

- **Problems About Combining**
- **Problems About Separating**

Combining stories have an **addition** pattern.

$$\text{Some} + \text{some more} = \text{total}$$

Separating stories have a **subtraction** pattern.

$$\text{Beginning amount} - \text{some went away} = \text{what remains}$$

Four-step process:

1. Read the problem and identify its pattern.
2. Write an equation for the given information.
3. Find the number that solves the equation and check the answer.
4. Review the question and write the answer.

Practice:

1. Shannon paused on step 125 on her way to the roof of the apartment building. If there are 180 steps in all, how many more steps did Shannon have to climb?

2. Luke has read 452 pages of a 705-page book. How many pages does Luke need to read to finish the book?

3. Kayla counted 73 red tomatoes in the garden. Her sister picked some of the tomatoes. When Kayla returned, she counted 25 red tomatoes. How many tomatoes did her sister pick?

4. Jordan's family is driving 230 miles to his grandmother's house. If they stop for lunch after 156 miles, how many more miles do they need to drive?

- **Place Value Through Trillions**
- **Multistep Problems**

- To determine place value:

A comma is always followed by 3 digits.

Say the number in front of each comma followed by “trillion,” “billion,” “million,” or “thousand.”

Whole Number Place Value Chart														
hundred trillions	ten trillions	trillions	,	hundred billions	ten billions	billions	,	hundred millions	ten millions	millions	,	hundred thousands	ten thousands	thousands
Trillions				Billions				Millions				Thousands		
													hundreds	tens
														ones
														Units (Ones)

- To solve multistep problems:

Find one number for each phrase with an operation.

Then solve the simple problem.

Sum	The answer when we add
Difference	The answer when we subtract
Product	The answer when we multiply
Quotient	The answer when we divide

Example: When the **sum of 3 and 4** is subtracted from the **product of 3 and 4**, what is the difference?

$$(3 \times 4) - (3 + 4) = 5$$

Practice:

- Write 5,000,000 in word form. _____
- What is the place value of the 6 in 987,654,321? _____
- What digit is in the millions place in 13,245,768? _____
- Write the numeral for twenty-three million, four hundred two thousand.

- What is the product of eight hundred forty and thirty-two?

- What is the quotient when the sum of 9 and 6
is divided by the difference of 9 and 6? _____

- **Problems About Comparing**
- **Elapsed-Time Problems**

- **Comparing** stories have a **subtraction** pattern.

$$\text{greater} - \text{lesser} = \text{difference}$$

- **Elapsed-time** problems have a **subtraction** pattern.

$$\text{later} - \text{earlier} = \text{difference}$$

Remember the **four-step process**:

1. Read the problem and identify its pattern.
2. Write an equation for the given information.
3. Find the number that solves the equation and check the answer.
4. Review the question and write the answer.

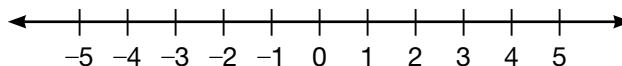
Practice:

1. The Mountain School has 865 students. The Lake School has 792 students.
How many more students are in the Mountain School than in the Lake School?

2. How many years were there from 1776 to 1998?

3. How many years were there from 1865 to 1910?

4. Volume 1 has 1582 pages. Volume 2 has 1947 pages. How many more pages are in Volume 2?

• The Number Line: Negative Numbers

On the number line:

- **Positive** numbers are to the *right* of zero.
- **Negative** numbers are to the *left* of zero.
- **Zero** is neither positive nor negative.
- **Opposites** are numbers the same distance from zero (-5 and 5).
- **Integers** are all the counting numbers, their opposites, and zero.

Example: What number is 7 less than 3?

“7 less than 3” means to **start with 3** and subtract 7.

$$3 - 7$$

On the number line, start on 3 and count 7 integers to the left.

The answer is -4 .

Order matters in subtraction.

$$5 - 2 = 3 \text{ is different from } 2 - 5 = -3$$

Reversing the order of subtraction results in the opposite answer.

Practice:

1. What number is 5 less than 3? _____
2. What number is 4 less than 0? _____
3. The morning temperature was -3° . The afternoon temperature was 8 degrees higher. What was the afternoon temperature? _____
4. The morning temperature was -7° . By noon the temperature was 6° .
How many degrees had the temperature risen? _____

• Problems About Equal Groups**Equal groups word problems**

Number of groups $\times$ number in group = total

Multiply to find the unknown total.

Divide to find an unknown factor.

Example: There were 232 students in 8 classrooms.

If there were the same number of students in each classroom, how many students would each classroom have?

- Write the equation.

$$8 \text{ classrooms} \times n \text{ in each classroom} = 232 \text{ students}$$

- Divide to find the unknown factor.

$$\begin{array}{r} 29 \text{ students} \\ 8 \overline{)232} \end{array}$$

Practice:

1. If 500 beads are put into bags of 20 beads, how many bags will be made?

2. The post office sold 39-cent stamps in sheets of 20 stamps. What was the price of a sheet of stamps?

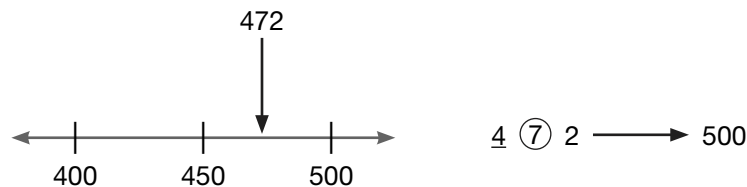
3. If 750 pennies are put into rolls of 50 pennies each, how many rolls will there be?

4. David has 26 pages of trading cards in a notebook. Each page holds 9 trading cards. How many trading cards does David have in all?

- **Rounding Whole Numbers**
- **Estimating**

- To round whole numbers:
 1. Underline the place value you are rounding to.
 2. Circle the digit to its right.
 3. Ask "Is the circled number 5 or more?"
If so, add one to the underlined number.
If not, the underlined number stays the same.
 4. Replace the circled number (and any numbers after it) with zero.

Example: Round 472 to the nearest *hundred*.



- To estimate answers, round the numbers before we add, subtract, multiply, or divide.

Practice:

1. Round 48,425 to the nearest thousand. _____
2. Round 5361 to the nearest hundred. _____
3. Estimate the product of 21 and 38. _____
4. Estimate the sum of 2345 and 6897 to the nearest thousand.

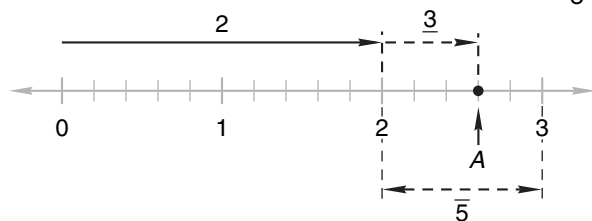
5. Estimate the difference of 642 and 357 to the nearest hundred.

6. The distance between New York, NY, and Los Angeles, CA, is 4685 km.
Round that distance to the nearest thousand.

• Number Line: Fractions and Mixed Numbers

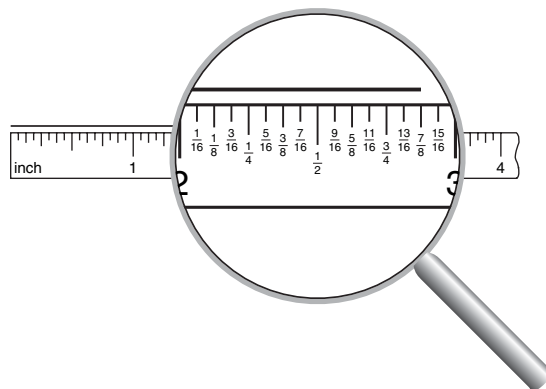


- Point A represents the mixed number $2\frac{3}{5}$.



$2\frac{3}{5}$ ← segments past the unit
 ← number of segments in the whole unit
 ↑
 number of units

- This inch ruler is divided into **sixteenths**. Count by sixteenths; reduce when possible.



Practice:

- Point B represents what mixed number on this number line? _____



Use a ruler to find the length of each of these line segments to the nearest sixteenth of an inch.

- _____



- _____



- _____



- **Average**
- **Line Graphs**

Average

- Add the numbers; then divide by the number of numbers.

Example: What is the average of 8, 7, and 3?

$$\text{Add } \longrightarrow 8 + 7 + 3 = 18 \quad \text{Divide } \longrightarrow 18 \div 3 = 6$$

Halfway

- Add the two numbers; then divide by 2.

Example: What number is halfway between 27 and 81?

$$\text{Add } \longrightarrow 27 + 81 = 108 \quad \text{Divide by 2 } \longrightarrow 108 \div 2 = 54$$

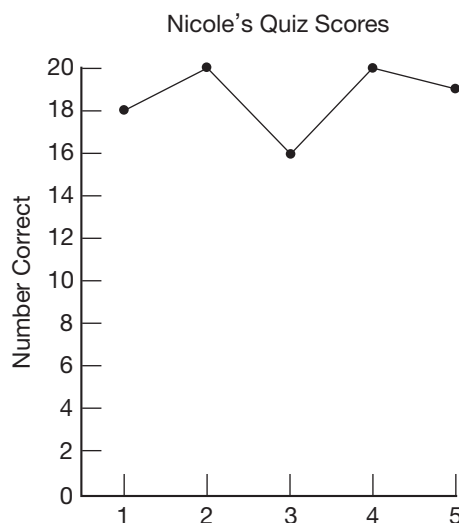
Line graphs

- Points connected by line segments; show how measurement changes over time

Practice:

1. What is the average of 3, 4, 6, 8, 8, and 7? _____
2. What number is halfway between 18 and 54? _____
3. What is the average of 167, 85, and 123? _____

Use the graph below to answer questions 4 and 5.



4. On which quiz did Nicole earn her lowest score? _____
5. What was Nicole's score on Quiz 4? _____

- **Factors**
- **Prime Numbers**

- A **factor** of a number is a whole number that divides the number evenly.

To list the factors of whole numbers:

- *Start* with the number 1.
- *End* with the number given.
- Then find all the other *factors* of the number.
- List the factors *in order*.

Example: The factors of 12 are 1, 2, 3, 4, 6, 12.

- A **prime number** has exactly 2 different factors.

The only factors are the number itself and 1.

Example: 5 is only divisible by 5 and 1, so 5 is a prime number.

6 is divisible by 1, 2, 3, and 6, so 6 is not a prime number.

Practice:

1. List the whole-number factors of 15. _____
2. List the six whole-number factors of 18. _____
3. List the whole-number factors of 21. _____
4. Which of these numbers is not a prime number? _____
A. 2 B. 3 C. 4 D. 5
5. Which of these numbers is a prime number? _____
A. 14 B. 17 C. 24 D. 25

• Greatest Common Factor (GCF)

To find the greatest common factor (GCF):

- List (in order) the factors of the *smallest* number.
- Starting with the greatest factor, cross off factors that are not factors of the other numbers.
- Circle the greatest factor that is a factor of all the numbers. This is the **GCF**.

Example: Find the greatest common factor of 6, 9, and 15.

Factors of 6: 1, 2, 3, 6

6 is not a factor of 15 and 9: 1, 2, 3, 6

3 is a factor of 15 and 9: 1, 2, ③, 6

2 is not a factor of 15 and 9: 1, 2, ③, 6

1 is a factor of 15 and 9: 1, 2, ③, 6

Practice:

1. What is the greatest common factor (GCF) of 12 and 18? _____
2. What is the GCF of 15 and 21? _____
3. What is the GCF of 27 and 36? _____
4. What is the largest number that is a factor of both 24 and 36? _____
5. What is the GCF of 10, 15, and 20? _____