Wentzville School District

ROBERT KAPLINSKY

@robertkaplinsky

Goals

- Engaging problem solving
  - Real world problem-based learning
  - Higher depth of knowledge problems
- Better implementation
  - Improve our ability to ask questions
  - Practice preparing to implement a lesson
  - Figure out how to deal with uncomfortable situations

DOUBLE-DOUBLE® *Double Meat & Double Cheese* 2.65

CHEESEBURGER 1.75

HAMBURGER 1.50

FRENCH FRIES 1.05

SHAKES *Chocolate Strawberry Vanilla* 1.55

SM	MED	LG	X-LG
99	1.10	1.29	1.49

COKE *Classic or Diet*
SEVEN-UP
ROOT BEER
DR PEPPER
LEMONADE
ICED TEA

MILK 70
COFFEE 70

IN-N-OUT BURGER

OPEN 10:30 a.m. to 1:00 a.m.
.....Fri. and Sat. until 1:30 a.m.

www.FriedmanArchives.com

2004-10-31

8:21 PM

YOUR GUEST NUMBER IS
98

IN-N-OUT BURGER LAS VEGAS EASTERN
2004-10-31 8:21 PM

165 1 5 98

Cashier: SAM
GUEST #: 98

Counter-Eat In

Dbl Dbl	
98 Meat Pty XChz	2.65
	88.20
Counter-Eat In	90.85
TAX 7.50%	6.81
Amount Due	97.66
CASH TENDER	$97.66
Change	$.00

2004-10-31

Cashier: SAM
GUEST #: 98

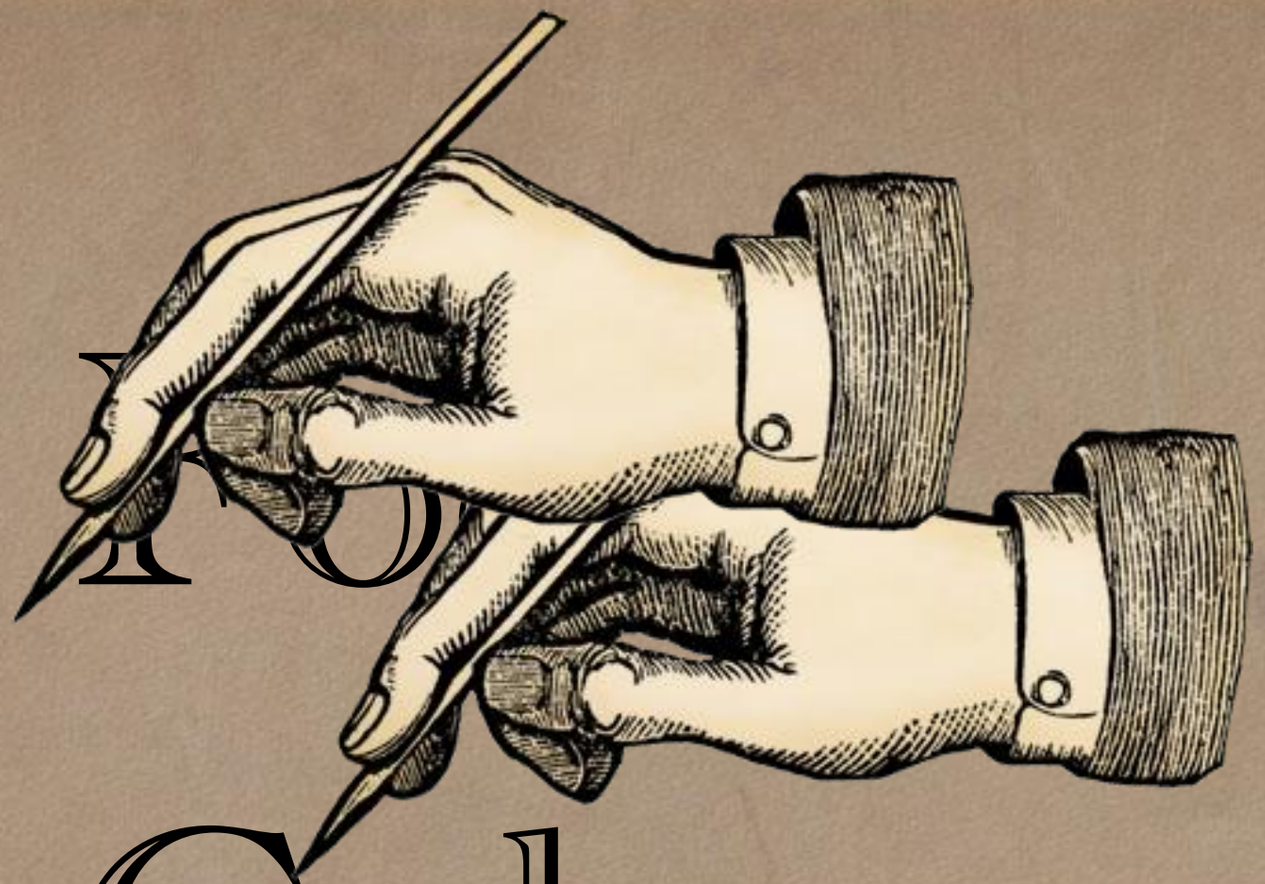
Counter-Eat In

Dbl Dbl	
98 Meat Pty XChz	2.65
	88.20
Counter-Eat In	90.85
TAX 7.50%	6.81
Amount Due	97.66
CASH TENDER	$97.66
Change	$.00

2004-10-31 8:21 PM

	Serving Size (g)	Calories
Hamburger w/Onion	243	390
Cheeseburger w/Onion	268	480
Double-Double w/Onion	330	670

- Focus
- Coherence
- Rigor



Layers	Cost
1	$1.75
2	$2.65
3	$3.55
4	$4.45
.	.
.	.
20	$18.85
.	.
.	.
100	$90.85
.	.
.	.
N	$1.75 + (N-1)*$0.90

bun + produce + meat + cheese + meat + cheese = $2.65

bun + produce + meat + cheese = $1.75

meat + cheese = $0.90

The Reality

- Students needed guidance to figure out a layer's cost
- Not every class is ready to go straight to 100x100
- Common wrong answers included:
  - $175.00 ($1.75 x 100 cheeseburgers)
  - $132.50 ($2.65 x 50 Double-Doubles)
- Students had equations that had more than X patties
- Students were surprised to see three different equations:
  - Starting with a Double-Double
  - Starting with a cheeseburger
  - Starting with produce and bun only

STUDENT WORK

What problem are you trying to figure out?

How much does a 100x100 burger cost?

What do you already know from the problem?	What do you need to know to solve the problem?
• theres 100 beef patties	• How much does a regular cheeseburger cost.

What is your conclusion?

To get the answer, I first figured out what the price of a regular & double-double cheeseburgers are. From there I subtracted the price of the produce & buns, then multiplyed by 100. That gave me the answer, which I once again had to add the price of the buns & produce.

What is your conclusion?

The only difference between a double double and a cheeseburger is one patty and one slice of cheese. So you subtract the prices of the two to find the price of only one patty & cheese. You then use that number (.90) & subtract it from the cost of one whole cheeseburger to find the price of all the extra stuff. Multiply by 100

What is your conclusion?

A 100×100 at In-n-Out cost $90.85. To solve that, you start by subtracting the price of a cheeseburger from a double double. The answer (.90) is the price of a patty and cheese slice. You multiply (.90) by one less patty than what you want. (x-1), and you add the price of a cheeseburger (1.75). You end up with the eq. [$y = .90(x-1)+1.75$.]. For the 100×100, you plug in 100 to the (x) and you end up with $90.85.

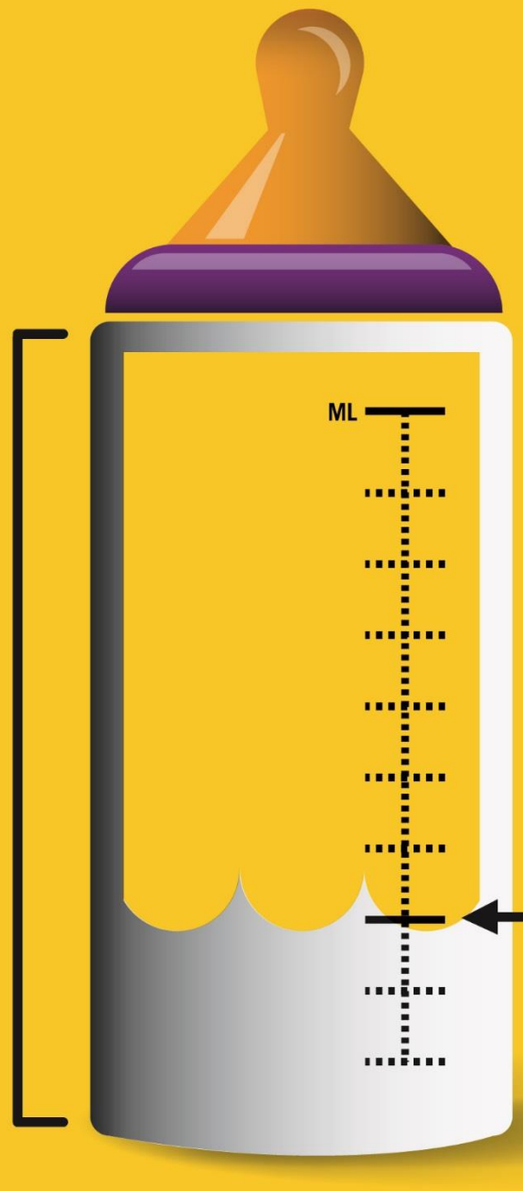
$$\left[\begin{array}{l} y = .90(100-1)+1.75 \\ y = 89.10+1.75 \\ y = 90.85 \end{array}\right]$$

What is your conclusion?

Figure the price difference from the Double-Double with a cheeseburger. Then find out the prize for the produce and cheese-burg. get total into $90.85

CHOOSE CAR SEAT:
BY AGE & SIZE

THE NUMBER OF PEOPLE **WHO THINK** THEY HAVE THEIR CHILD IN THE RIGHT SEAT.



THE ONES **WHO ACTUALLY DO.**

KNOW FOR SURE

IF YOUR CHILD IS IN THE RIGHT CAR SEAT.

VISIT SAFERCAR.GOV/THERIGHTSEAT

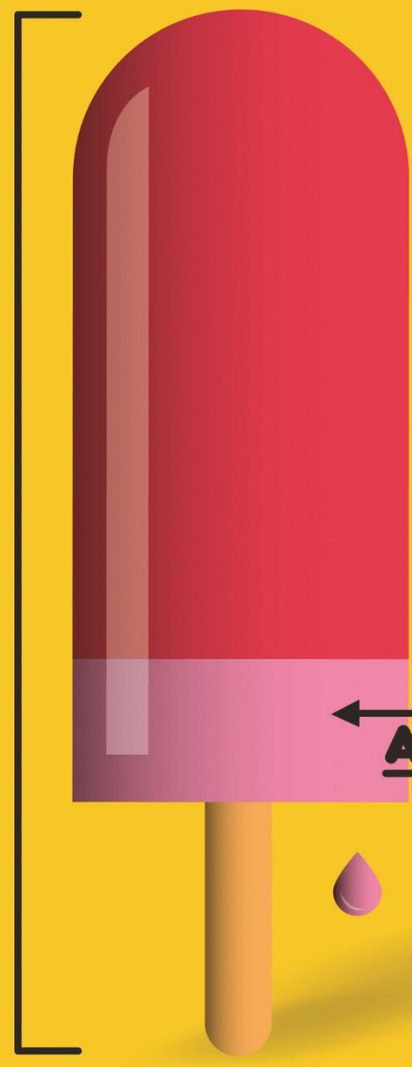
Ad Council

NHTSA www.nhtsa.gov

Child Car Safety

CHOOSE CAR SEAT:
BY AGE & SIZE

THE NUMBER OF PEOPLE **WHO THINK** THEY HAVE THEIR CHILD IN THE RIGHT SEAT.



THE ONES **WHO ACTUALLY DO.**

KNOW FOR SURE

IF YOUR CHILD IS IN THE RIGHT CAR SEAT.

VISIT SAFERCAR.GOV/THERIGHTSEAT

Ad Council

NHTSA www.nhtsa.gov

Child Car Safety

Math Question

- Solve the problem on your own. Do not work or share your answer with anyone else.
- You will have 30 seconds to complete it.
- Write your answer down on a paper.

There are 125 sheep and 5 dogs in a flock. How old is the shepherd?

Of the 32 students I interviewed…

- 75% of them gave me numerical responses
- 2 students calculated the answer to be 130 (125 + 5)
- 2 students calculated the answer to be 120 (125 – 5)
- 12 students calculated the answer to be 25 (125 ÷ 5)
- 0 students calculated the answer to be 625 (125 x 5)
- 4 students stated that they guessed their answer (90, 5, 42, and 50)
- 4 students tried to divide 125 by 5 but could not correctly implement the procedure

Takeaways

- Making sense of mathematics
- Intellectual autonomy
  - Intellectual autonomy is about being able to think for yourself and not being dependent on others for the direction and control of one's thinking.

What Does the NHTSA Say?

Key Statistics and Consumer Insights:

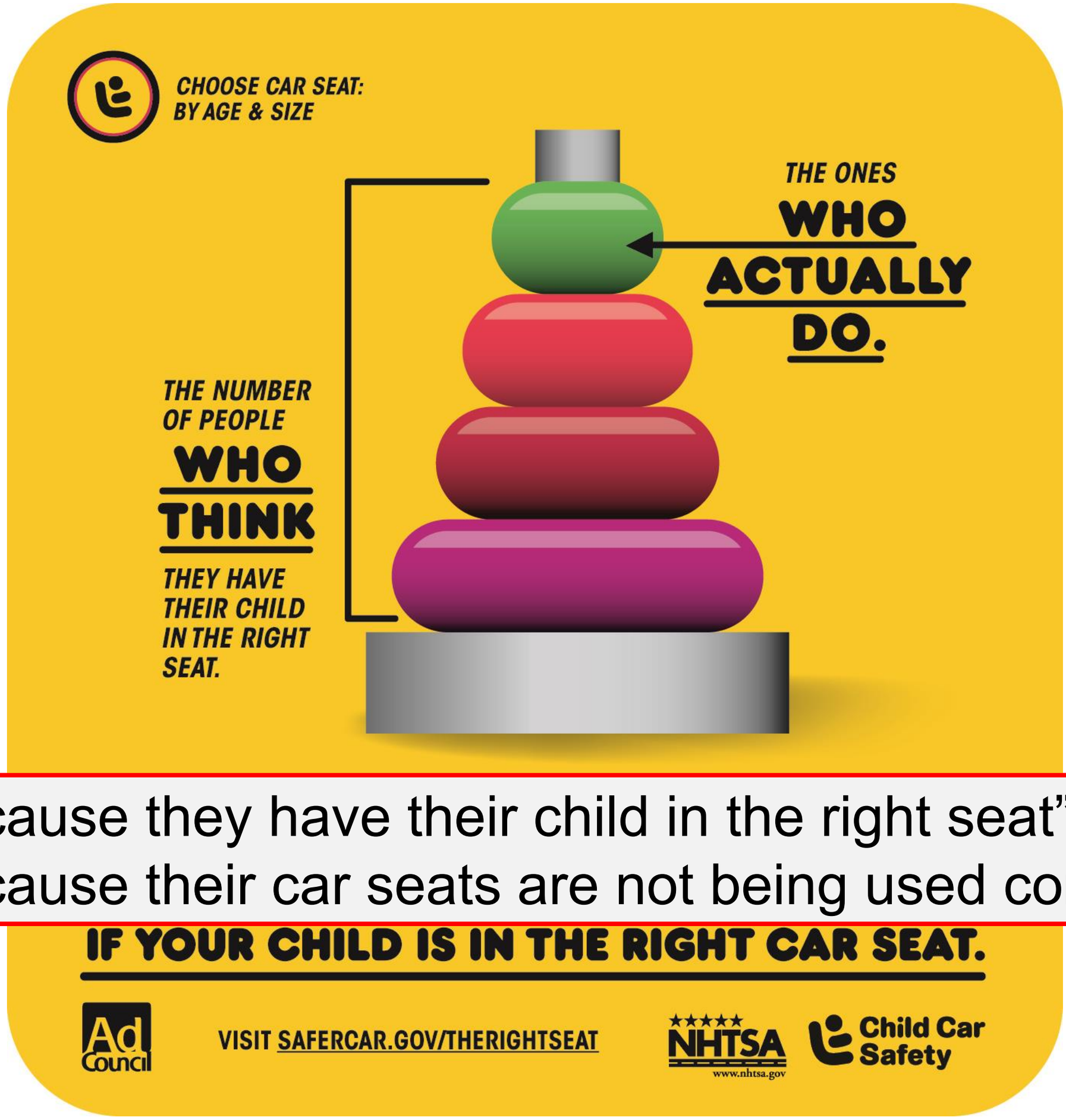
- Motor vehicle crashes are the leading cause of death for children age 1 through 12 years old.[1]

According to a NHTSA study, 3 out of 4 kids are not as secure in the car as they should be because their car seats are not being used correctly.

be reduced by about half if the correct child safety seats were always used.

---

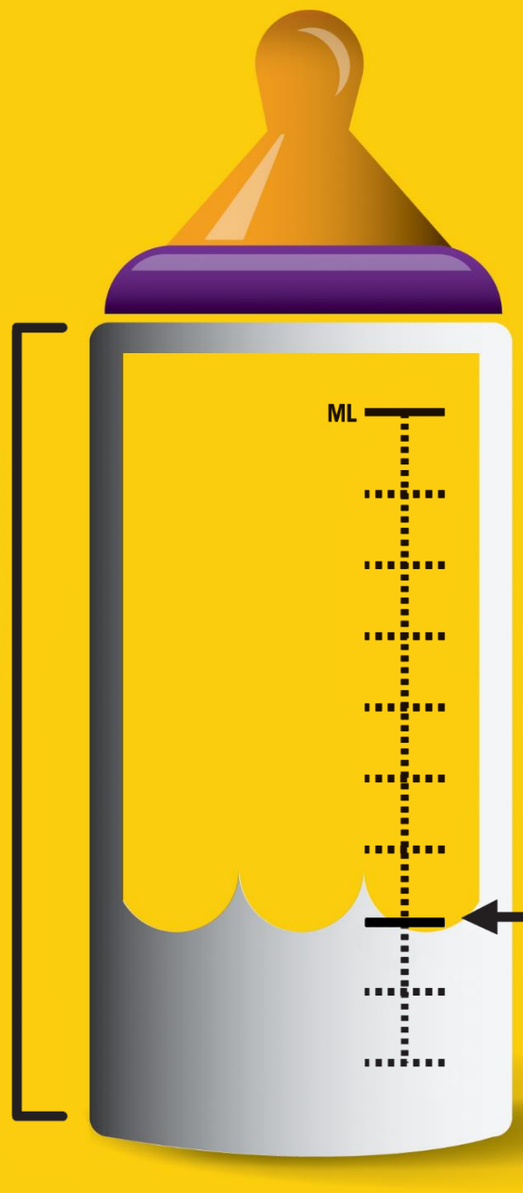
[1] Source: Based on the latest mortality data currently available from the CDC's National Center for Health Statistics.



- “because they have their child in the right seat”
- “because their car seats are not being used correctly”

CHOOSE CAR SEAT:
BY AGE & SIZE

THE NUMBER OF PEOPLE **WHO THINK** THEIR CAR SEATS ARE BEING USED CORRECTLY.



THE ONES **WHO ACTUALLY DO.**

KNOW FOR SURE

IF YOUR CHILD IS IN THE RIGHT CAR SEAT.

VISIT SAFERCAR.GOV/THERIGHTSEAT

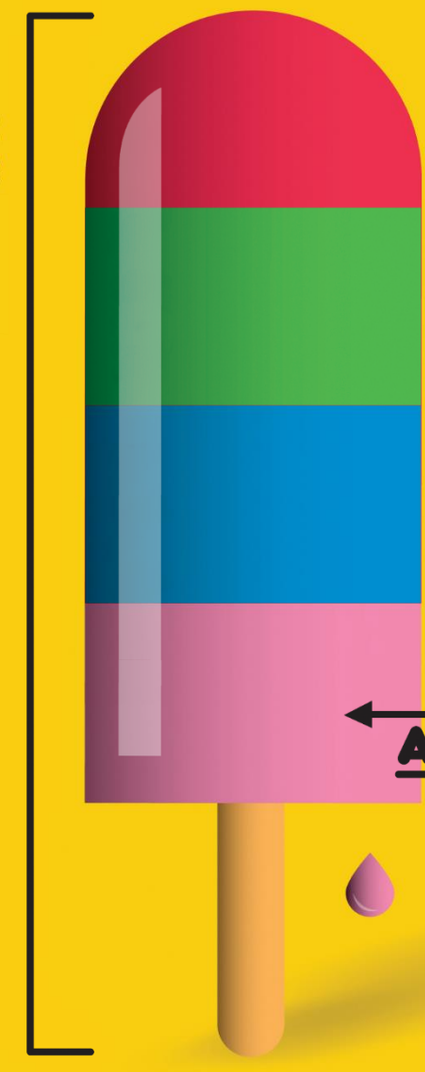
Ad Council

NHTSA www.nhtsa.gov

Child Car Safety

CHOOSE CAR SEAT:
BY AGE & SIZE

THE NUMBER OF PEOPLE **WHO THINK** THEIR CAR SEATS ARE BEING USED CORRECTLY.



THE ONES **WHO ACTUALLY DO.**

KNOW FOR SURE

IF YOUR CHILD IS IN THE RIGHT CAR SEAT.

VISIT SAFERCAR.GOV/THERIGHTSEAT

Ad Council

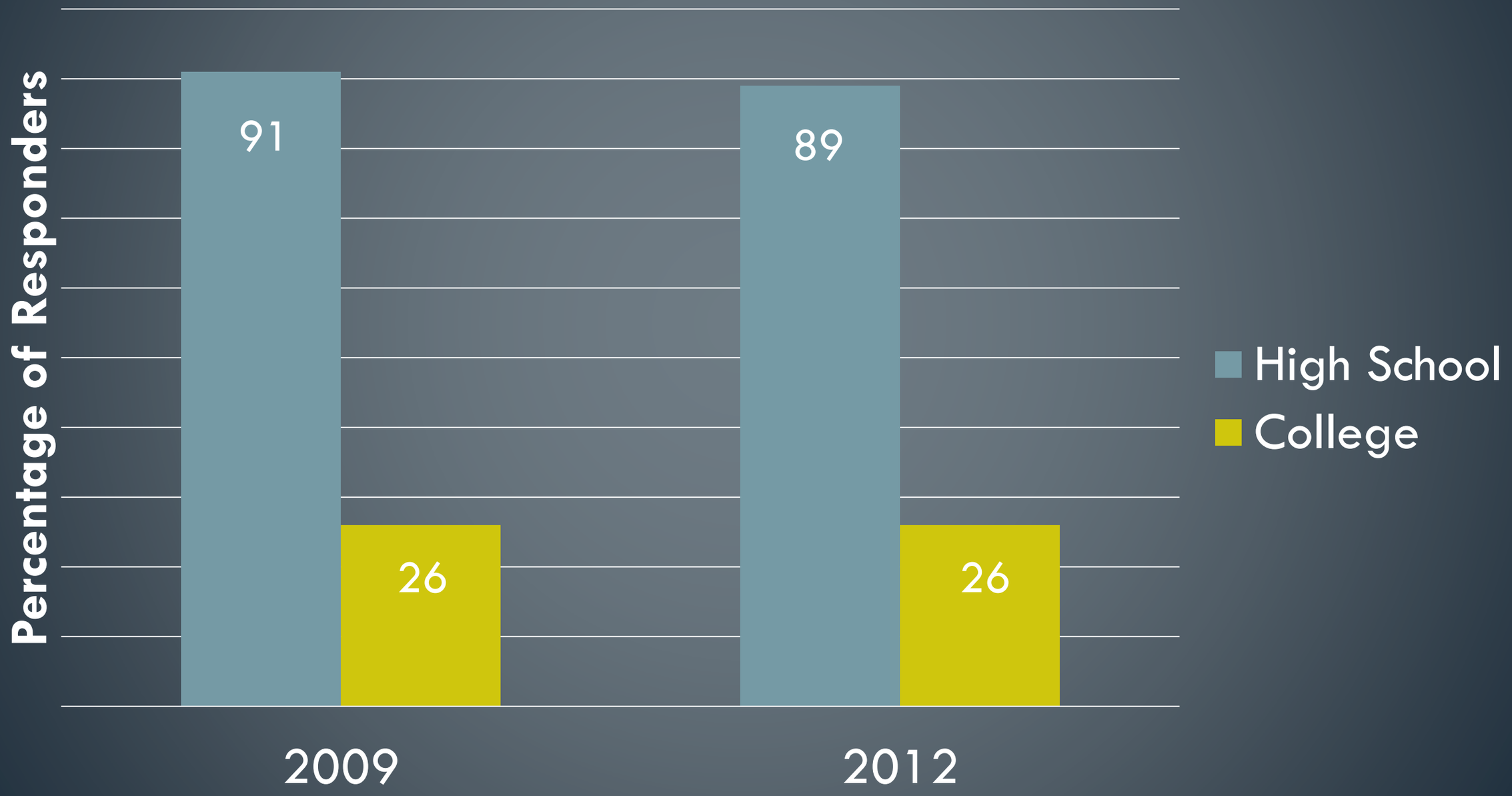
NHTSA www.nhtsa.gov

Child Car Safety

WHAT IS THE PURPOSE OF A K-12 EDUCATION?

- *College readiness*
  - *ACT National Curriculum Survey*
  - *Surveyed 9,937 educators*

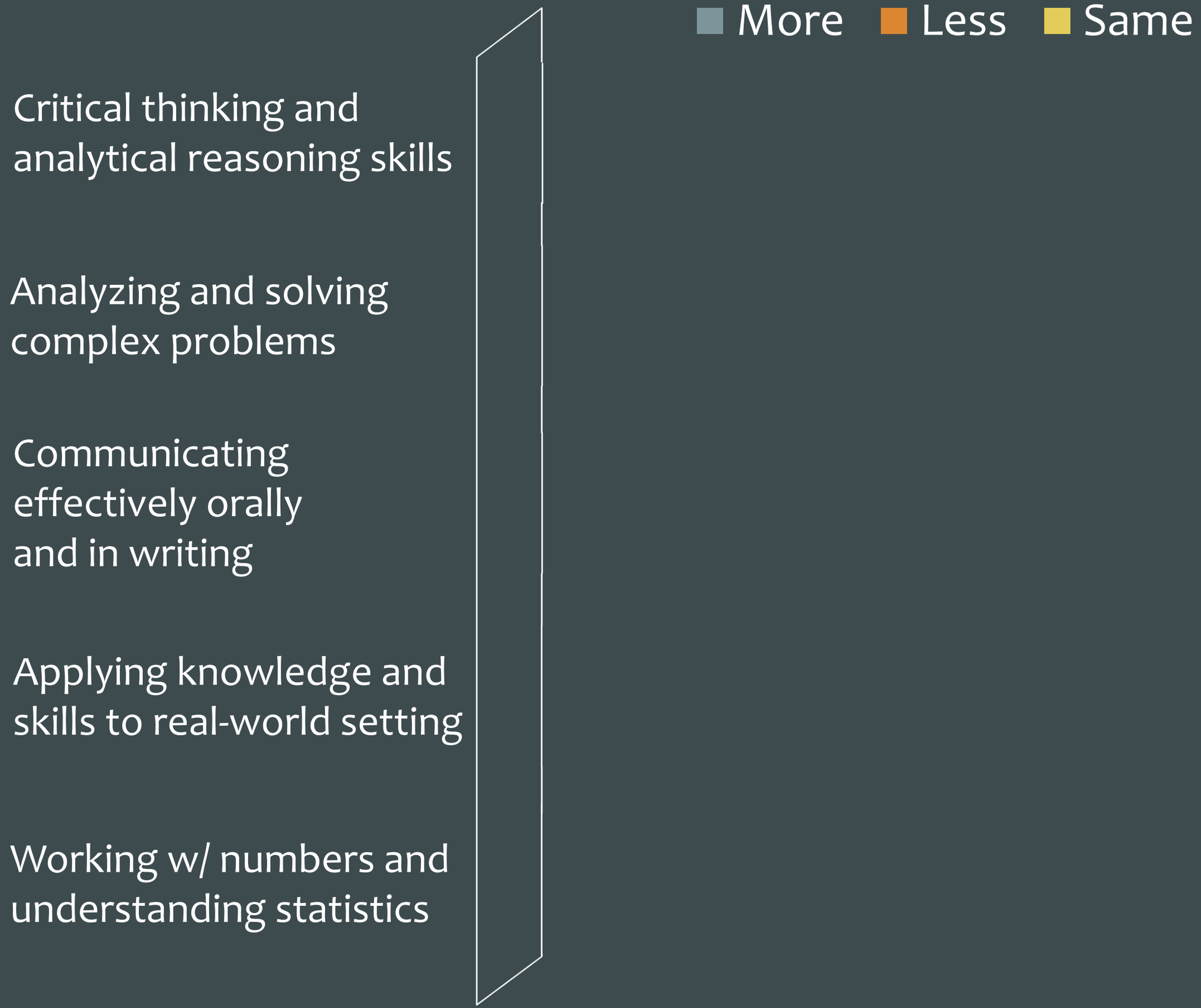
“Well” or “Very Well” Prepared for College



Source: http://www.act.org/research/policymakers/pdf/NCS-PolicySummary2012.pdf

WHAT IS THE PURPOSE OF A K-12 EDUCATION?

- *College readiness*
- *Career readiness*
  - *Association of American Colleges and Universities survey*
    - *Surveyed over 300 employers with at least 25 employees and many new hires*



Source: http://www.aacu.org/leap/documents/2013_EmployerSurvey.pdf

Junction

SUBPROCURADURIA
DE INVESTIGACIÓN ESPECIALIZADA
EN DELINCUENCIA ORGANIZADA

PGR

PROCURADURÍA GENERAL DE LA REPÚBLICA

SIEDO

PGR
SIEDO
PGR
SIEDO

FOX

WHAT ISN'T MATHEMATICAL MODELING?

- *It is not modeling in the sense of, "I do; now you do."*
- *It is not modeling in the sense of using manipulatives to represent mathematical concepts.*
- *It is not modeling in the sense of a "model" being just a graph, equation, or function.*
- *It is not just starting with a real world situation and solving a math problem.*
- *It is not beginning with the mathematics and then moving to the real world.*

Source: http://www.cde.ca.gov/ci/ma/cf/documents/aug2013apxdmathmodel.pdf

PROBLEM-BASED LEARNING FAQ

- *How long do problem based lessons take?*
- *How often do teachers do problem-based learning?*
- *Do teachers use problem-based lessons to introduce a topic or after you've already taught it?*
- *How is problem-based learning assessed?*
- *How much time does it take to create a problem-based lesson?*

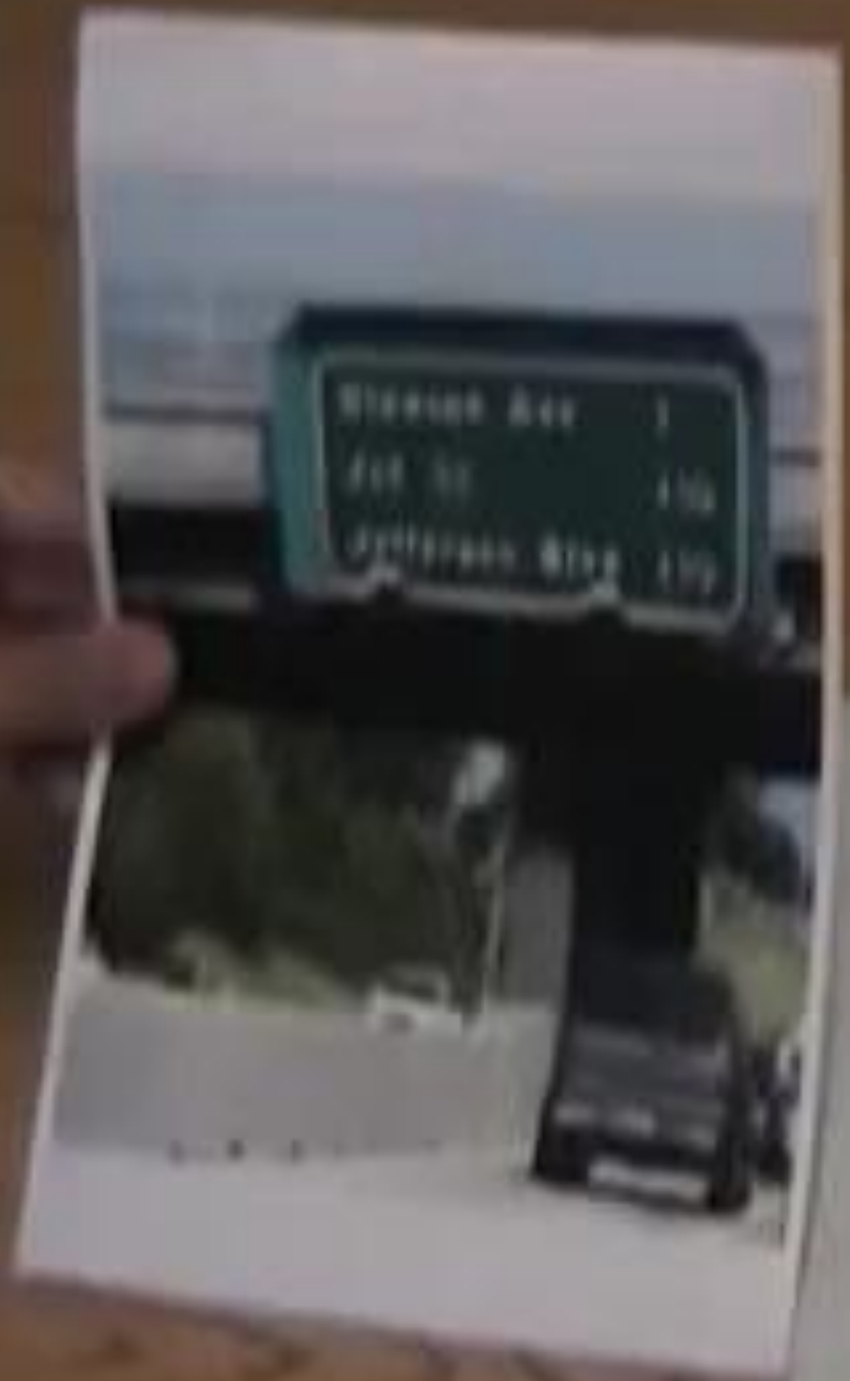
WHAT DOES IT LOOK LIKE…

- when students have procedural skill but not conceptual understanding or the ability to apply mathematics?
- when students **can** work with numbers but **cannot**:
  - critically think
  - applying knowledge and skills to real-world settings
  - analyze and solve complex problems

How far apart are the exits on this freeway: Jct 90 and Jefferson Blvd?

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

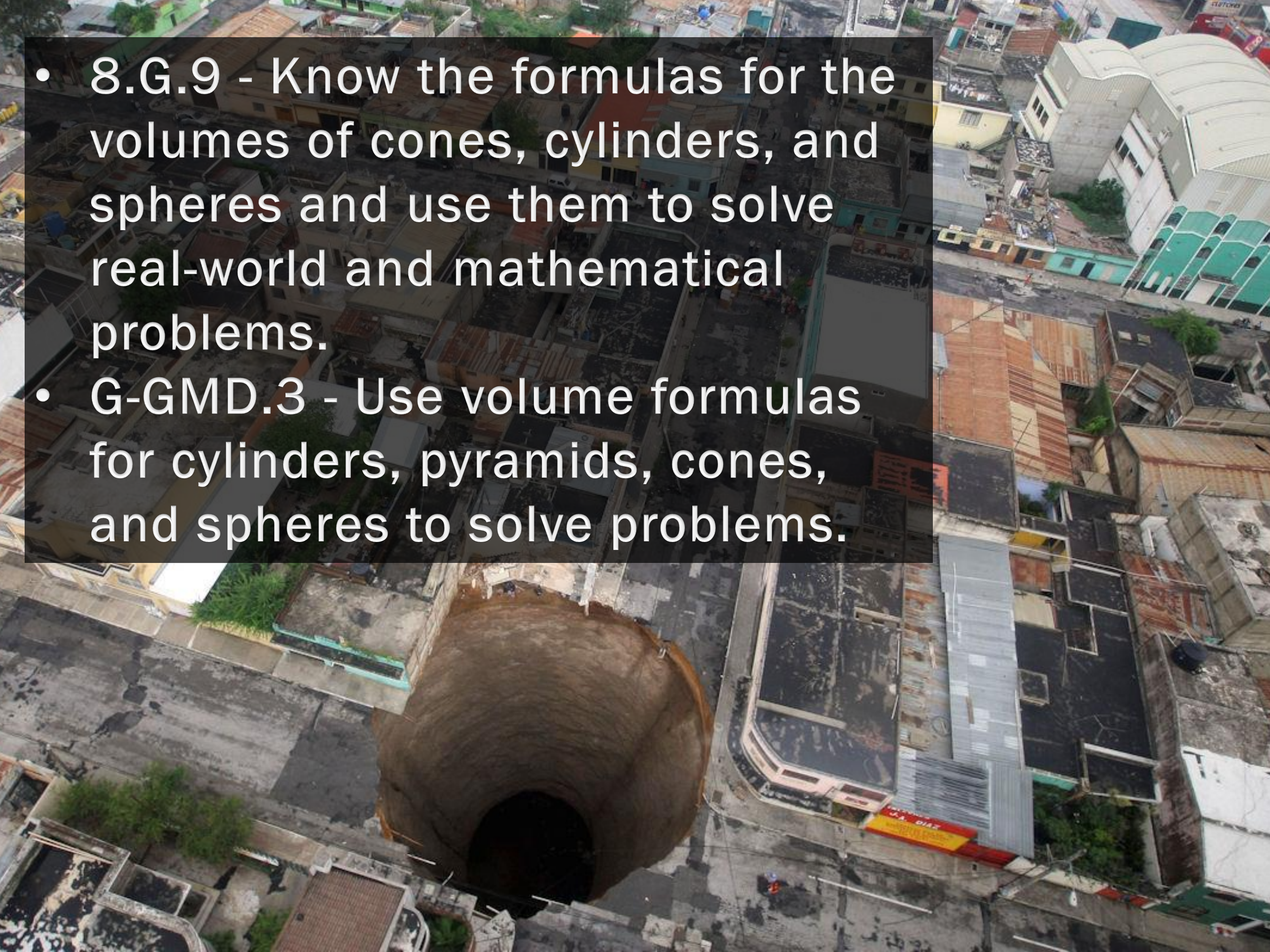
$$1\frac{1}{2} - 1\frac{1}{4}$$



The Four C's

- Communication
- Curiosity

- 6.G.4 - Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures.
- 7.G.6 - Solve real-world and mathematical problems involving area, volume and surface area.



- 8.G.9 - Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.
- G-GMD.3 - Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

- G-CO.6 Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure.

- A-CED.1 - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- F-IF.7a - Graph linear and quadratic functions and show intercepts, maxima, and minima.

- 6.RP.2 - Understand the concept of a unit rate

The Four C's

- Communication
- Curiosity
- Critical Thinking

Problem Solving Framework

- Inspired by Geoff Krall's resources at emergentmath.com

Name: _____ Period: _____ Date: _____

What problem are you trying to figure out?	What guesses do you have?
What do you already know from the problem?	**What do you need to know to solve the problem?**
What should we title this lesson?	
What is your conclusion? How did you reach that conclusion?	

The Four C's

- Communication
- Curiosity
- Critical Thinking
- Content Knowledge

Goals

- Engaging problem solving
  - Real world problem-based learning
  - Higher depth of knowledge problems
- Better implementation
  - Improve our ability to ask questions
  - Practice preparing to implement a lesson
  - Figure out how to deal with uncomfortable situations

Questioning Scenarios

- The activity begins with teachers in groups of three taking the roles of teacher, student, or observer.
- The individuals playing the role of teacher and student each receive a slip of paper describing their scenario.
- The individual playing the role of observer waits to record all of the teacher's questions to the student.
- Once the activity begins, the teacher will talk to the student in the context of the scenario they read about on the slips of paper.

What did you get for the area of the circle with a radius of 2 units?

4 pi

Great. Do you have any questions?

No

What did you get for the area of the circle with a radius of 2 units?

4 pi

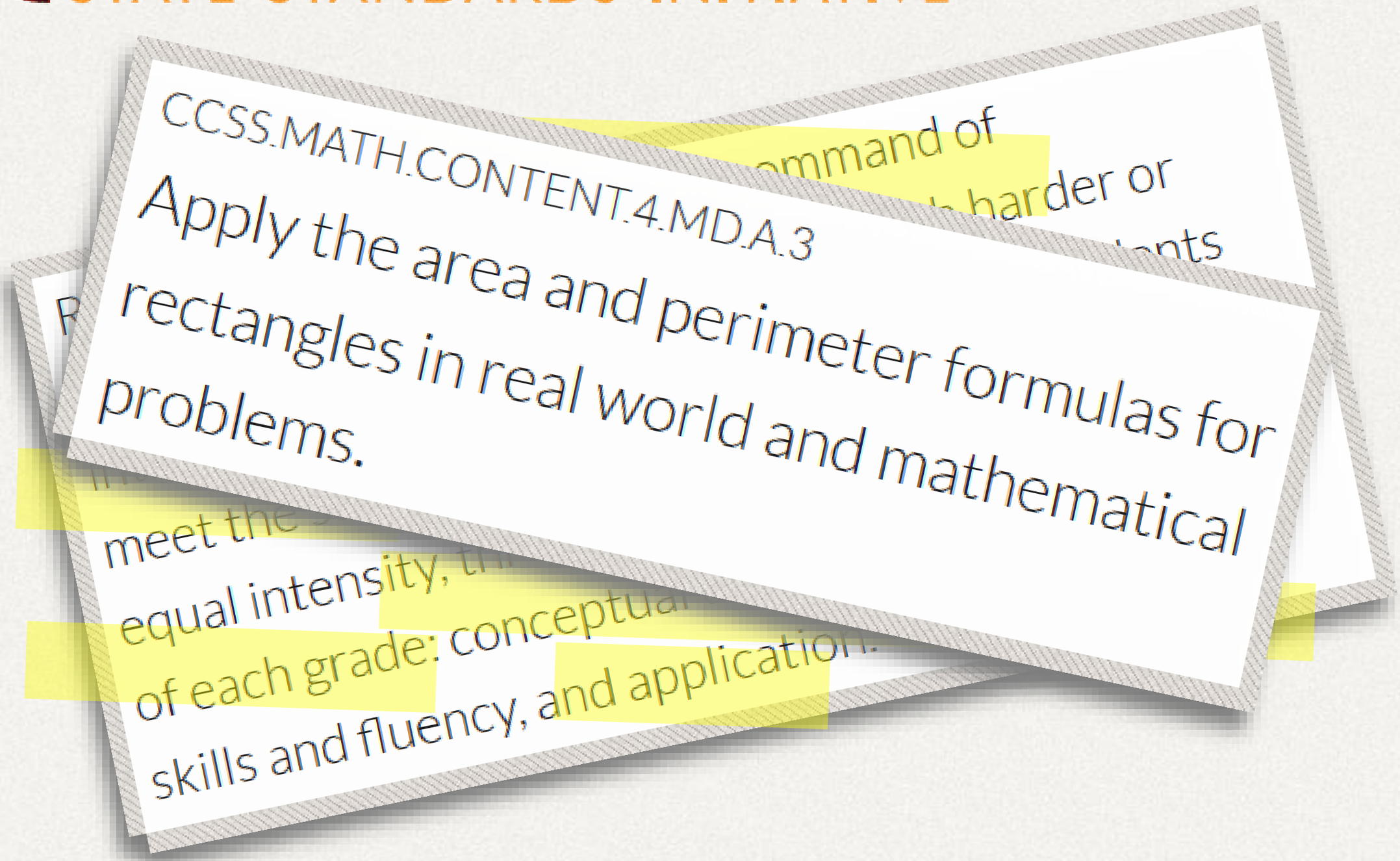
Great. How did you get your answer?

The radius is 2 so I plugged it into 2 pi r and got 4 pi.

Goals

- Engaging problem solving
  - Real world problem-based learning
  - Higher depth of knowledge problems
- Better implementation
  - Improve our ability to ask questions
  - Practice preparing to implement a lesson
  - Figure out how to deal with uncomfortable situations

COMMON CORE
STATE STANDARDS INITIATIVE



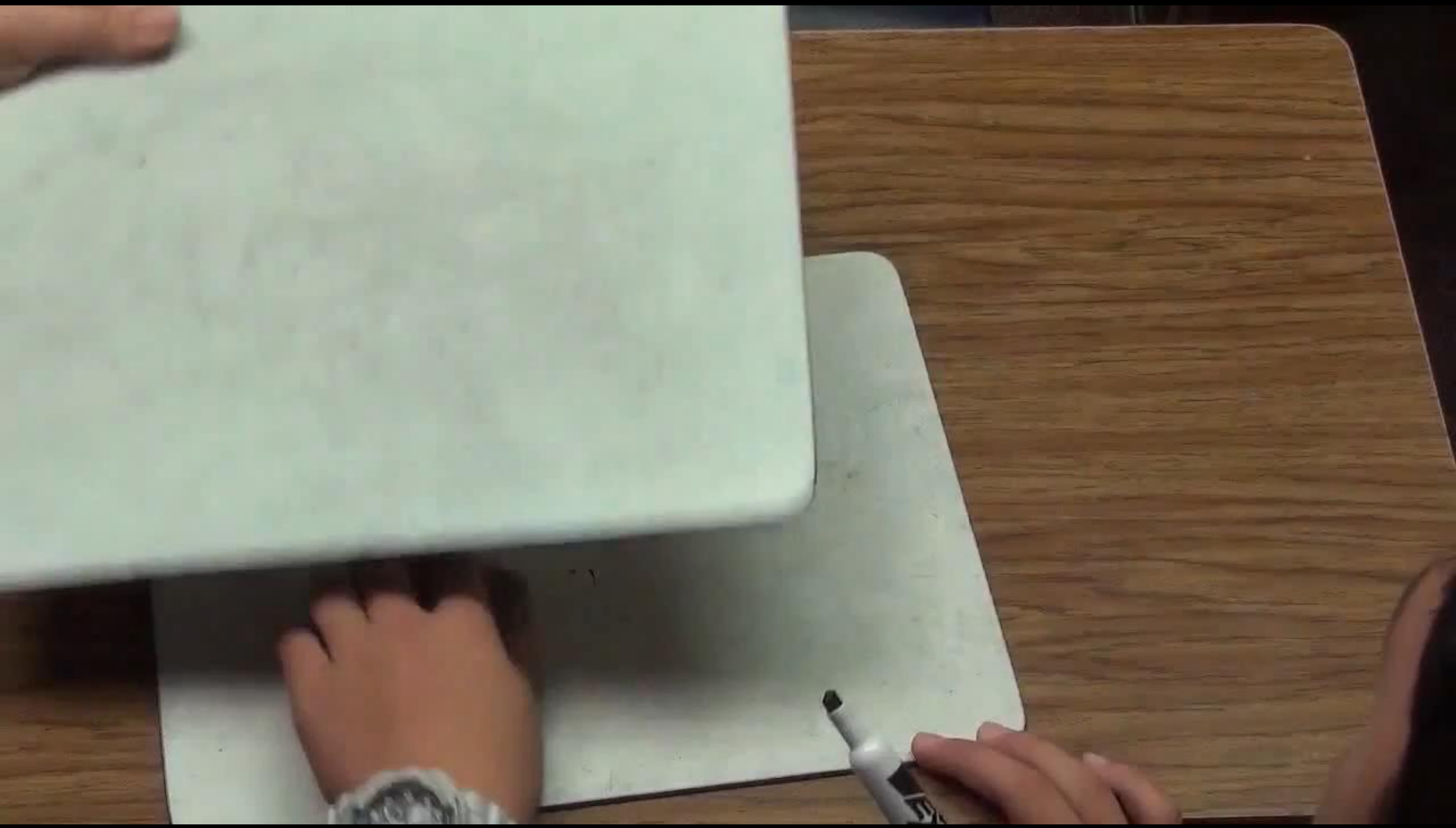
Source: http://www.corestandards.org/other-resources/key-shifts-in-mathematics/

What is the perimeter of a rectangle that measures 8 units by 4 units?

Components of Rigor

- ☑ Procedural Skill and Fluency
- ☑ Conceptual Understanding

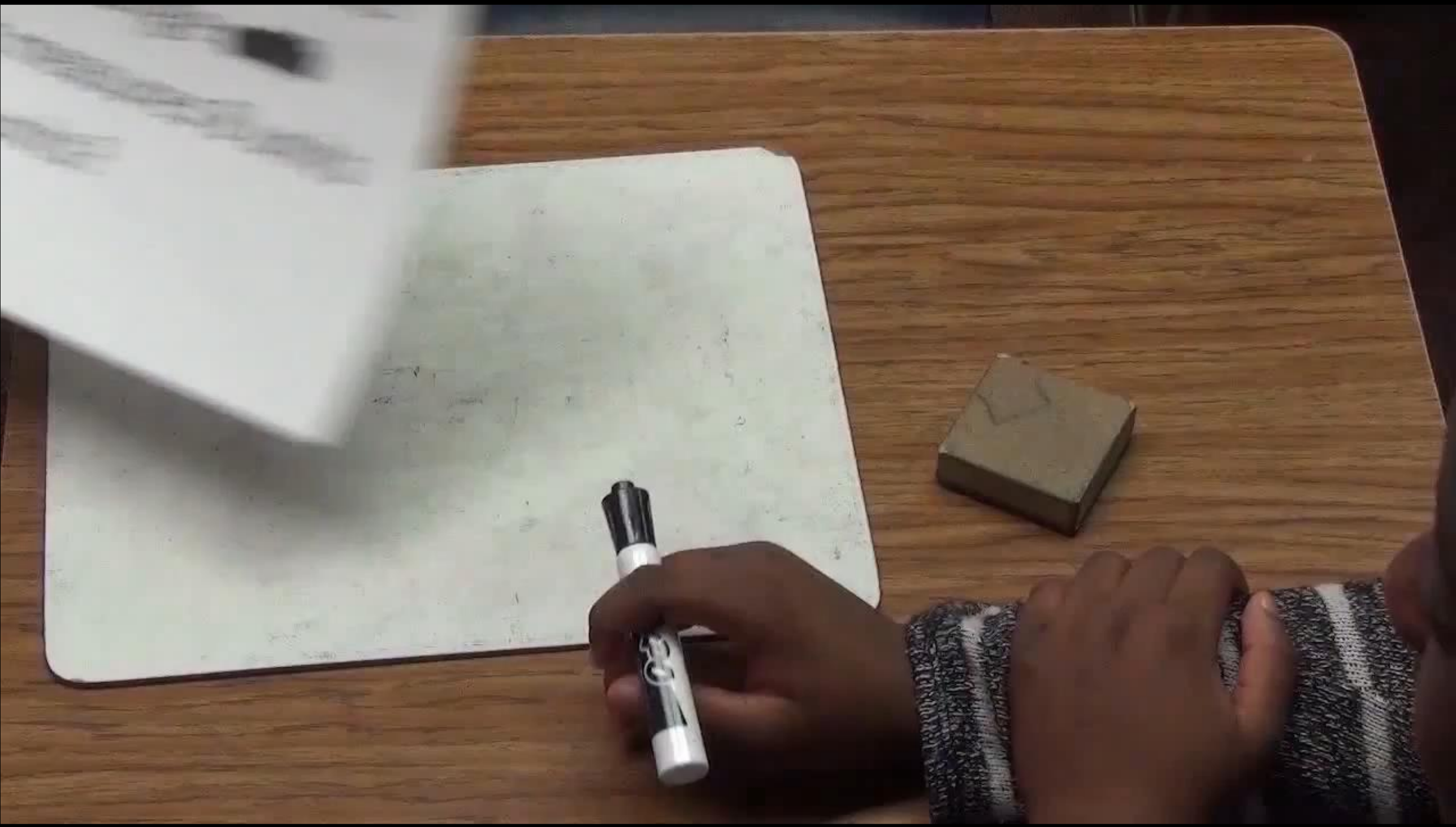
List the dimensions of a rectangle with a perimeter of 24 units.



Components of Rigor

- [x] Procedural Skill and Fluency
- [x] Conceptual Understanding

WHY?



Components of Rigor

- ☑ Procedural Skill and Fluency
- ☑ Conceptual Understanding

List the

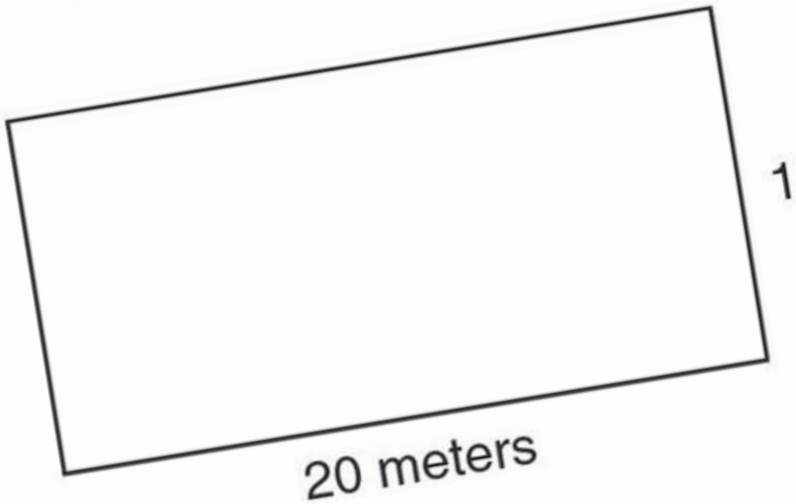
of a rectangle with a perimeter of 24 units.

Components of Rigor

- [x] Procedural Skill and Fluency
- [x] Conceptual Understanding

STAR

71 **A basketball court is shaped like a rectangle 20 meters long and 10 meters wide.**



What is the perimeter in meters of the court?

A 30 meters

B 50 meters

C 60 meters

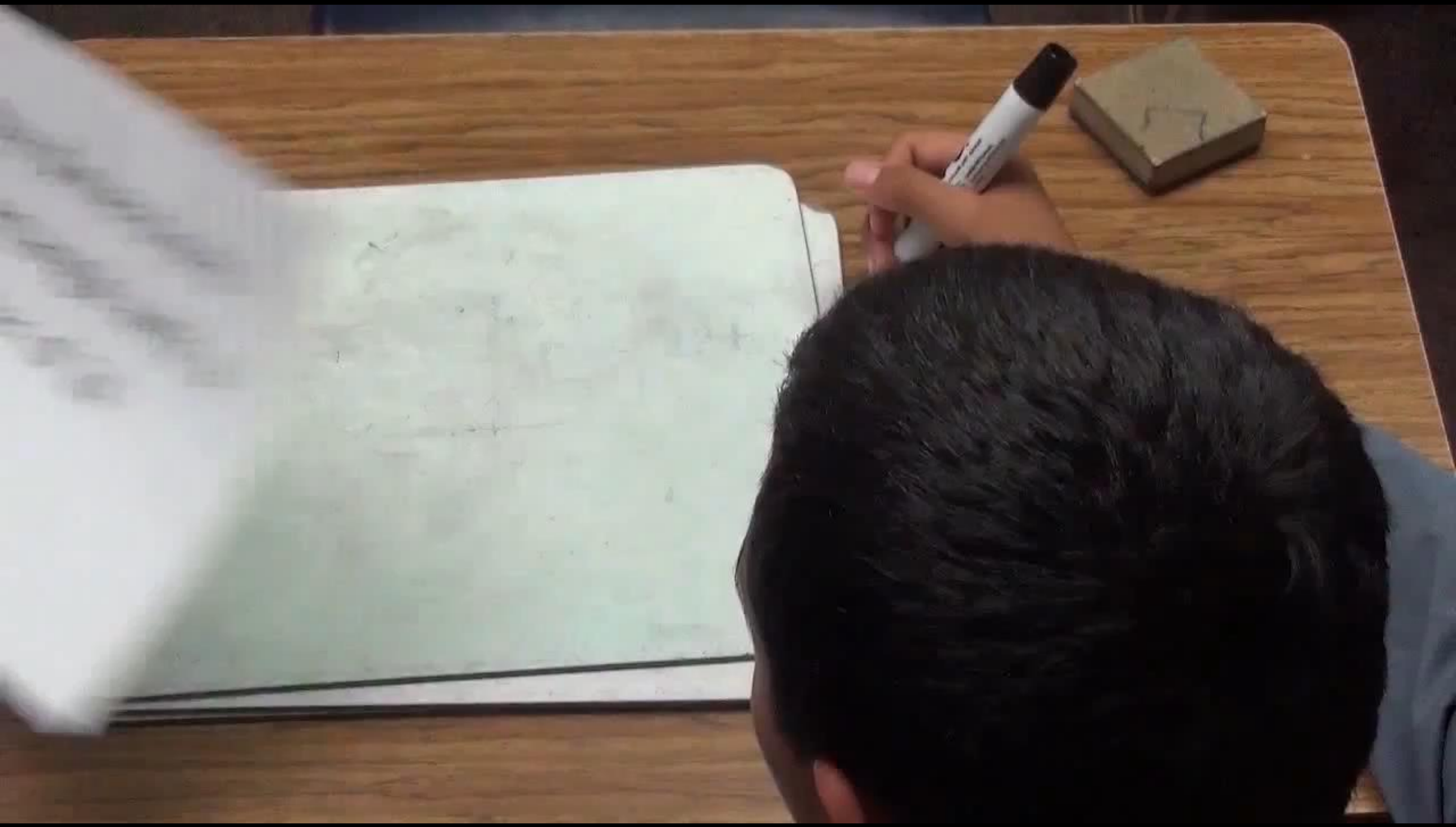
D 200 meters

Source: http://www.cde.ca.gov/ta/tg/sr/documents/cstrtqmath3.pdf

What is the perimeter of a rectangle [redacted] that measures 8 units by 4 units?

Components of Rigor

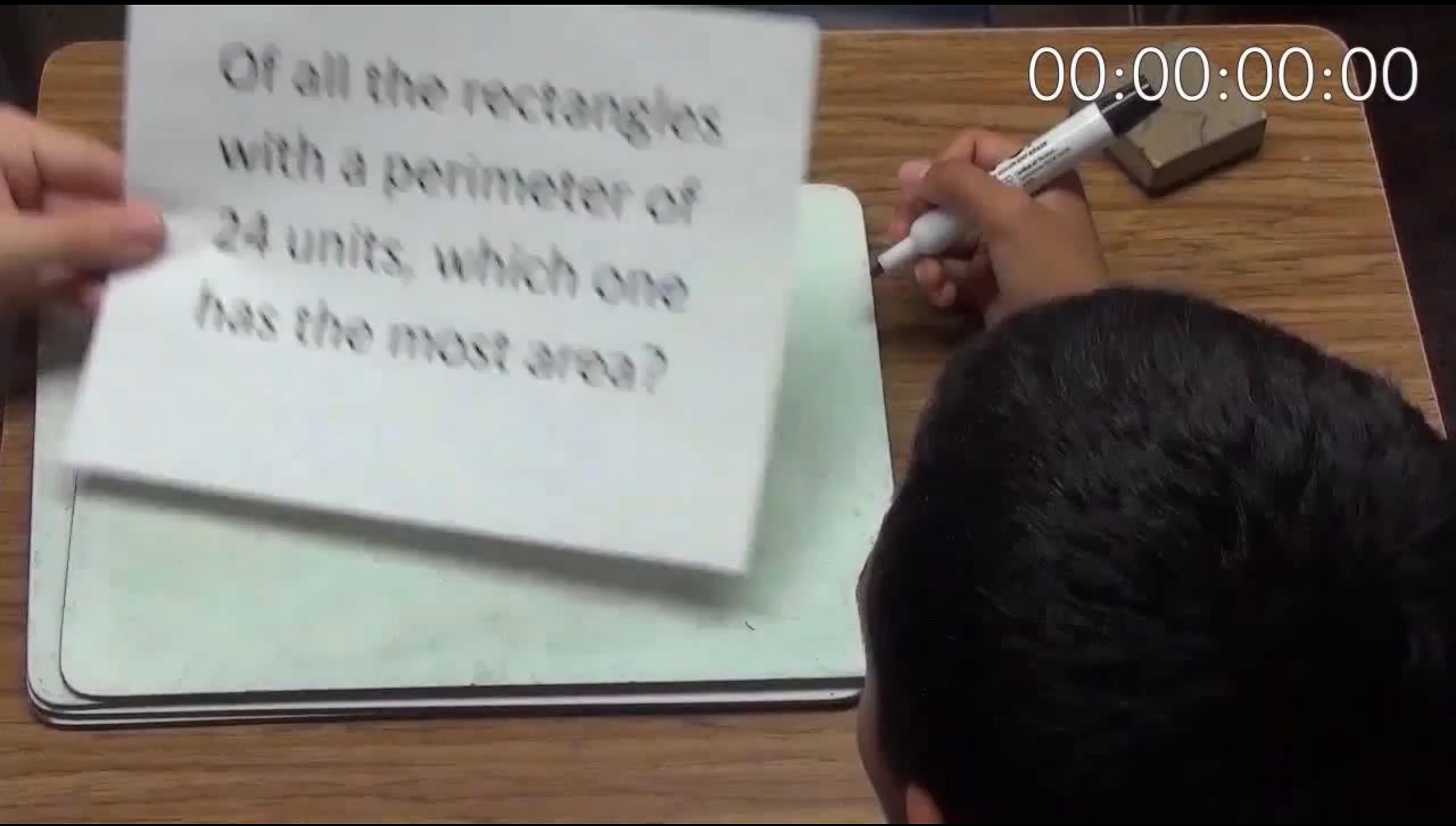
- ☑ Procedural Skill and Fluency
- ☑ Conceptual Understanding



Components of Rigor

- ☑ Procedural Skill and Fluency
- ☑ Conceptual Understanding

Of all the rectangles with a perimeter of 24 units, which one has the most area?


Of all the rectangles with a perimeter of 24 units, which one has the most area?
00:00:00:00

Components of Rigor

- [x] Procedural Skill and Fluency
- [x] Conceptual Understanding

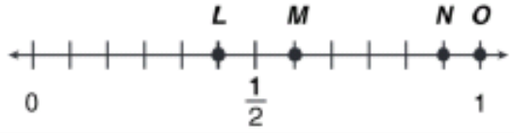
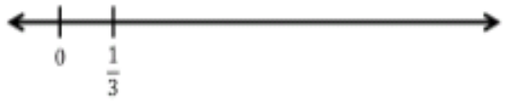
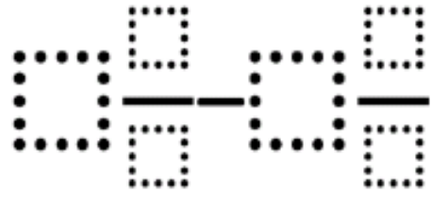
Defining the Problem

- Students appear to demonstrate "deep, authentic command of mathematical concepts" when given commonly used problems.
- However with more challenging problems, the same students seem to no longer demonstrate that command.

Addressing the Problem

- First, we must have a clear understanding about why these problems are different from one another.
- Next, we need to practice using these problems so that we understand how students may react to them.
- Last, we need a source that can provide us with a variety of free problems.

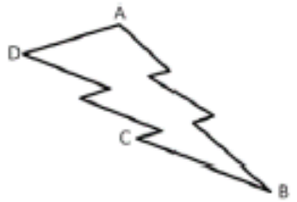
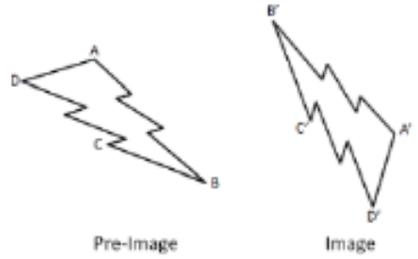
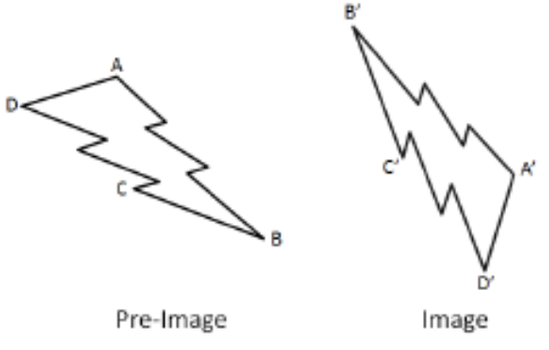
DOK | Distinguishing Between Depth of Knowledge Levels in Mathematics

Topic	Adding Whole Numbers	Money	Fractions on a Number Line	Area and Perimeter	Subtracting Mixed Numbers
CCSS Standard(s)	• 1.NBT.4 • 2.NBT.5	• 2.MD.8	• 3.NF.2	• 3.MD.8 • 4.MD.3	• 5.NF.1
DOK 1 Example	Find the sum. $44 + 27 =$	If you have 2 dimes and 3 pennies, how many cents do you have	Which point is located at $\frac{7}{12}$ below? 	Find the perimeter of a rectangle that measures 4 units by 8 units.	Find the difference. $5\frac{1}{2} - 4\frac{2}{3} =$
DOK 2 Example	Fill in the boxes below using the whole numbers 1 through 9, no more than one time each, so that you make a true equation. $\square\square + 53 = \square\square$	Make 47¢ in three different ways with either quarters, dimes, nickels, or pennies.	Label the point where $\frac{3}{4}$ belongs on the number line below. Be as precise as possible. 	List the measurements of three different rectangles that each has a perimeter of 20 units.	Create three different mixed numbers that will make the equation true by using the whole numbers 1 through 9, no more than one time each,. You may reuse the same whole numbers for each of the three mixed numbers. $5\frac{4}{5} - \square\frac{\square}{\square} = 3\frac{1}{20}$
DOK 3 Example	Make the largest sum by filling in the boxes below using the whole numbers 1 through 9, no more than one time each. $\square\square + \square\square =$	Make 47¢ using exactly 5 coins with either quarters, dimes, nickels, or pennies.	Create 5 fractions using the whole numbers 0 through 9, no more than one time each, as numerators and denominators and correctly place them all on a number line.	What is the greatest area you can make with a rectangle that has a perimeter of 24 units?	Make the smallest difference by filling in the boxes below using the whole numbers 1 through 9, no more than one time each. 

ROBERT KAPLINSKY

More free DOK 2 & 3 problems available at openmiddle.com | © 2015 Robert Kaplinsky, robertkaplinsky.com

DOK | Distinguishing Between Depth of Knowledge Levels in Mathematics

Topic	Surface Area and Volume	Probability	Transformations	Factoring Quadratics	Quadratics in Vertex Form
CCSS Standard(s)	• 6.G.4 • 7.G.6	• 7.SP.5 • 7.SP.7	• 8.G.1 • G-CO.5	• A-SSE.3a	• F-IF.7a
DOK 1 Example	Find the surface area of a rectangular prism that measures 3 units by 4 units by 5 units.	What is the probability of rolling a sum of 5 using two 6-sided dice?	Rotate the image below 90° counterclockwise and reflect it across a horizontal line. 	Find the factors: $2x^2 + 7x + 3$	Find the roots and maximum of the quadratic equation below. $y = 3(x-4)^2 - 3$
DOK 2 Example	List the measurements of three different rectangular prisms that each has a surface area of 20 square units.	What value(s) have a 1/12 probability of being rolled as the sum of two 6-sided dice?	List three sequences of transformations that take pre-image ABCD to image A'B'C'D'.  Pre-Image Image	Fill in the blank with integers so that the quadratic expression is factorable. $x^2 + \_\_x + 4$	Create three equations for quadratics in vertex form that have roots at 3 and 5 but have different maximum and/or minimum values.
DOK 3 Example	What is the greatest volume you can make with a rectangular prism that has a surface area of 20 square units?	Fill in the blanks to complete this sentence using the whole numbers 1 through 9, no more than one time each. Rolling a sum of ___ on two ___-sided dice is the same probability as rolling a sum of ___ on two ___-sided dice.	What is the fewest number of transformations needed to take pre-image ABCD to image A'B'C'D'?  Pre-Image Image	Fill the blank by finding the largest and smallest integers that will make the quadratic expression factorable. $2x^2 + 3x + \_\_$	Create a quadratic equation with the largest maximum value using the whole numbers 1 through 9, no more than one time each. $y = -\square(x-\square)^2 + \square$

ROBERT KAPLINSKY

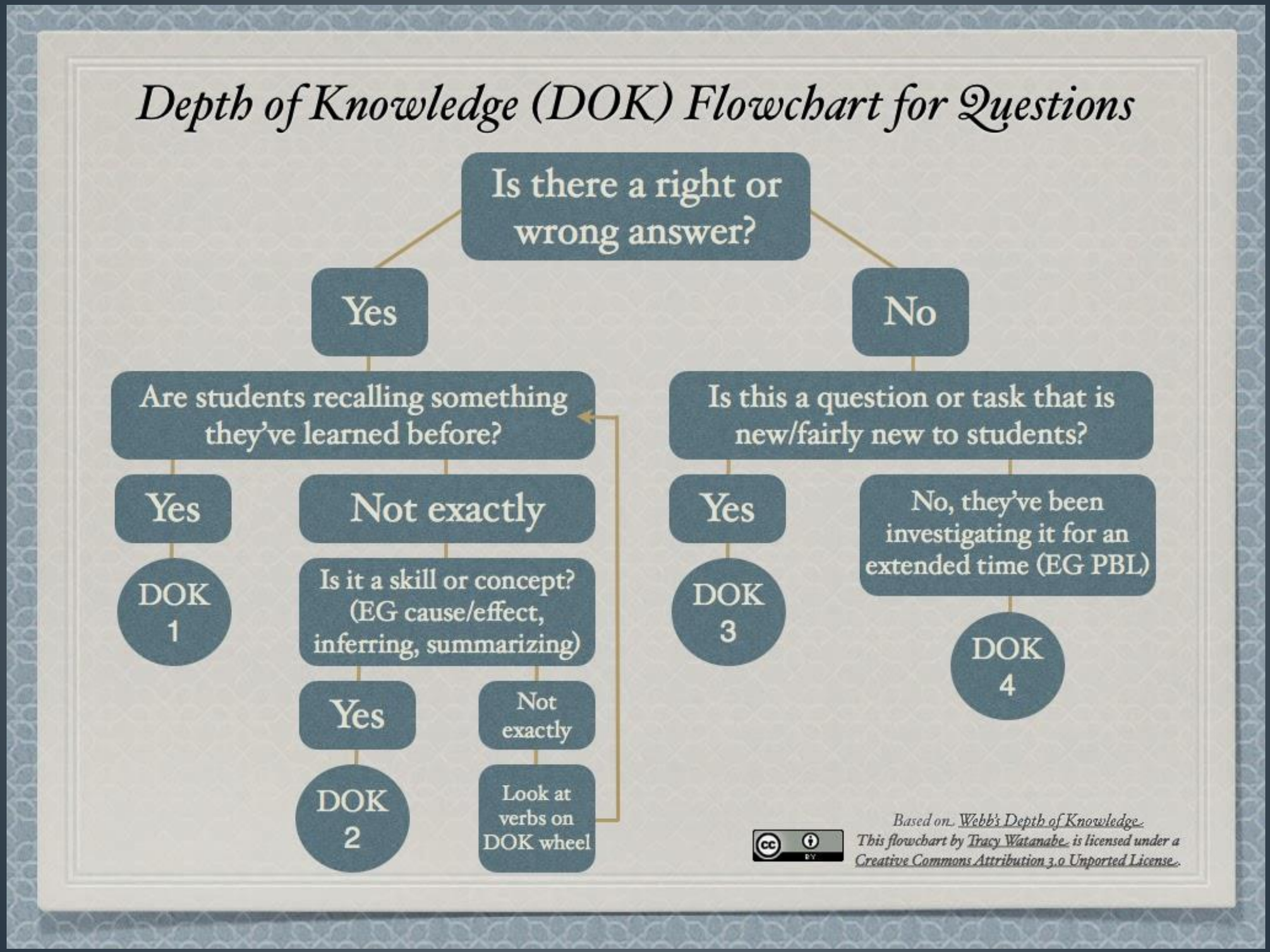
More free DOK 2 & 3 problems available at openmiddle.com | © 2015 Robert Kaplinsky, robertkaplinsky.com

Complicated or Complex?

DOK Verb Wheel

Source: Unknown

DOK Flowchart for Questions



Source: Tracy Watanabe - @tracywatanabe

DOK Level Differences

- **Level 1: Recall & Reproduction**
  - Often a trivial application of facts.
  - Requires little to no cognitive effort beyond remembering the right formula.
  - Usually only one answer.
- **Level 2: Skills & Concepts**
  - Usually requires more than one step to solve.
  - Often multiple answers.
- **Level 3: Strategic Thinking**
  - Usually requires critical thinking about the best way to approach a problem.
  - May be multiple answers or a single optimal answer.
  - Often challenging enough to make your head hurt.
- **Level 4: Extended Thinking**
  - In mathematics these are generally represented by performance tasks or problem-based lessons.

Probability

What is the probability of rolling a sum of 5 using two 6-sided dice?

Probability

What value(s) have a $\frac{1}{12}$ probability of being rolled as the sum of two 6-sided dice?

Author: Daniel Luevanos

Probability

Fill in the blanks to complete this sentence using the whole numbers 1 through 9, no more than one time each.

Rolling a sum of ___ on two ___-sided dice is the same probability as rolling a sum of ___ on two ___-sided dice.

Authors: Audrey Mendivil, Daniel Luevanos, and Robert Kaplinsky

Adding Decimals

Use the numbers 1 through 9, at most one time each, to fill in the boxes and make three decimals whose sum is as close to 1 as possible.

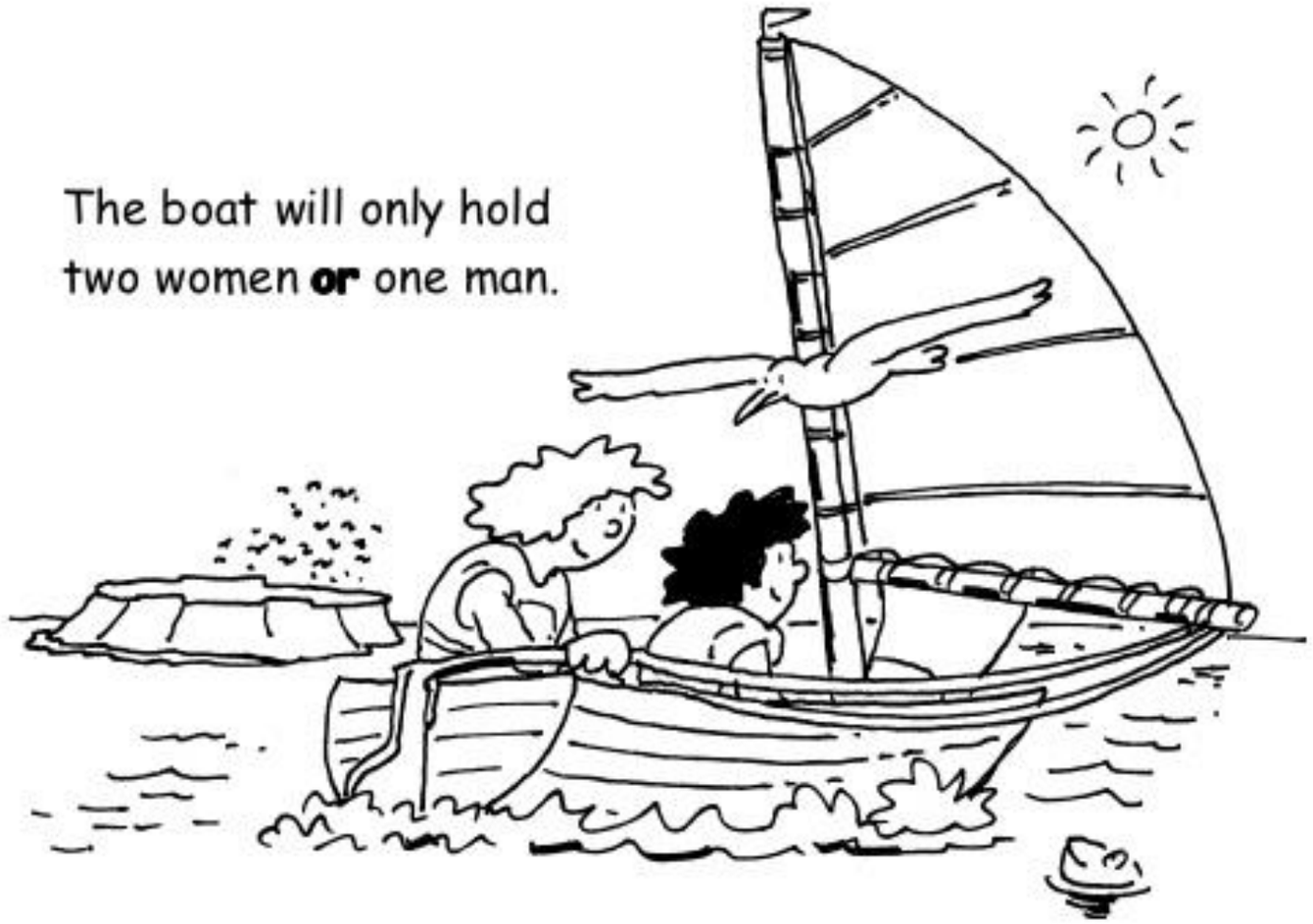
$$\begin{array}{r} 0.\square\square\square \\ +\,0.\square\square\square \\ \hline \end{array}$$

JUST BRAIN TEASERS?

Sail away

Two men and two women want to sail to an island.

The boat will only hold
two women **or** one man.



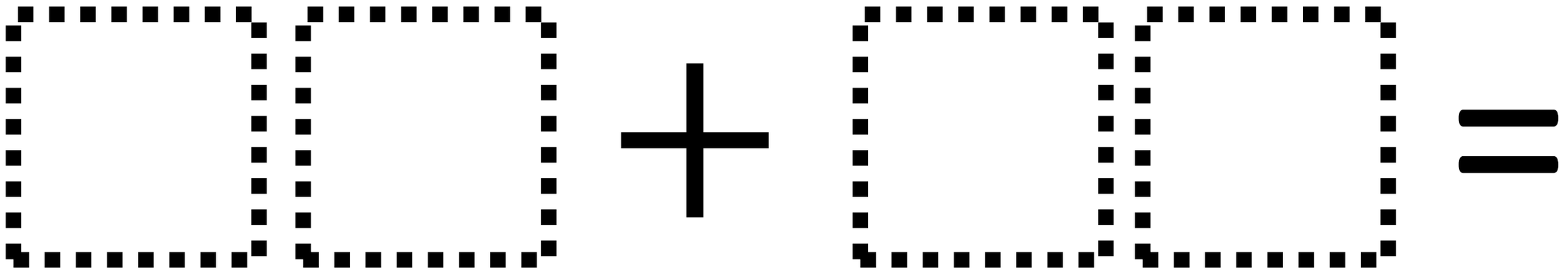
How can all four of them get to the island?

46

Teaching objectives

Solve mathematical problems or puzzles.
Explain methods and reasoning.

Make the largest sum by filling in the boxes below using the whole numbers 1 through 9, no more than one time each.



@robe
tease
more
1:27 P

Mark Chubb
@MarkChubb3

Follow

@robertkaplinsky @openmiddle I think the purpose is the difference. OMP are designed to learn important math. BT are designed to trick!

5:47 PM - 4 May 2015

Mike Flynn
@MikeFlynn55

Follow

@fawnpnguyen @robertkaplinsky @openmiddle I agree OMP allow for multiple approaches and/or solutions where BT seemed closed most of the time

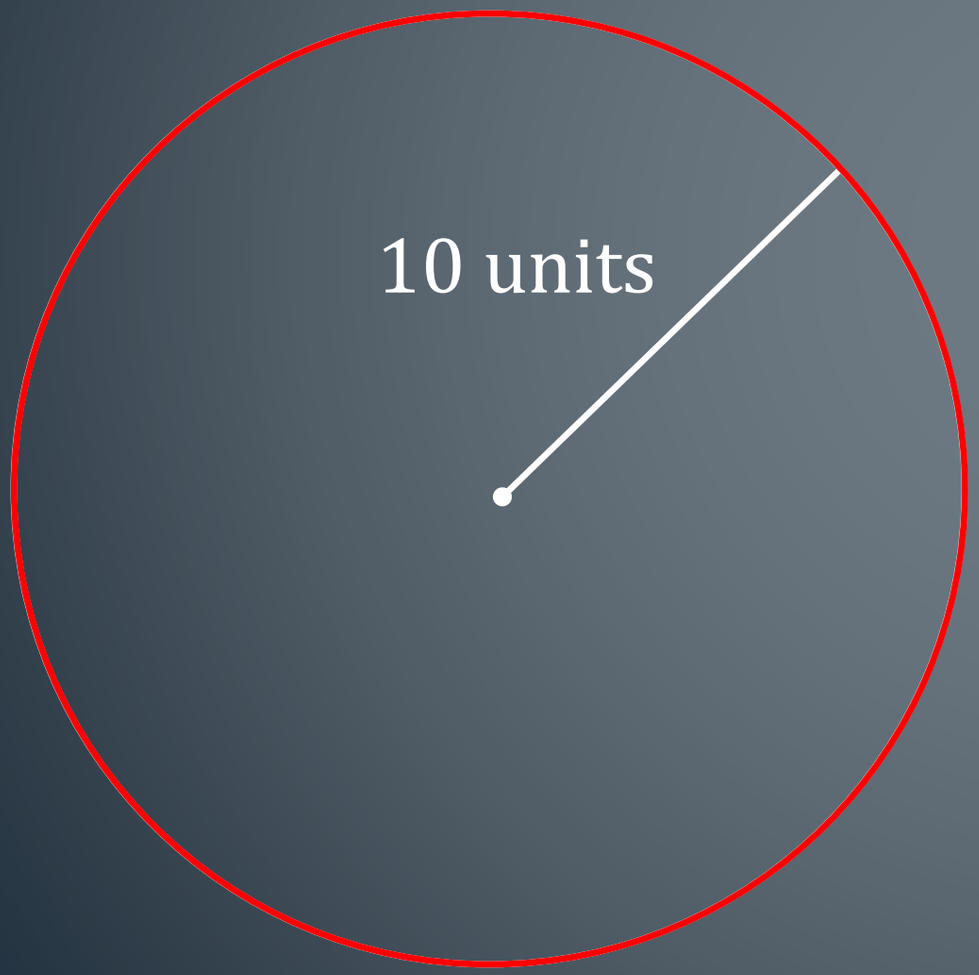
1:44 PM - 4 May 2015

llow

ave

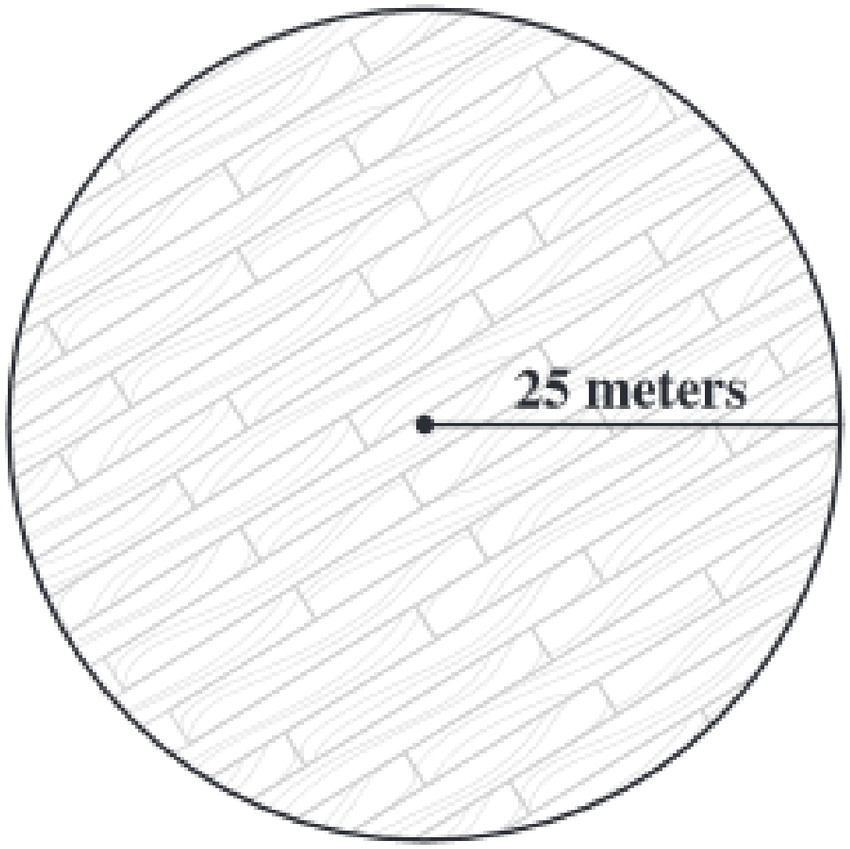
Depth of Knowledge – Level One

What is the circle's circumference? $\pi \approx 3.14$



What is the circle's area? $\pi \approx 3.14$

70 **This circular stage has a radius of 25 meters.**



Which equation could be used to find the area of the stage in square meters?

A $A = 25\pi$

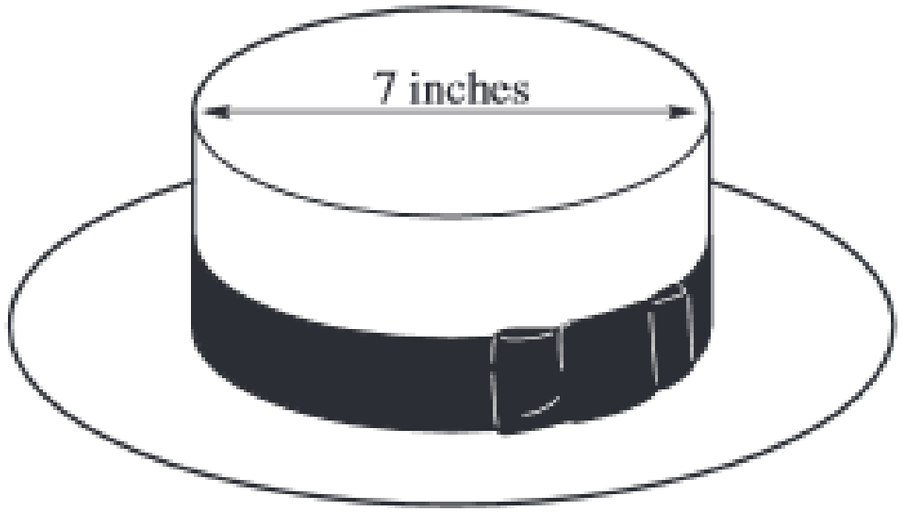
B $A = 50\pi$

C $A = \pi \bullet 25^2$

D $A = \pi \bullet 50^2$

CSM02059

72 **The top part of this hat is shaped like a cylinder with a diameter of 7 inches.**



Which measure is *closest* to the length of the band that goes around the outside of the hat?

A 10.1 inches

B 11.0 inches

C 22.0 inches

D 38.5 inches

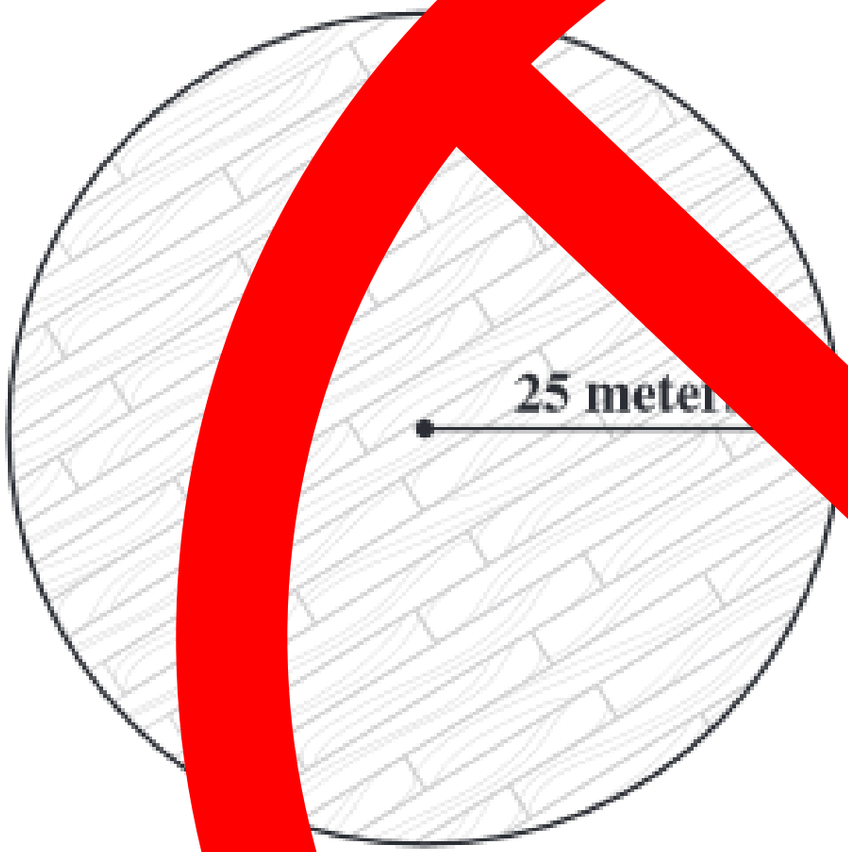
CSM00268

Source: 6th Grade CST Released Test Questions - http://www.cde.ca.gov/ta/tg/sr/documents/cstrtqmath6.pdf

Student Data Facts

- 396 seventh grade students were assessed
- 68.26% correctly answered the circumference question
- 78.59% correctly answered the area question

70 This circular stage has a radi… meters.



Which equat… ould be used to find the area of the stage in … re meters?

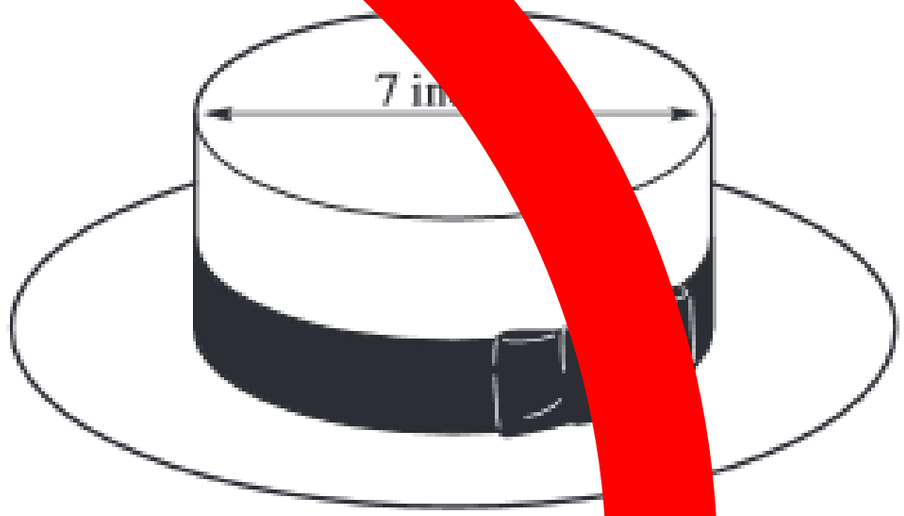
A $A = 25\pi$

B $A = 50\pi$

C $A = \pi \cdot 25^2$

D $A = \pi \cdot 50^2$

72 The … of this hat is shaped like a cylinder with a dia… 7 inches.



Which measure is *closest* to … ength of the band that goes around the c… le of the hat?

A …0.1 inches

B … inches

C 22… s

D 38.5 in…

CSM00268

Depth of Knowledge – Level Two

Which circle is bigger? How do you know?

Circle A

Area = 36 units^2

$$C = \pi \cdot 2 \cdot r$$

$$36 \approx 6.28 \cdot r$$

$$\frac{36}{6.28} \approx r$$

$$5.73\ units \approx r$$

Circle B

Circumference = 36 units

$$A = \pi \cdot r^2$$

$$A \approx 3.14 \cdot 5.73^2$$

$$A \approx 3.14 \cdot 32.83$$

$$A \approx 103.15\ units^2$$

SBAC Constructed Response Rubric

- For full credit (2 points):
  - Student reaches the correct conclusion.

    AND
  - Student provides sufficient reasoning to support this conclusion.
- For partial credit (1 point):
  - Student reaches the correct conclusion but does not provide sufficient reasoning to support this conclusion.

    OR
  - Student does not reach the correct conclusion but provides reasoning to support this conclusion that contains a minor conceptual or computation error.

Student Data Facts

- Of the 396 seventh grade students who were assessed, 12.12% earned two points on the DOK 2 question.
- 97.92% of the students who correctly answered the DOK 2 question also correctly answered both of the two DOK 1 questions.
- 10.61% of the students who correctly answered both of the two DOK 1 questions also correctly answered the DOK 2 question.

More Student Data Facts

- 28.28% of the students earned only one point.
- All of them earned one point by choosing Circle B and providing insufficient reasoning.
- 59.59% of the students earned no points.

DOK FAQ

- *When will students ever use this?*
- *What DOK level should I start students off with?*
- *How do teachers fit these problems into their pacing?*
- *How do I help prevent students from giving up after trying the problem once or twice?*
- *Where can I find other DOK 2 and DOK 3 problems or submit ones I've made?*

Goals

- [x] Engaging problem solving
  - [x] Real world problem-based learning
  - [x] Higher depth of knowledge problems
- [ ] Better implementation
  - [x] Improve our ability to ask questions
  - [ ] Practice preparing to implement a lesson
  - [ ] Figure out how to deal with uncomfortable situations

Open Middle

Challenging math problems worth solving

NEW OPEN M

Exponents a f Operations

February 10, 2015 Leave

Directions: Find 3 positive i t add up to 10. Place each number into one of the blanks to find the largest possible result. Source: Zack iller (@zmill415) **Read More »**

Create Squares

February 10, 2015 2 Comments

Directions: Create a square with one of the vertices at (2,3). Fill in the blanks with whole numbers 0 through 9, using each number at most once, to show the rest of the vertices of the square. Bonus: Find more than one set of vertices. Source: John Mahlstedt (@jdmahlstedt) **Read More »**

Solution of Two Linear Equations

February 10, 2015 Leave a comment

Directions: Using the Integers 0-9 (without duplication), provide four sets of points that represent two distinct lines. These lines can be written as two linear equations. Then provide a fifth point that represents the intersection (or solution) of those equations. Line 1: (__, __) and (__, __) Line 2: (__, __) and (__, __) Solution (__, __) Source: Bryan Anderson **Read More »**

Bingo card

February 5, 2015 1 Comment

Directions: In a standard game of BINGO, the cards are labeled with numbers 1 through 75. If it was possible, which card would you choose: a card with all of the same number or a standard bingo card? Source: Nanette

Google™ Custom Search Search ×

OPEN MIDDLE WORKSHEET

Download the Open Middle Worksheet:
Version 1.1

SUBSCRIBE

Receive emails every time a new problem is published.

Enter your e-mail address

Subscribe

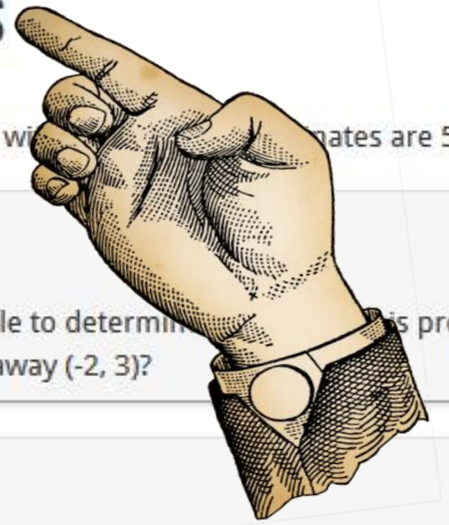
COMMON CORE STATE STANDARDS

- Grade 1 (6)
  - Number & Operations in Base Ten (3)
  - Operations & Algebraic Thinking (3)
- Grade 2 (6)
  - Measurement & Data (2)
  - Number & Operations in Base Ten (4)
- Grade 3 (11)
  - Measurement & Data (6)
  - Number & Operations in Base Ten (3)
  - Number & Operations—Fractions (2)

Open Middle

Challenging math problems worth solving

EQUIDISTANT POINTS



Directions: How many points wi nates are 5 units away from (-2, 3)?

Hint

Which methods are available to determi is problem? What shape is defined by *all* of the points that are 5 units away (-2, 3)?

Answer

12 points: (-5, 7), (-7, 3), (-5, -1), (-2, -2), (3, 3), (1, -1), (-2, 8), (1, 7), (2,6), (-6, -6), (-6, 0), and (2, 0)

Source: Dylan Kane

Print

SHARE ! Tweet 0 Like 0 +1 0 Share Pin it

Tagged with: 8.G.8 | DOK 2: SKILL / CONCEPT | DYLAN KANE | G-GPE.1

« Previous: Cone and Cylinder Volumes

Next: Pythagorean Shell »

LEAVE A REPLY

Google™ Custom Search Search ×

OPEN MIDDLE WORKSHEET

Download the Open Middle Worksheet:
Version 1.1

SUBSCRIBE

Receive emails every time a new problem is published.

Enter your e-mail address

Subscribe

COMMON CORE STATE STANDARDS

- Grade 1 (6)
  - Number & Operations in Base Ten (3)
  - Operations & Algebraic Thinking (3)
- Grade 2 (6)
  - Measurement & Data (2)
  - Number & Operations in Base Ten (4)
- Grade 3 (11)
  - Measurement & Data (6)
  - Number & Operations in Base Ten (3)
  - Number & Operations—Fractions (2)

Problem-Based Lesson Resources

- Problem-based lesson search engine:

  http://robertkaplinsky.com/prbl-search-engine/

- My lessons: http://www.robertkaplinsky.com/lessons
- Dan Meyer: http://threeacts.mrmeyer.com
- Andrew Stadel: http://tinyurl.com/mrstadel
- Geoff Krall: http://tinyurl.com/PrBLmaps
- Dan Meyer's TED talk: http://tinyurl.com/meyer-TED

Robert KAPLINSKY
Glenrock Consulting

Google™ Custom Search

Home Lessons Blog Speaking Services Beliefs About Contact

Why Choose Us?

1 Math content expert

Robert graduated from University of California, Los Angeles (UCLA) with a Bachelors of Science in Mathematics. He has taught mathematics to students at the elementary, middle, and high school levels. As an instructor for UCLA, he also taught math

Lessons

How Much Is One Third Of A Cup Of Butter?

How Do Skytypers Write Messages?

Robert Kaplinsky's Problem-Based Lessons

File Edit View Insert Format Data Tools Help All changes saved in Drive

	A	B	C	D	E	F	
1	Task Name	Concept / Skill	Standard 1	Standard 2	Standard 3	Standard 4	Sta
2	How Can We Water All Of The Grass?	Circles, Pythagorean Theorem, trigonometric ratios	7.G.4	8.G.7	G-SRT.8	G-MG.1	G-M
3	How Much Money IS That?!	Volume of rectangular prism	5.MD.3	5.MD.4	5.MD.5	5.MD.5b	5.M
4	How Much Money Should Dr. Evil Demand?	Exponential Growth	N-RN.2	A-SSE.1	A-SSE.3c	A-SSE.4	A-R
5	How Tall Is Mini-Me?	Scale and Dividing Decimals	5.NF.5	5.NF.5a	5.NF.5b	6.NS.3	
6	How Did They Make Ms. Pac-Man?	Transformations (Rotations, Reflections, and Translations)	8.G.1	8.G.2	8.G.3	8.G.4	G-S
7	Which Ticket Option Is The Best Deal?	Unit Rates and Ratios	6.RP.2	6.RP.3	6.RP.3a	6.RP.3b	
8	How Far Apart Are The Freeway Exits?	Fractions on a Number Line and Subtracting Fractions	3.NF.2	3.NF.2b	4.NF.2	4.NF.3a	4.N
9	Do We Have Enough Paint?	Area	3.MD.5	3.MD.6	3.MD.7		
10	How Many Stars Are There In The Universe?	Scientific Notation	8.EE.3	8.EE.4			
11	What Rides Can You Go On?	Inequalities and Measurement	2.MD.1	6.NS.7a	6.NS.7b		
12	Do You Have Enough Money?	Money	2.MD.8				
13	Which Bed Bath & Beyond Coupon Should You Use?	Percent Discount	7.RP.3				
14	Is Gas Cheaper With Cash Or Credit Card?	Percent Discount	7.RP.3				
15	Where's The Nearest Toys R Us?	Pythagorean Theorem (Distance in coordinate system)	8.G.8	G-SRT.8	G-GPE.7		
16	How Sharp Is The iPhone 5's Retina Display?	Pythagorean Theorem (Length of a side)	8.G.7	G-SRT.8	G-GPE.7		
17	When Should She Take Her Medicine?	Operations with Time Intervals	4.MD.2				
18	How Big Are Sunspots?	Converting Units, Proportions, and Scientific Notation	5.MD.1	7.RP.2	7.G.4	8.EE.4	G-M
19	What Michael's Coupon Should I Use?	Percent Discount	7.RP.3	A-CED.3			
20	Is It Cheaper To Pay Monthly or Annually?	Decimal Operations and/or Systems of Equations	5.NBT.7	8.EE.8c	A-CED.3	A-REI.11	F-B
21	How Big Is The 2010 Guatemalan Sinkhole?	Volume of Cylinder	5.MD.3	5.MD.4	5.MD.5	8.G.9	G-C
22	How Can You Win Every Prize At Chuck E. Cheese's?	Decomposing Numbers and/or Systems of Equations	2.NBT.7	3.NBT.2	3.NBT.3	8.EE.8c	A-C
23	How Many Royal Flushes Will You Get?	Probability	7.SP.5	7.SP.6	7.SP.7	S-MD.5	S-M
24	How Much Does The Paint On A Space Shuttle Weigh?	Surface Area	6.G.4	7.G.6	8.G.7	G-MG.1	G-M
25	How Did Motel 6 Go From $6 to $66?	Percent Increase and Compound Interest	7.RP.3	A-SSE.1b	F-BF.1	F-IF.8b	F-L
26	How Much Does The Aluminum Foil Prank Cost?	Surface Area and Unit Rates	6.G.4	6.RP.2	6.RP.3	7.G.6	
27	How Many Laps Is A 5k Race?	Perimeter	4.MD.3				
28	Which Toilet Uses Less Water?	Systems of Equations/Inequalities	8.EE.8c	A-CED.3	A-REI.11	F-BF.1	
29	How Did Someone Get A $103,000 Speeding Ticket In Finland?	Linear Equations	A-CED.2	F-BF.1	F-IF.4	F-IF.6	
30	Which Pizza Is A Better Deal?	Area or Circle, Square, and Unit Rates	3.MD.5	3.MD.6	3.MD.7	4.MD.3	6.R
31	How Big Is The World's Largest Deliverable Pizza?	Area of Square	3.MD.5	3.MD.6	3.MD.7	4.NBT.3	4.M
32	How Many Sheets Do You Need To Break Out Of Prison?	Integer Operations	5.NBT.6				
33	Do Hybrid Cars Pay For Themselves?	Systems of Equations or Rates	6.RP.2	6.RP.3	8.EE.8c	A-CED.3	F-B
34	How Many Hot Dogs Did They Eat?!	Linear and Quadratic Functions	8.F.3	8.F.4	F-BF.1	F-BF.2	F-I
35	How Much Purple Ribbon Will You Need?	Perimeter & Circumference	3.MD.8	4.MD.3	7.G.4		
36	Are We There Yet?	Adding Times	3.MD.1	4.MD.2			
37	Which Chinese Food Coupon Should I Use?	Percent Discount	7.RP.3				
38	How Big Is The Vehicle That Uses Those Tires?	Ratio and Proportions	7.RP.2				
39	Where Would The Angry Birds Have Landed?	Create Equation From Quadratic Graph	A-CED.1	F-BF.1	F-IF.4	F-IF.7a	F-L
40	How Many Movies Can You See In One Day?	Adding Times	3.MD.1	4.MD.2			
41	Which Carrots Should You Buy?	Unit Rates	6.RP.1	6.RP.2	6.RP.3		
42	How Fast Can You Throw A Baseball?	Converting Units and Unit Rates	5.MD.1	6.RP.2			

Problem-Based Lesson Search Engine

This search engine searches all of the sites below to quickly help you find a problem-based lesson (also called 3-Act Task, mathematical modeling, or application problem):

Submit

The links below are the pages that are being searched by the search engine:

- 101 Questions
- Andrew Stadel
- Dan Meyer
- Dane Ehlert
- Emergent Math's Problem Based Curriculum Maps
- Estimation180
- Geoff Krall

Subscribe to Lessons

Enter your email address below to receive emails whenever a new lesson is published.

Subscribe

Subscribe to Blog

Enter your email address below to receive emails whenever a new blog post is published.

Subscribe

Problem-Based Lessons

101qs.com

Andrew Stadel

Dan Meyer

Mathalicious

Problem Based Curriculum Maps

Contact

Robert Kaplinsky

robert@robertkaplinsky.com

robertkaplinsky.com

@robertkaplinsky

wsd16

Wentzville School District

ROBERT KAPLINSKY

@robertkaplinsky

Source: Andrew Stadel via www.estimation180.com

Height:
72 inches

Source: Andrew Stadel via www.estimation180.com

Height:
72 inches

Width:
36 inches

Source: Andrew Stadel via www.estimation180.com

Height:
72 inches

Width:
36 inches

Depth:
18 inches

Source: Andrew Stadel via www.estimation180.com

Sticky note

Dimensions:
3” x 3”

Source: Andrew Stadel via www.estimation180.com

Source: Andrew Stadel via www.estimation180.com

PERFORMANCE TASK

CEREAL BOXES

A cereal company uses cereal boxes that are rectangular prisms The boxes have the dimensions shown.

- 12 inches high
- 8 inches wide
- 2 inches deep

The managers of the company want a new size for their cereal boxes. The new boxes have to be rectangular prisms. You will evaluate one box design the company proposed. Then you will create and propose your own design for the company.

Requirements for the new boxes:

- The new boxes have to use less cardboard than the

1

Determine the volume of the current cereal box with the dimensions 12 inches high, 8 inches wide, and 2 inches deep.

Find the volume, V, in cubic inches, of each box.

Volume of Original Box: $V =$ __ in^3

1 2 3
4 5 6
7 8 9
0 . -

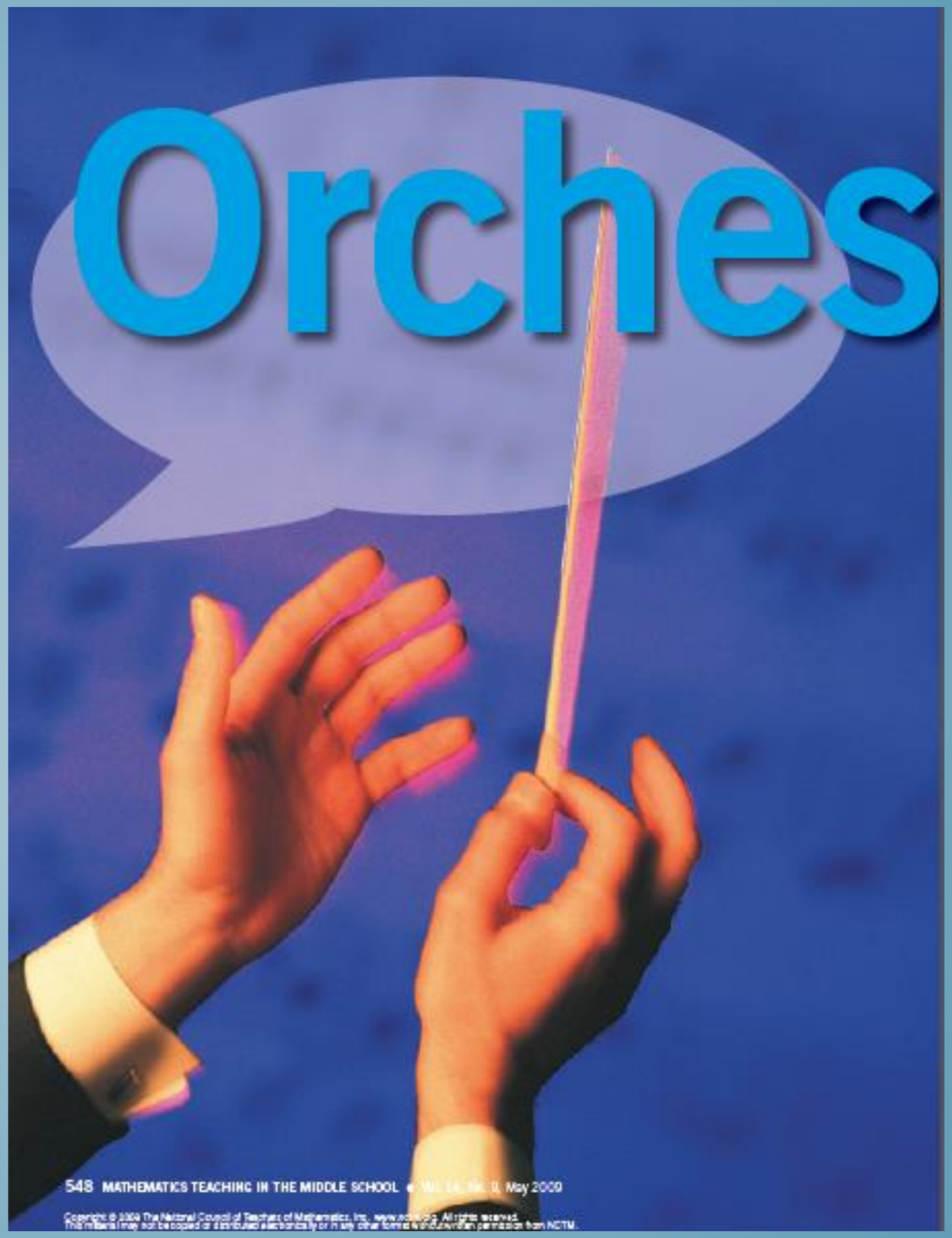
2

Label the dimensions of the net for the current cereal box with dimensions 12 inches high, 8 inches wide, and 2 inches deep.

12 in

Delete

FIVE PRACTICES



Discussion Questions

- "Giving students too much or too little support, or too much direction, can result in a decline in the cognitive demands of the task." (p. 550) Why?
- "By making purposeful choices about the order in which students' work is shared, teachers can maximize the chances that their mathematical goals for the discussion will be achieved." (p. 554) What ways do teachers currently select students? How would you suggest they change their selection process after reading this?
- What challenges might teachers have when trying to "connect" student solutions? (p. 554)

Implementing the Five Practices

1. Anticipate potential student responses to the file cabinet problem.
2. Review the ten student work samples that represent students in your classroom.
3. Figure out which students you would have share their mathematical work.
4. Determine the order you would have those students present their work.
5. Decide on which connections you would emphasize between the students' work and mathematical ideas.

Posters

- At the top of the poster, list the selection strategy used by your group. For example:
  - Starting with the most commonly used strategy and moving to one that few students used.
  - Starting with a strategy that is more concrete and moving to strategies that are more abstract.
  - Incorporating wrong answers to address common misconceptions.
- Attach those students' work to the poster in the order that you would present it.
- Next to the student work list the questions you would ask the student(s) or ideas that you would want to come out as a result of showing that student's work.

struggle: none
feedback: none
reward: none

struggle: low
feedback: low
reward: high

struggle: medium
feedback: high
reward: medium

struggle: high
feedback: high
reward: high

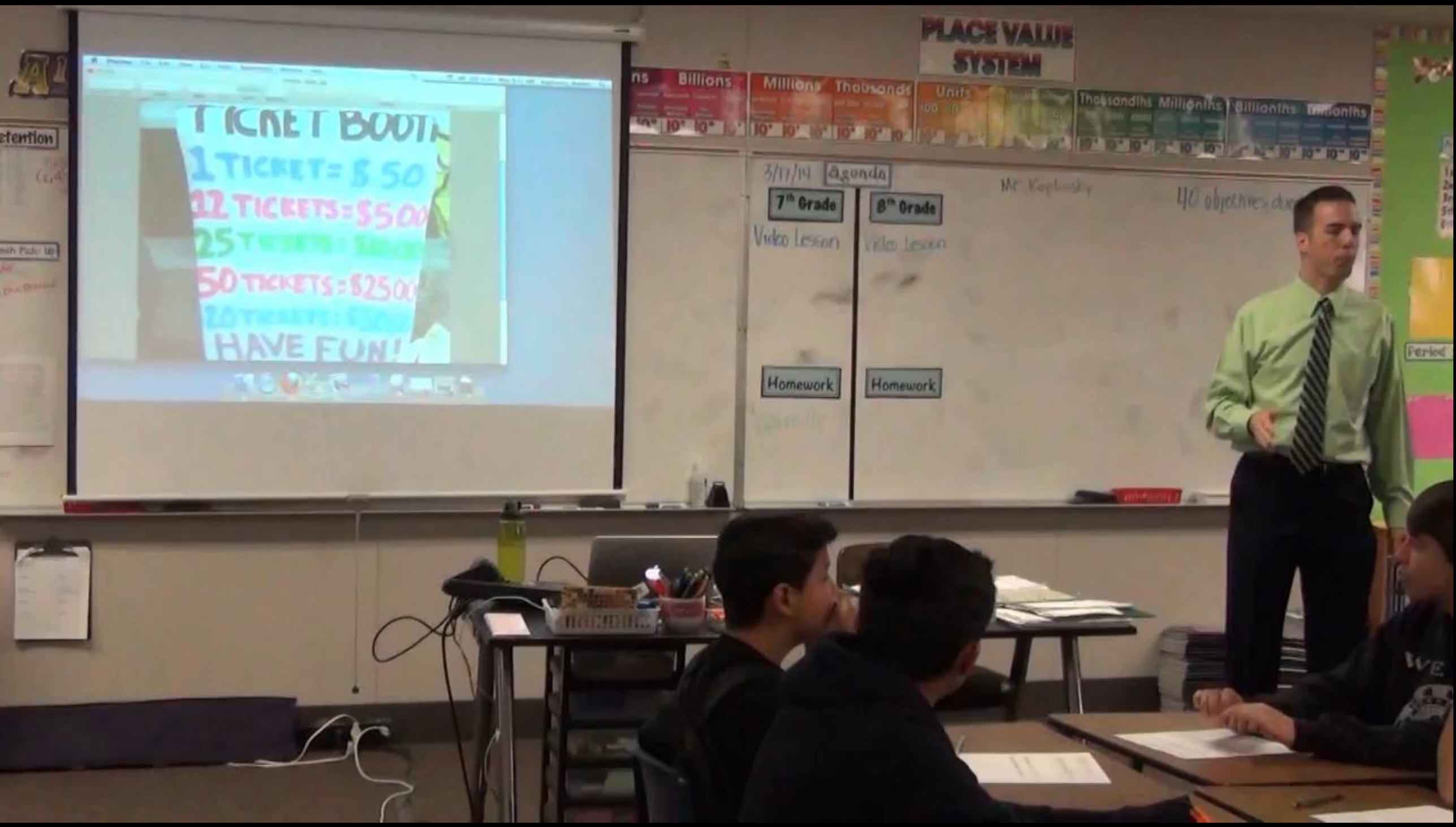
Goals

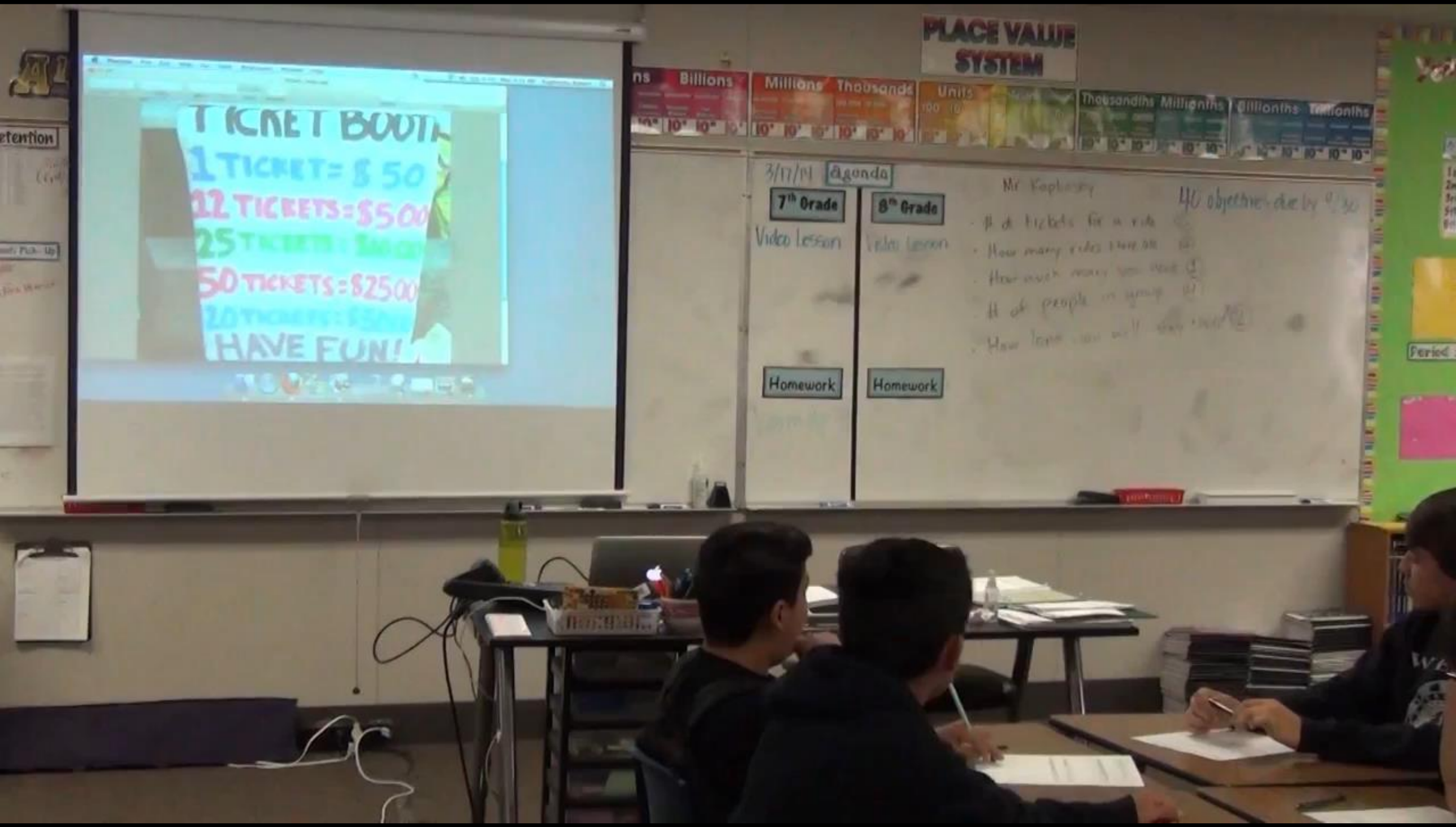
- [x] Engaging problem solving
  - [x] Real world problem-based learning
  - [x] Higher depth of knowledge problems
- [ ] Better implementation
  - [x] Improve our ability to ask questions
  - [x] Practice preparing to implement a lesson
  - [ ] Figure out how to deal with uncomfortable situations

Setting Up The Problem

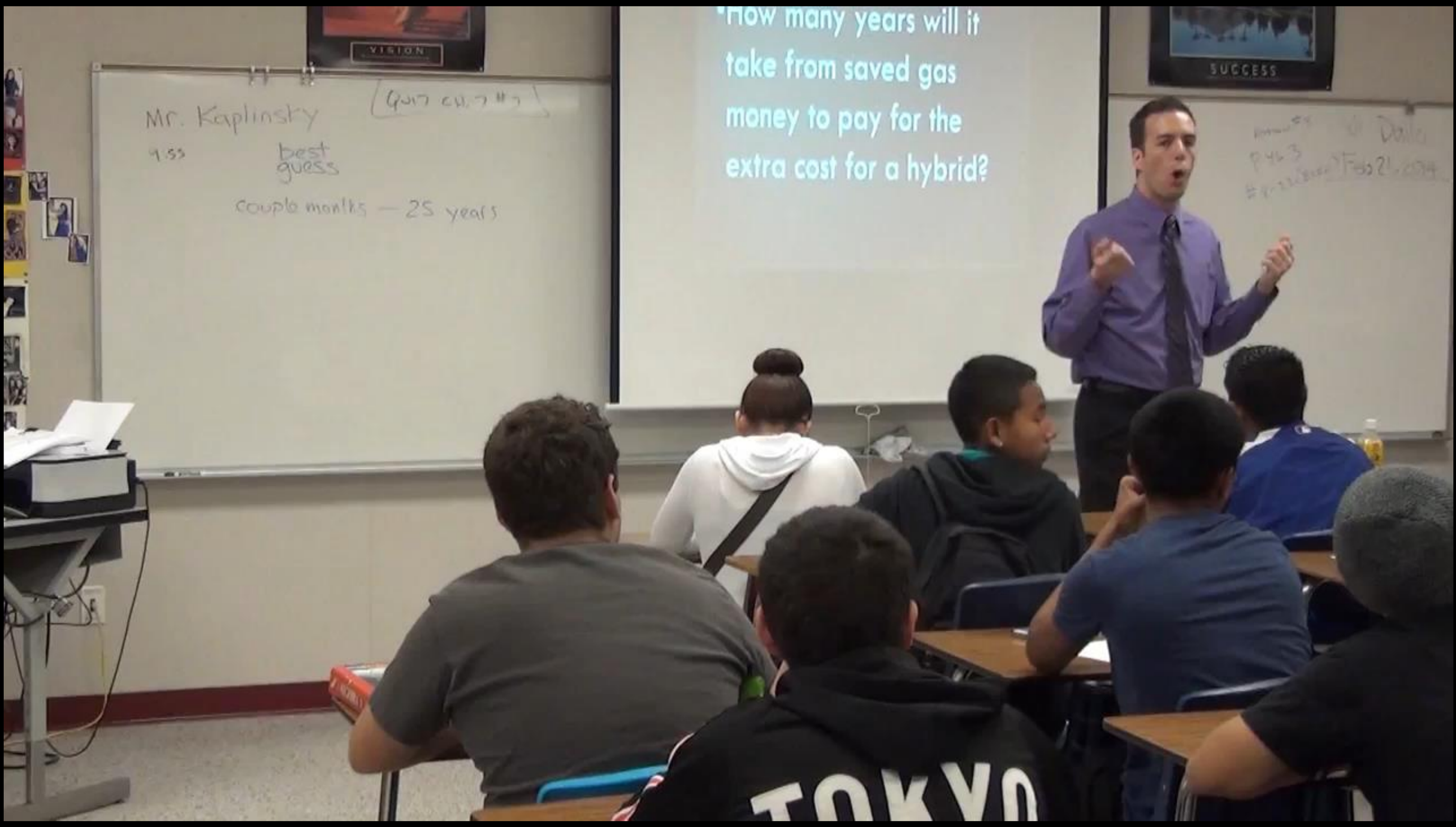
- What do you do when students ask for data/information I don't have, hadn't considered, or forgot to get?
- What do you do when students ask for information that is probably not important or that they don't actually need?

TICKET BOOTH
1 TICKET = $.50
12 TICKETS = $5.00
25 TICKETS = $10.00
50 TICKETS = $25.00
120 TICKETS = $50.00
HAVE FUN!

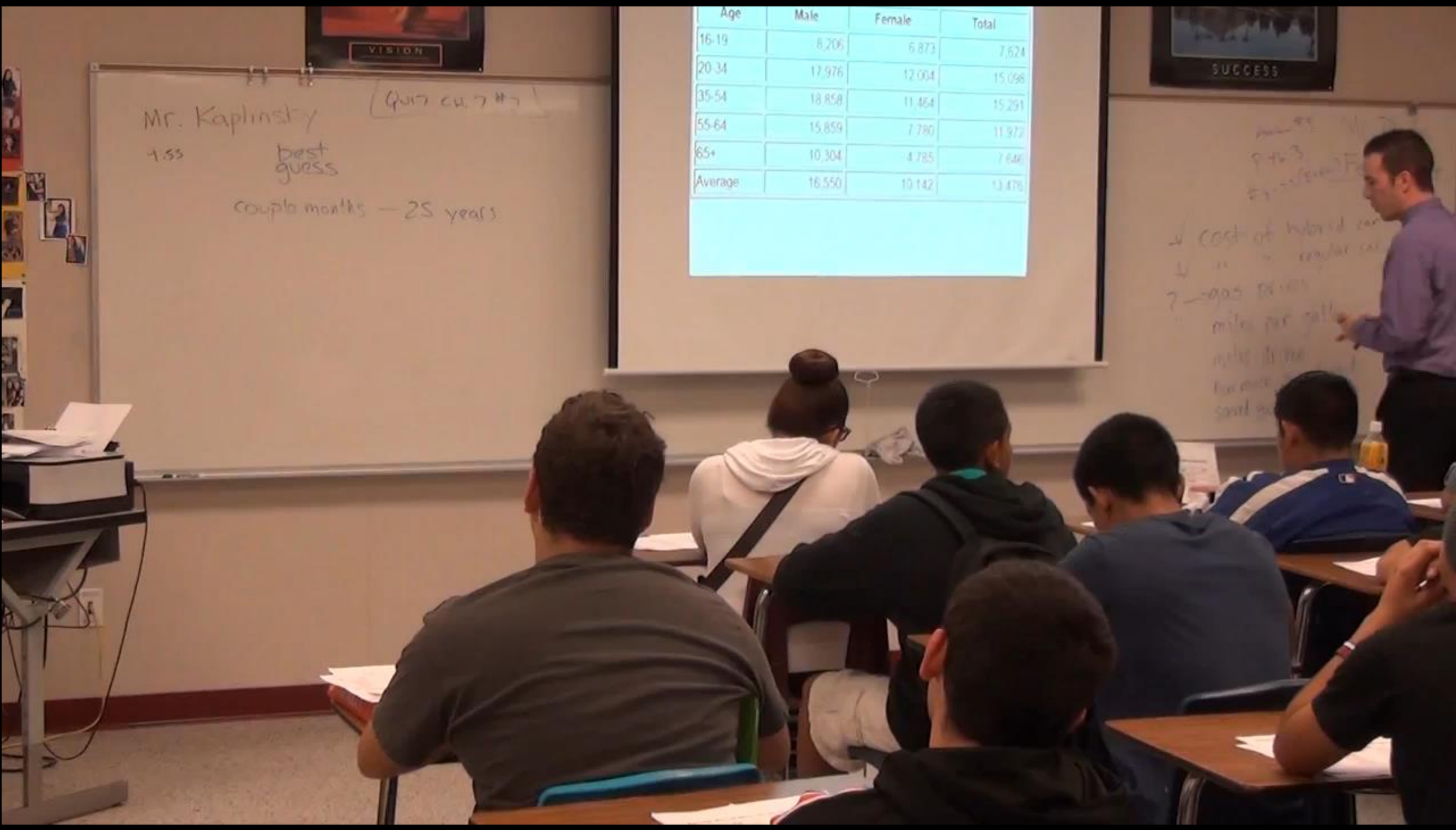

TICKET BOOTH
1 TICKET = $ 50
12 TICKETS = $500
25
50 TICKETS = $250
HAVE FUN!
PLACE VALUE SYSTEM
Billions
Millions
Thousands
Units
Thousandths
Millionths
Billionths
Millionths
3/11/14
Agenda
7th Grade
8th Grade
Video Lesson
Video Lesson
Homework
Homework
40 objectives
Period


TICKET BOOTH
1 TICKET = $ 50
12 TICKETS = $500
25
50 TICKETS = $2500
HAVE FUN!
PLACE VALUE SYSTEM
Billions
Millions
Thousands
Units
Thousandths
Millionths
Billionths
Trillionths
3/17/11
Agenda
7th Grade
8th Grade
Video Lesson
Homework
Homework
Period

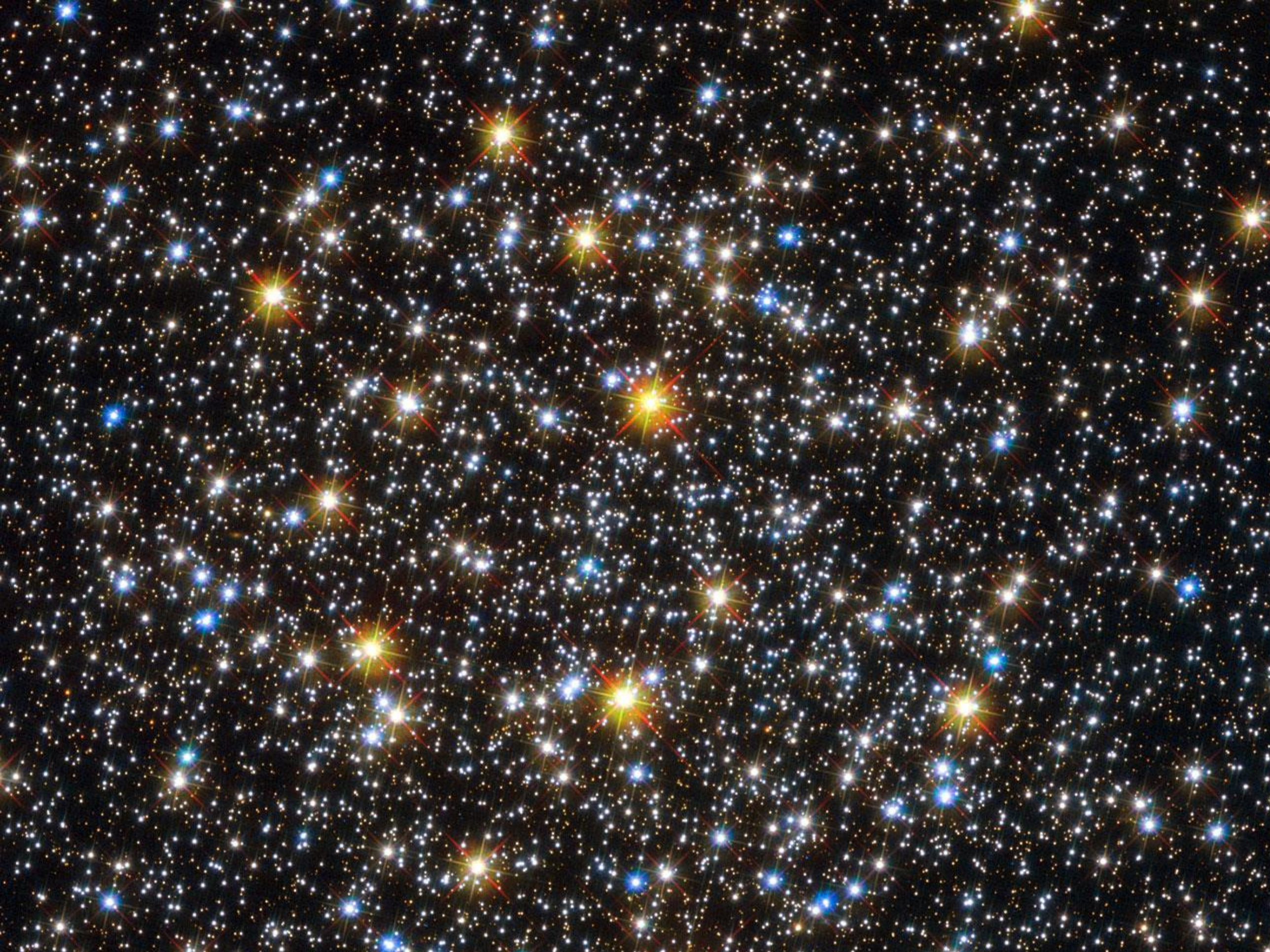
Does a hybrid car pay for itself?


VISION
Mr. Kaplinsky
best guess
couple months — 25 years
*How many years will it take from saved gas money to pay for the extra cost for a hybrid?
SUCCESS
TOKYO

Age	Male	Female	Total
16-19	8,206	6,873	7,624
20-34	17,976	12,004	15,098
35-54	18,858	11,464	15,291
55-64	15,859	7,780	11,972
65+	10,304	4,785	7,648
Average	16,550	10,142	13,476

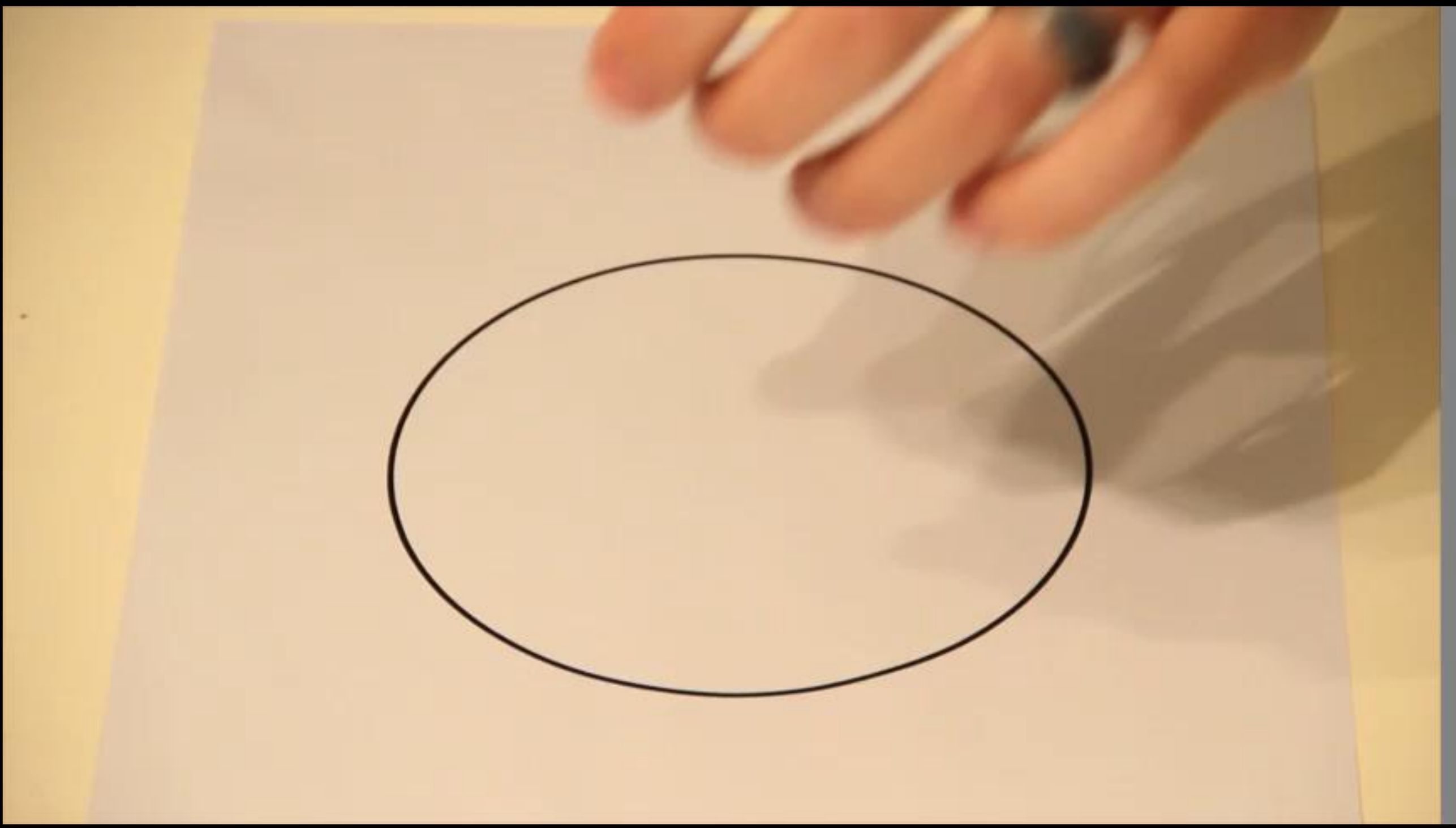


VISION
SUCCESS
Mr. Kaplinsky
best guess
couple months — 25 years
Age
Male
Female
Total
16-19
8,206
6,873
7,624
20-34
17,976
12,004
35-54
18,858
11,464
55-64
15,859
7,780
65+
10,304
4,735
Average
16,550
10,142
13,476



Setting Up The Problem

- What do you do when students ask for data/information I don't have, hadn't considered, or forgot to get?
- What do you do when students ask for information that is probably not important or that they don't actually need?
- What do you do when students don't know what to write for what they know and don't know?
- What do you do when you ask for a guess and they don’t know?
- What do you do when they don't ask you for information that they need to solve the problem?



Problem Solving Process

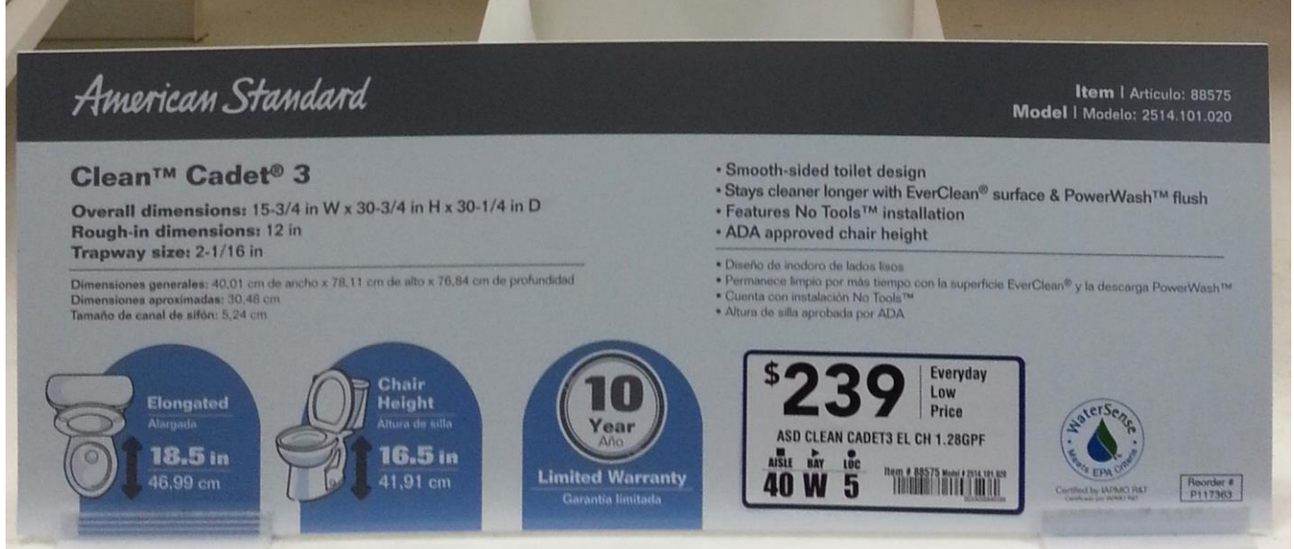
- What do you do when students don't use the strategy you anticipated they would use?

TICKET BOOTH
1 TICKET = $.50
12 TICKETS = $5.00
25 TICKETS = $10.00
50 TICKETS = $25.00
120 TICKETS = $50.00
HAVE FUN!

Dual Flush
Descarga Doble
1.0
gallon flush
for liquids
1.6
gallon flush
for solids
Dual Flush
1.0 gallon flush for liquids
1.6 gallon flush for solids
American Standard
Style That Works Better
LOWE'S
Display

American Standard
Item | Artículo: 84065
Model | Modelo: 3381.216.020
Clean™ Cadet® 3
Overall dimensions: 15 in W x 31 in H x 29-3/4 in D
Rough-in dimensions: 12 in
Trapway size: 2 in
Dimensiones generales: 38,10 cm de ancho x 78,74 cm de alto x 75,57 cm de profundidad
Dimensiones aproximadas: 30,48 cm
Tamaño de canal de sifón: 5,08 cm
• High-efficiency, dual flush toilet—1.6 gal. or 1.0 gal. flush
• Stays cleaner longer with EverClean® surface & PowerWash™ flush
• Features No Tools™ installation
• ADA approved chair height
• Inodoro de descarga doble de alta eficiencia con descarga de 6,06 litros o 3,79 litros
• Permanece limpio por más tiempo con la superficie EverClean® y la descarga PowerWash™
• Cuenta con instalación No Tools™
• Altura de silla aprobada por ADA
Elongated
Alargada
18.5 in
46,99 cm
Chair Height
Altura de silla
16.5 in
41,91 cm
10 Year Año
Limited Warranty
Garantía limitada
$199
Everyday Low Price
CLEAN CADET 3 DUAL FLUSH CH EL H
AISLE 40 W
BAY
LOC 1
Item # 84065
WaterSense
Meets EPA Criteria
Certified by IAPMO R&T
Reorder # P117364

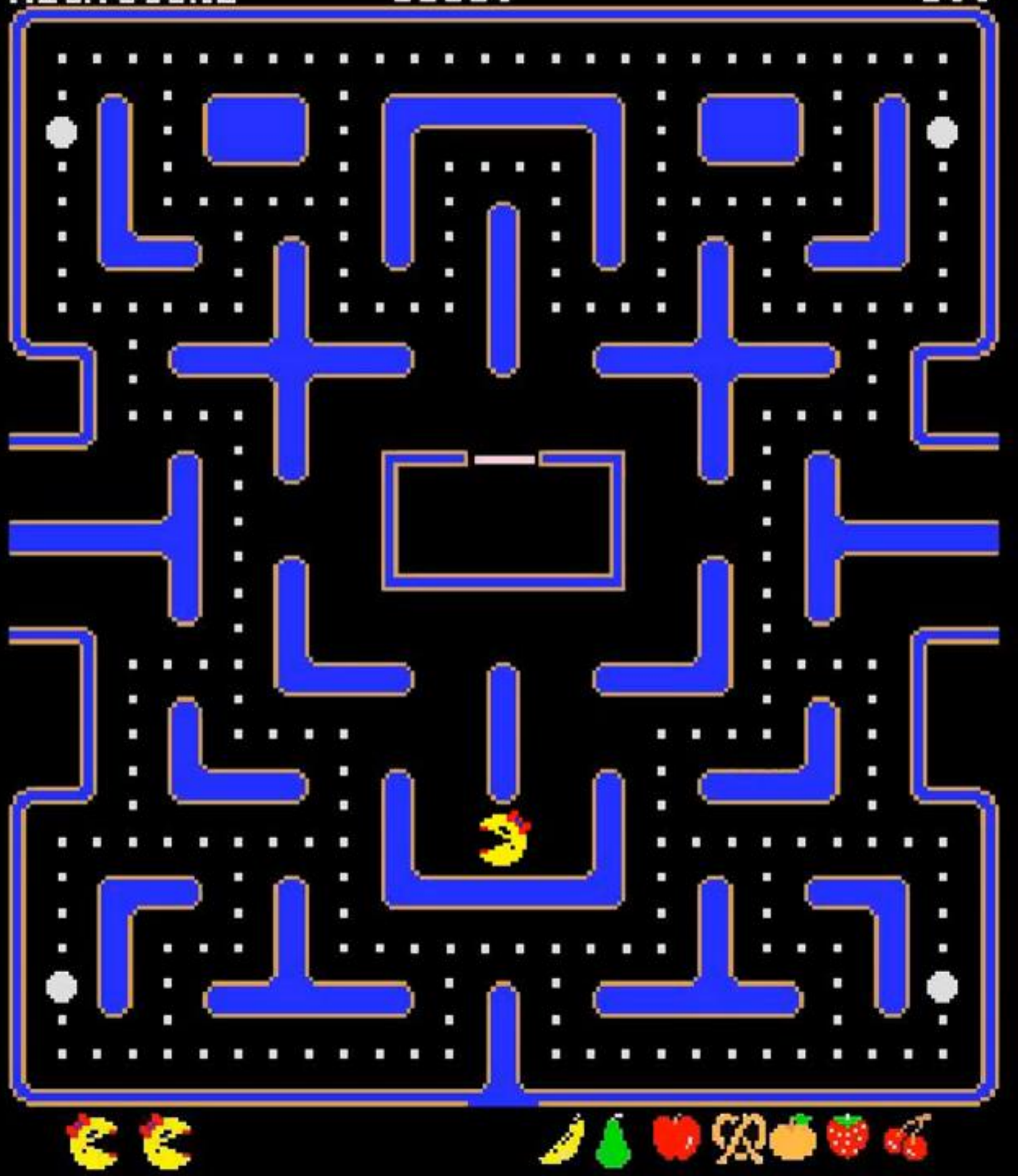
LOWE'S

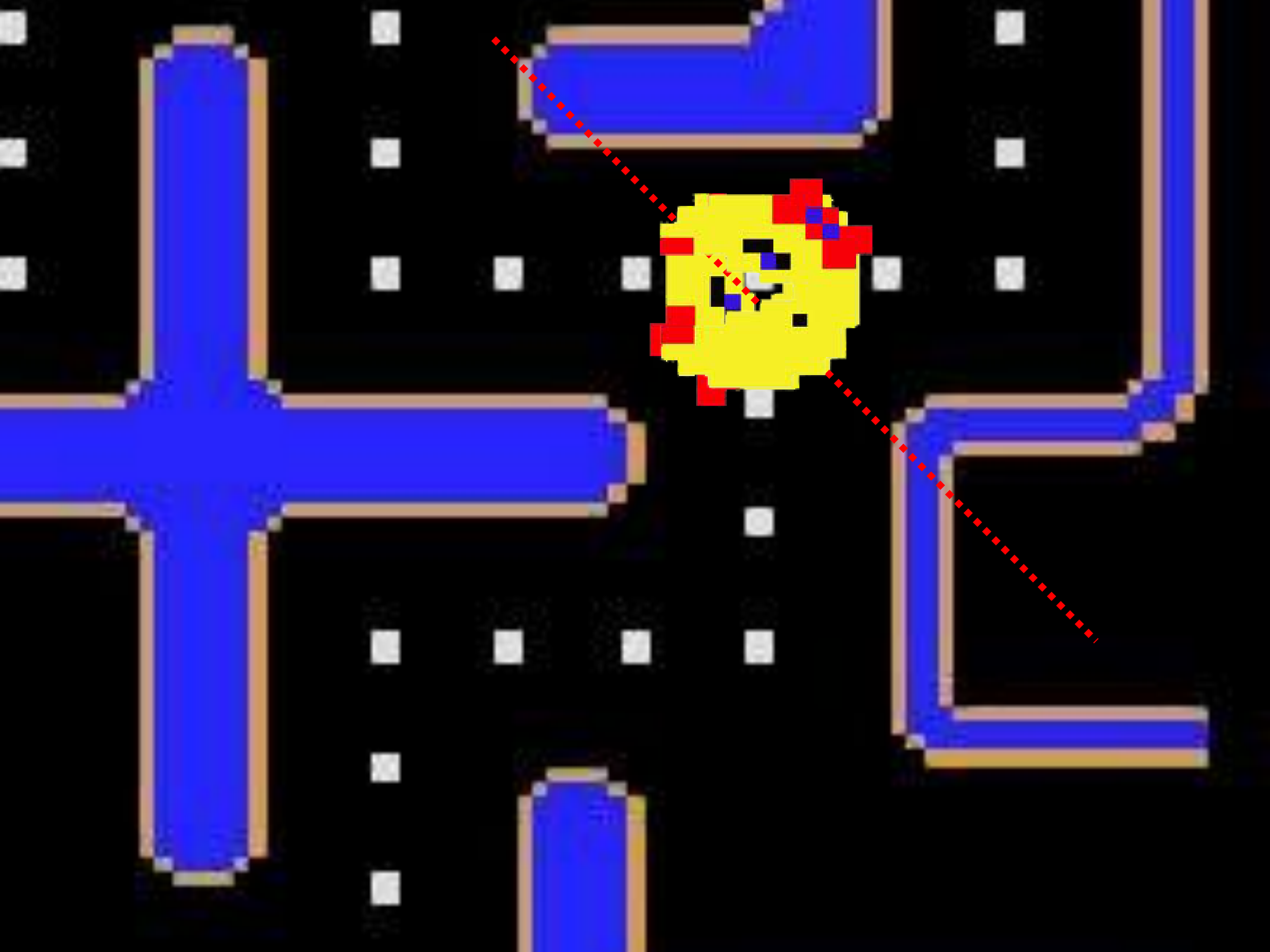

American Standard
Item | Artículo: 88575
Model | Modelo: 2514.101.020
Clean™ Cadet® 3
Overall dimensions: 15-3/4 in W x 30-3/4 in H x 30-1/4 in D
Rough-in dimensions: 12 in
Trapway size: 2-1/16 in
Dimensiones generales: 40,01 cm de ancho x 78,11 cm de alto x 76,84 cm de profundidad
Dimensiones aproximadas: 30,48 cm
Tamaño de canal de sifón: 5,24 cm
• Smooth-sided toilet design
• Stays cleaner longer with EverClean® surface & PowerWash™ flush
• Features No Tools™ installation
• ADA approved chair height
• Diseño de inodoro de lados lisos
• Permanece limpio por más tiempo con la superficie EverClean® y la descarga PowerWash™
• Cuenta con instalación No Tools™
• Altura de silla aprobada por ADA
Elongated
Alargada
18.5 in
46,99 cm
Chair Height
Altura de silla
16.5 in
41,91 cm
10 Year Año
Limited Warranty
Garantía limitada
$239
Everyday Low Price
ASD CLEAN CADET3 EL CH 1.28GPF
AISLE 40 W
BAY
LOC 5
Item # 88575
WaterSense
Meets EPA Criteria
Certified by IAPMO R&T
Reorder # P117363

Problem Solving Process

- What do you do when students don't use the strategy you anticipated they would use?
- What do you do when a student comes up with a strategy for solving the problem that I do not understand?

HIGH SCORE 36550 800





USA

Problem Solving Process

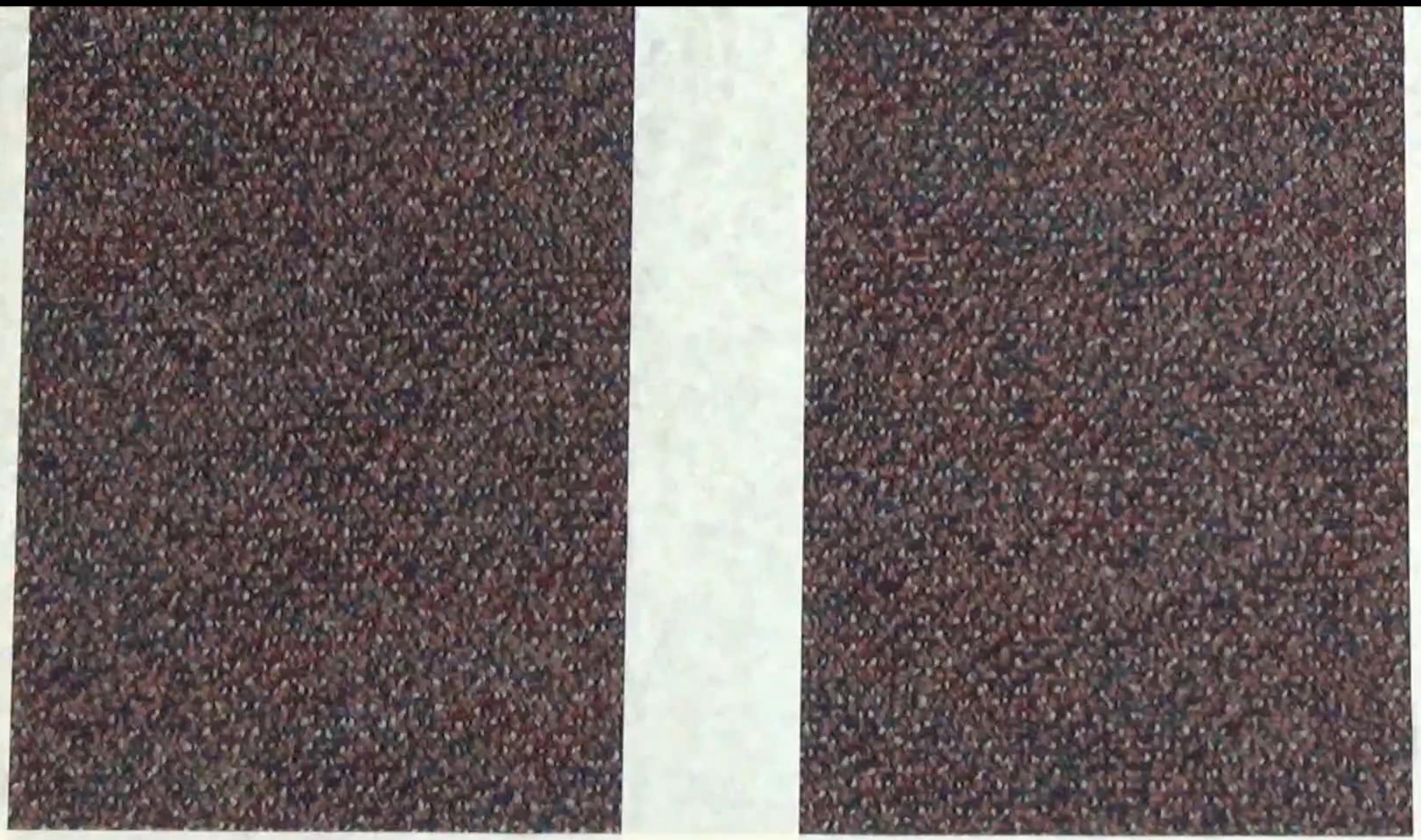
- What do you do when students don't use the strategy you anticipated they would use?
- What do you do when a student comes up with a strategy for solving the problem that I do not understand?
- What do you do when the answer we calculate does not match with the actual answer?
- What do you do when students get stuck during the problem solving process and are not sure what to do?

NON-STAGGERED

STAGGERED

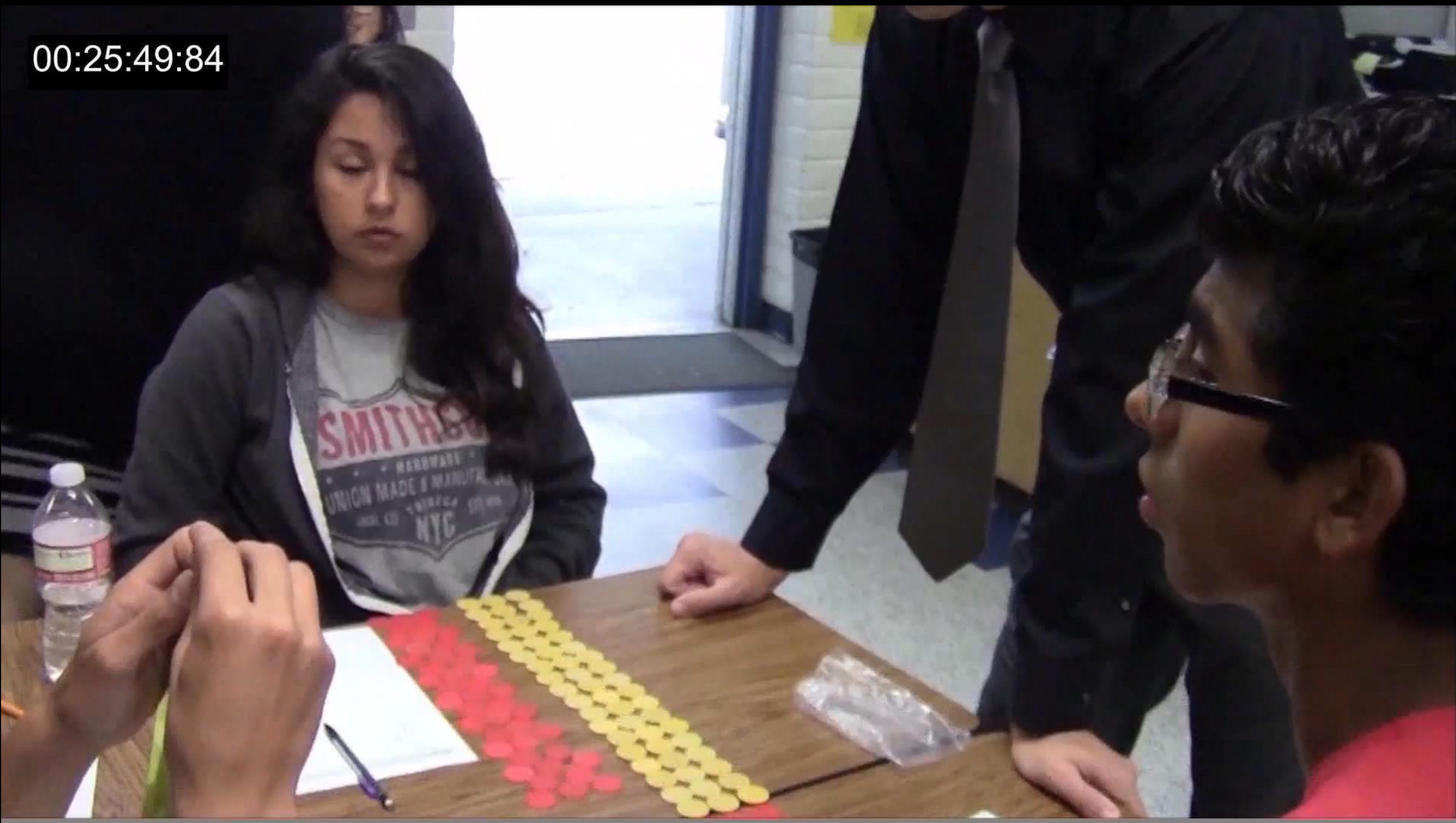
How much shorter are 20 layers of staggered pipe stacks?

1cm 2 3 4 6 7 8 9 10



Layers: 0

00:00:00:00


00:25:49:84
SMITH
HARDWARE
UNION MADE
NYC

Problem Solving Process

- What do you do when students don't use the strategy you anticipated they would use?
- What do you do when a student comes up with a strategy for solving the problem that I do not understand?
- What do you do when the answer we calculate does not match with the actual answer?
- What do you do when students get stuck during the problem solving process and are not sure what to do?
- What do you do when you ask students questions and few to no people are ready to respond?

00:32:29:68

Problem Solving Process

- What do you do when students don't use the strategy you anticipated they would use?
- What do you do when a student comes up with a strategy for solving the problem that I do not understand?
- What do you do when the answer we calculate does not match with the actual answer?
- What do you do when students get stuck during the problem solving process and are not sure what to do?
- What do you do when you ask students questions and few to no people are ready to respond?
- What do you do when the student conclusions are low quality and/or effort?

20% OFF

FOR LOCATIONS NEAREST YOU
visit bedbathandbeyond.com
and click on Store Locator or call
1-800-GO BEYOND®
(1-800-462-3966)

BED BATH & BEYOND®
Beyond any store of its kind.®
Offices: 650 Liberty Ave., Union, NJ 07083

PRSRT STD
U.S. POSTAGE
PAID
BED BATH &
BEYOND

Take 20% off one single item.
Present this coupon.

10157 73283 94566 13028
Also excludes Starbucks
Also excludes Dyson vacuums and Miele

Valid for in-store use only. Copies not accepted. Limit one coupon, Savings Certificate, special offer or discount (including price match) per item. Coupon must be surrendered at time of purchase; any return of purchase will reduce your savings proportionally. The discount cannot be applied to gift cards, shipping, or sales tax. Offer excludes the following: Alessi, Arthur Court, Breville®, Britto™ Collection, Brookstone®, DKNY, kate spade, Kenneth Cole Reaction Home, Kosta Boda, Le Creuset®, Lladró®, Monique Lhuillier, Nambe®, Nautica®, Orrefors, Riedel, Shun, Starbucks® Electrics, Swarovski, T-Tech, Vera Wang®, Victorinox Luggage, Vitamix, Waterford®, Wusthof®, or Zwilling; Argington®, babybrezza™, Baby Jogger™, BÉABA®, BOB, Bugaboo, Bumbleride™, ERGObaby®, Foundations®, iCandy®, Maxi-Cosi®, Mountain Buggy, Oeuf, Orbit Baby™, Peg Pérego®, Phil & Teds®, Plan Toys®, Quinny®, Svan®, Teutonia®, Under Armour®, UPPAbaby®, baby furniture, diapers, wipes, formula, baby food or portrait studio services.

G47QR-V2

BBC31313

$5 OFF

FOR LOCATIONS NEAREST YOU
visit bedbathandbeyond.com and
click on Store Locator or call
1-800-GO BEYOND® (1-800-462-3966)

VALID FOR IN-STORE USE ONLY.

BED BATH & BEYOND®
Beyond any store of its kind.®
OFFICES: 650 LIBERTY AVENUE, UNION, NJ 07083

PRSRT STD
U.S. POSTAGE
PAID
BED BATH & BEYOND

any purchase of $15 or more.
Present this coupon.

16150 81283 94566 13112
Also excludes Dyson vacuums and Miele

Valid for in-store use only. Copies not accepted. Limit one coupon, Savings Certificate, special offer or discount (including price match) per item. Coupon must be surrendered at time of purchase; any return of purchase will reduce your savings proportionally. The price of gift cards, shipping, or sales tax are not counted toward any minimum purchase required, and coupon cannot be applied to such items. Offer excludes the following: Alessi, Arthur Court, Breville®, Britto™ Collection, Brookstone®, DKNY, kate spade, Kenneth Cole Reaction Home, Kosta Boda, Le Creuset®, Lladró®, Monique Lhuillier, Nambe®, Nautica®, Orrefors, Riedel, Shun, Swarovski, T-Tech, Vera Wang®, Victorinox Luggage, Vitamix®, Waterford®, Wusthof®, or Zwilling; Baby Brezza®, Baby Jogger™, BÉABA®, BOB, Bugaboo, Bumbleride™, Destination Maternity®, ERGObaby®, Foundations®, Maxi-Cosi®, Mountain Buggy, Oeuf, Orbit Baby™, Peg Pérego®, Petunia Pickle Bottom®, Phil & Teds®, Quinny®, Svan®, Teutonia®, Under Armour®, UPPAbaby®, baby furniture, diapers, wipes, formula, baby food or portrait studio services.

Ver. 1

What is your conclusion? How did you reach that conclusion?

IA conclusion each conclusion Each Item is good for different Items

instore purchace, exclusions

What is your conclusion? How did you reach that conclusion?

If the Item is $15 use the $5 off because

15-5 = $10 and
15 - 20% = $12

If the Item is $47 it is better to use the 20% off coupon because

47 - 5 = $42 ($5 off) 47 - 20% = 37.60 (20% off)

42 vs 37.60

$5 off 20% off
18 vs 18.40

23 - 5 = 18

23 - 20% = 18.40

	Orange Chicken	5.25	
	Chicken Lo Mein	5.25	
	Cashew Nut Chicken	5.25	
🌶	Pungent Chicken	5.25	
	Sweet & Sour Chicken	5.25	
	Curry Chicken	5.25	
	Lemon Chicken	5.25	
	Vegetable Chicken	5.25	
	Mongolian Beef	5.25	
	Broccoli Beef	5.25	
🌶	Pungent Beef	5.25	
	Sweet & Sour Pork	5.25	

🌶	Eggplant with Garlic Sauce	5.25
🌶	Ma Po Tofu	5.25
🌶	Broccoli with Garlic Sauce	5.25
🌶	String Bean with Garlic Sauce	5.25
	Vegetable Delight	5.25
	Bamboo Fungus Tofu	5.25
	Shrimp with Asparagus	6.25
	Shrimp with Lobster Sauce	6.25
🌶	Fish Fillet with Szuchuan Sauce	6.25
🌶	Fish Fillet with Black Bean Sauce	6.25
	Crab meat with Asparagus	6.25
	Sweet & Sour Shrimp	6.25

FREE ORANGE CHICKEN WITH COUPON
with purchase from $50+tax/up
Not redeemable on lunch & special dinners & party items or with any other coupon
exp. 3/31/07

FREE CHICKEN LO MEIN WITH COUPON
with purchase from $25+tax/up
Not redeemable on lunch & special dinners & party items or with any other coupon
exp. 3/31/07

FREE Cheese Wonton WITH COUPON
with purchase from $25+tax/up
Not redeemable on lunch & special dinners & party items or with any other coupon
exp. 3/31/07

10% OFF WITH COUPON
with purchase from $20+tax/up
Not redeemable on lunch & special dinners & party items or with any other coupon
exp. 3/31/07

10% OFF WITH COUPON
with purchase from $20+tax/up
Not redeemable on lunch & special dinners & party items or with any other coupon
exp. 3/31/07

Free ~~lo~~ chicken lomein
if spended $25 and not redeemable
on lunch, special dinners and
Party Items

and chicken to main.

What is your conclusion? How did you reach that conclusion?

The 10% coupon is best with high Prices and small orders is best with the free chicken lomein or chesse wonton

What is your conclusion? How did you reach that conclusion?

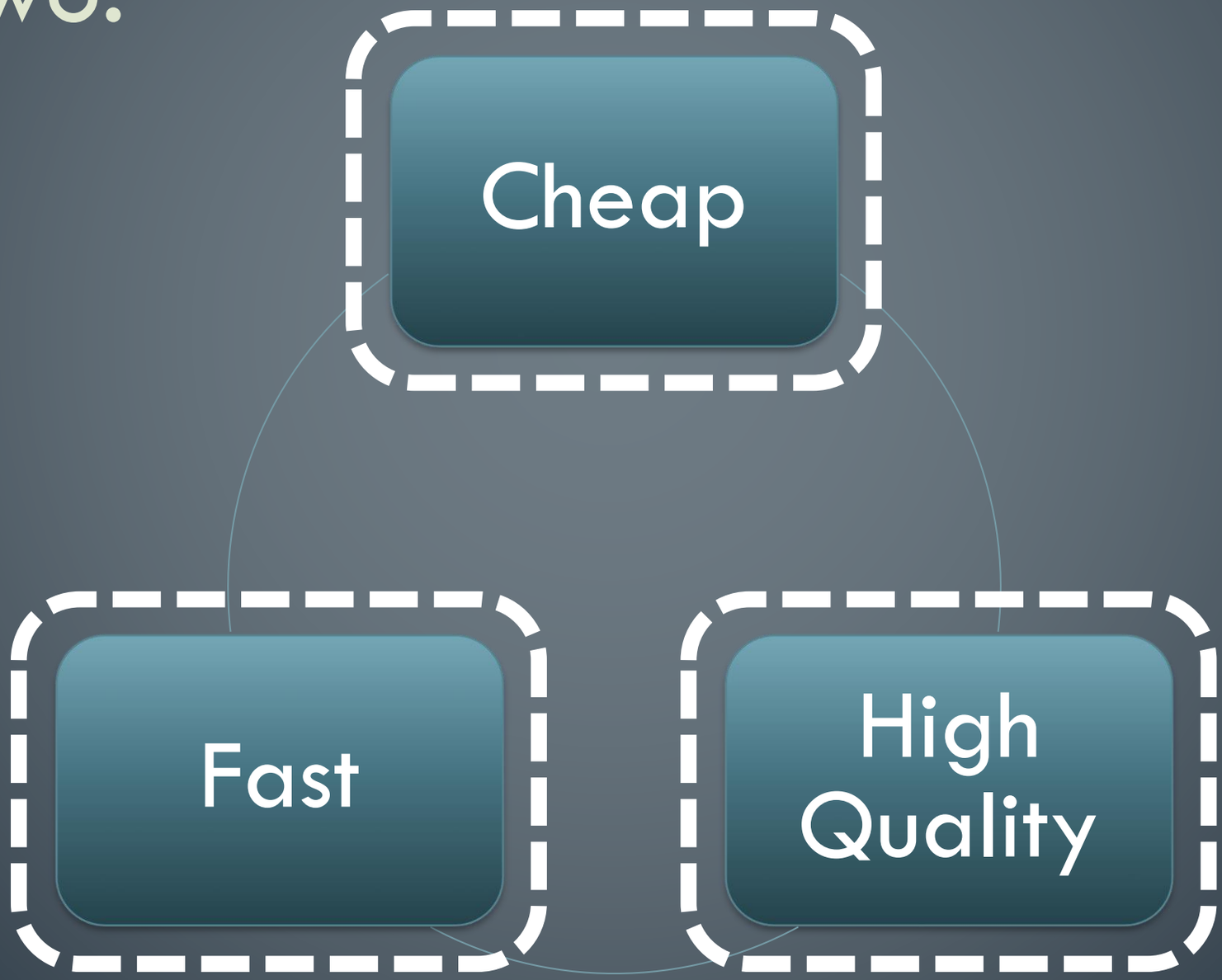
You can use the 10% off when you pay 20-24.99 or more the Free chicken LoMein when you pay 25-49.99 or more and the Free orange Chiken when you pay 50 or more

Goals

- Engaging problem solving
  - Real world problem-based learning
  - Higher depth of knowledge problems
- Better implementation
  - Improve our ability to ask questions
  - Practice preparing to implement a lesson
  - Figure out how to deal with uncomfortable situations

Construction

- Pick two:

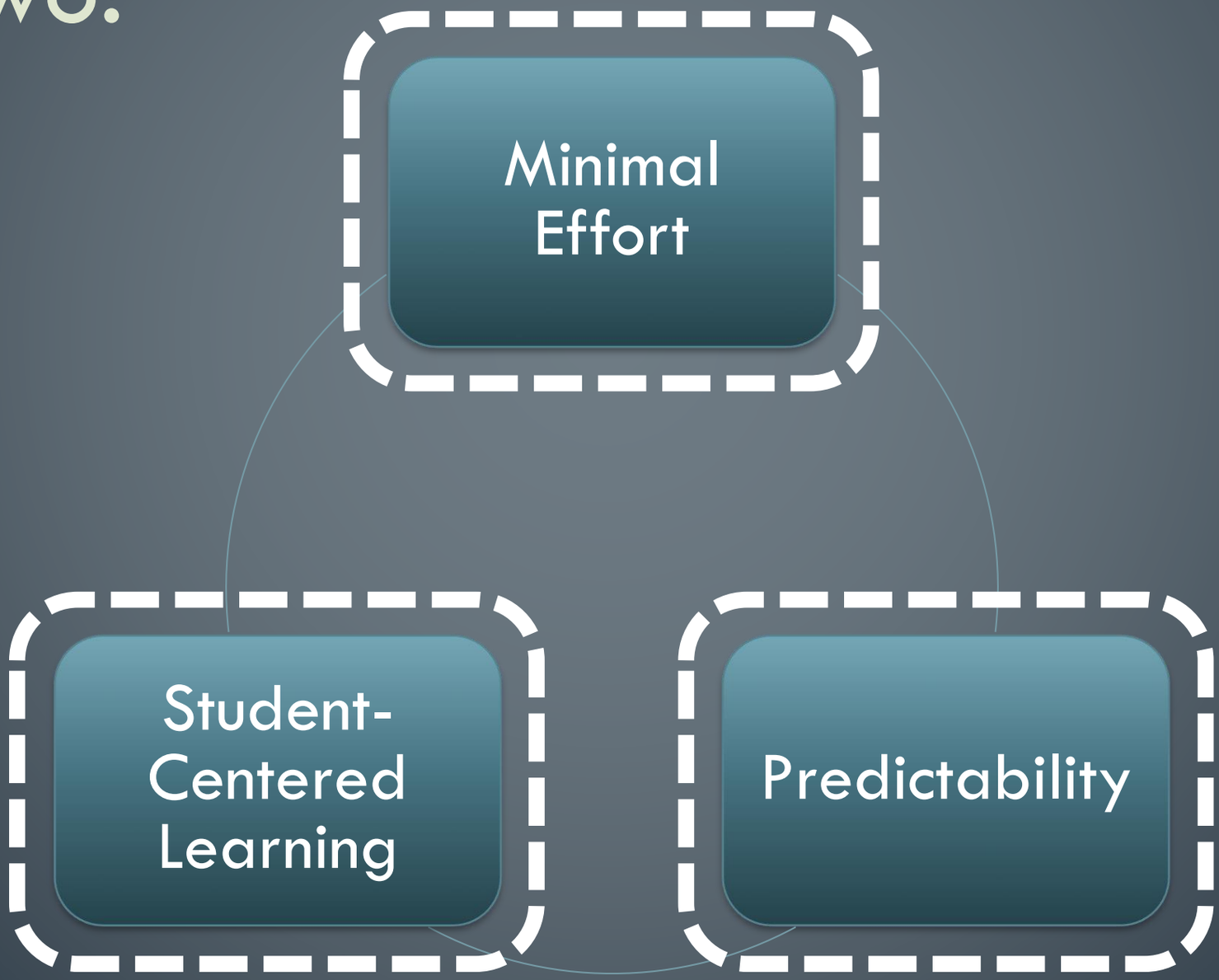


Family

- Pick two:

Problem-Based Learning

- Pick two:



Contact

Robert Kaplinsky

robert@robertkaplinsky.com

robertkaplinsky.com

@robertkaplinsky

wsd16