## Lesson 1-1A: Properties of Numbers; Addition and Subtraction

**Objectives:** Review basic operations and rules.

## Addition: working towards a \_\_\_\_\_\_.

Definition:

Parts of an addition problem:

8 + 3 = 11 \_\_\_\_\_

#### Terms:

1. \_\_\_\_\_: the numbers that are added together.

2. \_\_\_\_\_: the result of adding

#### Review:

1. Draw a picture to represent the following problem:

2. Find and list all the ways you can add 2 numbers to equal 15.





http://www.helpingwithmath.com/by\_subject/addition/ex\_regrouping01.htm

Subtraction: Working	a total.
Definition:	
Parts of a subtraction	problem: <b>8</b> - <b>3</b> = <b>5</b>
Terms:	
1	: the amount from which the number is subtracted.
2	: the number being subtracted.
3	: the result of subtracting.
Review:	
1. 47 <u>- 12</u>	
3. 202 <u>- 54</u>	ShOW HOW TO BOFFOW and Ungroup 100000 100000

## Chapter 1 Lesson 1-1B: Properties of Numbers; Multiplication and Division

Multiplication: Working	a total.
Definition:	
Parts of a multiplication problem:	$5 \times 3 = 15$
Terms:	
1: the numbers	s being multiplied.

2. \_\_\_\_: the result of multiplication.

## Ways to represent multiplication:

a. Addition Problem: 5 + 5 + 5 = 15	b. Multiplication problem:
c. Array:	d. Picture:
e. Skip Counting on a Number Line:	f. Area model:

Chapter 1 **Review**:



2. Draw an array to show 2 times 7. Count the squares to find the product.

Draw It'		I WANT YOU TO HELP ME RECOVER MY REPRESSED MEMORIES - I KEEP FORGETTING THE MULTIPLICATION TABLE.
3. 32 <u>x 7</u>	4. 33 <u>x 22</u>	EXPORT MORE MORE MORE MORE MORE MORE MORE MORE

# **Multiply Fractions**

Multiply the numerators	1.	$\frac{2}{5} \cdot \frac{3}{4} =$
Multiply the denominators	2.	$\frac{1}{4} \bullet \frac{3}{4} =$
Reduce the fraction if necessary	3.	$\frac{2}{6} \cdot \frac{2}{3} =$

Definition:		
Parts of a division pr	roblem: = 5 - Group of 2 The quantity 10 con	2 = 5
Terms:	: the numbers being divided (your total amount)	).

- 2. \_\_\_\_\_: the number being divided (how many equal groups).
- 3. \_\_\_\_\_: result of division (how many are in each group.)

#### Division 3 Ways: Write 21 divided by 7 all 3 ways.

Division Sign	Division Symbol	Division Bar (Fraction Bar)

#### Ways to show division: 12 divided by 3

a. Division problem:	b. Repeated Subtraction:	
c. Picture:	d. Use multiplication	
e. Number Line:	f. Array:	





#### **Interpret Remainders:**

: If the problem	: When the problem	
does not need the remainder for the	deals with items that require you to buy, order,	
explanation.	etc whole numbers. You cannot buy part of a	
	bag of cookies from the store.	

5. DVDs are on sale for \$8, including tax. How many CD's can you buy with \$30?

a. Number Sentence: \_\_\_\_\_

b. Answer: \_\_\_\_\_ CD's

c. What does the remainder represent?

## Lesson 1-1C: Using Exponents to Describe Numbers

After this lesson, you will be able to... • represent repeated multiplication with exponents

describe how powers represent repeated multiplication

#### Terms:

1	: the result of repeated multiplication
2	: the number or variable used as a factor in repeated multiplication.
3	: the number or variable that represents the number of times the base is used as a factor.
4	: a shorter way to write repeated multiplication using a base and an exponent.

#### Parts of a Power



# **Explore Repeated Multiplication**

In the story *Alice in Wonderland*, Alice could change her size dramatically by eating cake. If she needed to triple her height, she would eat a piece of cake. Imagine that she is currently 1 m tall. She needs to increase her height to 700 m in order to see over a hill. How many pieces of cake do you think she will need to eat?



#### (Triple means\_\_\_\_\_

- Create a table that shows how Alice's height changes after eating one, two, and three pieces of cake. Describe any patterns you see in the table.
- 2. a) How many pieces of cake does Alice need to eat to become at least 700 m tall? Show how you arrived at your answer.
  - **b)** What is Alice's exact height after eating the number of pieces of cake in part A?
  - c) How many factors of 3 do you need to multiply to obtain your answer to part B?
- **3.** Explore how you could use a calculator to determine Alice's height after eating eight pieces of cake. Share your method(s) with your classmates. Record the methods that work for your calculator. adapted from MHR Chapter 3

Pieces of Cake	Height

## **Reflect and Check**

- **4.** a) The expression 3<sup>2</sup> can be used to represent Alice's height after eating two pieces of cake. What does this expression mean in terms of factors of 3?
  - **b)** How could you represent  $3 \times 3 \times 3 \times 3 \times 3$  as a power ? Identify the base and exponent.
- 5. What is Alice's height after eating ten pieces of cake?

# Link the Ideas

#### **Example 1: Write and Evaluate Powers**

- a) Write  $2 \times 2 \times 2 \times 2 \times 2$  in exponential form.
- **b)** Evaluate the power.

#### Example 2: Model

a) The power 4<sup>2</sup> can be read as "four squared." You can use a model of a square to represent the power.

In the power  $4^2$ , the base is \_\_\_\_ and the exponent is \_\_\_\_.



Show You Know

- **a)** Write  $4 \times 4 \times 4$  as a power.
- **b)** Evaluate the power.

#### POWER

 an expression made up of a base and an exponent

# base exponent

 the number you multiply by itself in a power

DOW

#### EXPONENT

 the number of times you multiply the base in a power

#### EXPONENTIAL FORM

 a shorter way of writing repeated multiplication, using a base and an exponent
5 × 5 × 5 in exponential form, is 5<sup>3</sup>

## **Quick Check**

**1.** Write each expression as a power, and evaluate.

a) 
$$7 \times 7$$
  
b)  $3 \times 3 \times 3$   
c)  $8 \times 8 \times 8 \times 8$   
d)  $10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10$ 

**2.** Evaluate each power.

a) 
$$5^2$$
 b)  $3^3$  c)  $4^5$ 

**3.** Copy and complete the table.

Repeated Multiplication	Exponential Form	Value
$a)  6 \times 6 \times 6$	63	
<b>b)</b> $3 \times 3 \times 3 \times 3$		
c)		49
d)	112	
e)		125

**4.** Does  $4^3 = 3^4$ ? Show how you know.

### Chapter 1 Lesson 1-2: Fractions, Decimals and Percents

**Objectives:** Represent and/or use numbers in equivalent forms Convert decimals, fractions and percents to other forms. (A1.1.1.1)





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Chapter 1
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Chapter 1





# On Your Own!

	Fraction	Decimal	Percent
1.	$\frac{3}{5}$		
2.	$\frac{3}{8}$		
3.	$\frac{3}{10}$		
4.		0.8	
5.			3 %

Write the fraction, decimal, and percent equivalent to each. Simplify all fractions

## Lesson 1-3: Statistics

## Finding the Meaning of Mean

**Example 1:** Reconstruct the graph below with blocks. Determine how many hours per day Keisha would spend practicing if she rearranged her schedule so that she practiced for the same amount of time every day, but kept the same total hours.

## Keisha's clarinet practice schedule

Monday Tuesday Wednesday Thursday Friday U

### Draw in her new schedule

Monday Tuesday Wednesday Thursday Friday

How many blocks are in each row? \_\_\_\_\_

How many hours would Keisha be practicing each day?

Explain what average means? \_\_\_\_\_

#### Example 2: A Mean, or Average, Number of Children

a) Make a bar graph of the data in the table.

Family	Number of Children		
Kugel	5		
Abuka	1		
Lauer	2		
Miller	7		
Ellis	1		
Bosnak	2		

b) What is the average number of children in each family? (Show use the graph. Color in blocks or cross out blocks to build what your average will look like.)



## Words to Know:

- 1. Average (mean): \_\_\_\_\_
- 2. Median: \_\_\_\_\_
- 3. Mode: \_\_\_\_\_
- 4. Range: \_\_\_\_\_
- 5. Outlier: \_\_\_\_\_

#### Mean (Average):

## **Problem:**

My friend RJ is great at basketball, and it'd be cool to show him how well he's done by finding the average number of points he's scored in the last four games.

Here's my high speed solution to finding the average, or mean.



## Step 1:

First, make a list of each of the numbers listed in the data set.

# Step 2:

Next, add the numbers in the data set to find the sum.

## Step 3:

Now, take the sum and divide it by the total number of values in the set.

# Answer:

RJ's mean for the last four games is \_\_\_\_\_ points.

STUD

Median:



## Problem:

My soccer team had a super season, and I want to know how many goals we <u>usually</u> scored per game. Our one high-scoring game against the Vikings would throw off the average. Instead, let's find the median, the middle number.



# Step 1:

Make a list of the amounts in order from least to greatest.

## Step 2:

Next, find the middle number in the list by counting in from each end.

20	iame	Goals	Opponent
2	1	1	Warriors
5	2	11	Vikings
¥.	3	2	Raiders
F,	4	3	Blazers
E	5	5	Sabers
2	6	4	Tigers
2	7	1	Barons
5	8	2	Bulldogs
2	9	4	Cougars
2	10	3	Lions
5	11	4	Spartans

Answer: The median is \_\_\_\_\_\_ because that's the middle number.

# Watch Out!

Help Sam find out if his test score is in the top half of the class.

If the data set has an even number of values and there is no middle number, you need to change the rules!

Help Sam find out if his test score is in the top half of the class.

# Step 1:

Make a list of the scores in order from least to greatest.

# Step 2:

Next, find the middle number in the list by counting in from each end.

# Step 3:

Find the mean of those two middle values by adding them together and dividing by 2.



\_\_\_\_ is the median value.



## Mode

# **Problem:**

Elections were just held for class officers. Sam ran for Treasurer, and we need to find out if he scored a victory.

Since we need to know which candidate received the most votes, we should use mode to find out if Sam won the election.



## Step 1:

Make a list of all the names of all the students who ran. Write down each name only once, even if it repeats.

## Step 2:

Read through the votes, and write the candidate's name for each vote he or she received.

\_\_\_\_ won the election because he/she got the most votes.

\_\_\_\_\_ is the mode.



# mode = most often



#### Range



## Step 1:

List the prices in order from least to greatest.

# Step 2:

Find the lowest price.

Step 3: Find the highest price.

## Step 4:

Subtract the lowest price from the highest price.

The difference between the highest price and lowest price is the range.

The range is \_\_\_\_\_.

#### On Your Own

Your test scores: 85, 92, 84, 92, 63, 98, 87, 92, 91, 96, 93.

#### 1. Find the mean.

(Add up all of the scores, then divide the sum by the number of test scores.)

a) What is the mean of the data set? \_\_\_\_\_

\_\_\_\_\_=

b) What does this tell us? \_\_\_\_\_

- Find the median (Put the scores in order from least to greatest. The number in the middle is your mean.)
- 3. Find the mode. (The number that occurs the most)
- 4. Find the range. (The difference between the highest and lowest score)