

General Information

Lesson Parts & Duration

Total Duration: 45 minutes to 1 hour

- Game: “Mystery Numbers”

Subject(s)

- Place Value Through the Hundred- Thousands Place: Value of Digits; Expanded Form (4.NBT.2a)

Objective

- Students will use place value knowledge of digits, their values, and expanded form to solve mystery numbers using clues.

Materials

- blank paper (graph paper if possible)
- pencils
- document camera or whiteboard
- **Optional:** printable “Mystery Numbers” (page 4)
- **Optional:** printable “Break Up Your Day” brain/movement break ideas (page 5)

Instructional Setting

- Students should be seated with or near another student for partner work.

Throughout this lesson, you will find:

- ☀ **Scripted Text** indicates things that need to be said directly. Bullets starting with a “T” followed by *italicized* type indicate scripted text
- ☀ **Clarifiers** within scripted text are in orange
- ☀ **Teacher Directions** indicate things you should be doing
- ☀ **Side notes** provide helpful hints, ELL strategies, differentiation and information
- ☀ **Break Up Your Day** (Brain/Movement Breaks) are in green boxes (at the end)

Remember!

Quality over quantity. All components do not have to be accomplished; lessons may be ended at any time and resumed later.

Introduction

- T* All digits have a “place” which shows the digit’s quantity. Numbers can be compared when you know the digit’s place value.
- T* Place value happens in real life.
- T* For example, if you had 9 one dollar bills, 7 ten dollar bills, and 5 one-hundred dollar bills you could count the bills in their place values and calculate the amount of cash.
- T* 1-hundred-dollar bill has a value of \$100, so 5 one-hundred dollar bills has a value of \$500.
- T* 1 ten-dollar bill has the value of \$10, so 7 ten-dollar bill have a value of \$70
- T* And finally, a 1 dollar bill has a value of \$1, so 9 one dollar bills have a value of \$9
- T* If I were to add all of those up, how much money would I have? **Call on students. Answer \$579.**
- T* I would have \$579, we were able to figure that out by adding all the values together.
- T* Today we will be using what we know about place value and how it affects the value of a digit in a number to write out numbers in expanded value form.

Either give each student a copy of “Mystery Numbers” or give them each 1 piece of blank paper and project the “Mystery Numbers” sheet for students to copy.

- T* We have learned about what each place represents in a number and how digits hold a different value depending on where it falls within a number.
- T* We are going to try and solve some riddles using clues to help us figure out the mystery numbers.
- T* Before you start let’s analyze a number together as a class.
- T* The number is 378,291. **Write this number on the board so that students can look at it while answering questions about the number.**
- T* The 2 stands for? **Call on a student. Answer: 200 or 2 hundreds**
- T* The digit 7 is in _____ place? **Call on a student. Answer: ten-thousands place**
- T* The value of the digit 3 is? **Call on a student. Answer: 300,000**
- T* The digit in the thousands place is? **Call on a student. Answer: 8**
- T* The digit 9 is in the _____ place? **Call on a student. Answer: ten’s place**
- T* The digit 1 is in the _____place and its value is __? **Call on a student. Answer: ones; 1**

Setting up the Paper If you are having students copy the problems on blank paper.

- T* On your piece of paper please write your name and date in the top right-hand corner of your paper. **See example & model so students can follow.**
- T* Then title your paper, “Mystery Numbers.”
- T* You will then split your paper into 4 boxes and label each box 1-4 **See example & model so students can follow.**

You will need to read, write, or project clues for students to copy.

How to Play

Name _____ Date _____

Mystery Numbers

<p>#1 I am a five-digit number. The sum of all my digits is 19. My hundreds digit is 2 more than my tens digit. I am an odd number. I have 9 ones. My thousands digit is a multiple of 3. I am less than 14,000. What number am I?</p>	<p>#2 I am a six-digit number. The sum of all my digits is 24. I am an even number. I have 2 tens. My ten-thousands digit is greater than 7. I am less than 300,000. There is a 0 in the hundreds place. The digit in the thousands place is 6 more than the hundreds place. What number am I?</p>
<p>#3</p>	<p>#4</p>

- T* You will be working with a partner to try to solve each mystery number.
- T* You will read through the clues to try to determine the mystery number.
- T* Make sure you are working quietly so that no other groups can hear your ideas.
- T* Once you have solved the first two mystery numbers, you will come and have your answers checked by me.
- T* If you and your partner correctly solve the first 2 mystery numbers you will create 2 mystery numbers of your own by writing clues just as I have for mystery numbers 1 and 2.
- T* Once you have finished, you and your partner will switch papers with another group and try to solve their mystery numbers.
- T* They should be able to discover the mystery number with the clues you write.
- T* There is a checklist that I will put up for you to use when writing your clues.
- T* After you create a mystery number of your own, try to read the clues out loud for your partner to try to solve to make sure that your clues work!
- T* Once everyone has finished trying to solve another groups mystery numbers, if we have time I will have a few groups share their mystery numbers with the class!



Mystery Number Checklist

- I have at least 8 clues
- I use clues that help my partner solve for the mystery number
- There is only one possible number solution to my riddle
- My clues are not too obvious that they give the number away too quickly
- I used complete sentences
- I used mathematical terms appropriately (place value, tens, ones, digits, reasonable)
- I finished with a concluding statement “What number am I?”



Make sure to “Break Up Your Day!”

Now is a great time to take a break and get students re-energized. See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 5)

Collect students “Mystery Number” papers and leave them for the teacher.

Name _____ Date _____

Mystery Numbers

<p>#1 I am a five-digit number. The sum of all my digits is 19. My hundreds digit is 2 more than my tens digit. I am an odd number. I have 9 ones. My thousands digit is a multiple of 3. I am less than 14,000. What number am I?</p>	<p>#2 I am a six-digit number. The sum of all my digits is 24. I am an even number. I have 2 tens. My ten-thousands digit is greater than 7. I am less than 300,000. There is a 0 in the hundreds place. The digit in the thousands place is 6 more than the hundreds place. What number am I?</p>
<p>#3</p>	<p>#4</p>

Make sure to “Break Up Your Day!”

These can be used in the middle of a lesson or at the end of your lesson. Here are a few engaging movement and brain break ideas to get your students moving and ready to refocus!



Break Up Your Day: Notation Kid!



- Challenge students to write as many expanded notation 5-digit numbers (to the ten thousands place) as possible in one minute. (example: $15,432 = 10,000 + 5,000 + 400 + 30 + 2$, etc.)
- Students trade papers with a shoulder buddy and the buddy counts the correct expanded notations.
- Whoever has the most correct expanded notations may share their facts with the class (if document camera is available) or they simply become the new Notation Kid!



Break Up Your Day: Math Outside



- Students take scratch paper/pencil and find inverse operations outside.
- Students draw and label objects that can be expanded. (examples: 24 trees = $20 + 4$, 118 students = $100 + 10 + 8$, etc.)



Break Up Your Day: Thumbs Up!



- Student is called on to state their favorite number from 1 to 20, use name cards or equity cards if available.
- Other students signify whether they see that number somewhere in the classroom.
- Tally their responses.
- The number with the most votes or Thumbs Up is the winner for the activity!