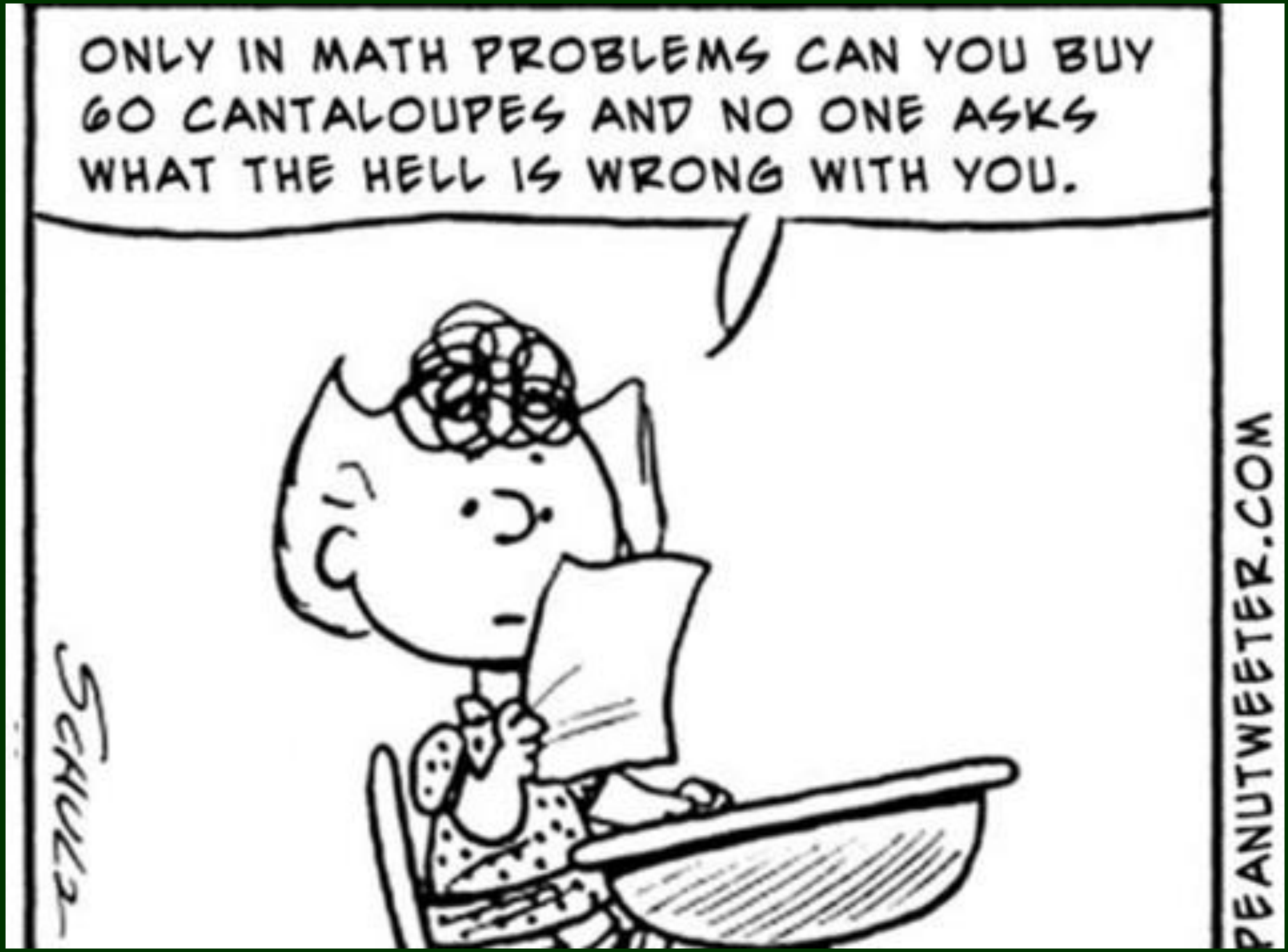
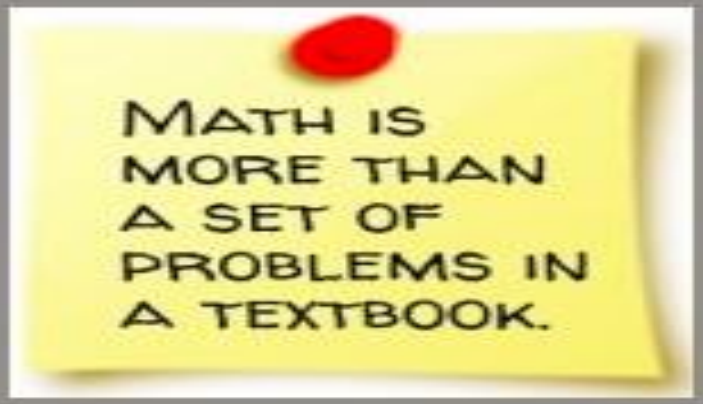

ONLY IN MATH PROBLEMS CAN YOU BUY 60 CANTALOUPES AND NO ONE ASKS WHAT THE HELL IS WRONG WITH YOU.
SCHULZ
PEANUTWEETER.COM

Making Math REAL~ Unleashing the power of the Practice Standards



"Real life math doesn't look like word problems. You're faced with a messy situation. You have to make assumptions, you have to simplify, and you have to bring the tools you know to bear on the problem to analyze and gain insight into it."

Jason Zimba, Ph.D

Math Team Coordinator - Common Core Video: The Importance of Mathematical Practices

ThenHunt Institute

Needs Assessment:

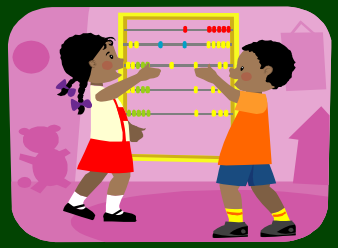
On a scale of 1-5, how familiar are you with the Standards for Math Practice?

1= Not at all familiar

5= Extremely familiar

(Hold up the appropriate number of fingers)

Standards for Mathematical Practice at a Glance



1. **Make sense of problems and persevere in solving them**
2. **Reason abstractly and quantitatively**
3. **Construct viable arguments & critique the reasoning of others**
4. **Model with mathematics**
5. **Use appropriate tools strategically**
6. **Attend to precision**
7. **Look for and make use of structure**
8. **Look for and express regularity in repeated reasoning**

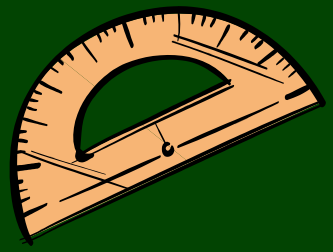
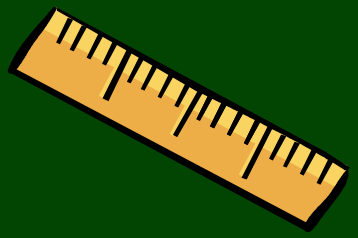
A Closer Look at Each Standard

1. Make sense of problems and persevere in solving them
   …start by explaining to themselves the meaning of a problem and looking for entry points to its solution

2. Reason abstractly and quantitatively
   …make sense of quantities and their relationships to problem situations

3. Construct viable arguments and critique the reasoning of others
   …understand and use stated assumptions, definitions, and previously established results in constructing arguments

4. Model with mathematics
   …can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace

5. Use appropriate tools strategically
   …consider the available tools when solving a mathematical problem

6. Attend to precision
   …communicate precisely using clear definitions and calculate accurately and efficiently

7. Look for and make use of structure
   …look closely to discern a pattern or structure

8. Look for and express regularity in repeated reasoning
   …notice if calculations are repeated, and look for both general methods and for shortcuts

Make sense of problems and persevere in solving them. Mathematical Practice 1

When presented with a problem, I can make a plan, carry out my plan, and check its success.

BEFORE...

EXPLAIN the problem to myself.

MAKE A PLAN to solve the problem

- *What is the question?*
- *What do I know?*
- *What do I need to find out?*
- *What tools/strategies will I use?*

DURING...

PERSEVERE (Stick to it!)

MONITOR my work

ASK myself, "Does this make sense?"

CHANGE my plan if it isn't working out

AFTER...

CHECK

- *Is my answer correct?*
- *How do my representations connect to my solution?*

EVALUATE

- *What worked/didn't work?*
- *How was my solution similar or different from my classmates'?*

Reason abstractly and quantitatively.

Mathematical Practice 2

I can use numbers, words, and reasoning habits to help me make sense of problems.

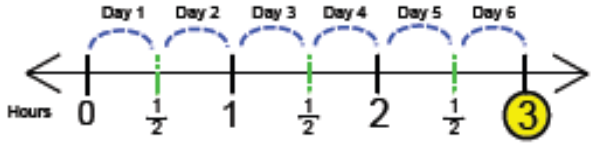
Contextualize (Numbers to Words)

$\frac{1}{2} \times 6 = 3$ *or* $6 \times \frac{1}{2} = 3$

Mary practices the piano $\frac{1}{2}$ hour a day for 6 days.
How many total hours does she practice?

Decontextualize (Words to Numbers)

Mary practices the piano $\frac{1}{2}$ hour a day for 6 days.
How many total hours does she practice?



$\frac{1}{2} \times 6 = 3$ *or* $6 \times \frac{1}{2} = 3$

Reasoning Habits

1) Make an understandable representation of the problem.
2) Think about the units involved.
3) Pay attention to the meaning of the numbers.
4) Use the properties of operations or objects.

Construct viable arguments and critique the reasoning of others. Mathematical Practice 3

I can make logical arguments and respond to the mathematical thinking of others.

I can make and present arguments by...

- using objects, drawings, diagrams and actions
- using examples and non-examples
- relating to contexts

I can analyze the reasoning of others by...

- listening
- asking and answering questions
- comparing strategies and arguments

Model with mathematics.

Mathematical Practice 4

I can recognize math in everyday life and use math I know to solve problems.

I can...

My box turtle is getting a new tank. He is 5 1/2" long and 3" tall. One side length of the tank needs to be 5 times his length. How long will the length of the tank need to be?

Use **estimates** to make the problem simpler.

I will round 5 1/2" to 6".

Find **important numbers**.

Turtle: About 6" long
Tank: 5 times the length of the turtle

Use **tools** to **show relationships**.

Turtle Length (inches)	Tank Length (inches)
4	20
5	25
6	30
7	35
8	40

Think about the **relationship** to find an **answer.**

The tank (30") is 5 times bigger than the turtle length (6").

Consider my **answer** – **Does it make sense?**

I thought about the problem again and a 30" side length on the tank makes sense!

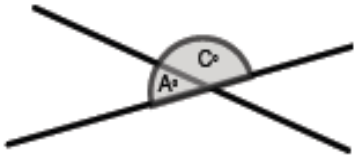
...to solve everyday problems.

Use appropriate tools strategically.

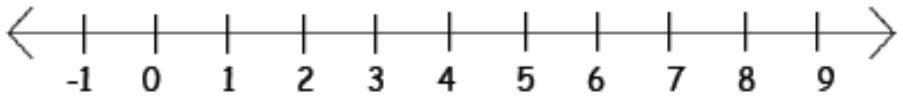
Mathematical Practice 5

I can use certain tools to help me explore and deepen my math understanding.

- I know *HOW* and *WHEN* to use math tools.
- I can reason: *"Did the tool I used give me an answer that makes sense?"*



a x b = b x a



Attend to precision.

Mathematical practice 6

I can be precise when solving problems and clear when communicating my ideas.

Mathematicians communicate with others using...

symbol: equal

(the same as)

48 inches = 4 feet

units of measure

- math vocabulary with clear definitions
- symbols that have meaning
- context labels
- units of measure
- calculations that are accurate and efficient

Look for and make use of structure.

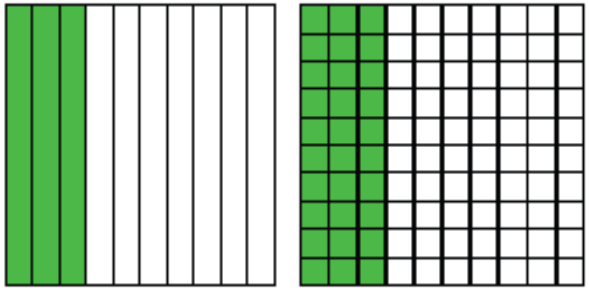
Mathematical Practice 7

I can see and understand how numbers and spaces are organized and put together as parts and wholes.

Numbers

For Example:

I know that $\frac{3}{10}$ is equal to $\frac{30}{100}$.



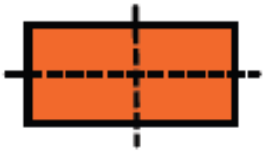
So, $\frac{3}{10} + \frac{4}{100} = \frac{34}{100}$.

Equivalent Fractions

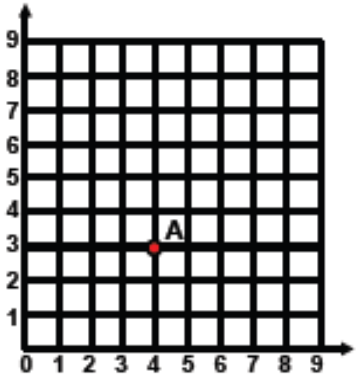
Spaces

For Example:

Lines and Angles



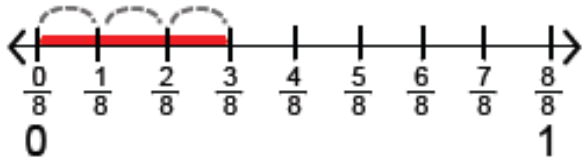
Symmetry



Location

Look for and express regularity in repeated reasoning. Mathematical Practice 8

I can notice when calculations are repeated. Then, I can find more general methods and short cuts.

As I work…	**There are many ways to decompose $\frac{3}{8}$ because it is composed of repeated $\frac{1}{8}$s.** **I CAN…..**
…I think about what I'm trying to figure out while I pay attention to the details	….***draw*** a whole and shade in three $\frac{1}{8}$s parts.  ….***add*** *eighths.* $\frac{3}{8}=\frac{1}{8}+\frac{1}{8}+\frac{1}{8}$ ….***count by*** *eighths.* *(one-eighth, two eighths, three eighths)* $\frac{3}{8}=\frac{1}{8},\frac{1}{8},\frac{1}{8}$
…I evaluate if my results are reasonable.	….*jump three $\frac{1}{8}$ size jumps on a number line.* 

Grouping the SMPs (McCallum, 2011)

1. Make sense of problems and persevere in solving them
6. Attend to precision

2. Reason abstractly and quantitatively

3. Construct viable arguments and critique the reasoning of others

Reasoning and explaining

4. Model with mathematics

5. Use appropriate tools strategically

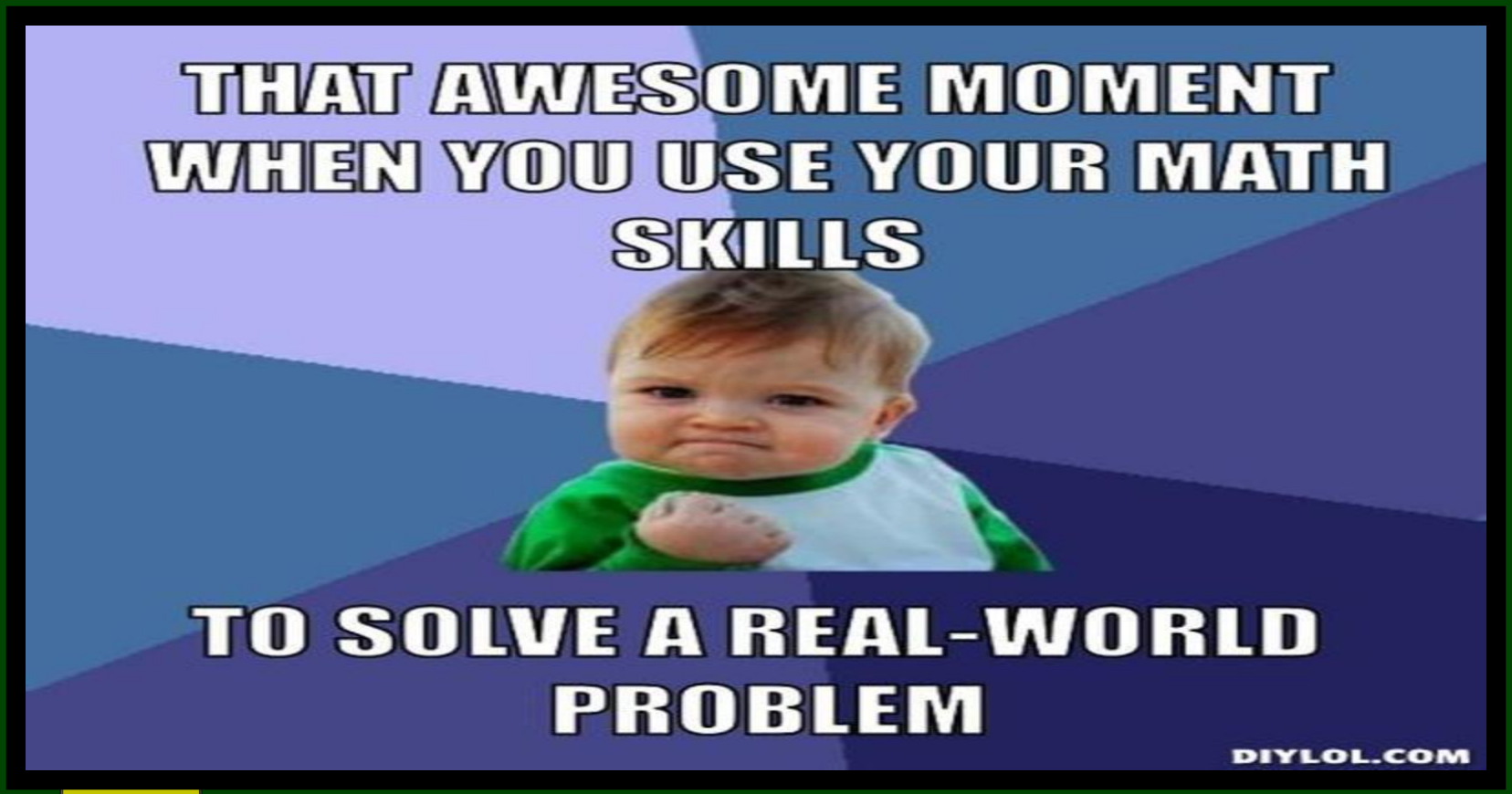
Modeling and using tools

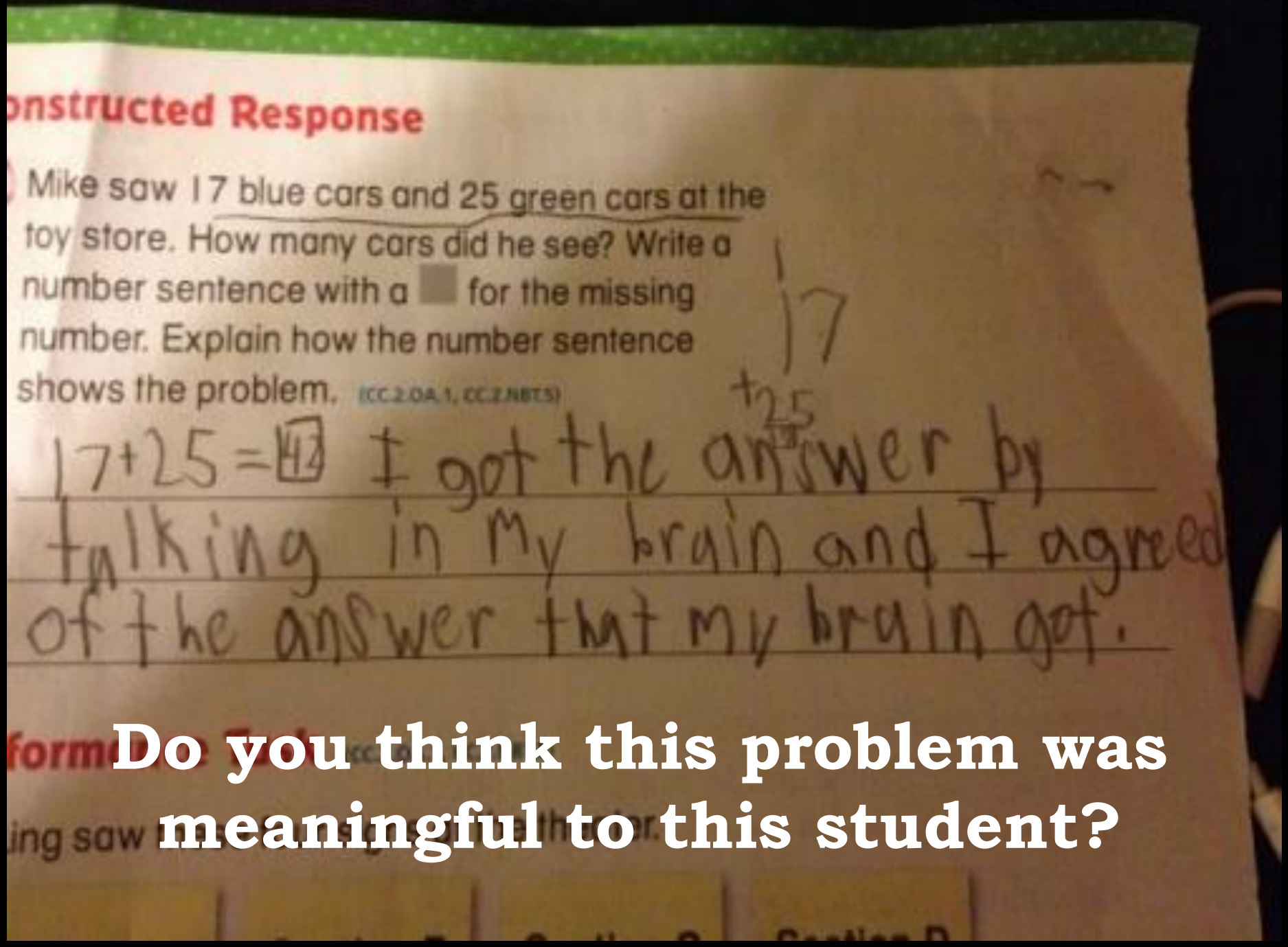
7. Look for and make use of structure.

8. Look for and express regularity in repeated reasoning.

Seeing structure and generalizing

Making Math MEANINGFUL
with
Authentic, High-Interest Problems





Do you think this problem was meaningful to this student?

The Hook….

Where is math in your world?

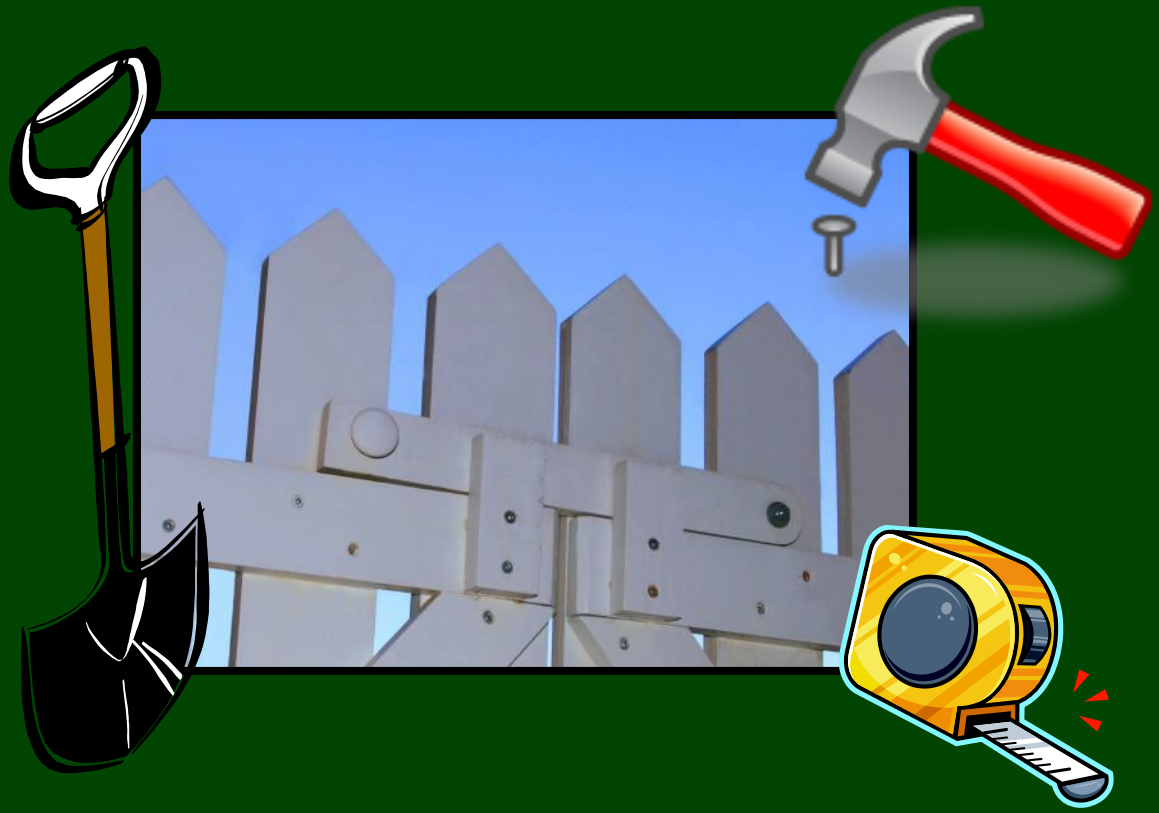
Why should you care?

Is it interesting?

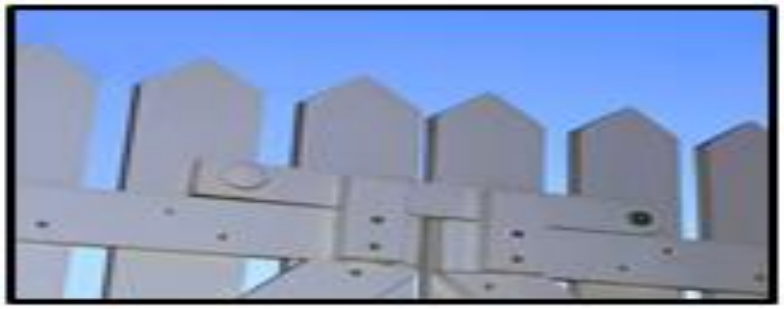
Striking Gold with a Real-World Problem

http://www.mathalicious.com/

Generating interest with a Real-World Problem



http://pbskids.org/video/?category=Cyberchase&pid=1tq_xceA_ffSpkY8fUjxcAWwk2VORzVe


Figuring out fences...

1. Is it possible to build a square fence with the pieces given? Explain. Support your answer with a labeled visual model.

2. Is it possible to build a parallelogram fence with the pieces given? Explain. Support your answer with a labeled visual model.

3. What differences would there be between the rectangular and parallelogram fences? Be sure to discuss angles and lines in your answer.

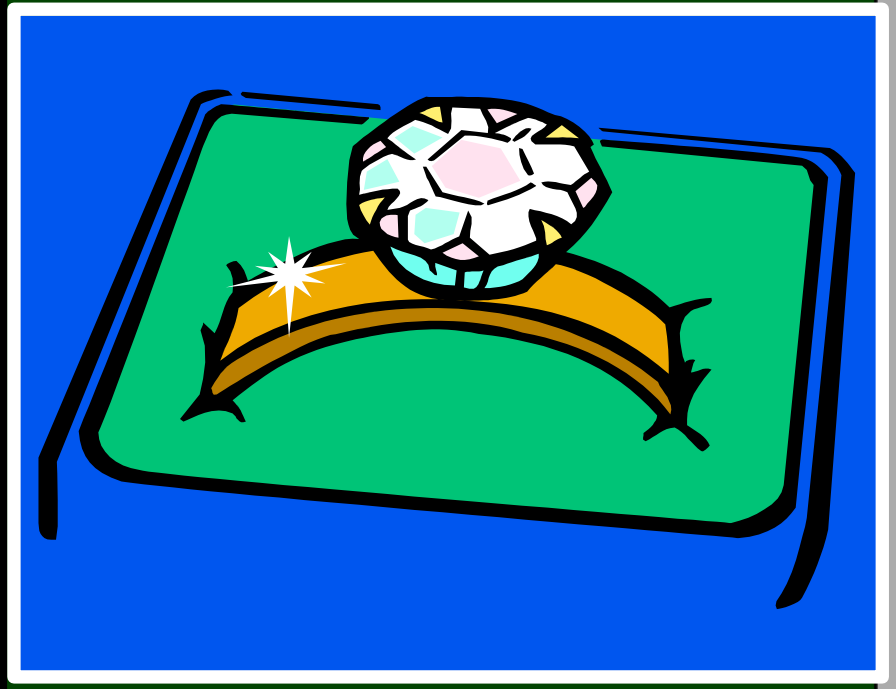
4. A rectangle, square, and parallelogram are all quadrilaterals. Are there any other quadrilaterals that could be built using the pieces given? Explain. Be sure to discuss angles and lines in your answer, and include a labeled visual model.

SMP Checkpoint.
Which did the activity hit?

1. *Make sense of problems and persevere in solving them*
2. *Reason abstractly and quantitatively*
3. *Construct viable arguments/critique reasoning*
4. *Model with mathematics*
5. *Use appropriate tools strategically*
6. *Attend to precision*
7. *Look for and make use of structure*
8. *Look for and express regularity in repeated reasoning*

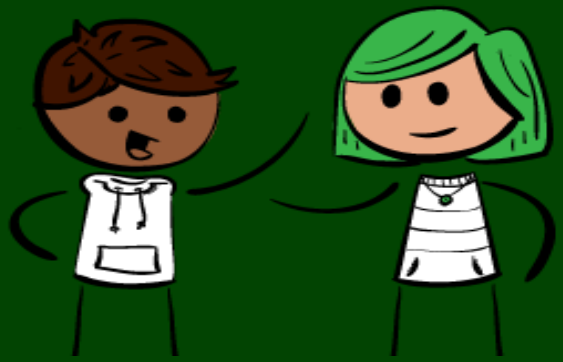
MEASUREMENT

Generating THINKING with an engaging scenario



http://pbskids.org/cyberchase/videos/cyberchase-the-dumas-diamond/

Turn and Talk



What are some problems you could create to follow this clip?

What other contexts would interest the kids?

What are some things you already do?


KEEPING
IT
REAL!!!
http://mass.pbslearningmedia.org/resource/vtl07.math.number.ope.unexpguest/an-unexpected-guest/

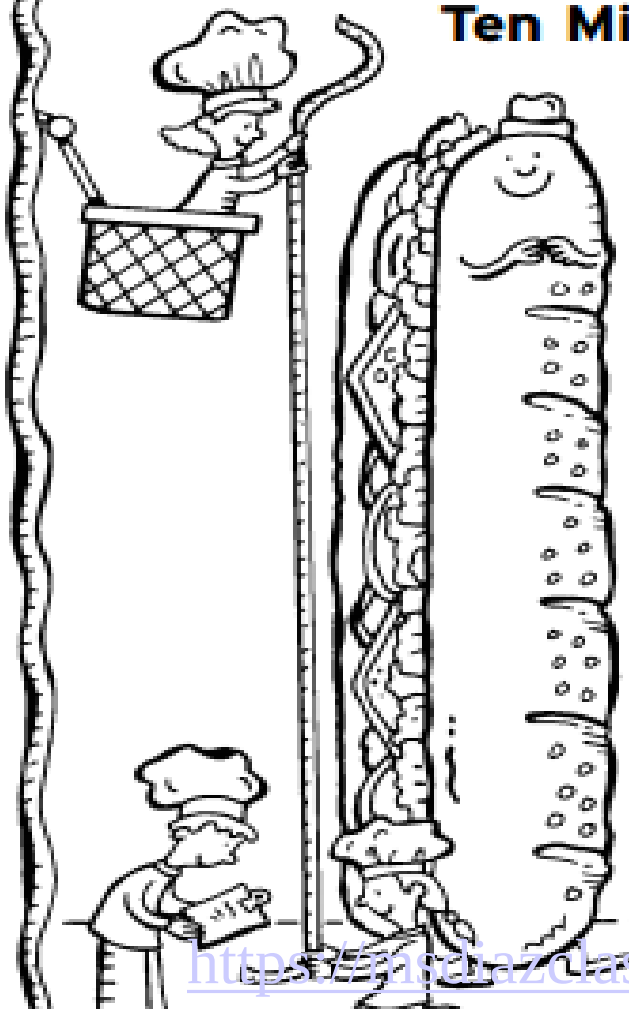
Menu Math

15 Super-Fun Reproducible Menus With Skill-Building Worksheets That Give Kids Practice in Multiplication, Division, Money, Fractions, Estimation, Problem Solving, and More

by Martin Lee & Marcia Miller

BEST FOOT FORWARD

Take-Out Foods Sold by Length!
Ten Miles Sold Each Day!



LONGS*

Long Hot Dog	$2.00
Sub Sandwich	$3.00
Cucumber	$ 1.00
Spaghetti	$ .25
Salami or Pepperoni	$ 1.50
Pretzel Stick	$ .25
Celery	$ .20
Licorice Laces	$ .40
Zucchini	$ .25
French Bread	$ 1.00

*ALL PRICES ARE FOR 1 FOOT.

SHORTS**

Carrot	$ .15
Green Bean	$ .15
Wax Bean	$ .20
Asparagus	$ .35
Pickle	$ .10
Cruller	$ .40

REAL Examples…

Entrées

Sirloin Steak Tips*
Juicy sirloin steak tips, brushed with a Worcestershire steak glaze and topped with sautéed onions, green peppers and baby Portobello mushrooms, on a bed of rice or mashed potatoes with garden vegetables and grilled garlic bread.

Chicken Strips Entrée
Country-breaded, juicy, all-white chicken breast strips, served with cole slaw and golden fries. Choose from: Signature Country Breaded, Honey BBQ, Kickin' Buffalo® or Create Your Own (choose any two flavors).

Roasted Turkey Dinner
Thick-sliced oven-roasted turkey breast served with mashed potatoes, gravy, stuffing, golden corn, cranberry sauce and garlic bread.

Bourbon BBQ Chicken
Two juicy chicken breasts grilled in Bourbon BBQ Sauce topped with melted Monterey Jack and Cheddar cheeses and crumbled bacon, served on a bed of Frenkins® with mashed potatoes, corn and garlic bread.

Signature Clamboat®
A meal for the hungriest of captains. Our steaming hot clam strips are served with tartar sauce, golden fries, fresh lemon and cole slaw.

New England Fish 'n' Chips
Five pieces of savory tavern-battered cod fillets served with golden fries, cole slaw, tartar sauce and fresh lemon.

Chicken Quesadilla
Grilled seasoned chicken breast with melted Monterey Jack and Cheddar cheeses between two warm tortillas. Served with Spanish rice, diced tomatoes, shredded lettuce, sour cream and salsa.

Under 555 Calories

Chicken Ginger Stir Fry
Sliced ginger-glazed chicken sautéed with green peppers, red peppers, broccoli, snap peas, carrots and red onions on a bed of rice pilaf with sprinkled sesame seeds. (530 Calories)

Sweet & Spicy Grilled Shrimp
Freshly grilled shrimp sautéed in a zesty orange peel sauce with green peppers, red peppers, broccoli, snap peas, carrots and red onions served over rice pilaf with sprinkled sesame seeds. (490 Calories)

Chicken Caprese Sandwich
Lite Balsamic Vinaigrette-grilled chicken breast and bruschetta tomatoes with diced onions on a warm Ciabatta roll, served with a mixed greens side salad and fat-free Italian dressing. (550 Calories)

Half Turkey Club SuperMelt® Sandwich & Garden Salad
Half of our Turkey Club SuperMelt® Sandwich packed with deli-sliced turkey, melted cheese, bacon, tomato and Thousand Island dressing on grilled sourdough, plus a mixed greens side salad served with fat-free Italian dressing. (420 Calories)

*Consuming raw or undercooked meats, poultry, seafood or eggs may increase your risk of foodborne illness, especially if you have certain medical conditions.

Calories listed are based on recipe standard. Your server's exact calorie count may vary.

These menu items meet HEALTHY DINING'S nutrition criteria. Our restaurant is featured on HealthyDiningFinder.com.

Seniors

All Senior meals served with a FREE Happy Ending® Sundae.

All American Burger*
The All American Burger is a real patriot. Adorned with crisp lettuce, fresh tomato, red onion and a dash of mayo. Add cheese. Add bacon. Add burger patty.

Fishamajig® Sandwich
Crisp, golden breaded white fish topped with American cheese and tartar sauce on grilled white bread with hot golden fries.

Turkey Club SuperMelt® Sandwich
Bacon, melted American cheese, turkey breast, tomato and Thousand Island dressing on grilled sourdough with hot golden fries.

Tuna Roll
Freshly prepared Albacore tuna salad with crisp lettuce on a grilled roll with hot golden fries.

Clamboat® Entrée
Our hot, delicious clam strips are served with tangy tartar sauce, golden fries, fresh lemon and our cole slaw. From the sea to your table, it's all Friendly's.

Bourbon BBQ Chicken
A perfectly portioned chicken breast, grilled in Bourbon BBQ Sauce topped with melted Monterey Jack and Cheddar cheeses and crumbled bacon, served on a bed of Frenkins® with mashed potatoes, corn and garlic bread.

Before placing your order, please inform your server if a person in your party has a food allergy.

*Consuming raw or undercooked meats, poultry, seafood or eggs may increase your risk of foodborne illness, especially if you have certain medical conditions. All burgers cooked to 158°.

Sides

Homestyle Mashed Potatoes • Rice Pilaf • Cole Slaw • Corn • Golden Fries
Garden Vegetables • Sweet Applesauce • Apple Slices • Broccoli

Treats & Drinks

Check out our many delicious ice cream beverages in our ice cream menu.

Original Fribble®
Our legendary, super-thick shake in your choice of chocolate, vanilla, strawberry or coffee.

Juice	Hot Chocolate
1% Milk	Hot Tea
Chocolate 1% Milk	Iced Tea
Fresh Brewed Coffee	Soda

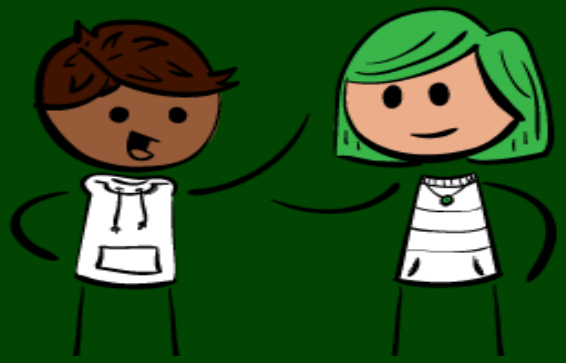
Free refills for all sodas and iced tea.

The Reese's® trademark and trade dress are under license from The Hershey Company.

Friendly's®

http://santamonicapier.org/wp-content/themes/sm-pier/docs/pier-curriculum/math-menu-math.pdf

Turn and Talk



What do you think about the problem types in the menu math?

Could you create problems with your own menus?

What kind of questions might you ask?

Having FUN with a real-world situation

ss.pbslearningmedia.org/resource/mw
dozoff/multidigit-multiplication-with-
standard-algorithm-the-donut-doze-off/

Bianca's Chocolate Dilemma

Bianca wanted to share this candy bar with her family, but first she kept half for herself.

Then, she gave half of what was left to her sister.

She gave half of what was left of that to her brother, and her mom and dad split the remaining piece, getting half each.

Her dad looked at his piece and said it didn't seem fair to him.
Bianca said it was fair because everybody got a half.

Do you think Bianca was right? Why or why not?

Draw or use manipulatives to model a rectangle.
Use this rectangle to make a diagram to support your answer.
Write a fraction to represent the amount that each person got.
Write the fractions so that they all have the same or common denominator.

Additional Resources for Real-World Problems

http://www.yummymath.com/birds-eye-of-activities/

http://www.mathalicious.com/ ($)

http://mathstervakkas.com/

http://pumas.gsfc.nasa.gov/

http://www.thirteen.org/get-the-math/teachers/math-in-basketball-lesson-plan/activities/206/

https://www.youtube.com/watch?v=oYIHLUxzRr8 hot dog buns

http://mass.pbslearningmedia.org/resource/msts14.ela.sunflowerbiscuit/measuring-sunflower-bone-biscuits/

High Interest Topics

- Scores on video games
- Sale prices at the mall
- Sports/ticket prices
- Building things
- Cooking
- Game shows
- Time spent playing video games/watching tv
- Prices: candy, video games, etc..
- Fashion/sewing
- Fairness/Odds of winning (ie: McDonald's Monopoly)
- Would You Rather questions

http://wyrmath.wordpress.com/

Show a clip/picture and have students generate their own story problems..

You may be surprised by what you get!

Write a real-life story to go with this number sentence. Also, solve the problem.

24 + 9 = 33

Ella got on 24 of her moms nerves. Soon she got on 9 more. How many total nerves did Ella get on? 33 nerves.

Thank You!

alisonmellomathpd@gmail.com