

Place Value
Math Kit for $\mathbf{2}^{\text {nd }}$ and $\mathbf{3}^{\text {rd }}$ Grades

## Place Value

The purpose of this kit is to generate understanding of place value, how to read and write numbers, comparing numbers, ordering numbers, and writing numbers in expanded notation. The concepts of this unit may also be utilized to teach place value in decimals.

## Standards

## $2^{\text {nd }}$ Grade

1.0 Students understand the relationship between numbers, quantities, and place value in whole numbers up to 1,000:
1.1 Count, read, and write whole numbers to 1,000 and identify the place value for each digit.
1.2 Use words, models, and expanded forms (e.g., $45=4$ tens +5 ) to represent numbers (to

1,000 ).
1.3 Order and compare whole numbers to 1,000 by using the symbols $<,=,>$. $3^{\text {rd }}$ Grade
1.0 Students understand the place value of whole numbers:
1.1 Count, read, and write whole numbers to 10,000 .
1.2 Compare and order whole numbers to 10,000 .
1.3 Identify the place value for each digit in numbers to 10,000 .
1.5 Use expanded notation to represent numbers (e.g., $3,206=3,000+200+6$ ).

## Basic Understandings

Place value is a basic and important concept in mathematics. The position, or place, of a digit in a number written in standard form determines the actual value the digit represents. There are only 10 digits that we use to create numbers that can either be incredibly small, or amazingly large. We have a base ten number system, and when students understand place value, they also understand the structure and sequence of this system. It is this understanding that allows students to count, interpret the values represented in spoken and written numbers, to decide how the numbers compare to one another-which is larger, which is smaller, and explore a variety of relationships among numbers as they continue to develop a picture of our base ten system. Other important understandings have to do with how numbers related to one another, such as 100 more or less, 10 more or less. Developing an understanding of where a particular
number fits into the numeric system is critical. Some of the critical questions that students must ask and answer include:

- How can the number be pulled apart into additive parts (somewhat like expanded notation), wondering whether 233 is best to be considered as $200+30+3,200+$ 33 . or $100+100+3-+3$ ?
- Where does the number fit into the overall number system (bigger than 10,25 , 50 , less than 100 ?
- What are the multiples of the number-what happens if you double it, multiply by 10 or 100 , or cut it in half?
- What are the factors of the number-can you count by 2 's, 3 's, 4 's, or what number to reach the number that you have?

When you look at the chart below, you can see the place values from one to the millions. If you put a number in any of those places (remember that once you have place a digit you must either place other digits to the right of that number if there is place for them, or you must add zero to the end. Ask yourself, what number would you have if you place a 6 in the thousands place, a 4 in the one's place, a 9 in the hundreds place, and a 3 in the tens place. $(6,934)$

| Millions | Hundred <br> Thousands | Ten <br> Thousands | Thousands | Hundreds | Tens | Ones |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |  |  |

In working with students it is important that we teach the guidline that beginning at the far right, you count to the left, and after three digits, you place a comma. The comma becomes the "last name" of the numbers that are in the hundreds, tens, and ones place. This "last name" can be billions, millions, thousands, or others as numbers become larger.

Providing students with a lot of opportunities to practice is critical-and the more fun the students have while practicing, the more time they will spend working on the skill set.

A second understanding that students need to have is how to compare numbers (how do you know which is larger, which smaller), and how do you use the < and > symbols to compare the numbers. Many repetitions are needed to ensure that students can compare numbers quickly and accurately.

A third understanding is around expanded notation-the ability to break a number down so you know exactly what you have $-300+20+4=324$ and so on.

## Activities to Teach Place Value

## WHAT PLACE IS IT?

Make a grid like the sample below:

| tens | hundred thousands | hundreds |
| :---: | :---: | :---: |
| ones | thousands | millions |
| ten thousands | hundred millions | ten millions |

Create a series of cards with numbers that range between 100 and 999,999,999. Highlight one of the digits in each number, randomly creating numbers with all of the places highlighted at some point.

Place the number cards face down. One at a time students draw a card and the have 10 seconds to determine which place is highlighted and to read the number aloud. If they do so correctly, student gets one point. At the end of 15 minutes, the player with the most points, wins.

## ROLL IT

Determine what place value will be the highest you will go (only to ten thousands, only to millions).

Give each student 1 die for each slot in the place value you have selected (if you have a six digit number then each student has 6 dice.)

Student rolls the dice and then arranges them in the largest number, the smallest number, or somewhere in between.

Ask each student to read his/her number aloud.
Students determine whose number is larger (conversely, smaller)
Taking turns, one student at a time rolls the extra die. If the roll is an even number, 2,4 , or 6 , the student with the largest of the two numbers wins a point. If the roll is an odd number, 1,3 , or 5 , student with the smallest of the two numbers wins the point.

Repeat until one student has scored 10 points.

## WATCH THAT MOVE!

Purpose of this game is to practice place value through the hundred thousands place.
You will need two decks of cards with tens, Jacks, Queens, Kings, and Jokers removed, one deck for each player.

Game has one die.
First student rolls the die, and the dots on the die indicate the number of "Places" in the number that each student is to make. For example, if the student rolls a 3 , then students are looking to create a 3 digit number.

Student then draws the numbers of cards indicated by the die and arranges them in any order, creating a number. For example, if player draws a 2,8 , and 5 , student can make the number $285,825,852,258,582,528$.

Once each student has made the number, he/she reads it to the other student. Each player then turns over another card and decides whether to discard it or replace one of the existing cards in play. For example, if player draws a 3 , he/she could discard the three, or replace either the 2,5 , or 8 -leaving all other digits (cards in place) 385,835 , and so on.

Students again read numbers out and then draw a second and third time, each time deciding whether or not to discard or replace a number.

After the third draw, student rolls the dice. If the roll is an even number, 2,4 , or 6 , the student with the largest of the two numbers wins a point. If the roll is an odd number, 1 , 3 , or 5 , student with the smallest of the two numbers wins the point.

## Magic Four

You will need one deck of cards with tens, Jacks, Queens, Kings, and Jokers removed.
Deal out one card to each student in the room.
Have students stand up, and move around the classroom (music makes this more fun). When the music stops, students group up in fours and make either the largest or smallest number that they can.

When time is called, group of 4 lines up and reads the number aloud.
Group with the largest or smallest number, wins the point.


For more information, contact
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