

Sudbury Public Schools

February 10th, 2016

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Parking Lot

+
positive

▲
change

?
**not sure
going
forward**



ah-ha!

- Designate a shape keeper
- 6 congruent squares
- No shapes left over
- Everyone is encouraged to OFFER. No one may TAKE. They may ACCEPT a puzzle piece to use if OFFERED.



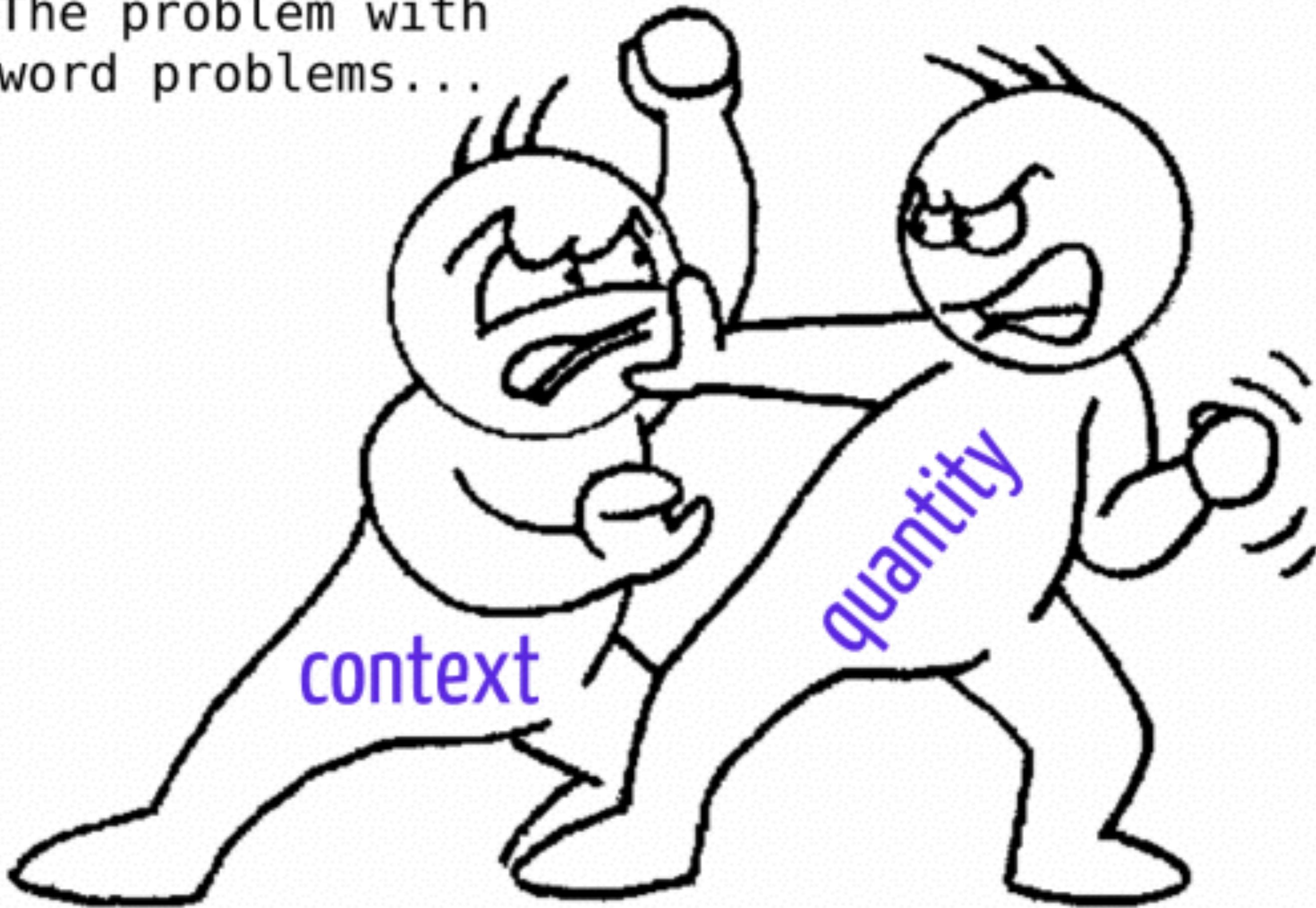


Joe had some playing cards in his bag. Ashley gave him 13 more cards. Joe now has 21 cards. How many cards did Joe have in his bag?

13

21

The problem with word problems...



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more cards. Joe now has
cards. How many cards did Joe
have in his bag?

3-ACT Tasks

DATE

PROD.CO.

DIRECTOR



What do you notice?

What do you wonder?

? Wonders ? ?

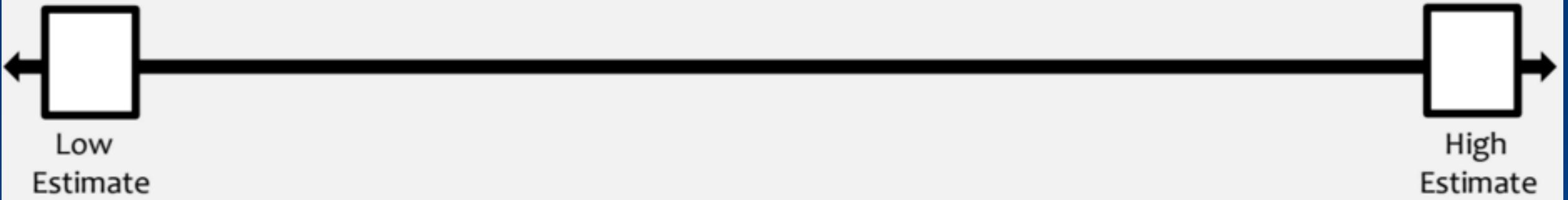
? How many Whoppers are in the jar? ?

How many Whoppers are in each pack?

How many packs of Whoppers did they use?

Why are the Whoppers in the jar?

4. Estimate



Name: _____

Date: _____

1. What did you notice?

he put more and more woppers
in the jar.

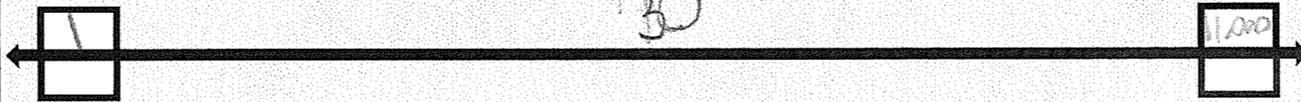
2. What do you wonder?

how many woppers are in each pack?

3. Main Question:

how many woppers are in the
jar

4. Estimate



Low
High
Estimate
Estimate

place your best estimate on the number line and label

5. What information would you like to know?

how many woppers are in each
pack



Questions

Packages Used



The number of Whoppers that come in a package



3 minutes

individual work time



What Standards for Mathematical Practice did we just engage in?

Standards for Mathematical Practice

Mathematically Proficient Students can.....

1. Make sense of problems and persevere in solving them

- doing mathematics means solving problems and discussing how they solved them
- plan a solution pathway and adjust as needed as they work through the problem
- persevere ("First, I drew a diagram, and it didn't help, so I tried to make a table. That worked much better because I found a pattern.")
- explain thinking through equations, verbal descriptions, tables, graphs, diagrams and search for trends in data

2. Reason abstractly and quantitatively

- numbers represent quantities and these quantities can be represented with symbols
- generalize based on what they observe
- "I know that rectangles are parallelograms with four right anglesso that means this square must be a rectangle because . . ."

3. Construct viable arguments and critique the reasoning of others

- make conjectures with support and reason through the use of objects, drawings, diagrams and actions
- ask and respond to questions like, "How did you get that?" and "Why is that true?"

4. Model with mathematics

- put mathematics in the context of real world situations and identify those relationships
- use organizational strategies such as making a table, creating a number line, drawing diagrams, use objects, etc.

5. Use appropriate tools strategically

- use familiar, grade appropriate tools and know when they can be helpful
- recognize both the strengths and limitations of the tool being used

6. Attend to precision

- communicate precisely to others through my language, models and representations
- calculate accurately and efficiently, and show flexibility with strategies

7. Look for and make use of structure

- look closely at patterns and structure
- identify and understand the make-up and inclusion of number (commutative and distributive properties)

8. Look for and express regularity in repeating reasoning

- continually evaluate the reasonableness of intermediate results ("I notice when I divide 4 by 11, I get 0.36, then I keep dividing the same numbers over and over.")
- students continually check their work by asking themselves, "Does this make sense?"



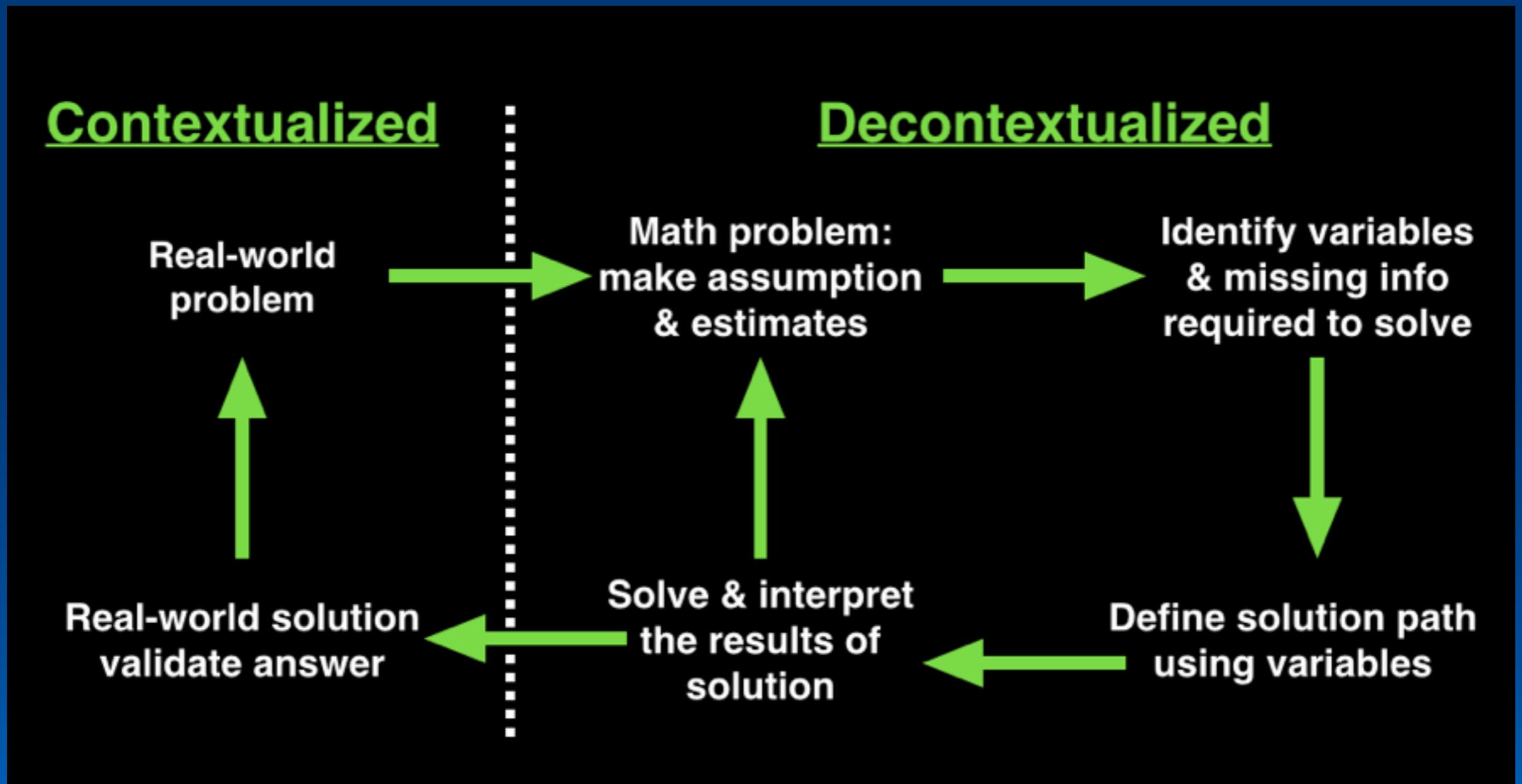
Model with Mathematics

Mathematically proficient students can apply the mathematics they know to **solve problems arising in everyday life**, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. Mathematically proficient students who can apply what they know are comfortable **making assumptions and approximations** to simplify a complicated situation, realizing that these may need revision later. They are able to **identify important quantities** in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can **analyze those relationships** mathematically to draw conclusions. They routinely **interpret their mathematical results** in the context of the situation and **reflect on whether the results make sense**, possibly improving the model if it has not served its purpose.

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#4 Model with Mathematics in the Elementary Grades

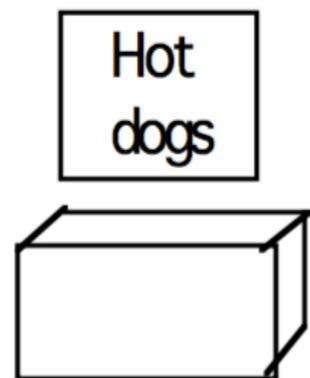


Five Representations of Functions

Language

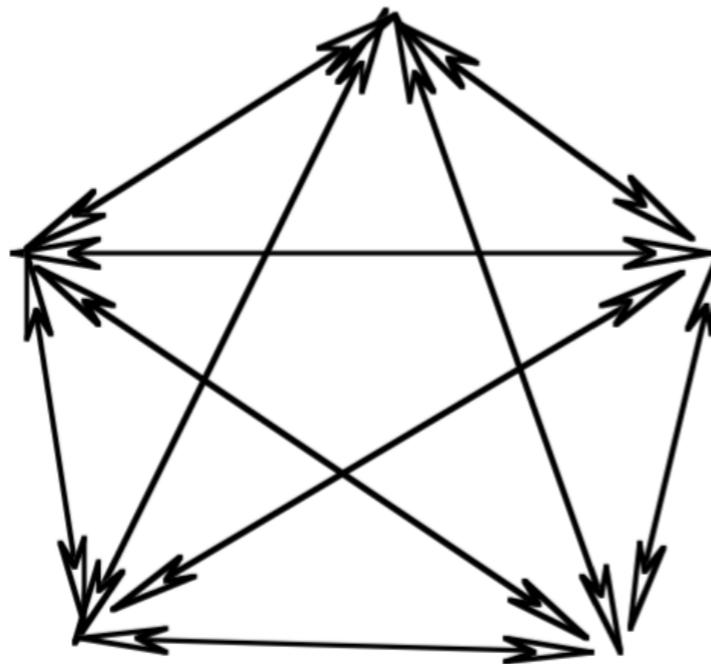
The amount of profit that can be made selling hot dogs is a function of the number of hot dogs that are sold.

Context

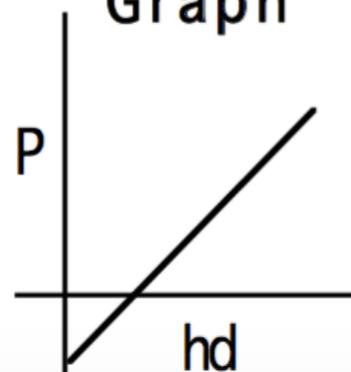


Table

hd	P
0	-35
100	30
200	



Graph



Equation

$$P = .65H - 35$$

5 Practices for Orchestrating Productive Mathematics Discussions

Peg Smith's Article

The **5** practices are:

1. **Anticipating** student responses to challenging mathematical tasks;

Anticipate student solutions for the Whopper Jar task.

Identify and record the types of strategies students will use to solve the task.

The **5** practices are:

1. **Anticipating** student responses to challenging mathematical tasks;
2. **Monitoring** students' work on and engagement with the tasks;
3. **Selecting** particular students to present their mathematical work;
4. **Sequencing** the student responses that will be displayed in a specific order and;
5. **Connecting** different students' responses and connecting the responses to key mathematical ideas.

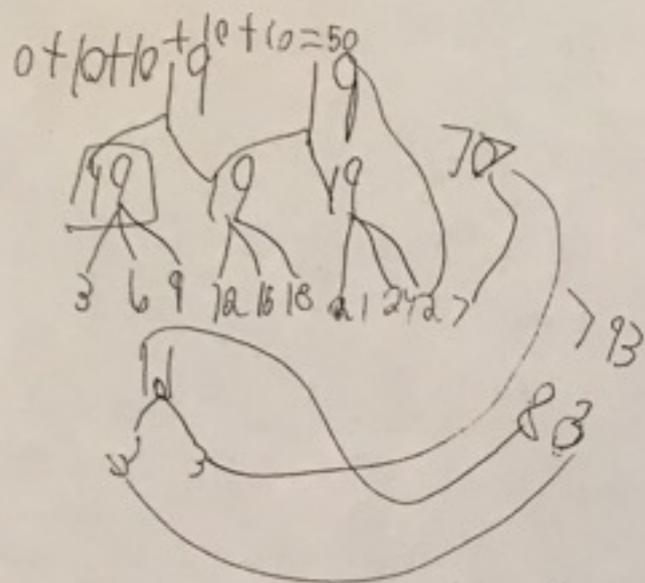
Task Planning Document

Task:		
Misconceptions:		
Strategy	Who and What (highlight)	Order

Anticipating → Monitoring → Selecting → Sequencing → Connecting

5 Moves Planning

- Look at the student work samples
- Select the solutions you want to highlight in the closing
- Sequence how you'll share them
- Discuss the connection focus you're after



Show your work

He put three Whoppers
in the jar 55c
that was a little
spas.

23

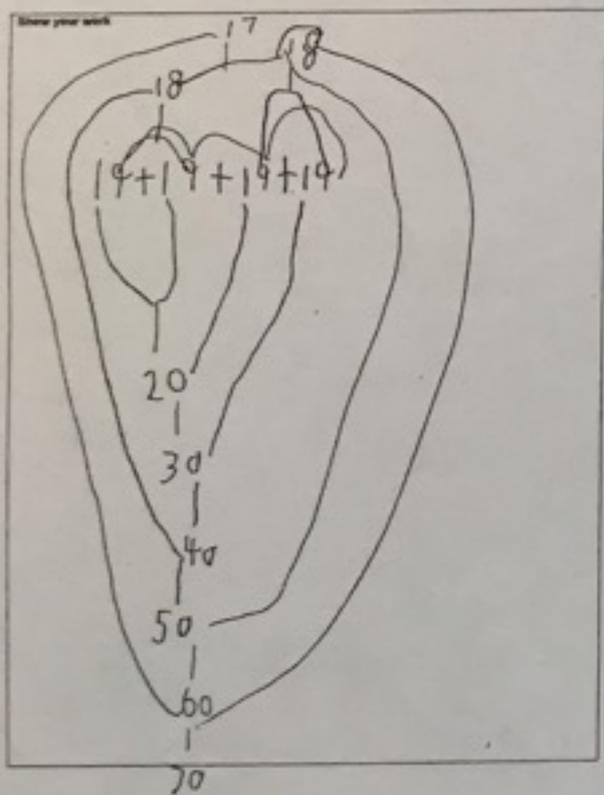
Show your work

$19 + 19 = 38 + 19 = 57 + 19 = 76 + 3 = 79$

Show your work

$19 + 19 = 38$
 $19 + 19 = 38$
 $+ 19 =$
I know
 $19 + 19 = 38$
and then
I use my
number
chart and
I started
on 38 and
counted
on 38 to
get
76.

Answer
76



Show your work

$28 + 28$

$19 + 19 = 28$

Show your work

$9 + 9 + 9 + 9$
 $8 + 8 = 16$
 $16 + 50$
 $10 + 60 = 70$
 $70 + 5 = 75$
 $75 + 3 = 78$

$19 + 19 + 19 + 19$
 $10 + 10 = 20$
 $40 + 10 = 50$
 $50 + 10 = 60$
 $60 + 3 = 63$

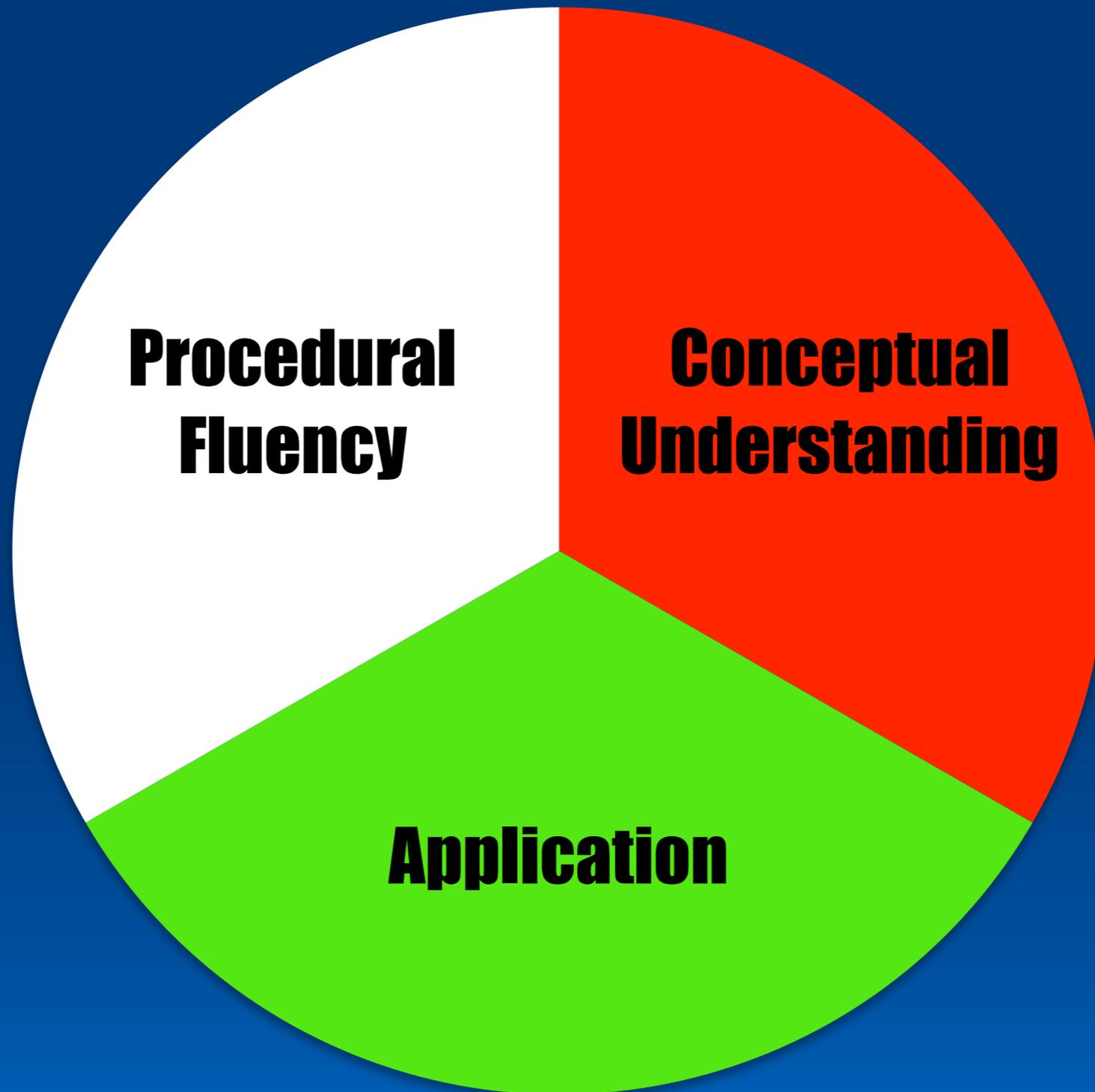
$19 + 19 + 19 + 19$
 $10 + 10 = 20$
 $40 + 10 = 50$
 $50 + 10 = 60$
 $60 + 3 = 63$

Show your work

$40 + 9 = 49$
 $49 + 9 = 58$
 $58 + 9 = 67$
 $67 + 9 = 76$

Most asked questions:

- How often should we use 3-Act Tasks?
- When should we use 3-Act tasks? How do they fit into the scope of a unit?
- How long does one task usually take?
- What if we don't have the time?
- Any others?



**Procedural
Fluency**

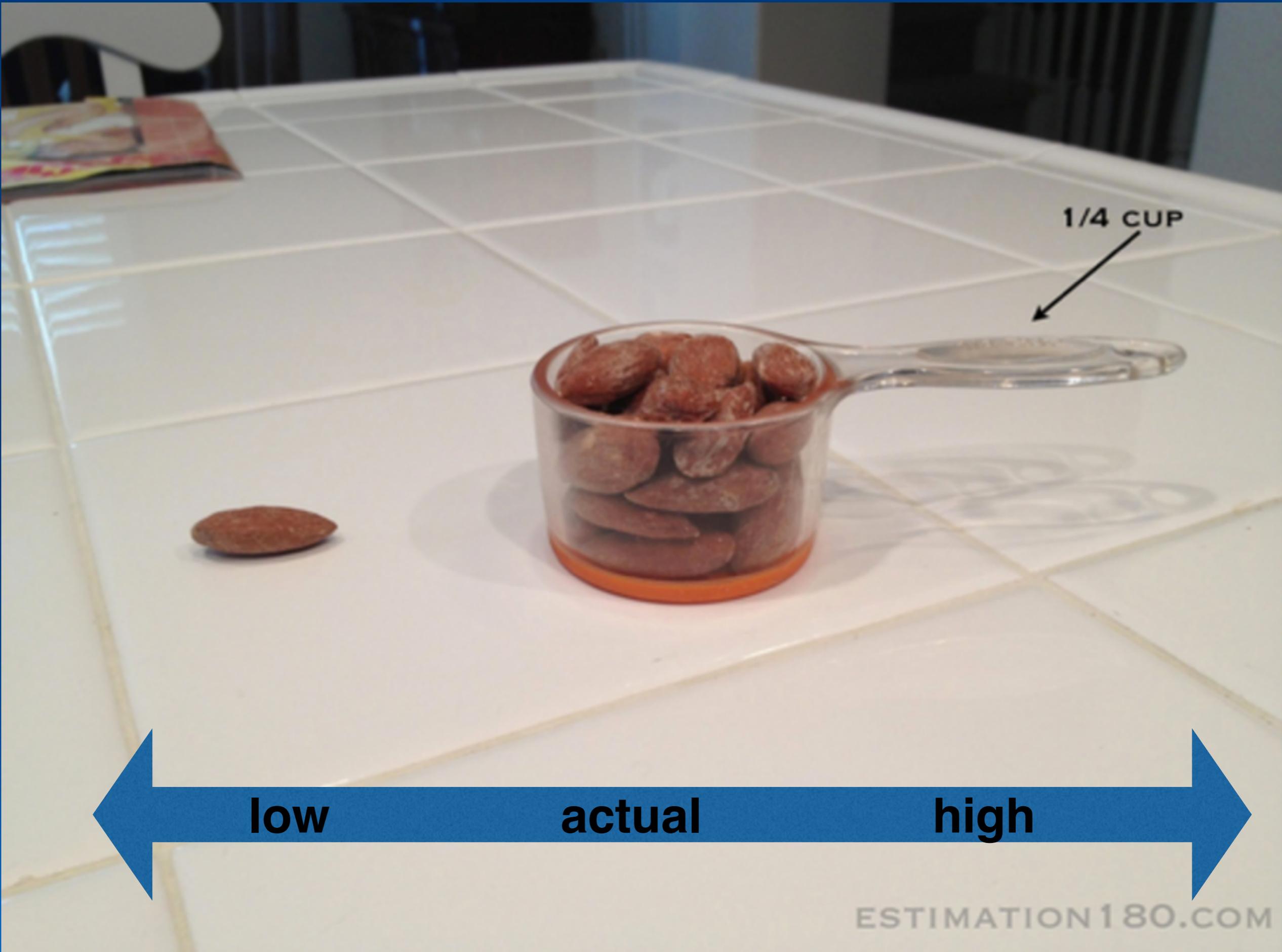
**Conceptual
Understanding**

Application

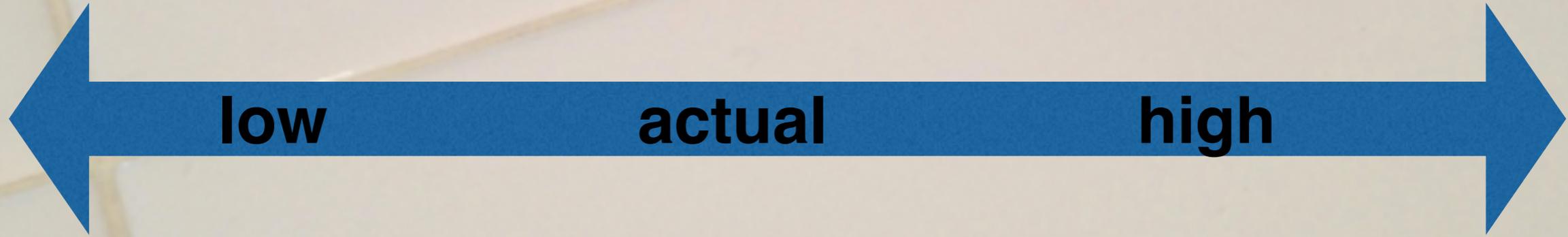
$$\begin{array}{r} 50\boxed{}6 \\ - \boxed{}48\boxed{} \\ \hline 16\boxed{}8 \end{array}$$

The Spinning Dancer

Got SMIPs ????



1/4 CUP



low

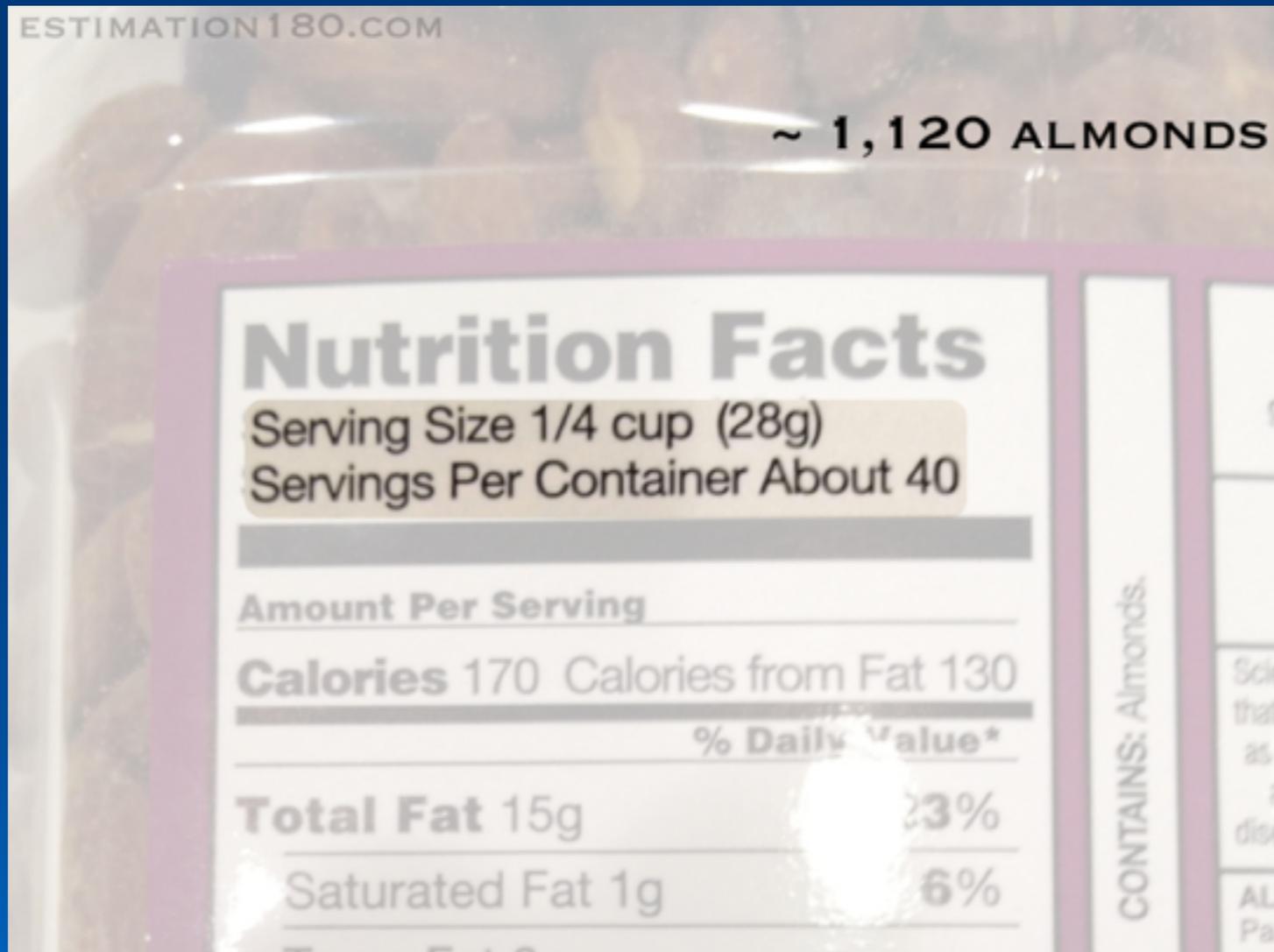
actual

high





Building number sense one day at a time.



www.esteemation.com

Becoming a good estimator takes practice

What are you currently doing to promote number sense through estimation in your classroom?

Estimation Station



ANISHA
21

Emma
20

Kirsten
14

Reginald
1002

LAWSON
16

Jimiyah
20

20

Blake
19

Thaddeus
200

Evan
20

Delia
20

28

Jay
20

Trianna
1100

Arman tee
100

RDBE
100

malayah
20

Hunter
15

Sammy
30

Abdul



estimation jar

Jan
Larsen
ADLE
20
Del in
20
REJANK
1002
30
Kirsten
14
Blake
19
Thaddeus
200
Jimish
20
32

16 100 20 20 1002 50 14 19 200 20 32

Sammy

30

ARISM

21

Emma

20

E. Jain

20

91K

20

malayah

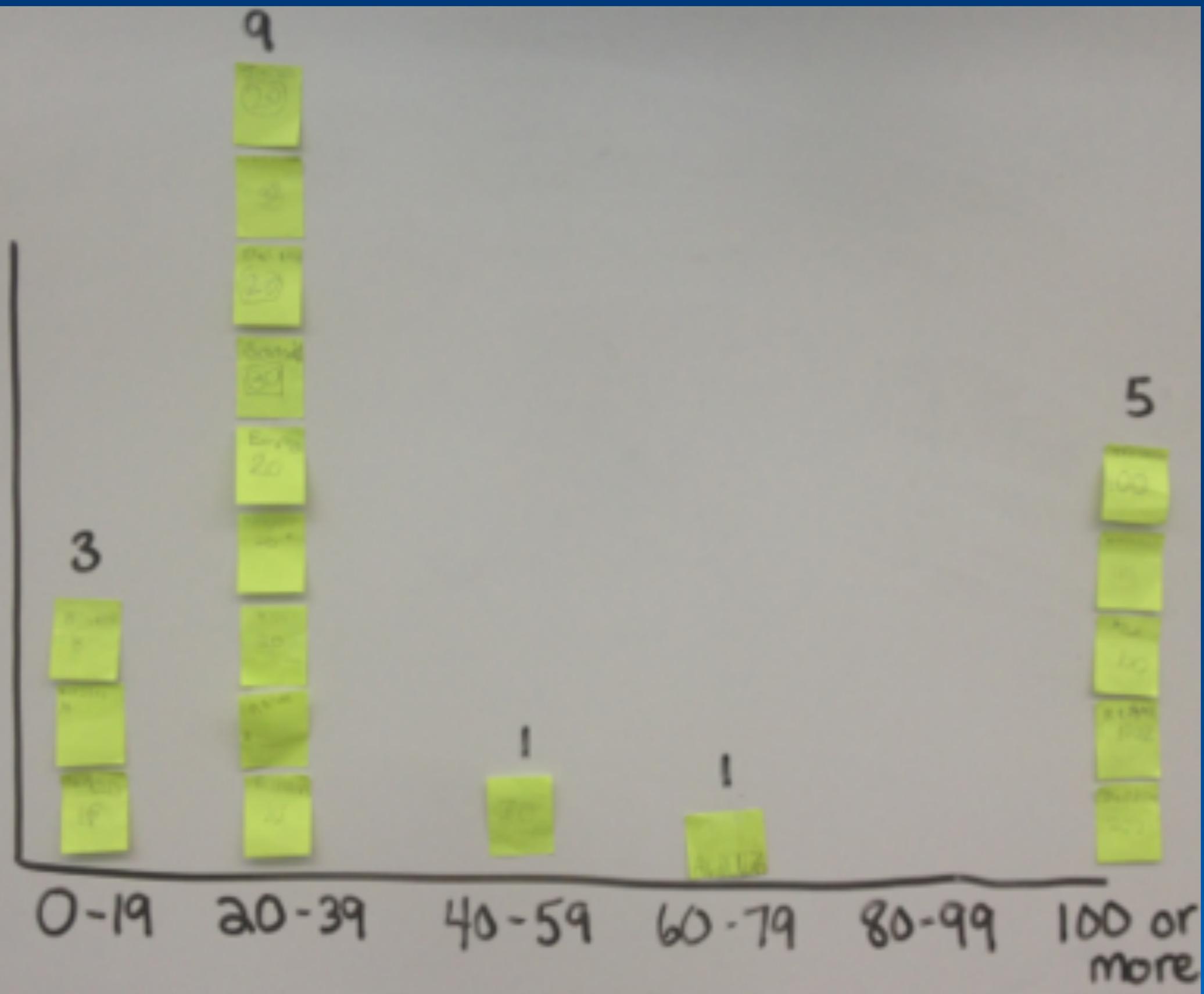
20

Delicon

20

Jimitah

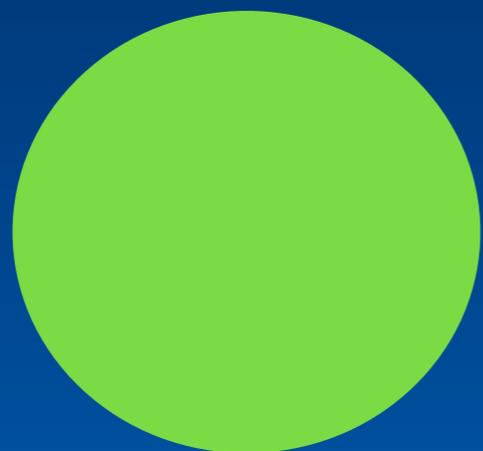
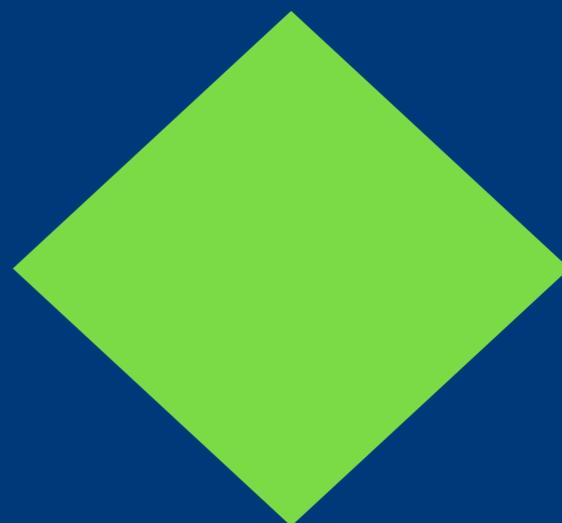
20





The 1-Minute Challenge

Got SMIPs ????



9

16

25

43

Got SMIPs ????

Directions: Create the closest possible sum to 100 by filling in the boxes using the whole numbers 1-9 no more than one time each.

<input type="text"/>	<input type="text"/>	+	<input type="text"/>	<input type="text"/>	+	<input type="text"/>	<input type="text"/>
----------------------	----------------------	---	----------------------	----------------------	---	----------------------	----------------------

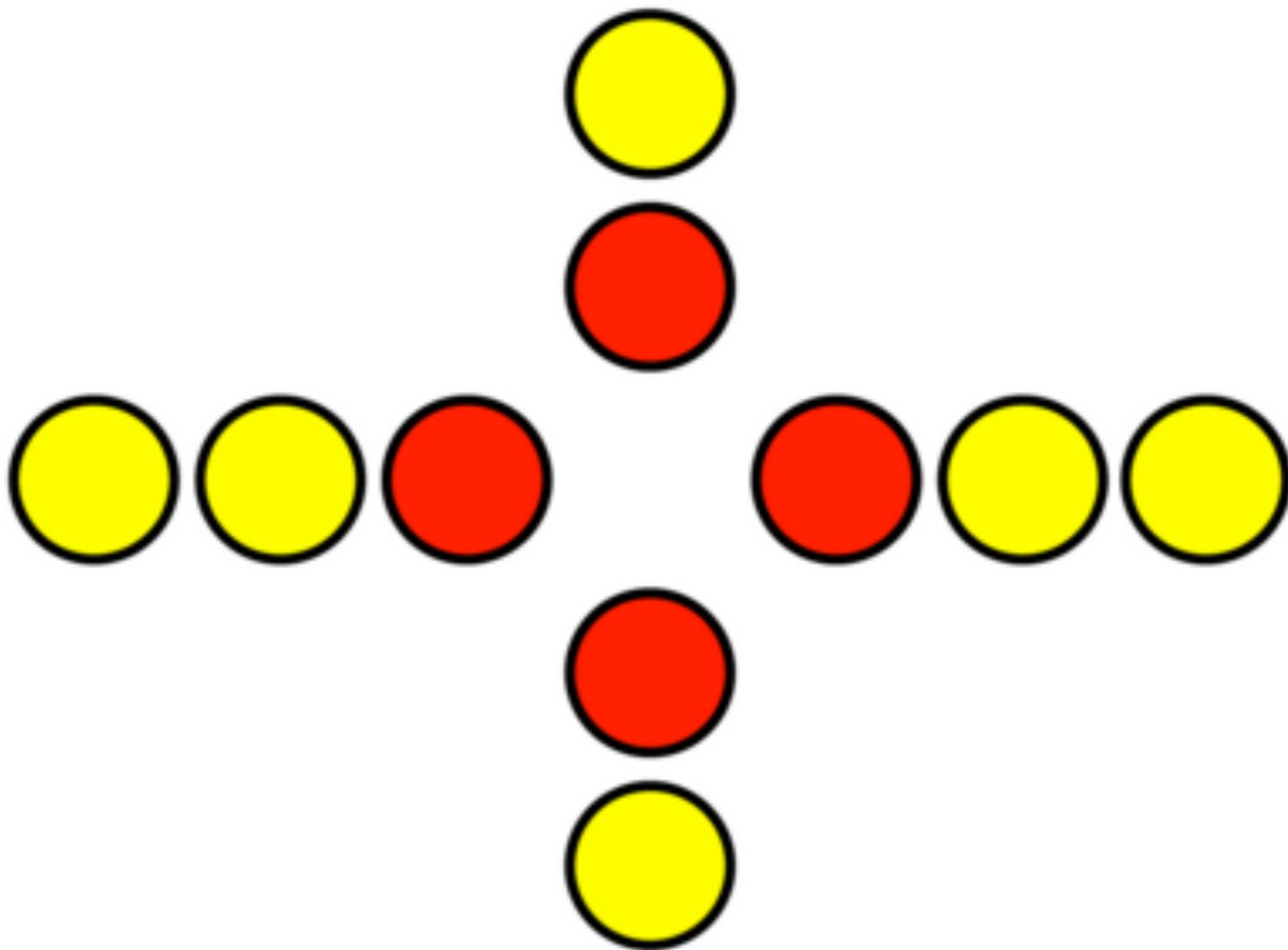
OPEN MIDDLE

Directions: Place any digit, 0 through 9, in the boxes below to make a true statement. Each digit can only be used once.

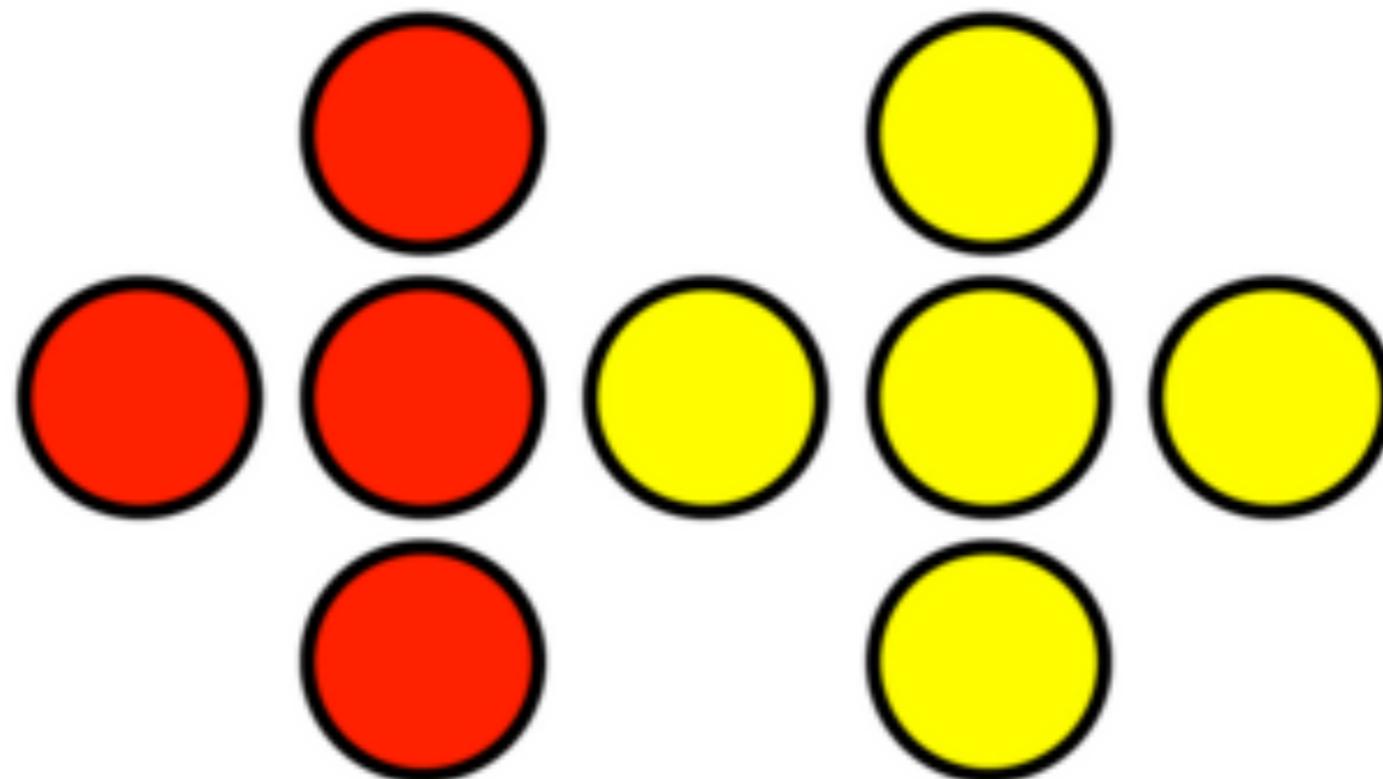
$$\square + \square = \square + \square = \square + \square = \square - \square = \square + \square$$

Got SMIPs ????

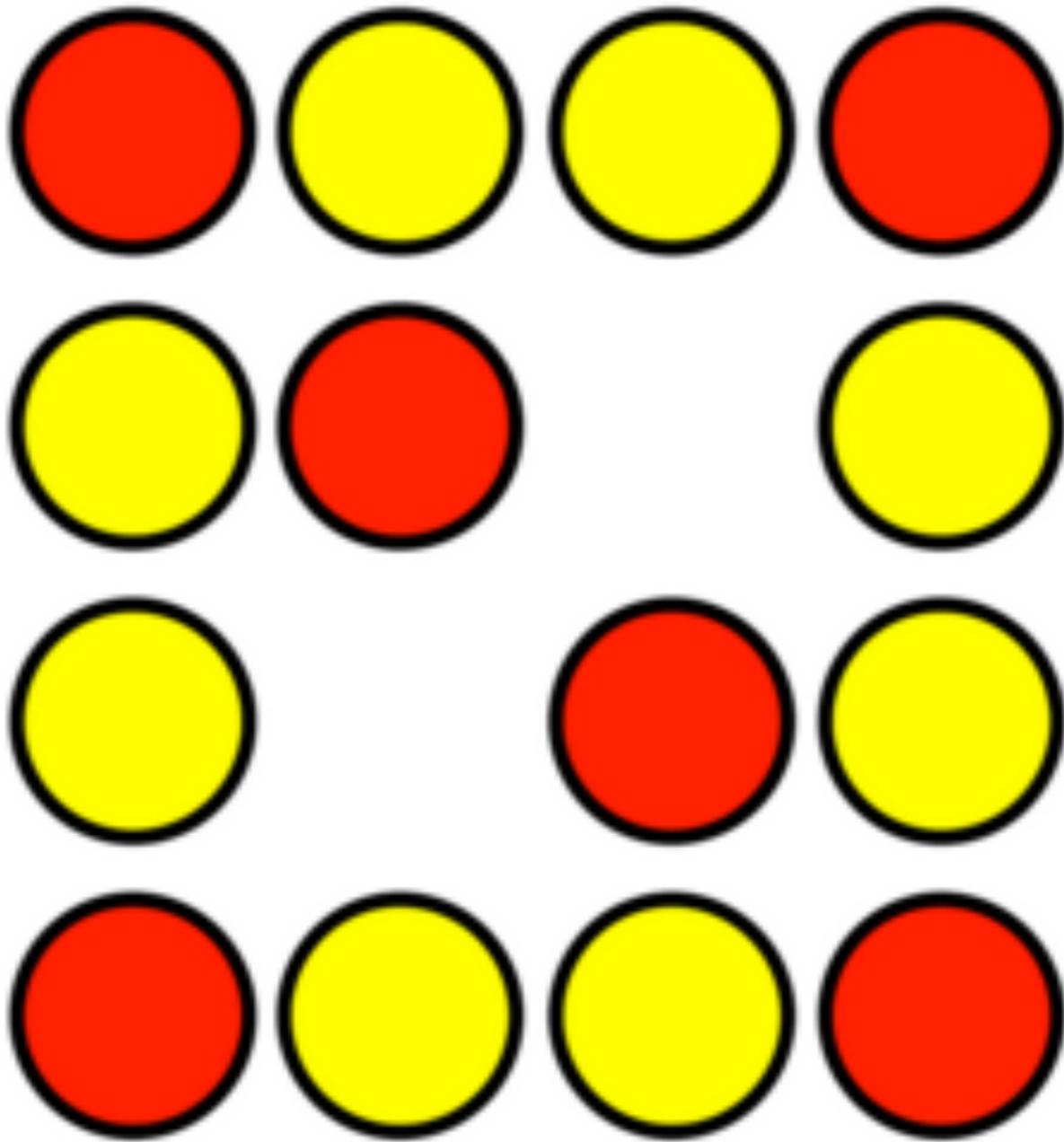
Tell me what you see



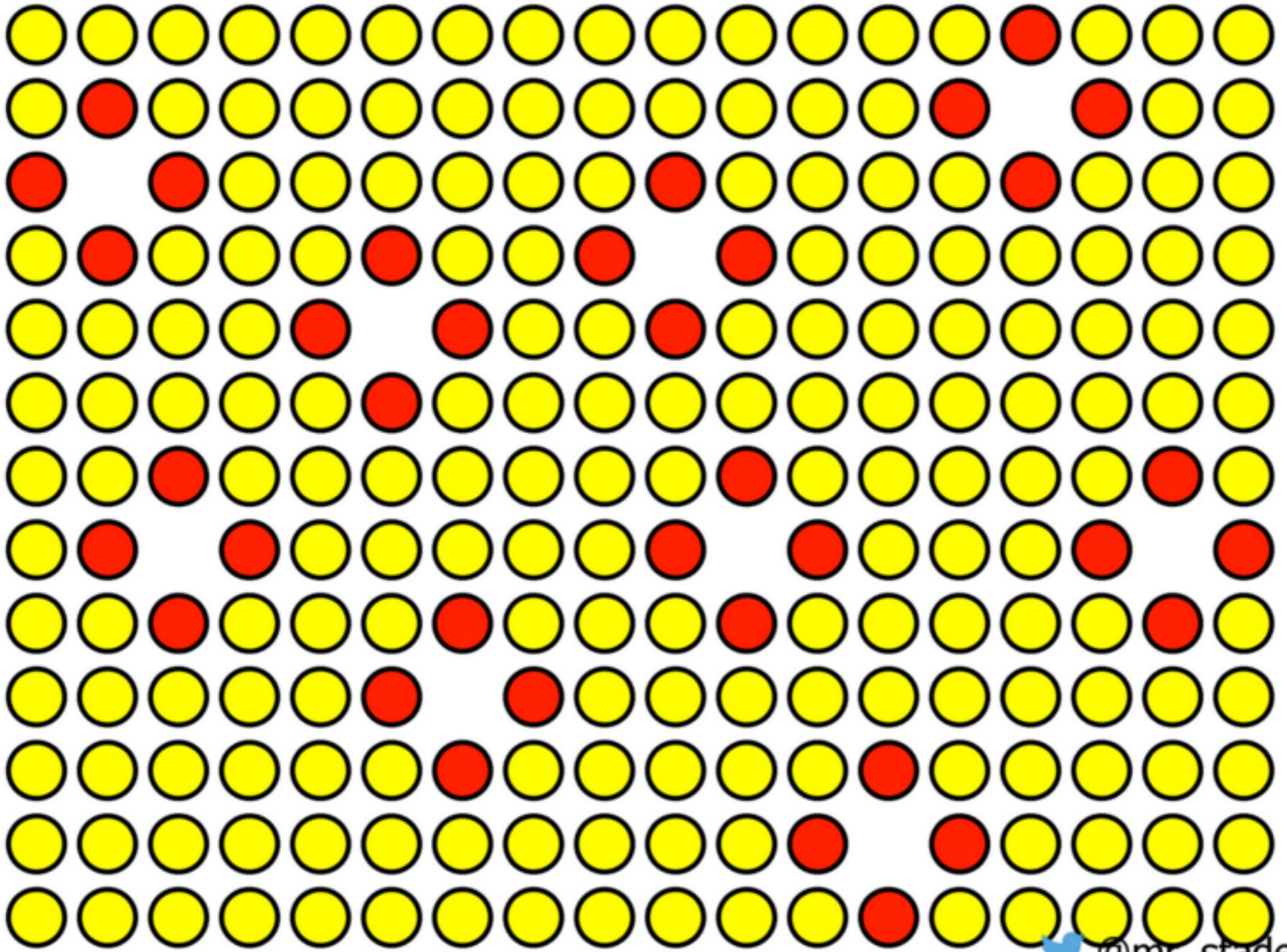
Tell me what you see



Tell me what you see



Tell me what you see



Tell me what you see



What information do you need?



&

there are 12 coins in the bank





Thoughts on differentiation?

Parking Lot

+
positive

▲
change

?
**not sure
going
forward**



ah-ha!

Questioning My Metacognition

Trying to be a better teacher



3-Acts Lessons

Check out [Dan's Blog](#) or watch [Math Class Needs a Makeover](#)

Date Added	Lesson Title	Standard 1	Standard 2
4/17/2014	Peas in a Pod	K.NBT.1	K.CC.4
4/25/2014	Dotty	K.CC.1,2,3	K.CC.4,5
1/16/2015	Counting Squares	K.NBT.1	K.CC.4,5
1/16/2015	Stage 5 Series	K.NBT.1	K.CC.4,5
3/24/2015	Shark Bait	K.NBT.1	K.CC.4,5
3/4/2014	Lil' Sister	K.MD.2	K.CC.6
9/1/2015	Bag-O-Chips	K.OA.4	K.OA.5

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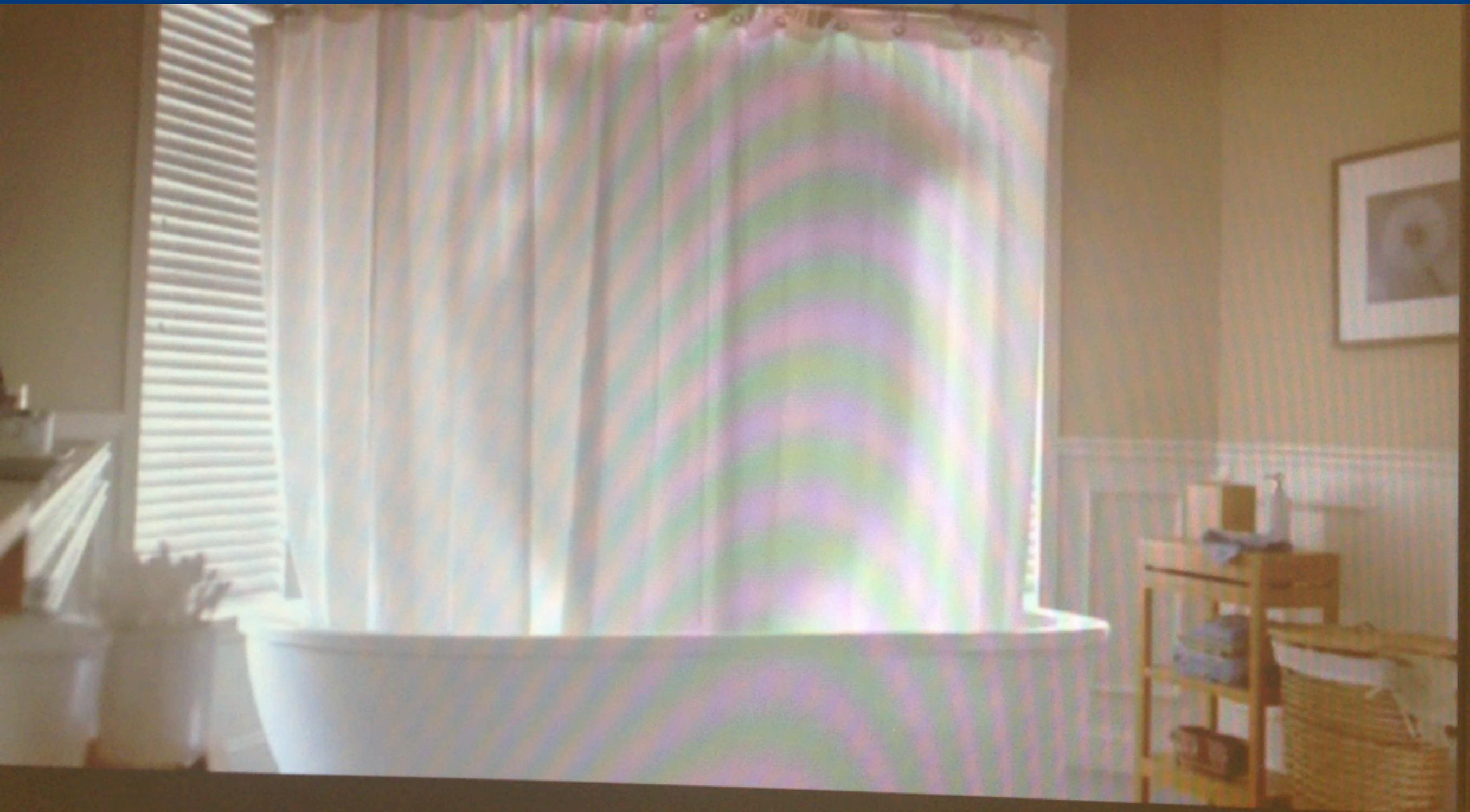
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get plugged in



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