



Unit 1: Whole Numbers, Place Value, and Operations

Lesson 1: Place Value, Number Forms, and Comparing Whole Numbers



Lesson at a Glance

A strong math foundation begins with understanding how whole numbers are structured, written, compared, and rounded. This lesson introduces students to place value, digit value, standard form, word form, expanded form, comparison symbols, ordering, rounding, and real-world uses of whole numbers. These skills develop the number sense students need for whole-number operations and future topics throughout Basic Middle School Math.



Students Will Learn To

- Identify the place and value of digits in whole numbers.
- Write whole numbers in standard, word, and expanded form.
- Compare whole numbers using $>$, $<$, and $=$.
- Order whole numbers from least to greatest or greatest to least.
- Round whole numbers accurately to a specified place value.
- Apply place value understanding to real-world quantities.



Essential Questions

- 1 How does place value help us understand whole numbers?
- 2 How can one number be written in standard, word, and expanded form?
- 3 How do we compare, order, and round whole numbers accurately?



Key Vocabulary

- **Place Value:** The value of a digit based on its position in a number.
Example: In 4,582, the 5 is worth 500.
- **Value of a Digit:** The amount a digit represents because of its place value.
Example: In 6,324, the 3 is worth 300.
- **Standard Form:** A number written using digits.
Example: 42,318.
- **Word Form:** A number written using words.
Example: forty-two thousand, three hundred eighteen.
- **Expanded Form:** A number written as the sum of each digit's value.
Example: $42,318 = 40,000 + 2,000 + 300 + 10 + 8$.
- **Compare:** To decide whether one number is greater than, less than, or equal to another number.
- **Order:** To arrange numbers from least to greatest or greatest to least.
- **Rounding:** Replacing a number with a nearby value that is easier to use.
Example: 4,682 rounds to 4,700 to the nearest hundred.



Key Concepts

- Whole numbers use the base-10 place value system.
- Each place value is 10 times the value of the place to its right.
- Powers of 10 explain place value: $10^0 = 1$, $10^1 = 10$, $10^2 = 100$, $10^3 = 1,000$, $10^4 = 10,000$.
- To find the value of a digit, multiply the digit by its place value.
Example: In 7,246, the 2 is in the hundreds place, so $2 \cdot 100 = 200$.
- Standard form uses digits: 305,714.
- Word form uses words: three hundred five thousand, seven hundred fourteen.
- Expanded form shows each digit's value: $305,714 = 300,000 + 5,000 + 700 + 10 + 4$.
- To compare whole numbers, compare the number of digits first. If the numbers have the same number of digits, compare from left to right.
- Comparison symbols: $>$ means greater than, $<$ means less than, and $=$ means equal to.
- To round, look at the digit to the right of the rounding place: 0–4 stays the same, 5–9 rounds up.



Teaching Notes

- This lesson builds the foundation for whole number operations, decimals, fractions, ratios, percents, and Pre-Algebra.
- Emphasize that a digit's value changes depending on its position: 5,000, 500, 50, and 5 all use the same digit but have different values.
- Students should use commas and place value patterns to read large numbers carefully.
- Real-world connections include population, money, scores, distances, attendance, and quantities.
- Rounding should connect to estimation and reasonableness, especially when an exact answer is not needed.
- Common mistakes include ignoring zeros, comparing from right to left, misreading large numbers, or rounding based on the wrong digit.
- Study hint: Line up numbers by place value when comparing, ordering, adding, or subtracting.

Standards Covered

6.EE.A.1



The Standard:

Write and evaluate numerical expressions involving whole-number exponents.



The Explanation:

Understand that an exponent represents repeated multiplication of a base number. Recognize and apply exponential notation to express powers concisely.



The Application:

Be able to understand powers of 10 as part of the base-10 number system and recognize how place value positions increase by factors of 10. Students use this understanding to read, write, compare, and interpret whole numbers accurately.



"Students will be able to understand place value through powers of 10 and use this structure to read, write, compare, and interpret whole numbers."

6.NS.B.2



The Standard:

Fluently divide multi-digit numbers using the standard algorithm.



The Explanation:

Understand that division represents how many times one number is contained within another and can be expressed through repeated subtraction or partial quotients.



The Application:

Be able to use place value understanding to support accurate work with multi-digit whole numbers. Students recognize that strong place value knowledge is necessary for organizing digits correctly when performing operations.



"Students will be able to use place value understanding to organize and interpret multi-digit whole numbers accurately, preparing them for fluent whole-number operations."

8.EE.A.3



The Standard:

Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one quantity is than another.



The Explanation:

Understand that scientific notation expresses numbers using powers of ten to simplify calculations involving extremely large or small values. Recognize that this form is useful for comparing quantities and estimating scale.



The Application:

Be able to recognize that place value and powers of 10 help compare large quantities, estimate size, and understand how numbers grow by place. Students apply this thinking when comparing populations, money, distances, and other real-world quantities.



"Students will be able to use powers of 10 and place value reasoning to compare, estimate, and interpret large whole-number quantities."

Lesson Plan

Unit 1, Lesson 1: Place Value, Number Forms, and Comparing Whole Numbers

1.

INTRODUCE PLACE VALUE

Begin by reviewing the base-10 number system and explaining that a digit's value depends on its position.

Use a number such as 55,555 to demonstrate that the same digit can have very different values depending on where it appears:

50,000

5,000

500

50

5

Reinforce the idea that the digit tells what number we see, while its position determines what that digit is worth.

2.

IDENTIFY PLACE AND VALUE

Model how to identify both the place and the value of a digit.

Example: In 472,316, the digit 7 is in the ten-thousands place and has a value of 70,000.

Emphasize the distinction between the digit itself, its place, and its value.

3.

TEACH STANDARD, WORD, AND EXPANDED FORM

Use the same number to model all three representations.

Standard Form: 305,714

Word Form: three hundred five thousand, seven hundred fourteen

Expanded Form: $305,714 = 300,000 + 5,000 + 700 + 10 + 4$

Encourage students to use commas and place-value patterns to read large numbers carefully.

4.

COMPARE AND ORDER WHOLE NUMBERS

Teach students to compare the number of digits first.

If two numbers contain the same number of digits, compare from left to right until the first different digit is found.

Use $>$, $<$, and $=$ to record comparisons.

Then extend the process to ordering several numbers from least to greatest and greatest to least.

Encourage students to line numbers up by place value when helpful.

5.

TEACH ROUNDING

Identify the place to which the number should be rounded. Look at the digit immediately to the right of that place.

- If the digit is 0–4, keep the rounding digit the same.
- If the digit is 5–9, increase the rounding digit by 1.
- Change the digits to the right of the rounding place to 0.

Connect rounding to estimation and determining whether an answer is reasonable.

6.

APPLY THE SKILLS

Use practice problems that require students to:

- identify the place and value of digits
- convert between standard, word, and expanded form
- compare whole numbers
- order several whole numbers
- round to specified place values

Use real-world quantities involving population, money, scores, distances, attendance, classroom quantities, science, and travel whenever appropriate.

7.

CHECK FOR UNDERSTANDING

Before moving on, confirm that students can:

- identify both the place and value of a digit
- write whole numbers in standard, word, and expanded form
- compare numbers using $>$, $<$, and $=$
- order several whole numbers accurately
- round whole numbers to a specified place

Pay particular attention to mistakes involving zeros, comparing from right to left, and using the wrong digit when rounding.

8.

CLOSE THE LESSON

Reinforce the central idea:

Every digit has a position, and every position gives that digit its value.

Remind students that this understanding will be used immediately when they begin working with whole-number operations and will later extend to decimals, fractions, ratios, percents, and Pre-Algebra.