 to 26: _____

Skip- count by 3s from 15 to 30: _____

Skip - count by 4s from 4 to 24: _____

3 Make two expressions equal:

a) 17 + 12 = 20 + ____ b) 37 + 19 = 40 + ____ c) 79 + 24 = 80 + __

New Material

Natural numbers or Counting Numbers. How many…?

1, 2, 3, 4, 5, etc. are ***NATURAL or Counting numbers*** (we use them to count objects).
Any natural number is either one or a collection of as many ones as a number represents.
Example - number 27 is a collection of 27 ones.

A **number** is a count or measurement that is just an **idea** in our minds. We write or talk about numbers using **numerals** such as "3" or "three." But we could also hold up three fingers or tap the table 3 times. A numeral is a **symbol or name** that stands for a number. *Examples:* 3, 49, eleven.

4

Counting out loud:

a) Go over all names from 1 to 10,

b) skip-count by 10s to 100,

c) skip-count by hundreds to 1,000

A digit is a **single symbol** used to make numerals. **0, 1, 2, 3, 4, 5, 6, 7, 8**, and **9** are the ten digits we use in everyday numerals. *Example:* The numeral 51 is made up of 2 digits ("5", and "1").

The number system used today is called the **base-ten, or decimal, system**. It has 10 digits (0–9) that can be combined to write any number. The base-ten system was invented by Hindus in ancient India. Later, Arabs improved the system. For this reason, the digits 0–9 are called **Hindu-Arabic numerals.**

5

What number has:

a) 5 hundreds, 2 tens and 7 ones? _____

b) 7 hundreds, 0 tens and 0 ones? _____

c) 3 thousands, 0 hundreds, 2 tens and 9 ones _____

In the base-ten system, the value of each digit is based on its **position, or "place,"** in a number. There is a "ones place," a "tens place," a "hundreds place," and so forth. In the number 456, for example, the 4 is in the hundreds place, the 5 is in the tens place, and the 6 is in the ones place.

Written in another way, the number 456 actually represents $(4 \times 100) + (5 \times 10) + (6 \times 1)$.
Sometimes at school and here instead of "position value system", we will use another name - "place value system", but they both have the same meaning.

6

Write each number in the expanded form. *Example: 1,345 = 1,000 + 300 + 40 + 5*

a) 541 = _____

b) 707 = _____

7

Find the missing place value:

a) 300 + ___ + 7 = 387

b) 2,000 + ____ + _____ + 1 = 2,141

c) 800 + ____ + ____ = 822

8

Compare numbers, using <, >, = (less than, greater than, equal to)

500 ___ 50	322 ___ 232	606 ___ 660
15 ___ 155	8,134 ___8,314	2,111 ___ 2,111

9

Write the equivalent value in each number:

2, 000 is _____ hundreds

4, 300 is _____ hundreds

507 is _____ hundreds and _____ones

507 is _____ tens and ___ones

900 is _____ tens

8,020 is _____ hundreds and _____

8,020 is _____ tens

10

Think and discuss:

a) Does the biggest number exist? What it could be?

b) What is the difference between any number and the next number?

c) What is the difference between any number and the previous number?

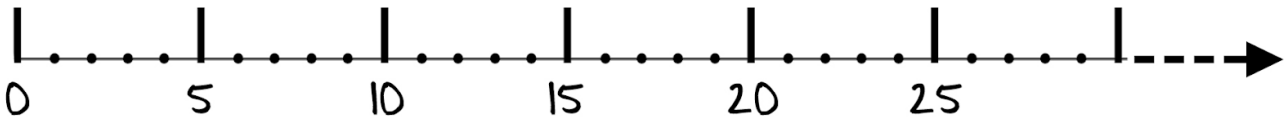
d) What operation should you do to get from a number to a bigger number?

e) What operation should you do to get from a number to a smaller number?

Number Line

Moving along the number line: The number line goes from left to right - the smallest number is zero, number 2 will be after 1.
Number 5 will be after 4, meaning it's bigger than 4, and before 6, meaning it's smaller than 6.

11



On the number line above find and write the numbers: 4, 9, 13, 17, 21, 27 and 30.

12

Compare and order the numbers: 6,431 235 2,809 980 3,999 1,023

_____ < _____< _____ < _____ < _____ < _____

Questions: While moving along the number line, which direction should you choose to get

a) to the bigger number?

b) to the smaller number?

NUMBERS

The sequence of natural numbers is **infinite** - the biggest number doesn't exist. To any number you take, you can always add another 1 and get even bigger number.

This year and many years after that we will talk a lot about numbers.
There are several areas of mathematics which study NUMBERS.

One of them is **Number Theory** and it studies numbers and the properties of operations between them.

First, we go back 20,000 years

Ancient ways of recording:

- Tally marks. Dot and lines tallying, stroke tallying (picture of Ishango bone)
- Human body is the 1st calculator (fingers, toes, arms and face)
- Mesopotamian's symbols. 2,500 years ago, in ancient Mesopotamia,

  ones were written as Δ, tens as ◄, and 60 as ▼.

13

Choose a correct answer. How would they write number 124 in Mesopotamia those days?

a) ◄▼▼ΔΔΔΔ

b) ▼▼◄◄ΔΔΔΔ

c) ▼◄◄ΔΔΔΔ

d) ▼ΔΔΔ◄◄▼

e) ▼▼ΔΔΔΔ 60 +60 +4 = 124

14

Try writing your own birthday in Mesopotamian's symbols (day and month)

_____

Did you Know …?

It may be hard to imagine today that long ago people used to count using scratches (**tally marks**) on sticks or counted with the help of small stones or just with fingers. The word tally comes from Latin *talea* – twig or cutting. The word "calculate" comes from the Latin *calculus*, which means *small stone*. In the following we look at these ancient counting devices**.**

Tally sticks, made of wood or bone, have been used since ancient times as a "data recording" device or memory aid to record numbers, quantities, or even messages.

The most famous of such artefacts is possibly the **Ishango bone** has been dated to the **Upper Paleolithic Period** around 22000 years ago. It is on permanent exhibition at the **Royal Belgian Institute of Natural Sciences**, Brussels, Belgium

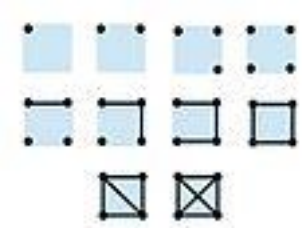
The Ishango bone, dated from 22,000 years, can be considered as the oldest mathematical tool of humankind because the arrangement of the notches on three columns suggests an arithmetical intention.

Tally marks are typically clustered in groups of five and we all use it.

1. Mostly used in Europe, Australia, New Zealand and North America

2. Mostly used in France, Spain and Brazil

3. This method is used for counting by 10.



Can you write 47, using each of these systems?

1. _____

2. _____

3. _____