



Multiplication Masters, Fraction Fanatics and Vocabulary Victors

Games and hands-on activities to master
multiplication and fraction concepts while building
fluency, vocabulary, and problem-solving skills.

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Multiplication & More

- A. Concepts: Marilyn Burns is the Queen! The Math Solution
 - 1. Chopstick Problem
 - 2. Children's Line-up
 - 3. Circles & Stars
 - 4. Visual Multiplication with Rectangles
 - 5. Area Models and Base Ten Blocks
 - 6. Things That Come in Groups
 - 7. Generate Problems – Concepts to Applications
- B. Master Multiplication Facts in 10 & 10! - 10 min. & 10 days!
 - 1. 0's, 1's, 2's, 5's, 10's, & 9's
 - 2. Hard 15 Made Easy!
 - 3. 11's & 12's
 - 4. Short Consistent Review – Square Scramble
 - 5. Missing Factor Bingo (Introduction to Division)
- C. Mathematical Patterns That Work
 - 1. 6-10 Hand Jive
 - 2. Check with a Big X.
 - 3. Legal Cheat Sheet
- D. Going Beyond Lessons
 - 1. Individual Multiplication Projects
 - 2. Multiplication Number Sense Tricks

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Student Name _____

Any # X 0 = 0

Any # X 1 = The other number.

Any # X 2 = I can count by 2's.

Any # X 5 = I can count by 5's.

Any # X 10 = I can count by 10's.

Any # X 9 = I'll use my Trick of 9's.

NOW THERE
ARE ONLY 15 MORE!
LET'S LEARN THEM
NOW!

	0's	1's	2's	3's	4's	5's	6's	7's	8's	9's	10's
0's	0x0=	1x0=	2x0=	3x0=	4x0=	5x0=	6x0=	7x0=	8x0=	9x0=	10x0=
1's	0x1=	1x1=	2x1=	3x1=	4x1=	5x1=	6x1=	7x1=	8x1=	9x1=	10x1=
2's	0x2=	1x2=	2x2=	3x2=	4x2=	5x2=	6x2=	7x2=	8x2=	9x2=	10x2=
3's	0x3=	1x3=	2x3=	3x3=	4x3=	5x3=	6x3=	7x3=	8x3=	9x3=	10x3=
4's	0x4=	1x4=	2x4=	3x4=	4x4=	5x4=	6x4=	7x4=	8x4=	9x4=	10x4=
5's	0x5=	1x5=	2x5=	3x5=	4x5=	5x5=	6x5=	7x5=	8x5=	9x5=	10x5=
6's	0x6=	1x6=	2x6=	3x6=	4x6=	5x6=	6x6=	7x6=	8x6=	9x6=	10x6=
7's	0x7=	1x7=	2x7=	3x7=	4x7=	5x7=	6x7=	7x7=	8x7=	9x7=	10x7=
8's	0x8=	1x8=	2x8=	3x8=	4x8=	5x8=	6x8=	7x8=	8x8=	9x8=	10x8=
9's	0x9=	1x9=	2x9=	3x9=	4x9=	5x9=	6x9=	7x9=	8x9=	9x9=	10x9=
10's	0x10=	1x10=	2x10=	3x10=	4x10=	5x10=	6x10=	7x10=	8x10=	9x10=	10x10=



Sandra Says

Congratulations!
I'm proud of YOU!

Check out these cool tricks for your 11's and 12's.
Find more Number Sense Tricks at www.lonestarlearning.com

Trick of 11 × one digit

Write 11's partner down twice.

$$11 \times 1 = 11$$

$$11 \times 2 = 22$$

$$11 \times 3 = 33$$

$$11 \times 4 = 44$$

$$11 \times 5 = 55$$

$$11 \times 6 = 66$$

$$11 \times 7 = 77$$

$$11 \times 8 = 88$$

$$11 \times 9 = 99$$

Trick of 11 × two digits

1. Write ones digit of 11's partner.
2. Add two digits.
3. Write tens digit of 11's partner.

*Remember HTAM! That's MATH spelled backwards.
(Say like SHAZAM!)

We read from left to right, but we add, subtract, multiply and place commas working backwards from right to left.

Example: $11 \times 11 = 1\ 2\ 1$

Step 1: Write ones digit of 11's partner. 1

Step 2: Add two digits. $1 + 1 = 2$

Step 3: Write tens digit. 1

Example: $11 \times 12 = 1\ 3\ 2$

Step 1: Write ones digit of 11's partner. 2

Step 2: Add two digits. $1 + 2 = 3$

Step 3: Write tens digit. 1

Trick of 12 × one digit

Step 1: Double 12's partner.

Step 2: Write 12's partner.

Step 3: Regroup when needed.

Example:

$$12 \times 1 = \text{Double } 1 \rightarrow 2$$

$$\text{Write } 1 \rightarrow 12$$

$$12 \times 2 = \text{Double } 2 \rightarrow 4$$

$$\text{Write } 2 \rightarrow 24$$

$$12 \times 3 = \text{Double } 3 \rightarrow 6$$

$$\text{Write } 3 \rightarrow 36$$

$$12 \times 4 = \text{Double } 4 \rightarrow 8$$

$$\text{Write } 4 \rightarrow 48$$

$$12 \times 5 = \text{Double } 5 \rightarrow 10$$

$$\text{Write } 0 \text{ Regroup } 1$$

$$\text{Write } 5 + 1 \rightarrow 60$$

$$12 \times 6 = \text{Double } 6 \rightarrow 12$$

$$\text{Write } 2 \text{ Regroup } 1$$

$$\text{Write } 6 + 1 \rightarrow 72$$

$$12 \times 7 = \text{Double } 7 \rightarrow 14$$

$$\text{Write } 4 \text{ Regroup } 1$$

$$\text{Write } 7 + 1 \rightarrow 84$$

$$12 \times 8 = \text{Double } 8 \rightarrow 16$$

$$\text{Write } 6 \text{ Regroup } 1$$

$$\text{Write } 8 + 1 \rightarrow 96$$

$$12 \times 9 = \text{Double } 9 \rightarrow 18$$

$$\text{Write } 8 \text{ Regroup } 1$$

$$\text{Write } 9 + 1 \rightarrow 108$$

Multiplication with Rectangles

Task Card 1

1. Use color tiles to make ALL the possible rectangles for the numbers 1, 6, 11, 16, and 21.
2. Cut rectangles out of grid paper.
3. As you finish, have one person at a time tape each rectangle on the chart.
4. Raise your hands when completely finished for extensions.
5. Be a super group member.

Task Card 2

1. Use color tiles to make ALL the possible rectangles for the numbers 2, 9, 17, 20 and 22.
2. Cut rectangles out of grid paper.
3. As you finish, have one person at a time tape each rectangle on the chart.
4. Raise your hands when completely finished for extensions.
5. Be a super group member.

Task Card 3

1. Use color tiles to make ALL the possible rectangles for the numbers 3, 8, 13, 18, and 25.
2. Cut rectangles out of grid paper.
3. As you finish, have one person at a time tape each rectangle on the chart.
4. Raise your hands when completely finished for extensions.
5. Be a super group member.

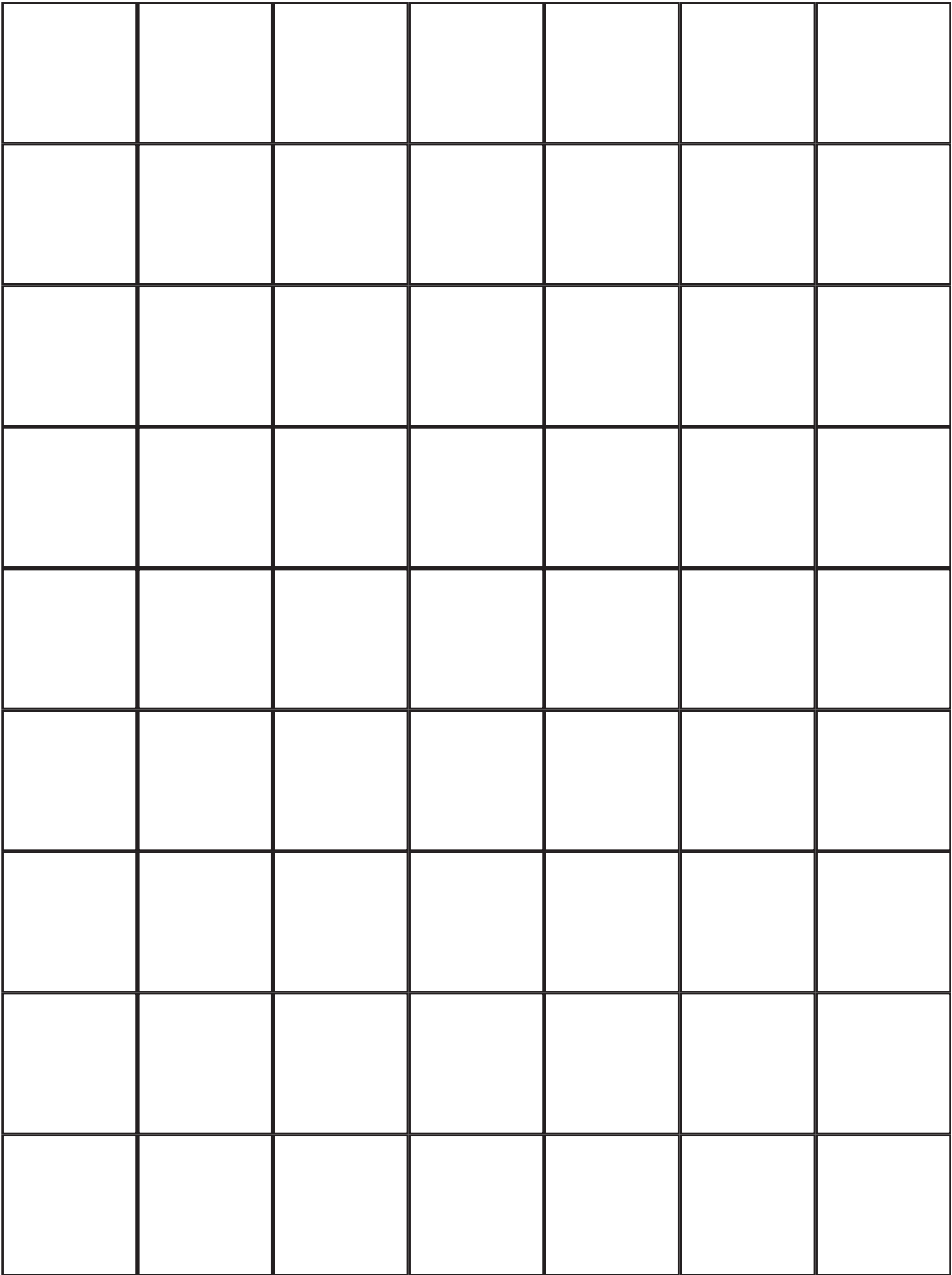
Task Card 4

1. Use color tiles to make ALL the possible rectangles for the numbers 4, 14, 19 and 24.
2. Cut rectangles out of grid paper.
3. As you finish, have one person at a time tape each rectangle on the chart.
4. Raise your hands when completely finished for extensions.
5. Be a super group member.

Task Card 5

1. Use color tiles to make ALL the possible rectangles for the numbers 5, 7, 10, 15, and 23.
2. Cut rectangles out of grid paper.
3. As you finish, have one person at a time tape each rectangle on the chart.
4. Raise your hands when completely finished for extensions.
5. Be a super group member.

1 inch grid

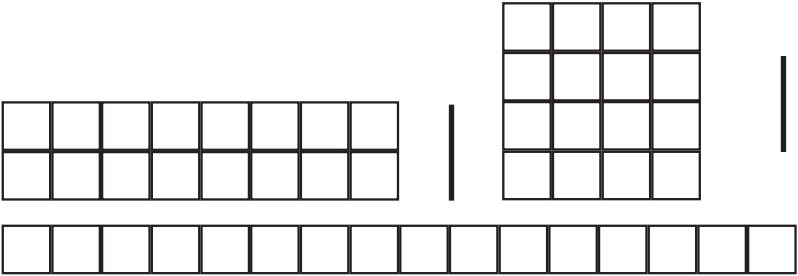


Visual Multiplication Facts

3. Color perfect squares red.

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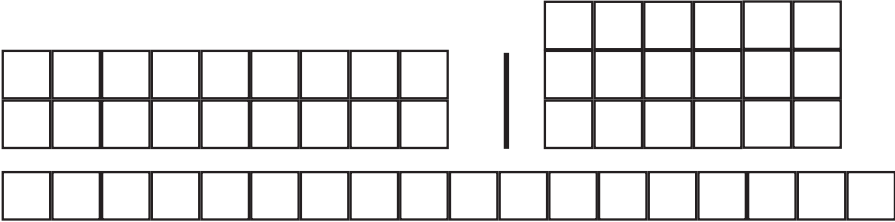
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17



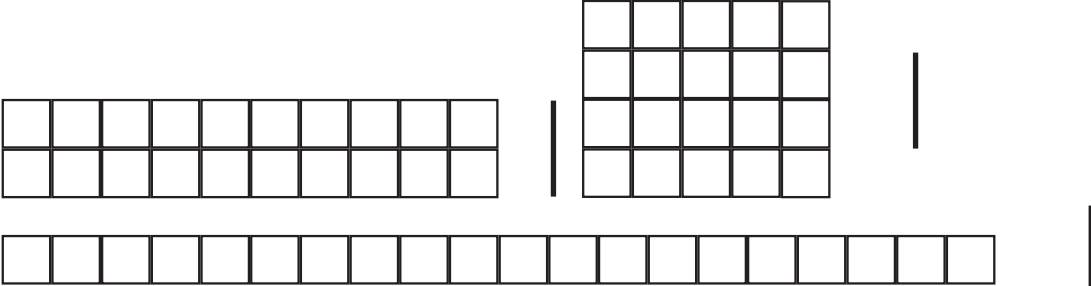
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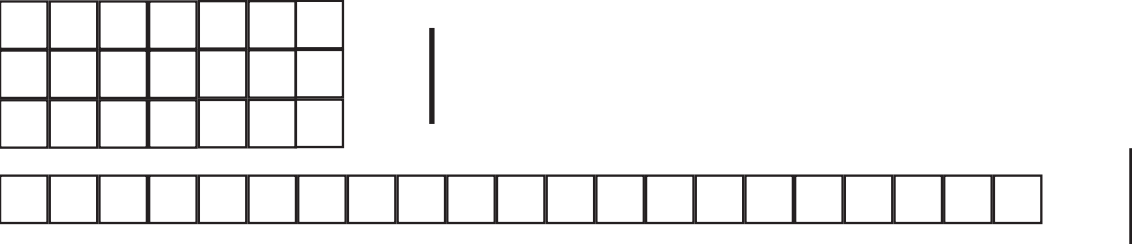
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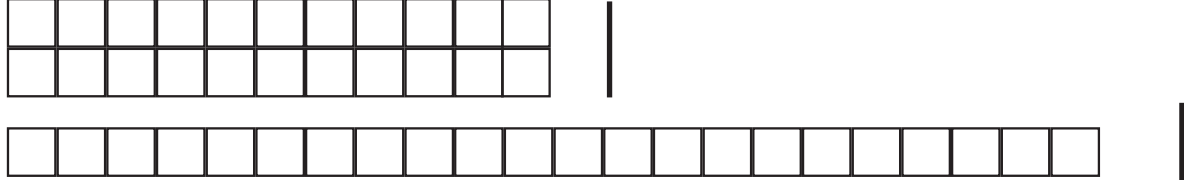
20



21



22



Name _____



GOING BEYOND!

Select an Advanced Multiplication Project to complete independently. Be prepared to present to the class.

- A. Write and illustrate word problems using these guidelines. Each one should be on a single sheet of 8.5x11 paper.
1. One step multiplication problem.
 2. Two step problem using multiplication only.
 3. Two step problem including multiplication and addition.
 4. Two step problem including multiplication and subtraction.
 5. Two step problem including multiplication and division.
 6. Two step problem including multiplication and measurement or geometry.
- B. List five different ways / situations when you would use multiplication in real life. Illustrate.
- C. Find the surface area of a Kleenex Box. Draw and label your findings. You may Google "Surface Area."
- D. Make a Multiplication Game for the class to play.
- E. Fill in blanks. Use a calculator to check. Show work.
- I am _____ years old. I am _____ months old. I am _____ days old. I am _____ hours old. I am _____ minutes old.



Fractions

Sandra White

- A. Rap: Way up North in the Numerator –
How many parts are we talking about?
Way Down Deep in the Denominator_ –
How many equal parts in all?
- B. Definition: A fraction is a part of an object or group.
It is less than whole #1.
 - 1. Objects: Tortillas, Red & Blue Fraction Plates.
Hefty Plates with 36 & 48 scallops & Win at One
(Dollar, Hour, Gallon)
 - 2. Groups: Our Class / Red & Yellow Counters / Worksheet
- C. Linear Model: Number Line
 - 1. Place 0, $\frac{1}{2}$, 1
 - 2. Place unit fractions
 - 3. Place fractions with a difference of 1 or close to 1
 - 4. Place fractions close to $\frac{1}{2}$
 - 5. Place decimal fractions
- D. Short Consistent Reviews
 - 1. Whole group / all TEKS – TEKSas Target Practice
 - 2. Individual - Square Scrambles
 - a. Equivalent Fractions
 - b. Picture Fraction with Name
 - c. Improper with Mixed Numbers
 - d. Decimal Fraction with Common Fraction
- E. Fraction Without Distractions Mini Guide
 - 1. Definition
 - 2. Comparing Fractions - War
 - 3. Add & Subtract Like Denominators
 - 5. Multiply Fractions, Whole #s & Mixed #s
 - 6. Divide Fractions, Whole #s & Mixed #s
 - 7. Simplify Fractions
- F. Probability



Fraction Rap

Way up **N**orth in the **N**umerator

(Point up, high voice)

Way **D**own **D**eep in the **D**enominator

(Point down, low voice)

Way up **N**orth in the **N**umerator

(Point up, high voice)

Way **D**own **D**eep in the **D**enominator

(Point down, low voice)

WHAT DOES IT MEAN ??

Way up **N**orth in the **N**umerator

(Point up, high voice)

How many parts are we talking about?

Way **D**own **D**eep in the **D**enominator

(Point down, low voice)

How many equal parts in all?

ONE MORE TIME!

Way up **N**orth in the **N**umerator

(Point up, high voice)

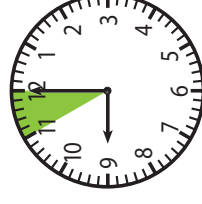
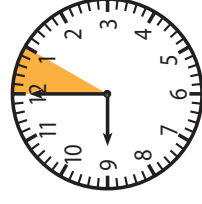
How many parts are we talking about?

Way **D**own **D**eep in the **D**enominator

(Point down, low voice)

How many equal parts in all?





No Wasted Time

from Beginning to End

Procedures	Traveling / Waiting	Unexpected Visitors	Finishing Early
A. Hug! Greet! S-M-I-L-E B. Discipline/Attendance Cards C. Portfolio/Journals D. Red, Yellow, Green Cups E. Call backs: 1,2,3, Eyes on me! 1, 2, Eyes on you! - Chit Chat! Stop That! - Meanwhile... Back at the ranch! F. Stopwatch for Tasks, dismiss, change groups. G. WARM UPS! - Words' Worth - Days of School - Math TEKSas Target Practice Target the Question - Reading Target Reading - Language Word of the Day - Science Seeing Science Structures	Be aware! Plan ahead! Library, Lunch, Picture Day, Changing Classes... A. Vocabulary Review B. Multiple Mental Math C. Rhymes: 6 x 4 is 24, 6 x 6 is 36 6 x 8 is 48, 8 x 8 is 64 That is all and say, "No More!" D. Skip/Buzz E. Square Scramble Race F. Show Me! Trick of 9's Trick of 6's Ten more, one hundred more, one hundred less, etc.	Parent, Principal, Teacher, Student ... A. Warm Up or Lesson, CONTINUE ON!! B. Smart Choices C. Write definitions synonyms, antonyms ... D. Scavenger Hunt E. KWL F. Mystery to Mastery Math Mini-Museum Math & Quiet Center Stations Century Club Math Made Easy Parent Night	Math and Quiet!! Center, Shelf, Treasure Chest, Tub... (Talk! = Walk!) A. Quiet Dice for Make the Largest Number, Probability Game, etc. B. Place Value Folders, Square Scrambles, Guess and Check, Flash Cards, Win at One C. Geometry Challenges with manipulatives D. Going Beyond Lessons E. Concentration with vocabulary cards and definitions/factors and products

Every Child! Every Chance! Every Day!

Multiplication of Fractions

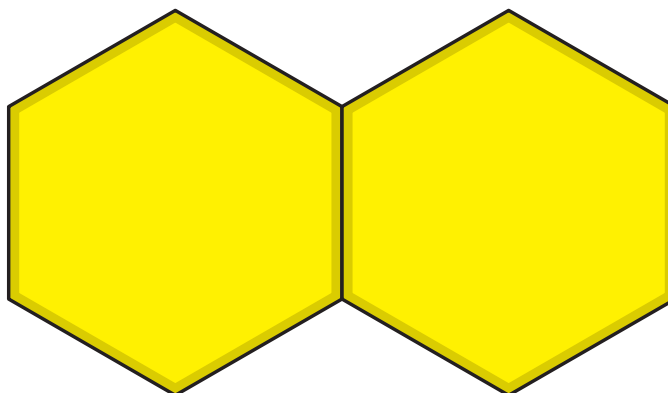
The problem $\frac{1}{6} \times \frac{1}{2}$ requires students to find the value of one of six equal parts of one half. With pattern blocks, this can be thought of as finding the fractional value, in terms of the double hexagon, of one sixth of the yellow piece.

To solve these problems:

1.) Show the second fraction as part of the double hexagon. ($\frac{1}{2}$)

2.) Find the fractional part of the second fraction indicated by the first fraction. ($\frac{1}{6}$ of $\frac{1}{2}$)

3.) Use the fractional part of the second fraction indicated by the first fraction and rename the pattern block(s) as a fractional part of the double hexagon ($\frac{1}{6}$ of $\frac{1}{2}$ is $\frac{1}{12}$)



Multiplying With Fractions

Use pattern blocks to solve the multiplication problems listed below

1.) $\frac{1}{6} \times \frac{1}{2}$

2.) $\frac{1}{2} \times \frac{1}{2}$

3.) $\frac{1}{3} \times \frac{1}{4}$

4.) $\frac{1}{4} \times \frac{2}{6}$

5.) $\frac{2}{3} \times \frac{1}{4}$

6.) $\frac{3}{4} \times \frac{2}{6}$

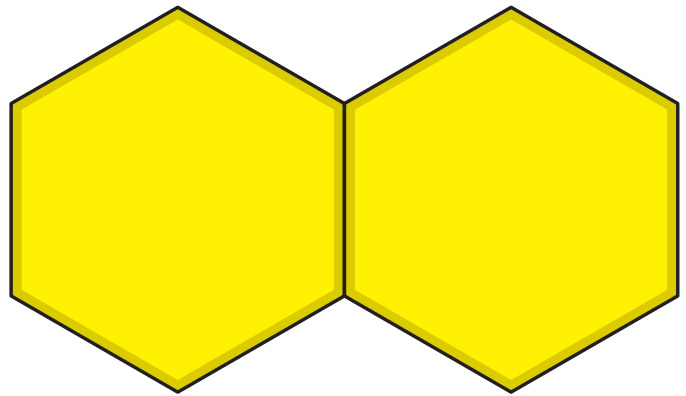
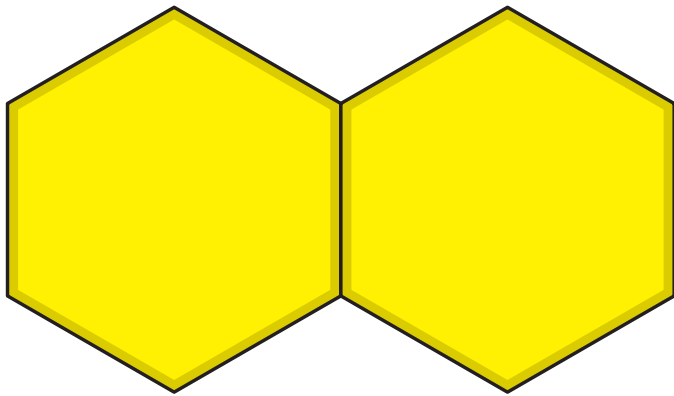
Division of Fractions

The problem $\frac{1}{2} \div \frac{1}{6}$ means "in one half, there are how many sixths?" With pattern blocks, this can be thought of as "dividing" the yellow piece into blue pieces.

To solve these problems:

- 1.) Show the first fraction
- 2.) Find how many of the second fraction are needed to exactly cover the first one;
- 3.) The number of pieces needed tells you the answer to the problem.

Use pattern blocks to solve the division problems listed below.



A.) Dividing Fractions by Fractions

1.) $\frac{1}{2} \div \frac{1}{6}$

2.) $\frac{1}{6} \div \frac{1}{12}$

3.) $\frac{2}{4} \div \frac{1}{12}$

4.) $\frac{9}{12} \div \frac{1}{4}$

B.) Dividing Mixed Numbers by Fractions

1.) $1 \frac{1}{2} \div \frac{1}{4}$

2.) $1 \frac{1}{6} \div \frac{1}{12}$

3.) $1 \frac{2}{12} \div \frac{1}{6}$



1. Find least common denominator (See #2, Plan B on p. 3)
2. Subtract numerators
3. Denominators stay the same

$$\frac{2}{3} - \frac{1}{4} = \frac{8}{12} - \frac{3}{12} = \frac{5}{12}$$

Subtract Unlike Denominators



1. Find least common denominator (See #2, Plan A on p. 3)
2. Add numerators
3. Denominators stay the same

$$\frac{1}{2} + \frac{1}{4} = \frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

Add Unlike Denominators

Multiply Fractions

1. Multiply numerators
2. Multiply denominators

$$\frac{2}{3} \times \frac{1}{5} = \frac{2}{15}$$

Multiply a Fraction and a Whole Number

1. "Of" means multiply.
2. Put whole numbers over 1

$$\frac{1}{9} \times 5 \text{ or } \frac{1}{9} \text{ of } 5 = \frac{1}{9} \times \frac{5}{1} = \frac{5}{9}$$

Multiply a Fraction and a Mixed Number

1. Use quality check ✓
2. Say "Whole number times denominator plus numerator equals numerator"
3. Denominator stays same

$$2\frac{1}{2} \times \frac{1}{3} = \frac{5}{2} \times \frac{1}{3} = \frac{5}{6}$$



1. Subtract numerators
2. Denominators stay the same

$$\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$$

Subtract Like Denominators



1. Add numerators
2. Denominators stay the same

$$\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$$

Add Like Denominators

Divide Fractions

1. Invert the second fraction
2. Change the ÷ to ×
3. Multiply (See p. 6)

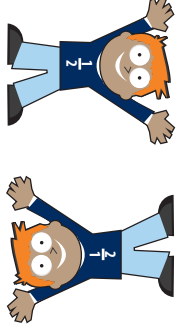
$$\frac{6}{7} \div \frac{1}{2} = \frac{6}{7} \times \frac{2}{1} = \frac{12}{7}$$

- a. fraction ÷ fraction
- b. whole number ÷ fraction
- c. mixed number ÷ fraction

$$4 \div \frac{3}{4} = \frac{4}{1} \times \frac{4}{3} = \frac{16}{3}$$

$$3\frac{2}{3} \div \frac{3}{4} = \frac{11}{3} \times \frac{4}{3} = \frac{44}{9}$$

Reciprocals Rock!



3. What's the 5th Grade Battle Cry? Cross-Multiply!

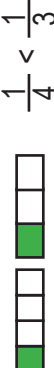
$$\frac{2}{3} < \frac{3}{4} = \frac{8}{12} < \frac{9}{12}$$

- Plan B: Try multiples of largest denominator to find the least common (same) in each list

$$\frac{1}{2} < \frac{2}{4} = \frac{1}{2} < \frac{2}{4}$$

- Plan A: Try largest denominator

2. Find LCD - Least Common (same) Denominator



1. Draw pictures of fractions in congruent shapes

To Compare Fractions

Simplify Fractions

- A. If numerator is smaller, find a "magic number" (common factor) that will divide evenly into the numerator and denominator
1. Try smallest numerator
2. Try 2, 3, 4, 5, etc.

$$\frac{2}{8} \div \frac{2}{2} = \frac{1}{4}$$

$$\frac{6}{9} \div \frac{3}{3} = \frac{2}{3}$$

- B. If numerator is larger, change improper fraction to a mixed number

1. Divide denominator into numerator for whole number

$$\frac{9}{3} = 3$$

2. If you have a remainder, place it over the divisor

$$\frac{3}{2} = 1\frac{1}{2}$$

A common fraction is a part of an object or group. It is less than whole number 1.

Denominator

How many equal parts in all?

Way down **Deep** in the

Numerator

How many parts are we talking about?

the in the

FRACTIONS WITHOUT DISTRACTIONS



Math Makes Sense!

FOLDING SHAPES

ACADEMIC VOCABULARY

- 1 Discuss all math terms & concepts illustrated by blank side of paper.

rectangle
quadrilateral
parallelogram
right angle
parallel lines
line segment
plane, area of a rectangle
polygon



- 2 Discuss all math terms & concepts illustrated by circle side of paper.

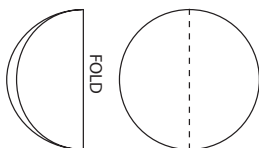
circle
area of circle
circumference of circle
interior of circle
exterior of circle

- 3 Cut out circle & discard scraps.

lines of symmetry

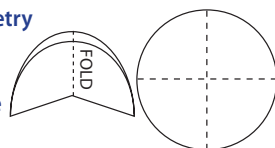
- 4 Fold the disk in half & unfold.

diameter
semicircle



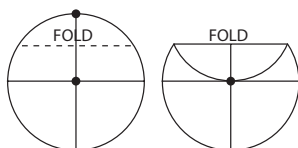
- 5 Fold the disk in half matching the endpoints of the diameter together & unfold.

lines of symmetry
radius
quadrant
center of circle
central angle



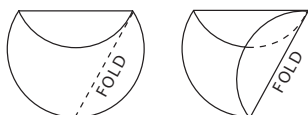
- 6 Mark a point on the circle at the end of one of the radii formed in step 5. Fold the point to the center using one endpoint of the chord formed in step 6 as an endpoint for a new chord & unfold.

point
chord
sector



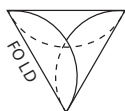
- 7 Fold another point on the circle to the center using one endpoint of the chord formed in step 6 as an endpoint for a new chord & unfold.

inscribed angle



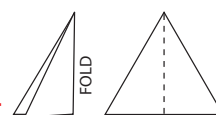
- 8 Fold the remaining arc of the circle to the center.

triangle
arc
vertex
equilateral triangle
isosceles triangle
scalene triangle
equilateral triangle
sum of the measures of angles
base of a triangle
acute angle
obtuse angle
area of a triangle
triangle inscribed in a circle



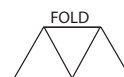
- 9 Fold the triangle on one of its lines of symmetry. Unfold.

right triangle
altitude
median
perpendicular bisector



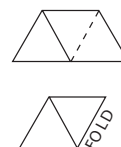
- 10 Fold to find the midpoint of one of the sides of the triangle. Fold the opposite vertex to this midpoint.

midpoint of a line segment
trapezoid
isosceles trapezoid
area of trapezoid



- 11 Notice that the trapezoid consists of 3 congruent triangles. Fold one of the triangles over the top of the middle triangle.

rhombus
congruent triangles
area of rhombus



* remember that the area of the original equilateral triangle was assumed to be one square unit.

- 12 Fold the rhombus on a line of symmetry & discuss the area of this new triangle & the relationship to the original triangle.

similar



- 13 Open up the 3 folded over triangles until their corners meet forming a 3-D figure.

polyhedron
tetrahedron
pyramid
surface area



- 14 Open the large equilateral triangle made in step 8. Fold each of the vertices to the center of the circle.

irregular pentagon
(formed when second corner was folded in)
hexagon
regular polygon
sum of measures of interior angles of a polygon
area of irregular pentagon
regular hexagon



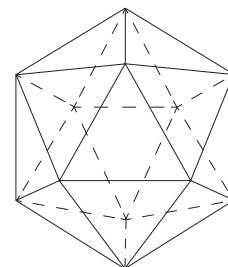
- 15 Bring the small triangles in the middle of the hexagon, formed in step 13, so that they are on top of each other.

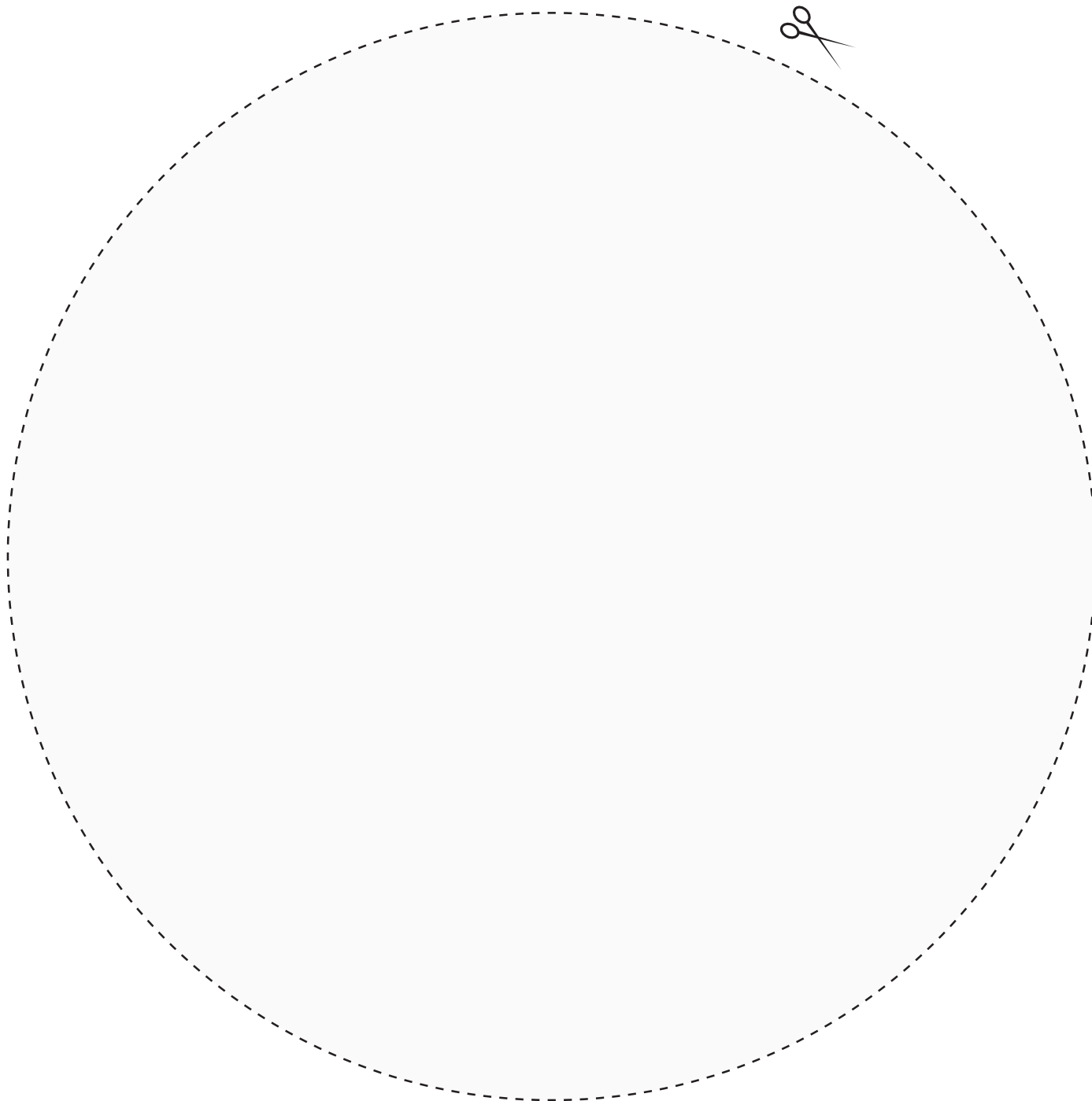
truncated tetrahedron
surface area



- 16 Tape the top of your truncated tetrahedra. For a "Going Beyond Project," make 19 more truncated tetrahedra and tape them together to display an icosahedron, the Platonic Solid which is also the form the AIDS virus takes, as well as, many other well known viruses. Tape five of the truncated tetrahedra together to form a "top," five to form a "bottom," and ten to form a "band" for the center. Then tape the top and bottom to the center band. This may motivate some to research independently!

icosahedron





8,502,749,136

**Underline the number
just after “nearest.”**

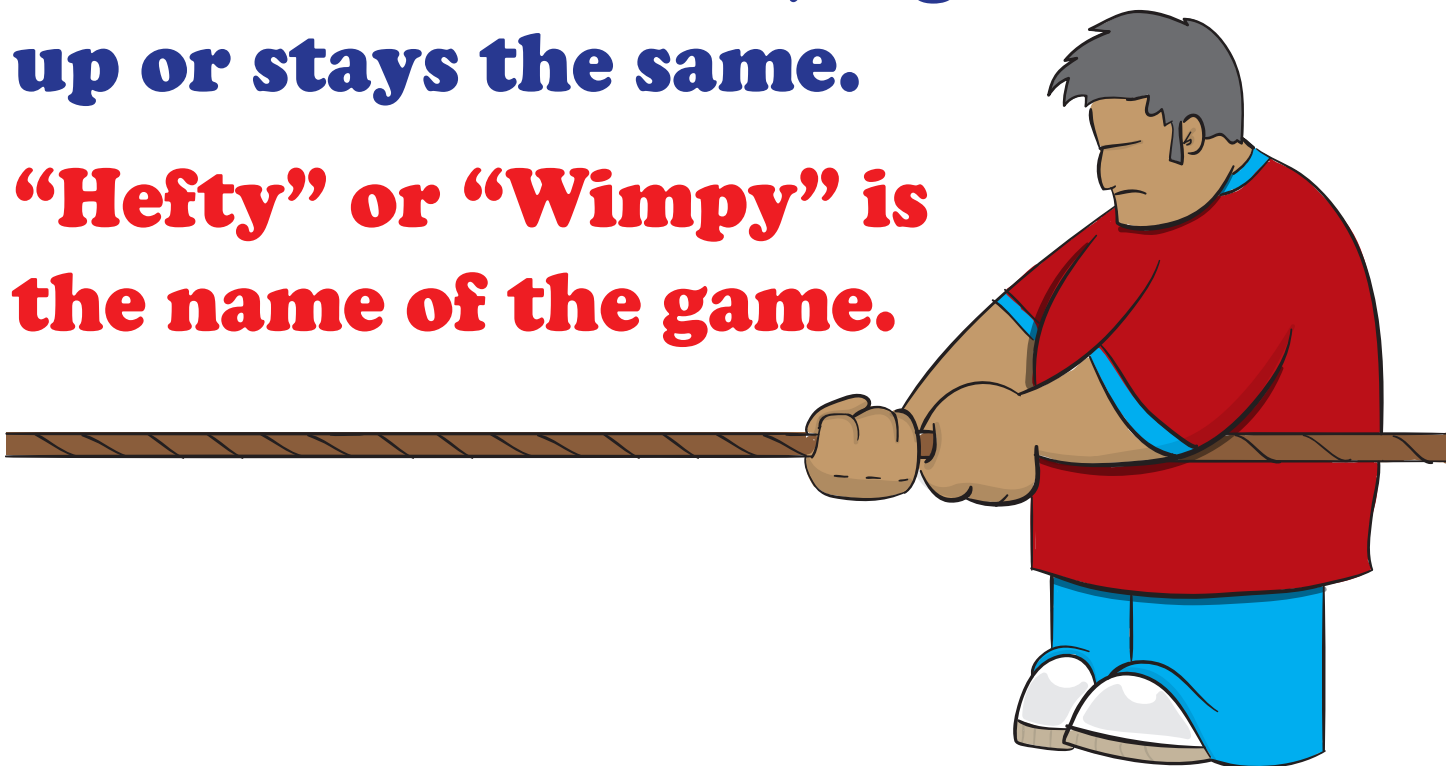
**On that # your thinking
must be clearest.**

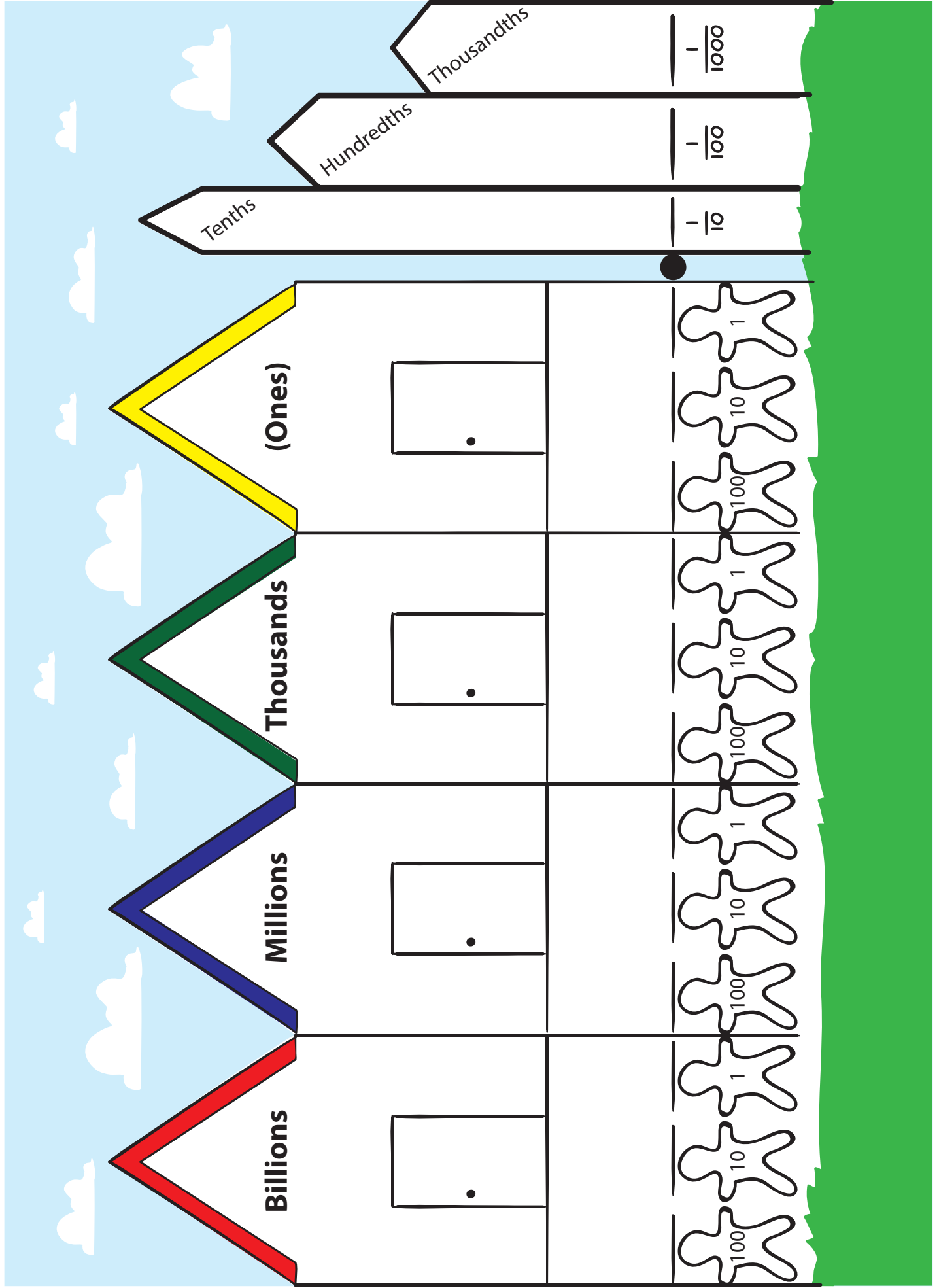
O's go under everything right.

**On the left you just see
the same sight.**

**Look behind that #; it goes
up or stays the same.**

**“Hefty” or “Wimpy” is
the name of the game.**





Be Vocabulary Victors

DON'T just say a word! They may mispronounce it and have no idea what it means!

DON'T just give matching vocabulary tests to memorize! Use active participation!

DO use Marzano's 6 step plan for vocabulary acquisition:

1. Provide a description, explanation, or example in their own words
2. Ask students to restate the description, explanation, or example in their own words.
3. Ask students to construct a picture, symbol, or graphic representing the term.
4. Periodically engage students in activities that help them add to their knowledge of terms in their notebooks.
5. Frequently ask students to discuss the terms with one another.
(Tell a Friend! Partner Teach!)
6. Regularly involve students in games that allow them to play with terms.

And, Let's say it again- a little elaboration / a few more ideas / examples

1. LOVE teaching vocabulary - and MATH! If you don't, fake it!
2. Use a journal when possible. TEACH the words using visuals - your cards!
3. Have a class count syllables by clapping, stomping, snapping, etc.
4. Write the word.
5. Spell as you write.
6. Tell a partner what it means.
7. Draw a sketch of the word.
8. WRITE the definition.
9. Use in a sentence.
10. Play games when possible!
 - a. Mystery to Mastery
 - b. A Minute to Win it
 - c. Word Walks
 - d. Read My Mind
 - e. Rap it!
 - f. Vocabulary Parade / Newscast
 - g. Square Scrambles
 - h. In the Spotlight
 - i. Baseball
 - j. Cover Up! Uncover!
 - k. Race for a Hundred, Dollar, Hour, Whole



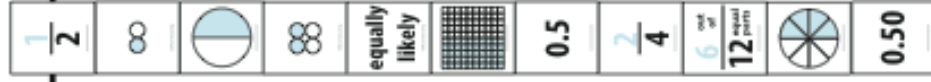
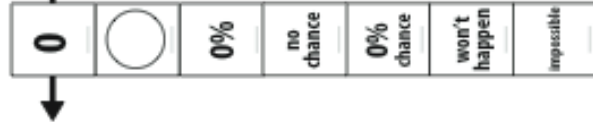
Metric Conversion Chart

	Grams			Unexpectedly (Units of Measure)	Drinking	Chocolate	Milk
	Liters						
	Meters						
	King	Henry	Died				
	kilo	hecto	deca				

Moving Right - Add 0's or move decimal right. Multiply!

Moving Left - Take away 0's or move decimal left. Divide!

NO WASTED SPACE!





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