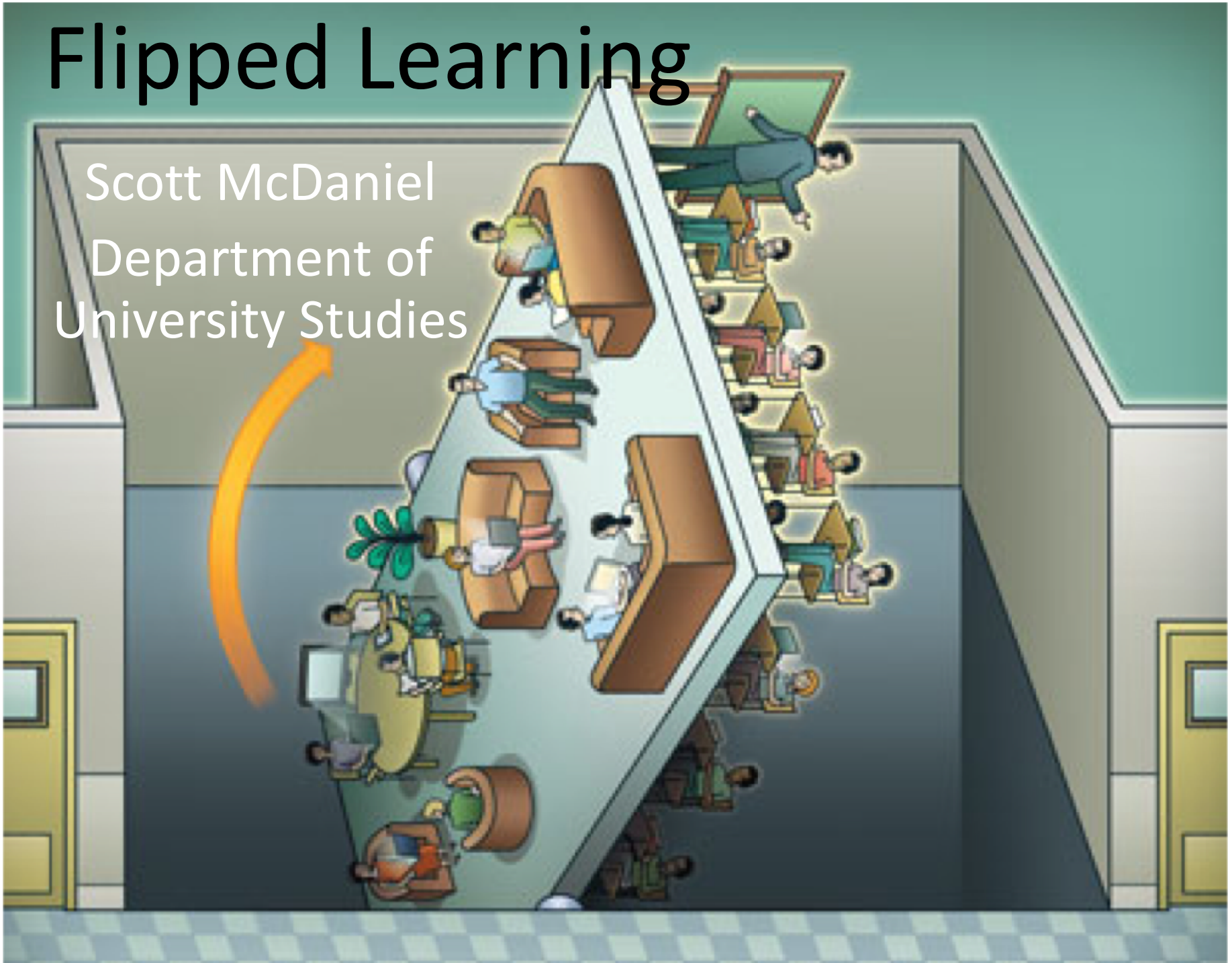
Flipped Learning

Scott McDaniel

Department of University Studies



- Introduction to Flipped Learning
- Handout
- Articles/resources
- Time total: 30 mins

- https://www.teachthought.com/learning/10-pros-cons-flipped-classroom/

Defined

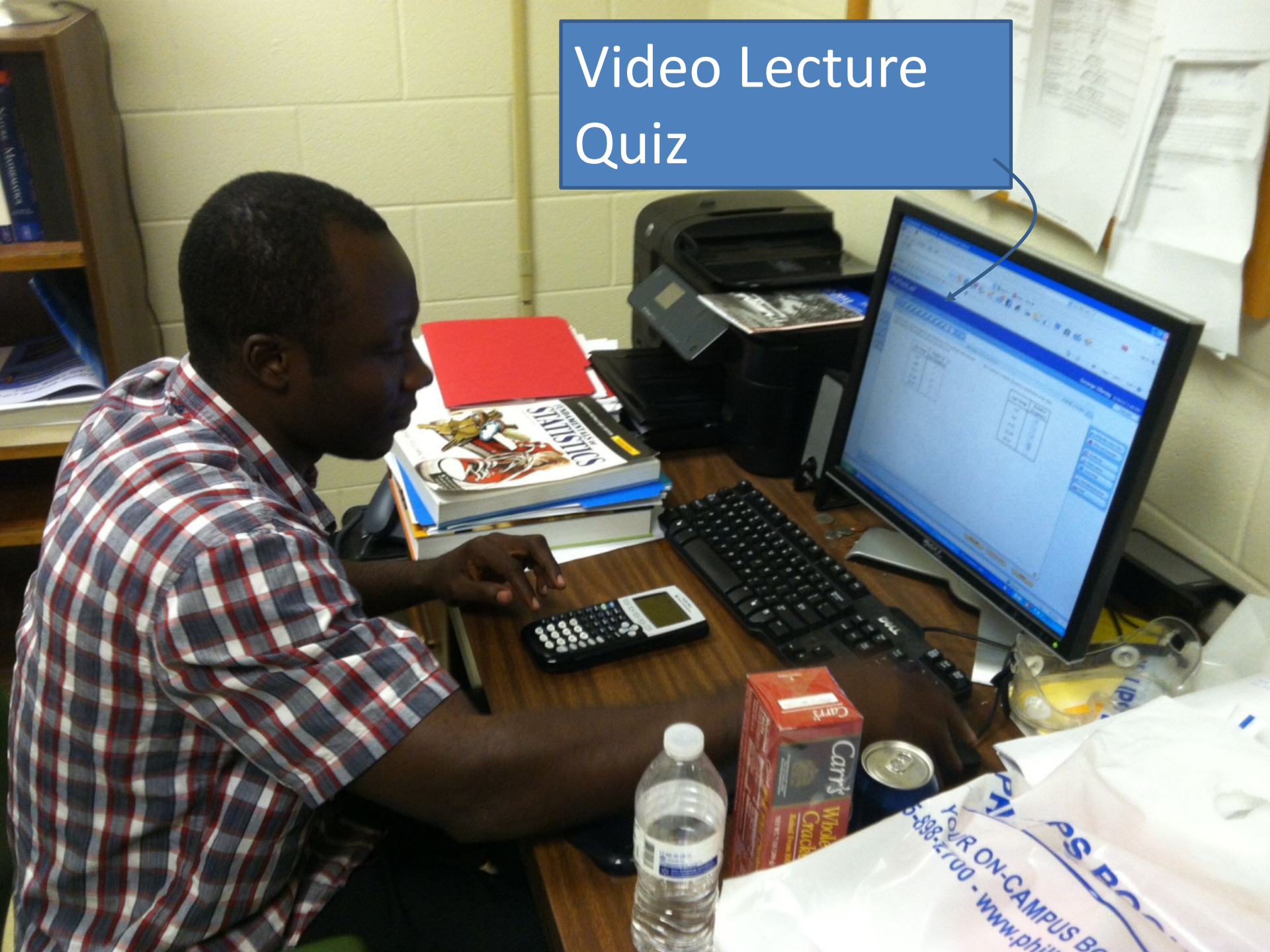
A **flipped classroom** is a specific type of blended learning design that uses technology to move lectures outside the classroom and uses learning activities to move practice with concepts inside the classroom (Strayer, 2009)

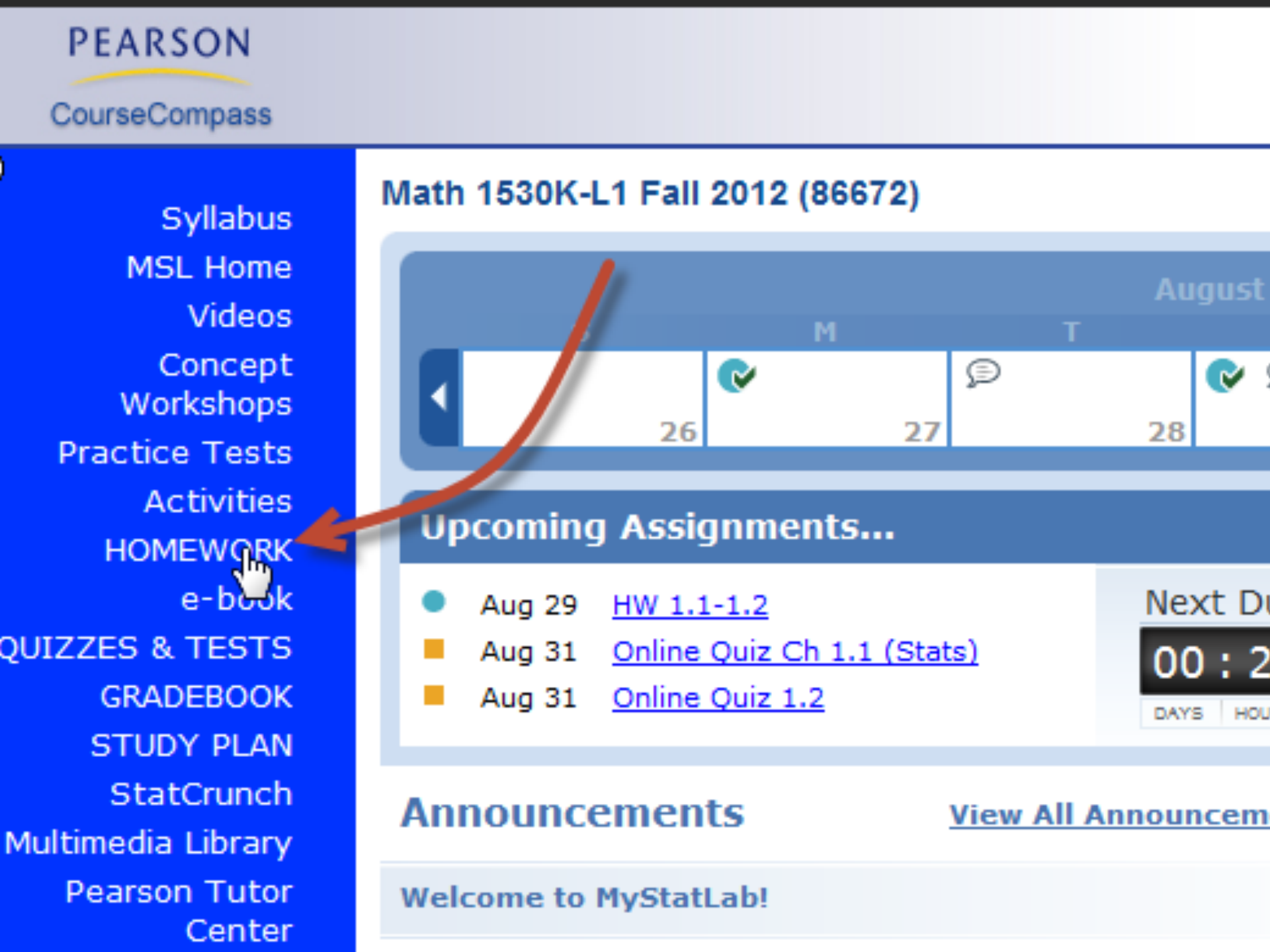
https://www.colorado.edu/ftep/sites/default/files/attached-files/strayer_-_inverted_classroom_influences.pdf

Flip 1.0

2006-2012


Video Lecture


Video Lecture
Quiz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CourseCompass
Syllabus
MSL Home
Videos
Concept Workshops
Practice Tests
Activities
HOMEWORK
e-book
QUIZZES & TESTS
GRADEBOOK
STUDY PLAN
StatCrunch
Multimedia Library
Pearson Tutor Center
Math 1530K-L1 Fall 2012 (86672)
August
M
T
26
27
28
Upcoming Assignments...
Aug 29 HW 1.1-1.2
Aug 31 Online Quiz Ch 1.1 (Stats)
Aug 31 Online Quiz 1.2
Next Du
00 : 2
DAYS
Announcements
View All Announcem
Welcome to MyStatLab!

Current Score 0% (0 points out of 6)

Number of times you can complete each question: unlimited

Questions: 6	Scored: 0	Correct: 0	Partial Credit: 0

Question 1 (0/1) Question 2 (0/1) Question 3 (0/1)

Question 4 (0/1) Question 5 (0/1) Question 6 (0/1)

To see what to study next, go to your Study Plan.

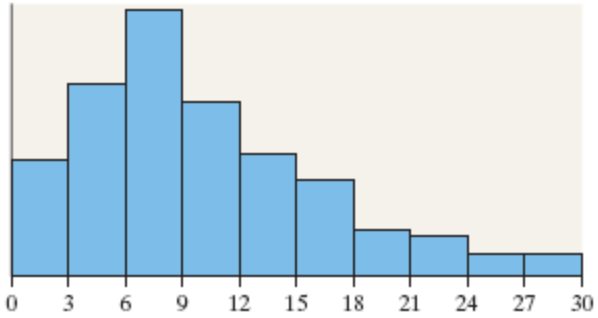
1 2 3 4 5 6

2.2.9

Ex. Score: 0 of 1 pt **HW Score:** 0% (0 of 6 pts) **0 of 6** complete

Determine whether the following statement is true or false.

The shape of the distribution shown is best classified as skewed left.



Textbook

StatCrunch

Tech Help

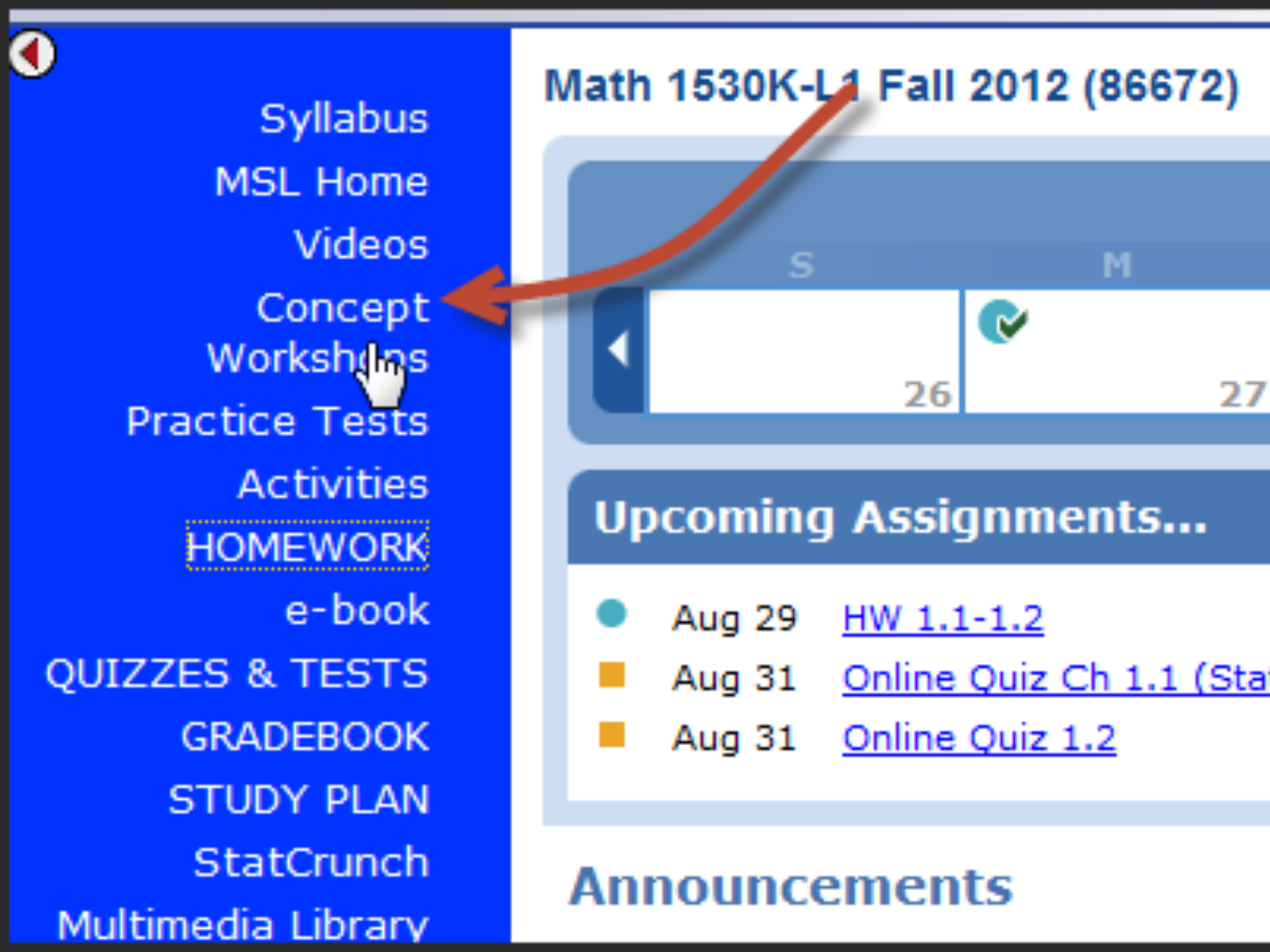
Calculator

Ask My Instructor

Print

Choose the correct answer below.

- True
- False


Syllabus
MSL Home
Videos
Concept
Workshops
Practice Tests
Activities
HOMEWORK
e-book
QUIZZES & TESTS
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STUDY PLAN
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Math 1530K-L1 Fall 2012 (86672)
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Upcoming Assignments...
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Announcements

Syllabus
MSL Home
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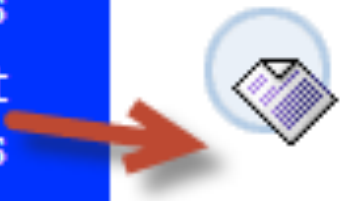


Section 3.1-3.2 (stats)
Open (PDF) (127397 Bytes)
Updated 2012

Section 3.3 (stats)
Open (PDF) (34212 Bytes)

Section 3.4-3.5 (stats)
Open (PDF) (85324 Bytes)
Updated 2012.

Datasets for 3.1-3.2
Heights (8XI) (769 Bytes)
Open (DOC) (16872 Bytes)
Siblings (8XI) (769 Bytes)
These are the datasets (the 8XI files) that can be sent
connects your calculator to the computer. If you don't
bring the hard copy of the datasets to class.

Concept Workshop 3.1 & 3.2: Measures of Central Tendency and Dispersion

Objectives: (1) Determine the mean, median, and m ode for a set of raw data, (2) Explain what it means for a statistic to be resistant. (3) Be able to determine the range, standard deviation and variance.

Use StatCrunch or the TI-83/84 to evaluate the following. You should compare these measures of central tendency with their corresponding histograms you found in an earlier concept workshop.

1. Based on the survey results, find the mean, median, mode, range, variance and sample standard deviation number of siblings.

   Mean_____ Median_____ Mode_____

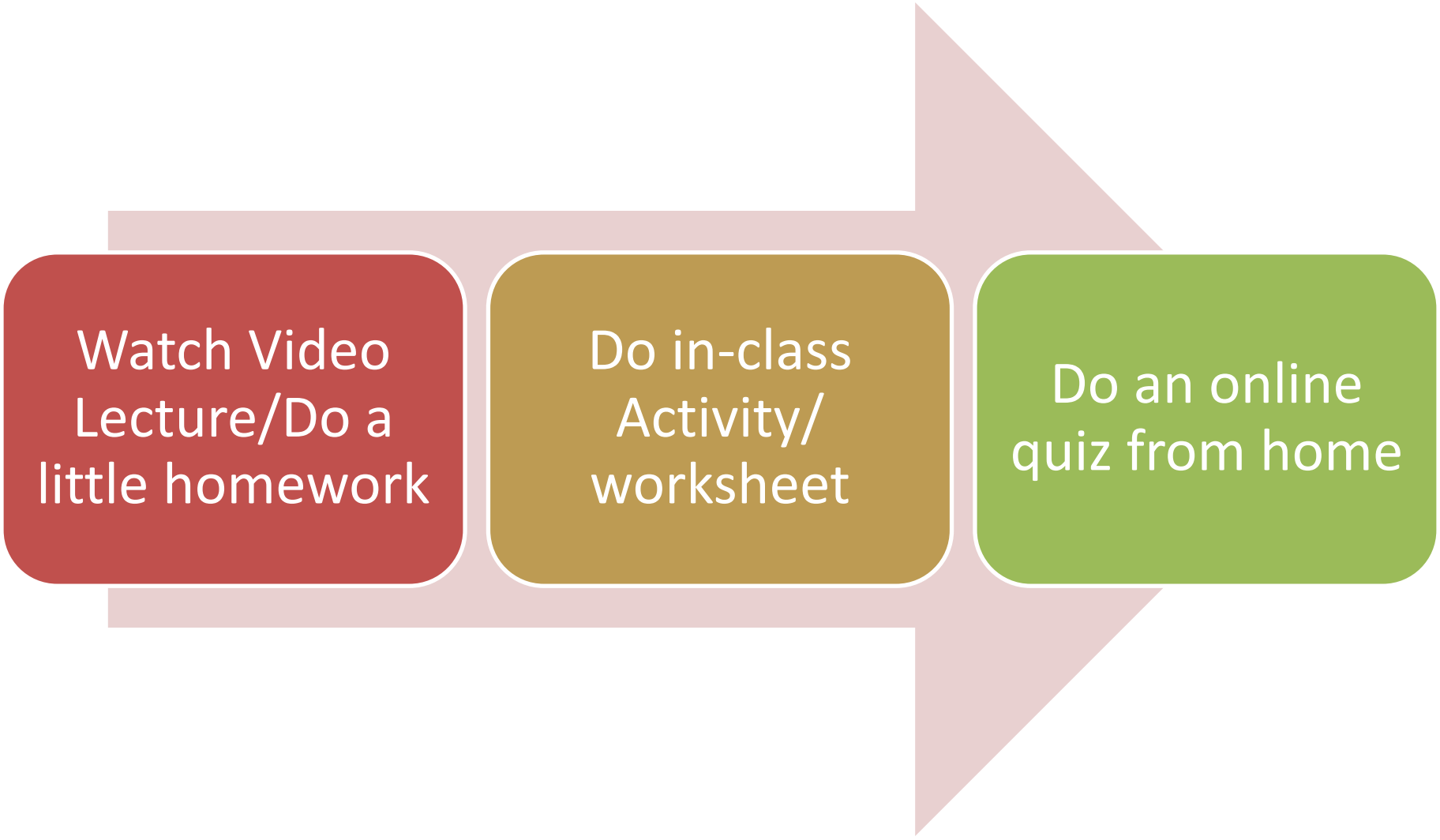
   Range_____ Variance_____ Standard Deviation_____

2. Find the mean, median, and sample standard deviation for student heights.

   Mean_____ Median_____ Standard Deviation_____

3. A certain type of concrete mix is designed to withstand 3000 pounds per square inch (PSI) of pressure. The strength of concrete is measured by pouring the mix into casting cylinders 6 inches in diameter and 12 inches tall. The cylinder is allowed to set up for 28 days. The cylinders are then stacked on one another until the cylinders are crushed. The following data represent the strength of 9 randomly selected casts

   3960, 4090, 3200, 3100, 2940, 3830, 4090, 4040, 3780


Watch Video Lecture/Do a little homework
Do in-class Activity/ worksheet
Do an online quiz from home

Flip 2.0

2013-Present

Classes should do hands-on exercises before reading and video, Stanford researchers say

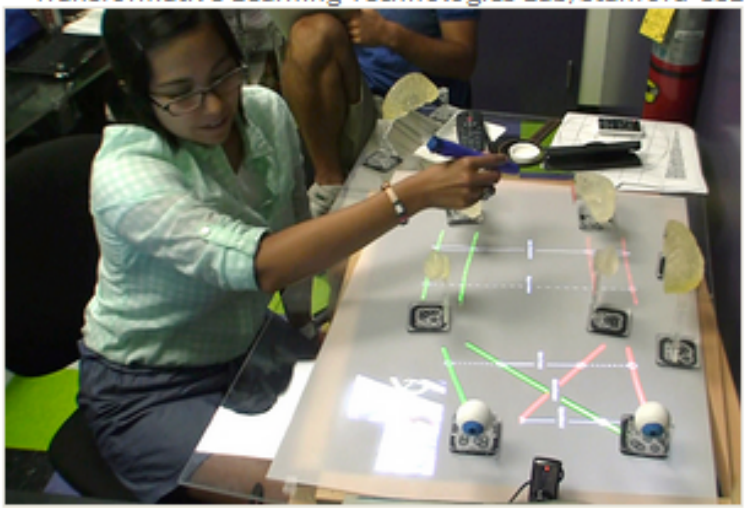
A study from the Stanford Graduate School of Education of how students best learned a neuroscience lesson showed a distinct benefit to starting out by working with an interactive 3D model of the brain.

BY DAVID PLOTNIKOFF

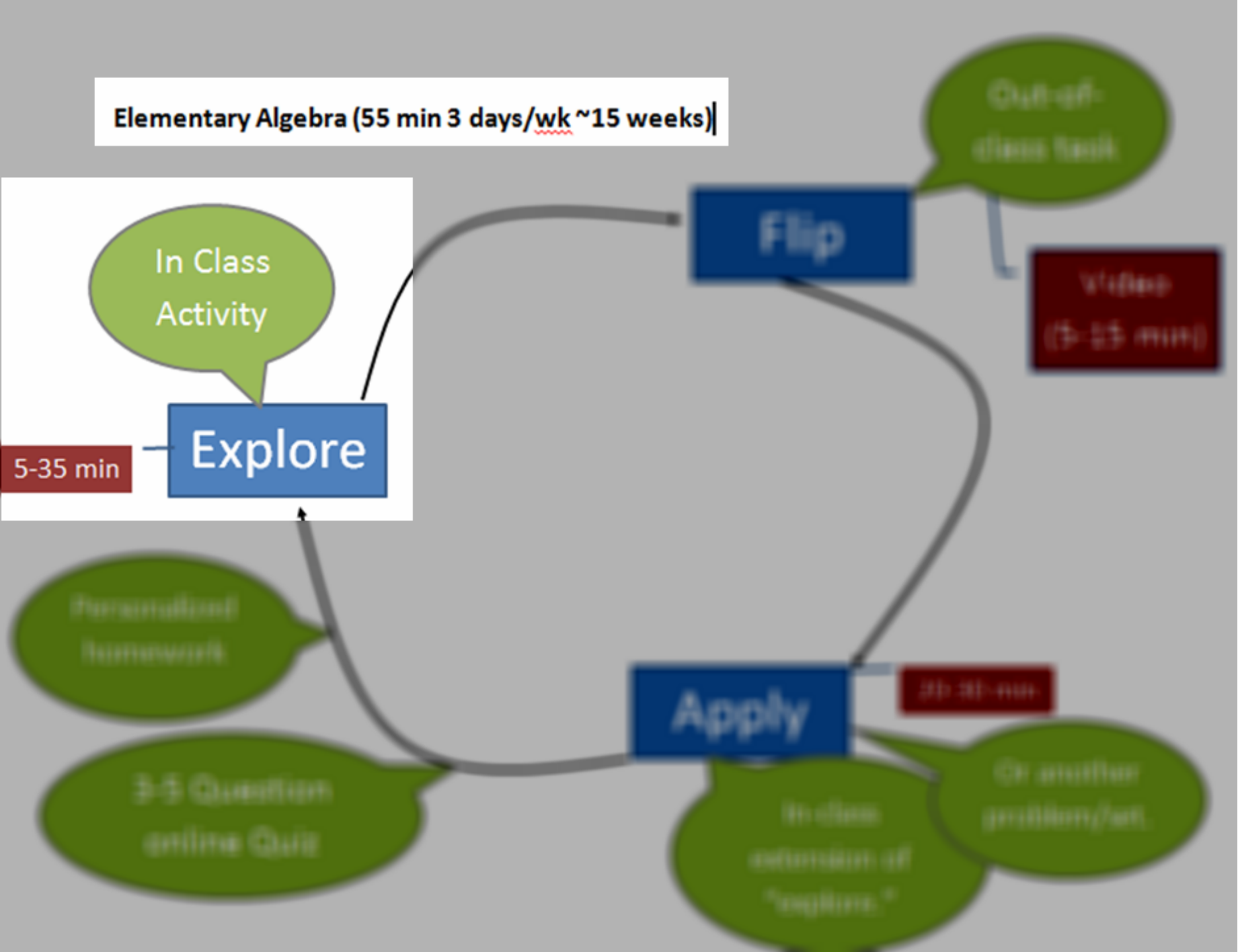
A new study from the Stanford Graduate School of Education flips upside down the notion that students learn best by first independently reading texts or watching online videos before coming to class to engage in hands-on projects. Studying a particular lesson, the Stanford researchers showed that when the order was reversed, students' performances improved substantially.

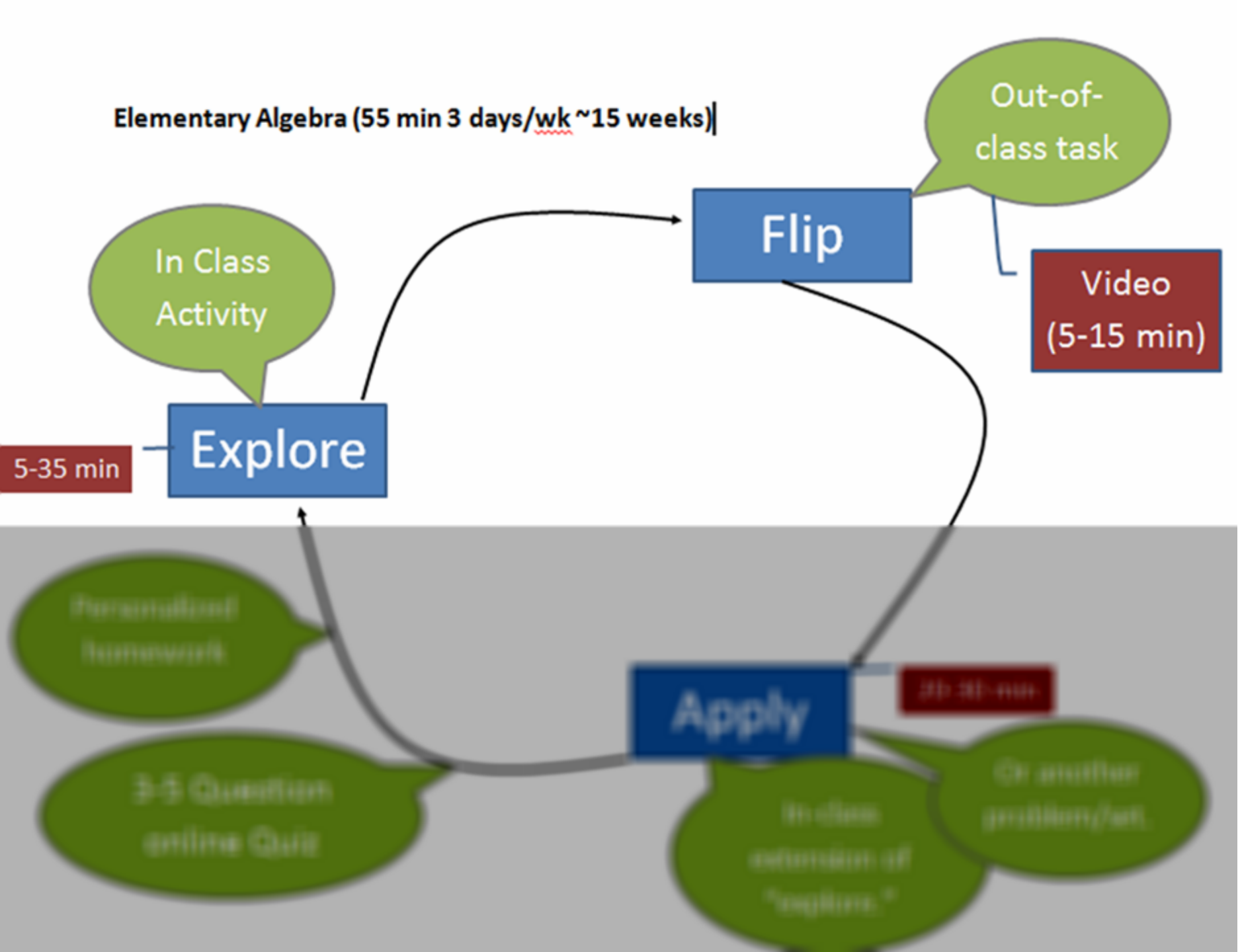
While the study has broad implications about how best to employ interactive learning technologies, it also focuses specifically on the teaching of neuroscience and underscores the effectiveness of a new interactive tabletop learning environment, called BrainExplorer, which was developed by Stanford GSE researchers to enhance neuroscience instruction.

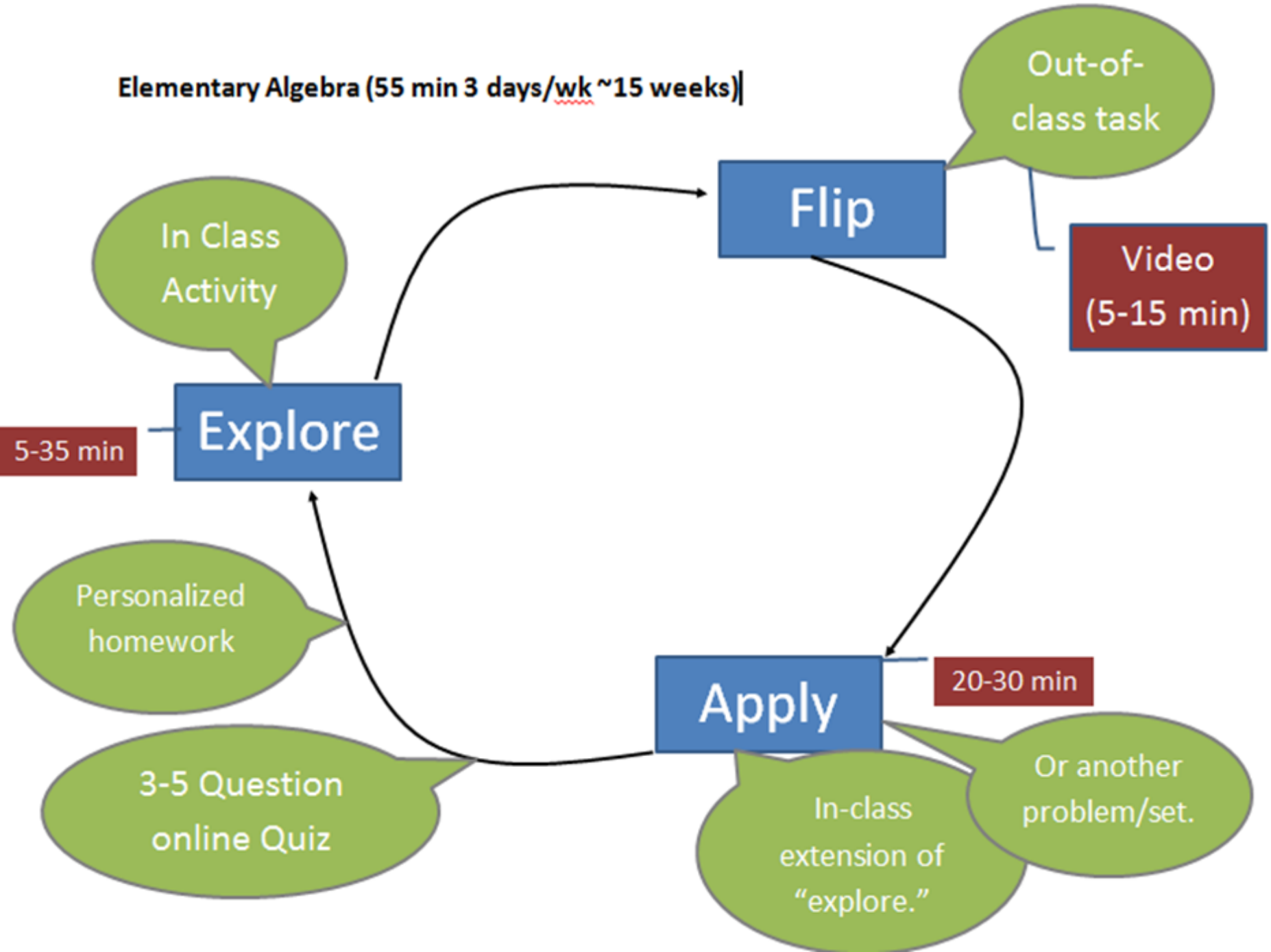
Transformative Learning Technologies Lab/Stanford GSE



The researchers drew on data gathered from students using the BrainExplorer, a tabletop tool that simulates how the human brain processes visual images.

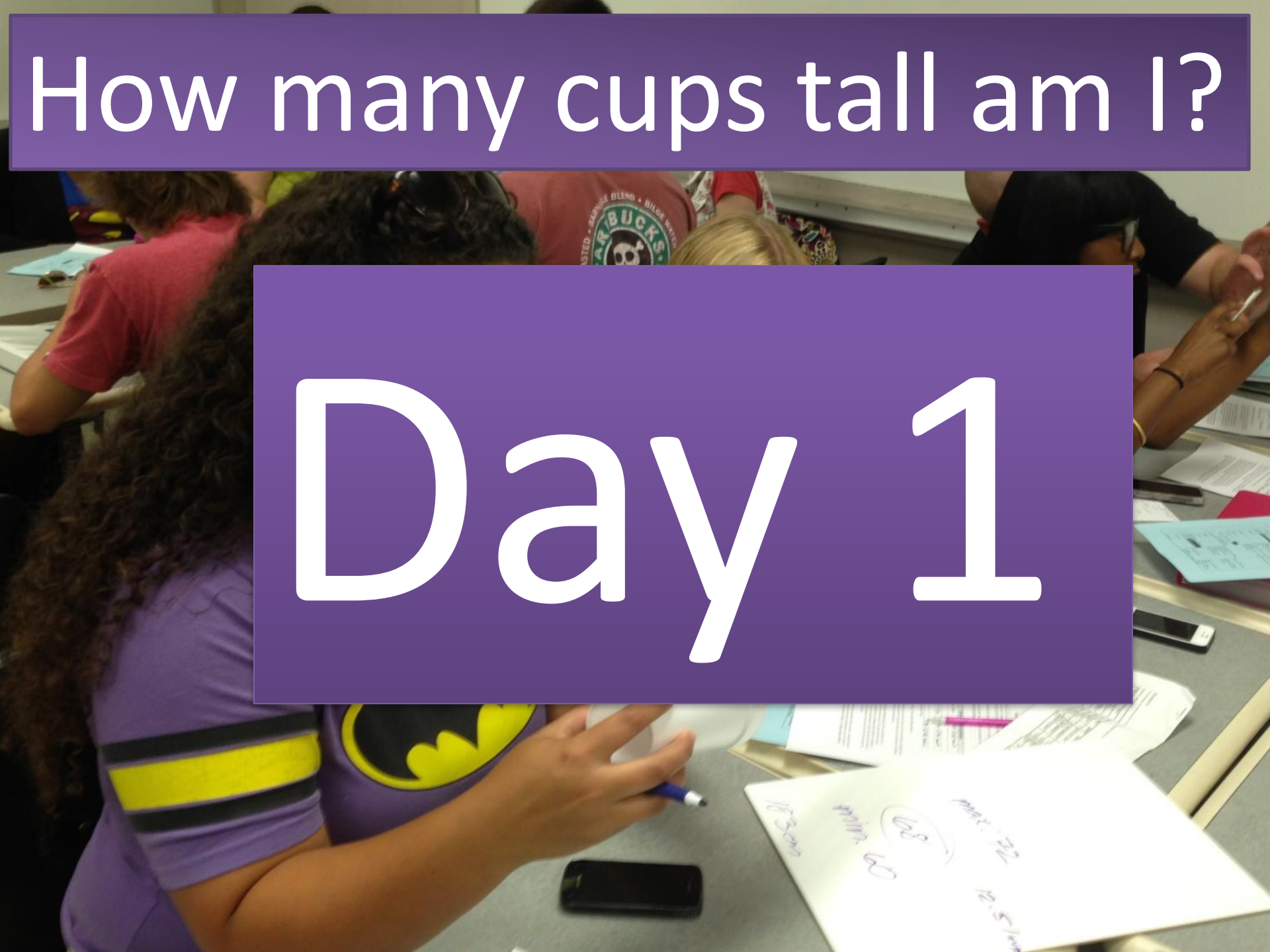

Elementary Algebra (55 min 3 days/wk ~15 weeks)
In Class Activity
Explore
5-35 min
Flip
Apply


Elementary Algebra (55 min 3 days/wk ~15 weeks)
Out-of-class task
Flip
Video (5-15 min)
In Class Activity
Explore
5-35 min
Apply

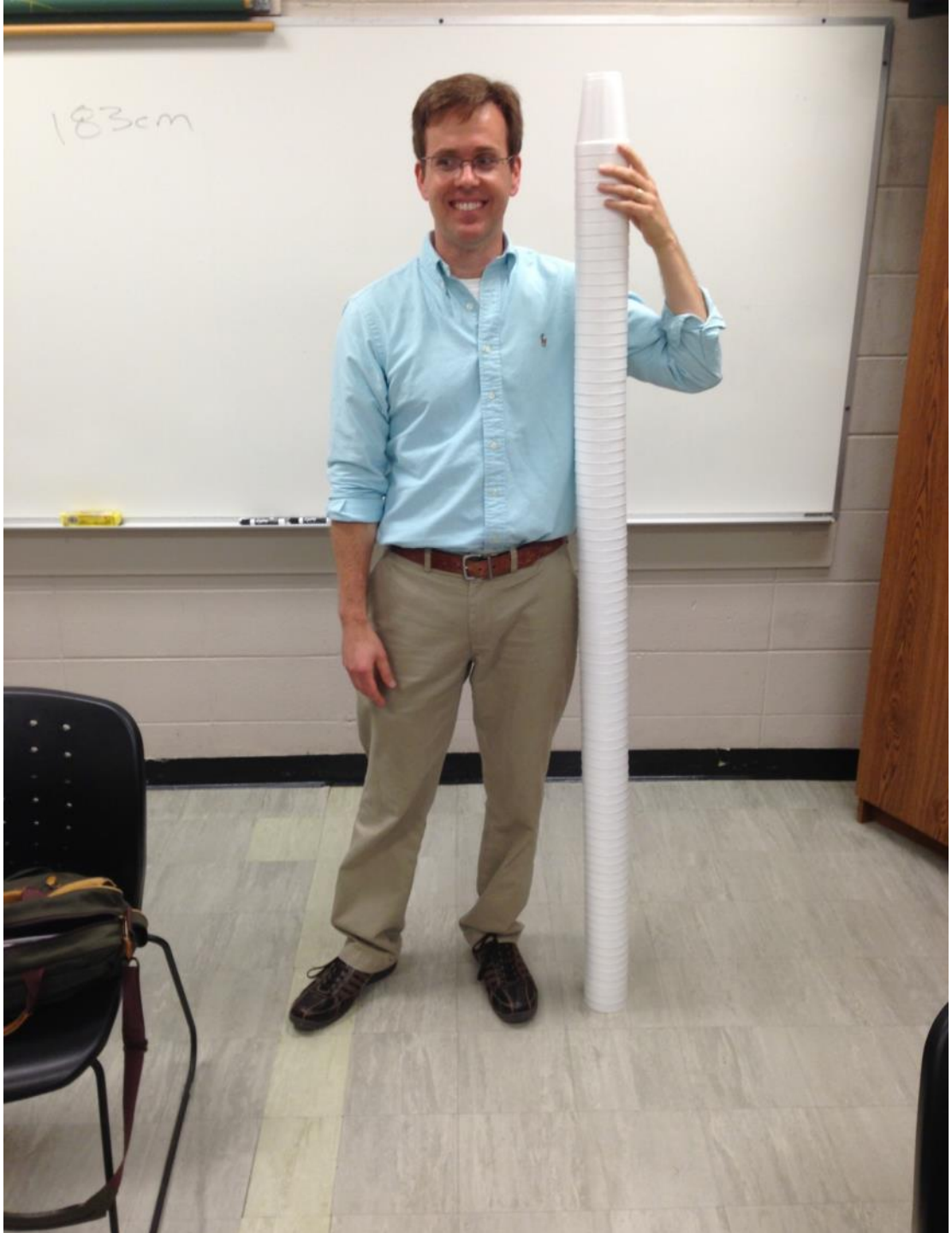

Elementary Algebra (55 min 3 days/wk ~15 weeks)
Out-of-class task
Flip
Video (5-15 min)
In Class Activity
Explore
5-35 min
Personalized homework
3-5 Question online Quiz
Apply
20-30 min
In-class extension of "explore."
Or another problem/set.


Explore

How many cups tall am I?

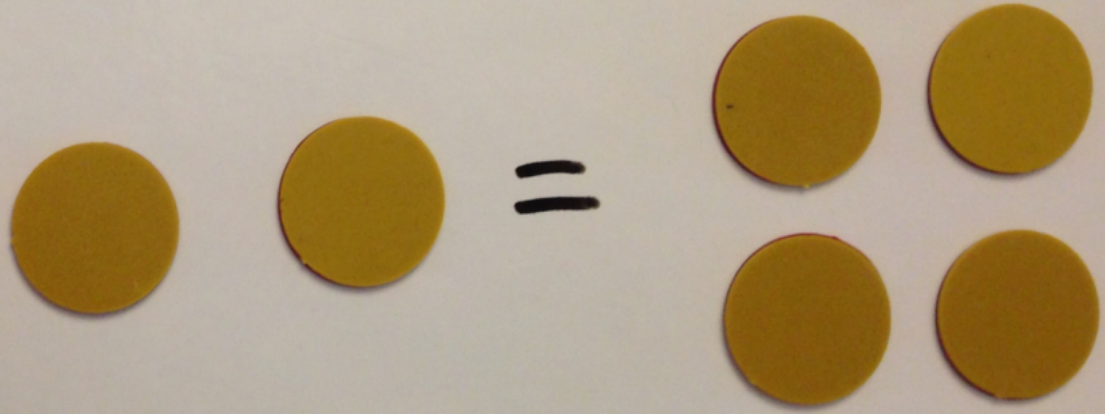


Day 1

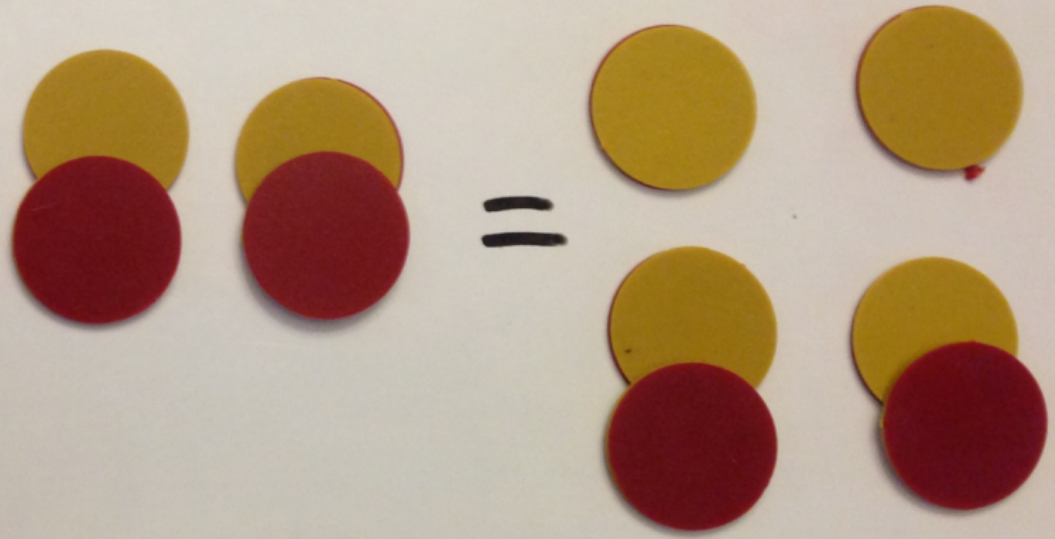

183cm

Solving 1-step Linear Equations

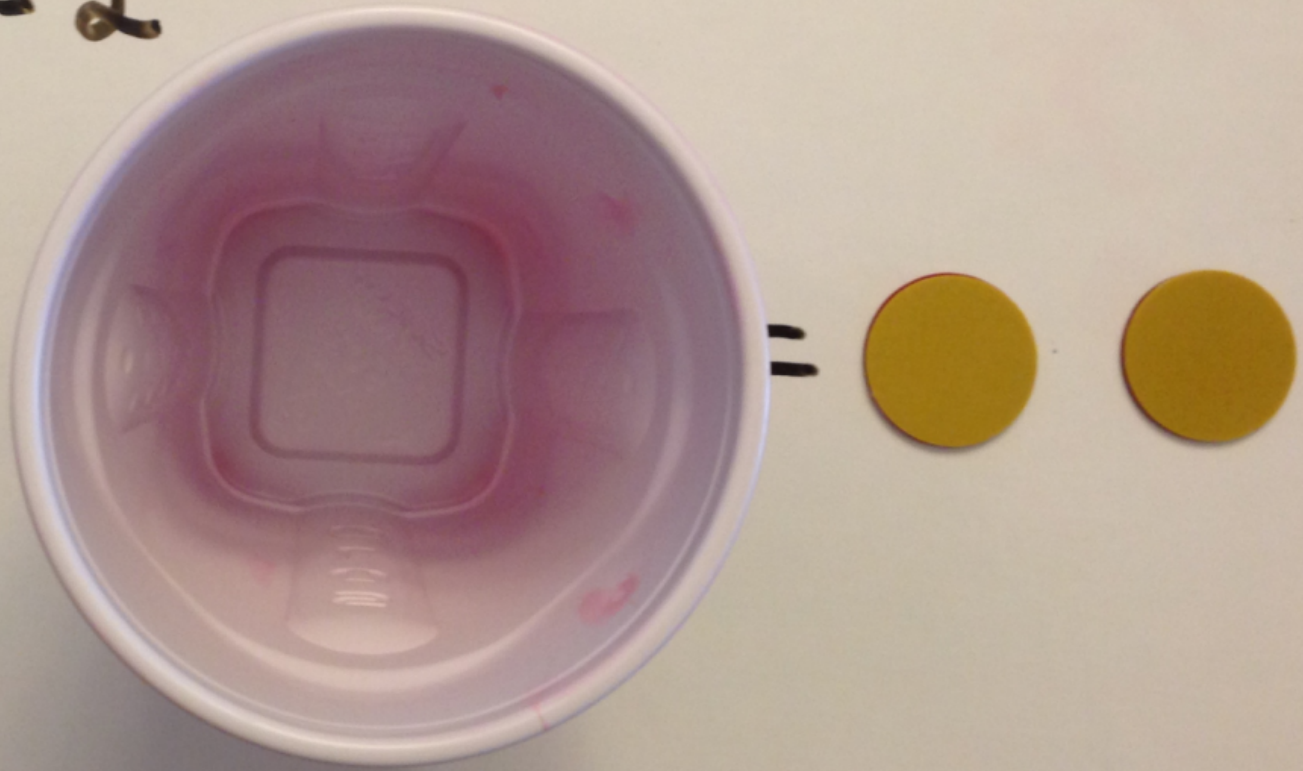
$x + 2 = 4$



$$x + 2 = 4$$
$$+ -2 \quad + -2$$

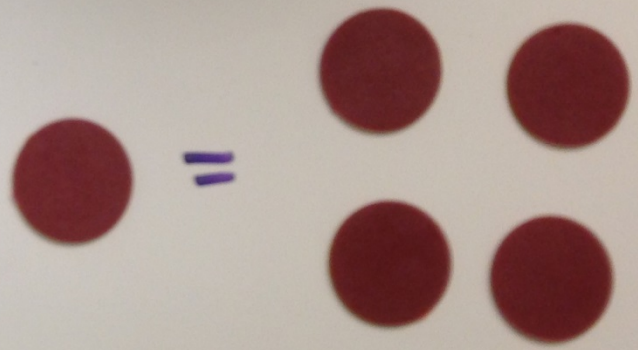


$$x + 2 = 4$$
$$+ -2 \quad + -2$$
$$x = 2$$



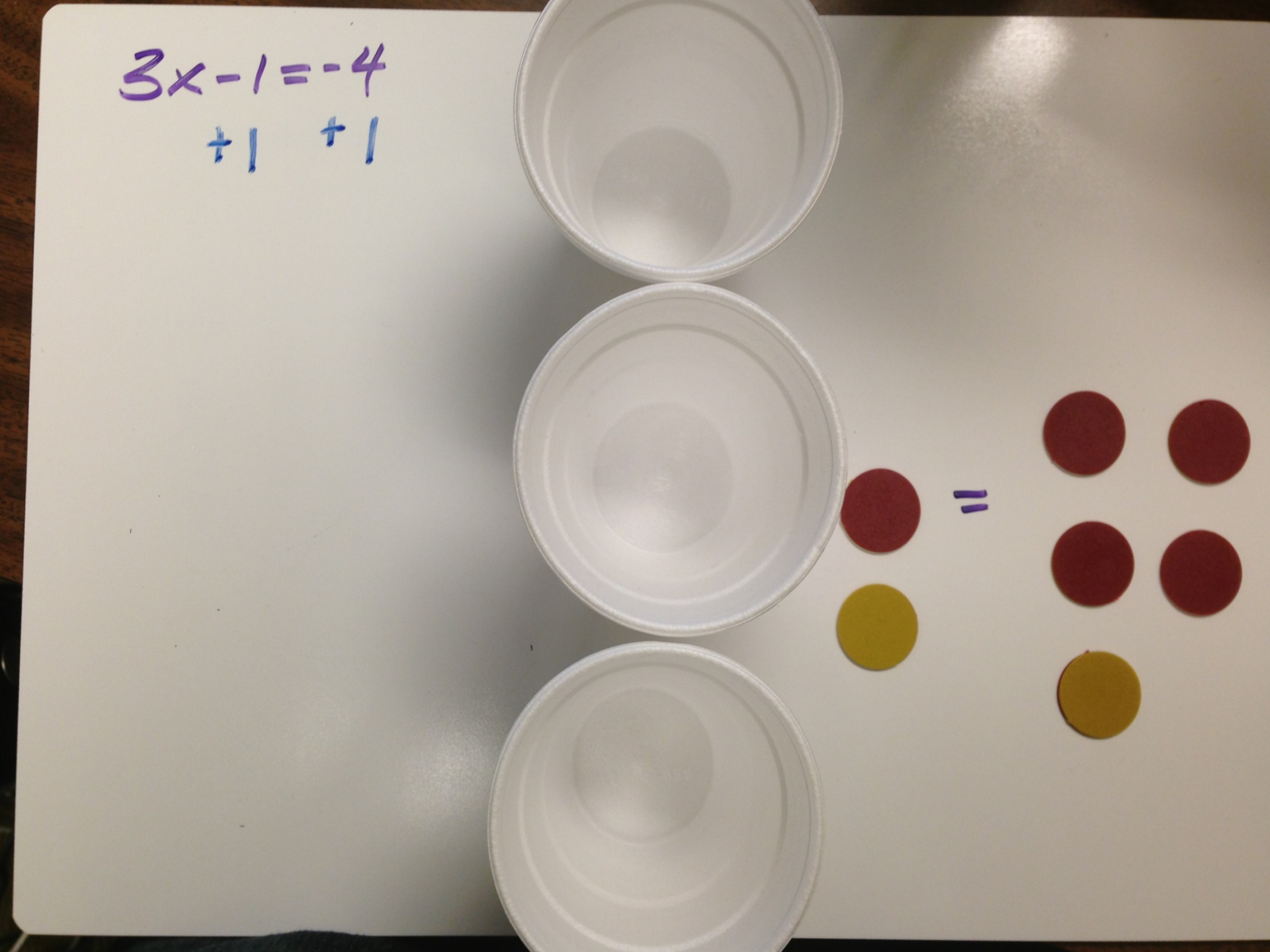
Solving Multi-step Linear Equations

$3x-1=-4$



$3x - 1 = -4$

$+1 \quad +1$



$3x - 1 = -4$

$+1 \quad +1$

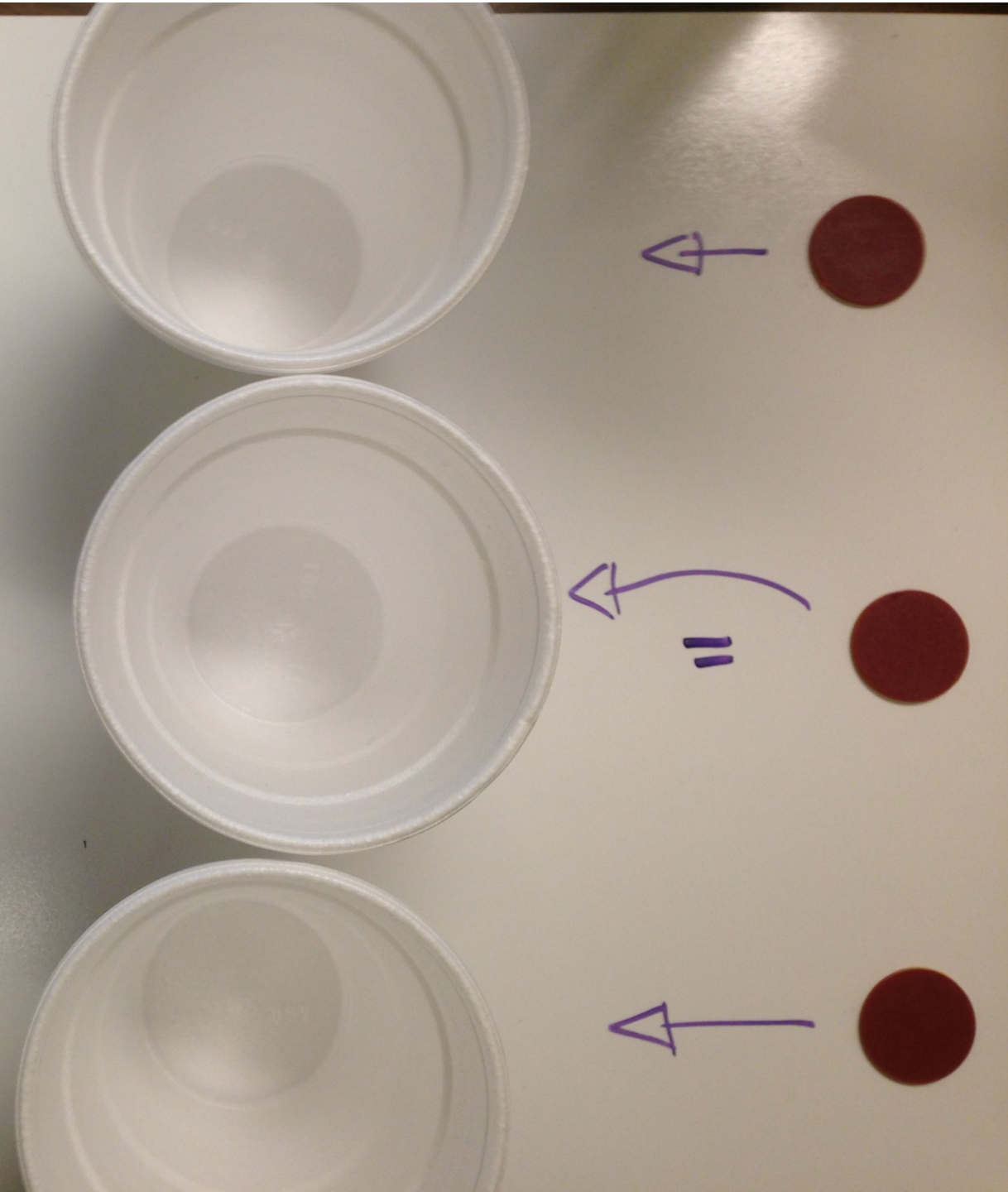
$3x = -3$

=

$3x - 1 = -4$

$+1 \quad +1$

$\frac{3x}{3} = \frac{-3}{3}$



$$3x - 1 = -4$$
$$+1 \quad +1$$
$$\frac{3x}{3} = \frac{-3}{3}$$
$$x = -1$$

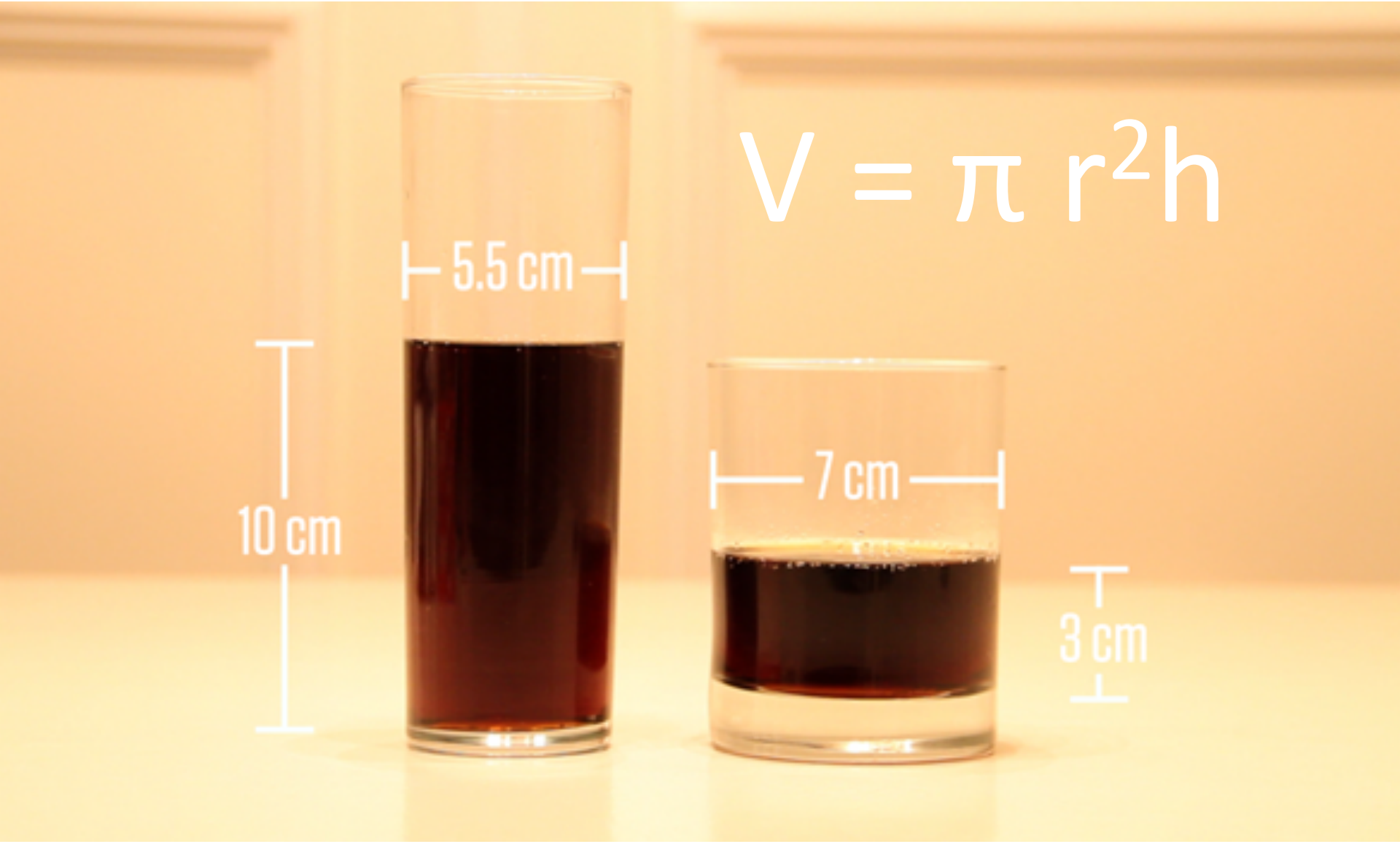
3-Act Tasks

Formulas or “Problem Solving”


ACT I

ACT II

What do you need to know in order to figure this out?


$V = \pi r^2 h$
5.5 cm
10 cm
7 cm
3 cm

$$V_{Tall} = \pi r^2 h$$

$$= \pi(5.5/2)^2(10)$$

$$= 75.625\pi \ cm^3$$

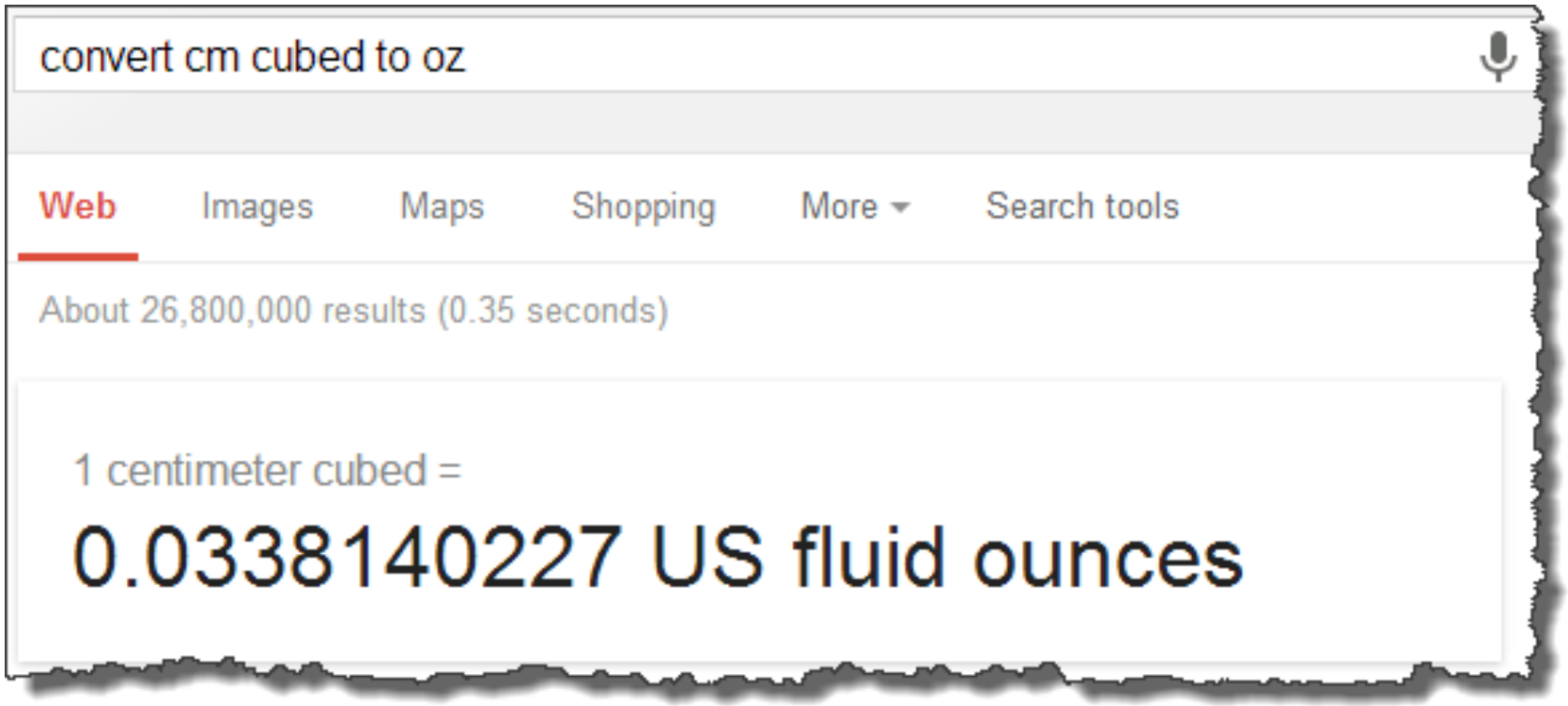
$$\approx 237.58 \ cm^3$$

$$V_{Short} = \pi r^2 h$$

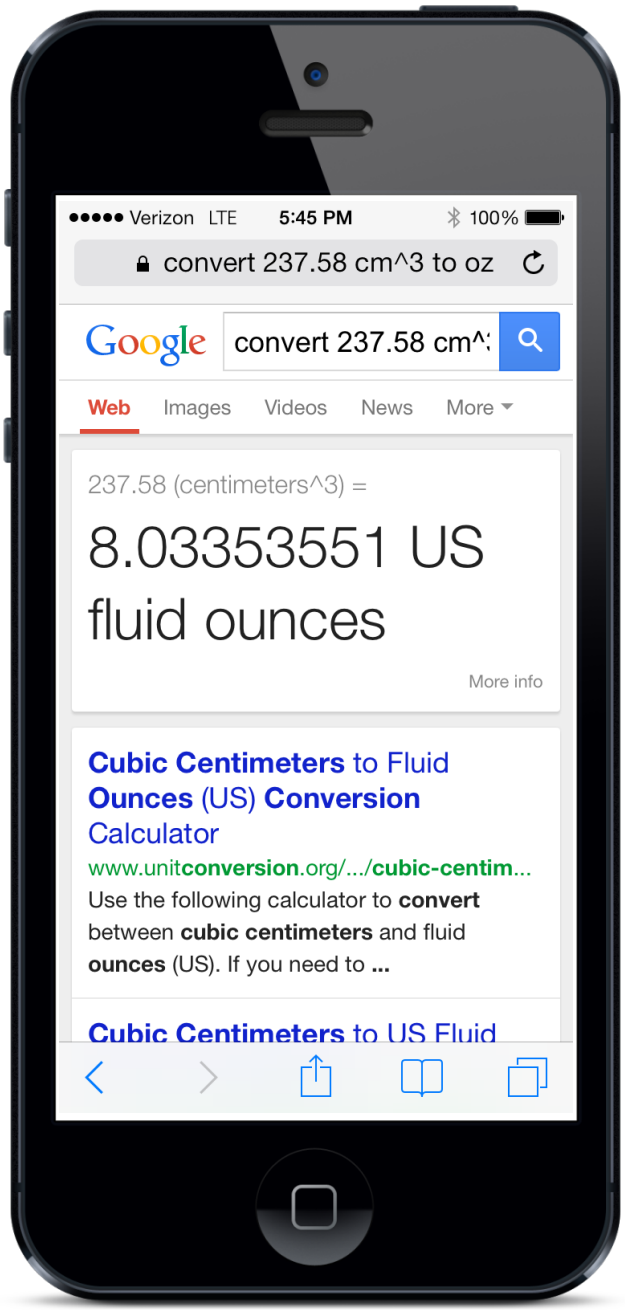
$$= \pi(7/2)^2(3)$$

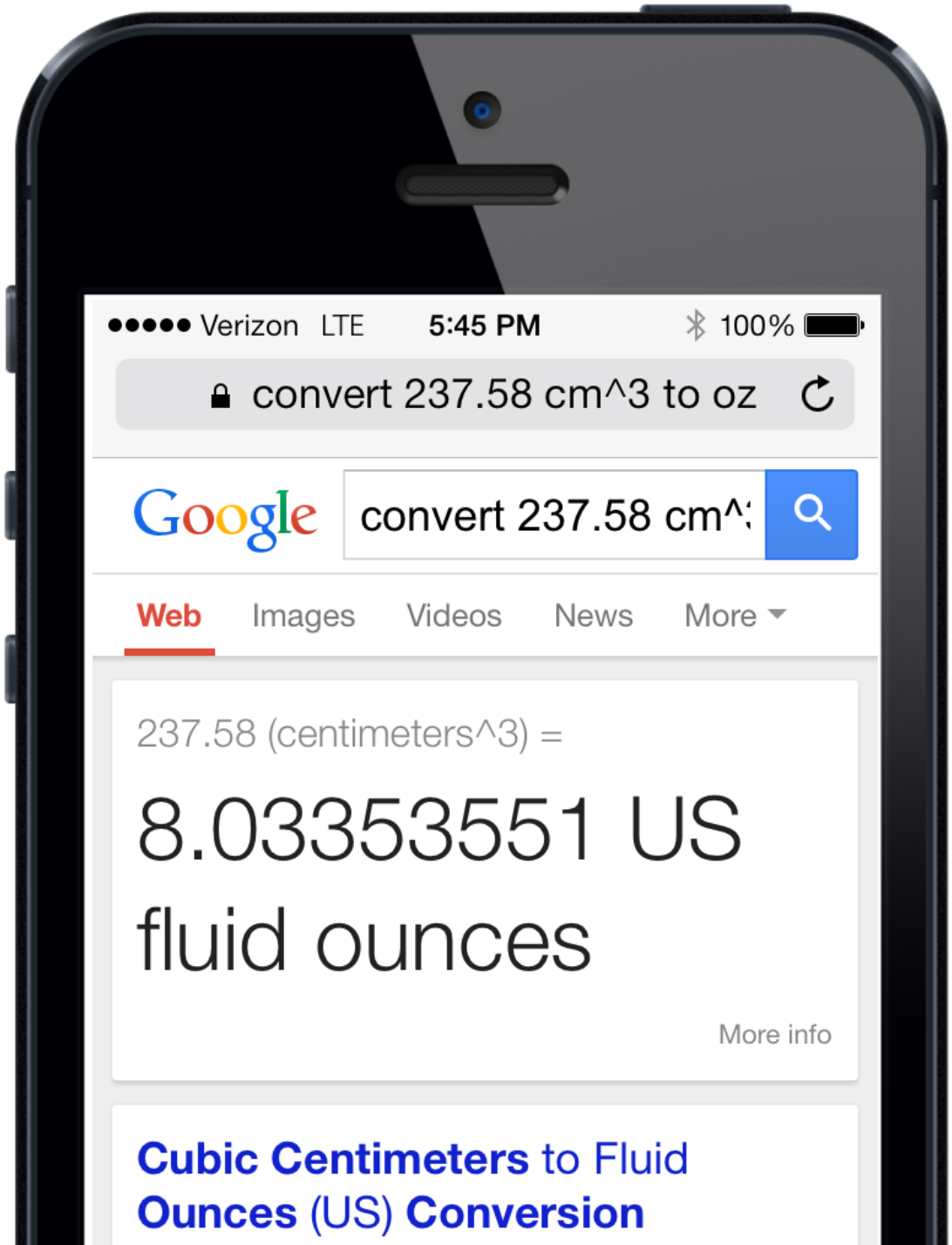
$$= 36.75\pi \ cm^3$$

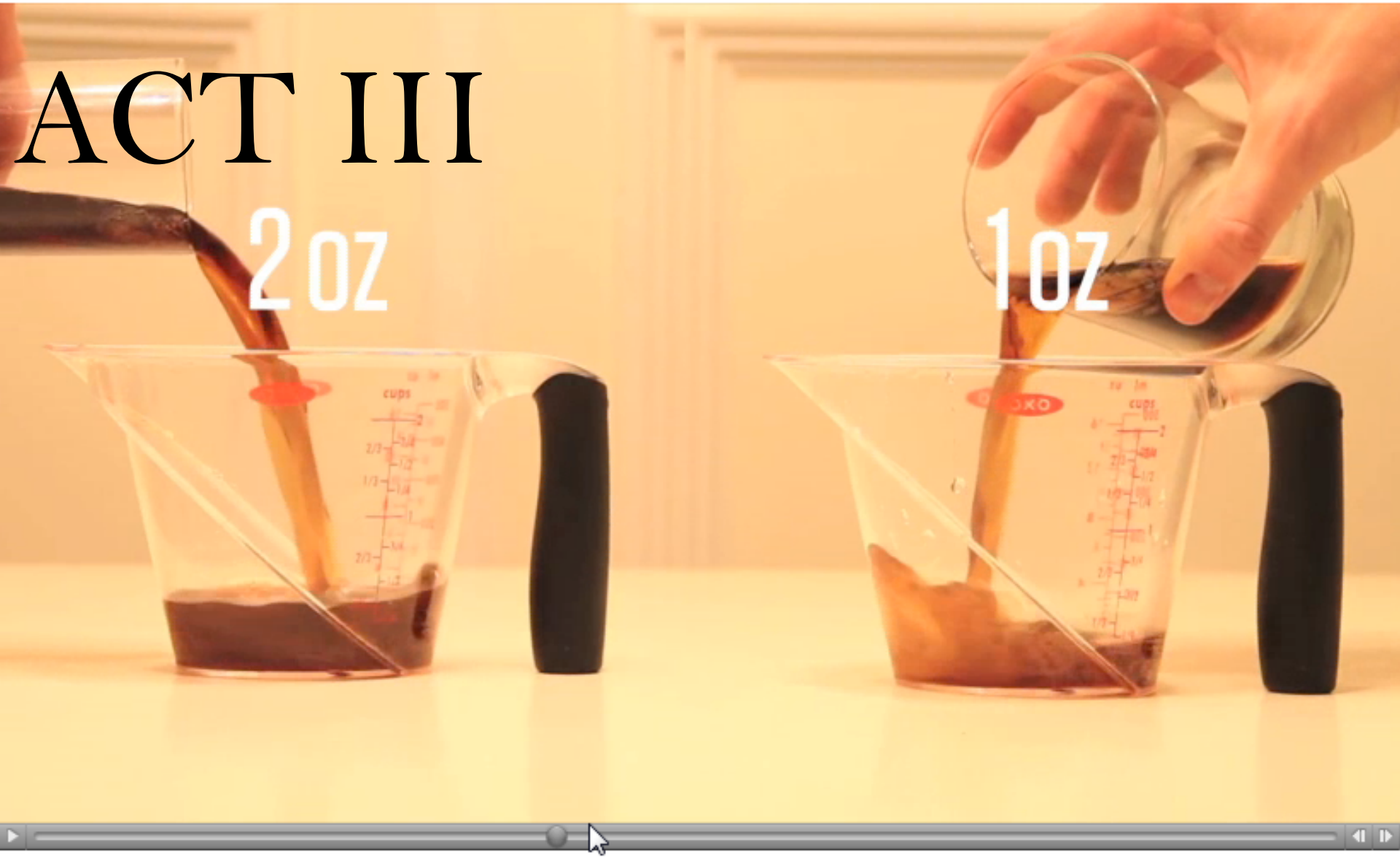
$$\approx 115.45 \ cm^3$$



If you're brave enough…have them look it up on their smart phones.

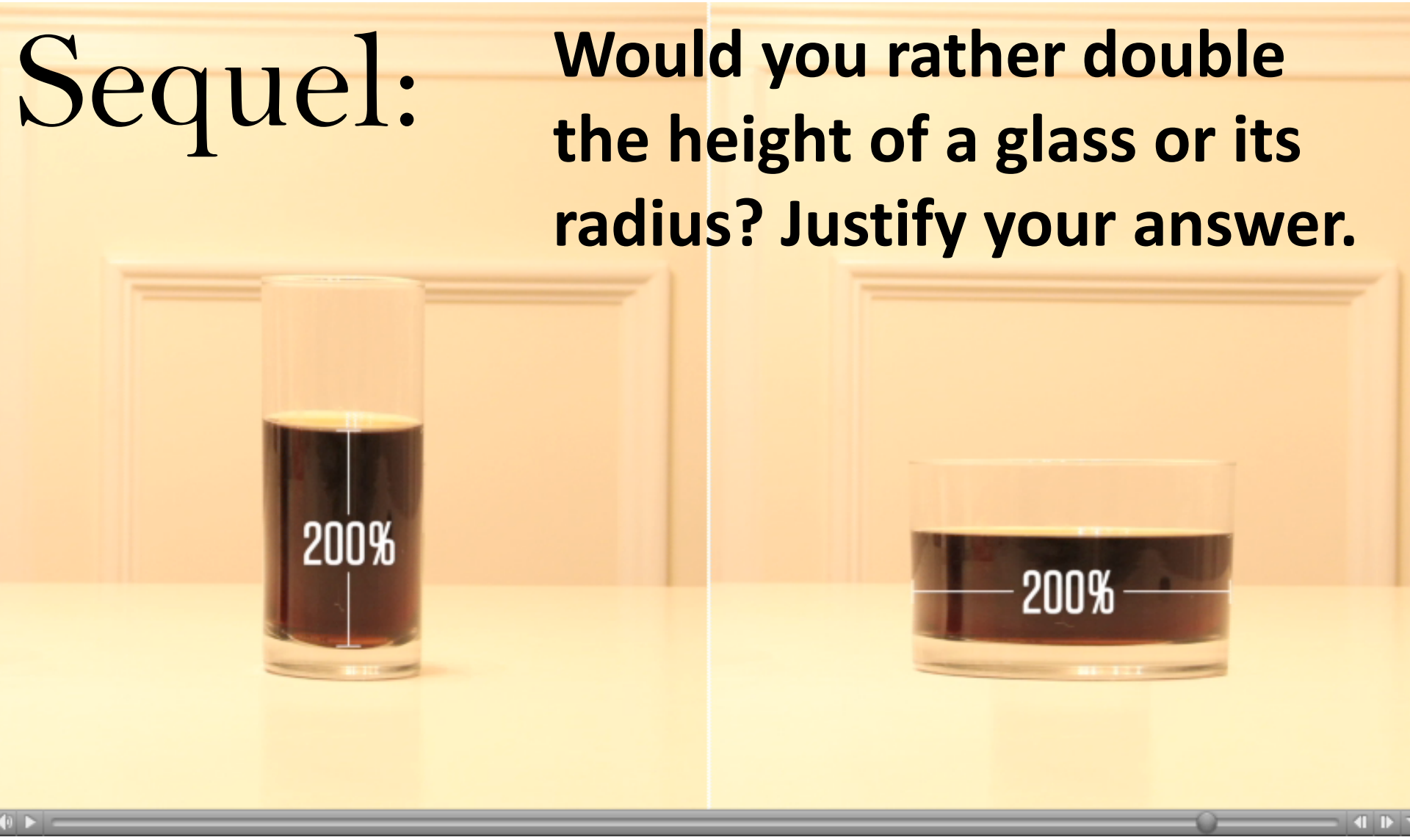

Verizon LTE 5:45 PM 100%
convert 237.58 cm^3 to oz
Google
convert 237.58 cm^3
Web Images Videos News More
237.58 (centimeters^3) =
8.03353551 US fluid ounces
More info
Cubic Centimeters to Fluid Ounces (US) Conversion Calculator
www.unitconversion.org/.../cubic-centim...
Use the following calculator to convert between cubic centimeters and fluid ounces (US). If you need to ...
Cubic Centimeters to US Fluid


●●●●● Verizon LTE
5:45 PM
100%
convert 237.58 cm^3 to oz
Google
convert 237.58 cm^3
Web
Images
Videos
News
More
237.58 (centimeters^3) =
8.03353551 US fluid ounces
More info
Cubic Centimeters to Fluid Ounces (US) Conversion


ACT III
2oz
1oz

Sequel:

Would you rather double the height of a glass or its radius? Justify your answer.



Writing and graphing linear equations

From Mathalicious.com

DOMINO'S PIZZA BUILDER

SIZE & CRUST | CHEESE & SAUCE | TOPPINGS

MY PIZZA

Medium (12") Hand Tossed Pizza

Whole: Pepperoni, Jalapeno Peppers

Quantity: 1

ADD TO ORDER

◄ BACK

CHOOSE TOPPINGS

CHOOSE MEATS

- [x] Pepperoni — Normal
- [ ] Salami
- [ ] Premium Chicken
- [ ] Italian Sausage
- [ ] Sliced Italian Sausage
- [ ] Beef
- [ ] Philly Steak

CHOOSE NON-MEATS

- [ ] Cheddar Cheese
- [ ] Feta Cheese
- [ ] Shredded Parmesan Asiago
- [ ] Shredded Provolone Cheese
- [ ] Banana Peppers
- [ ] Black Olives
- [x] Jalapeno Peppers — Normal
- [ ] Green Peppers
- [ ] Mushrooms
- [ ] Pineapple
- [ ] Onions

How much per topping?

DOMINO'S PIZZA BUILDER

SIZE & CRUST | CHEESE & SAUCE | TOPPINGS

MY PIZZA

Medium (12") Hand Tossed Pizza

Whole: Pepperoni, Jalapeno Peppers, Mushrooms

Quantity: 1

ADD TO ORDER

◄ BACK

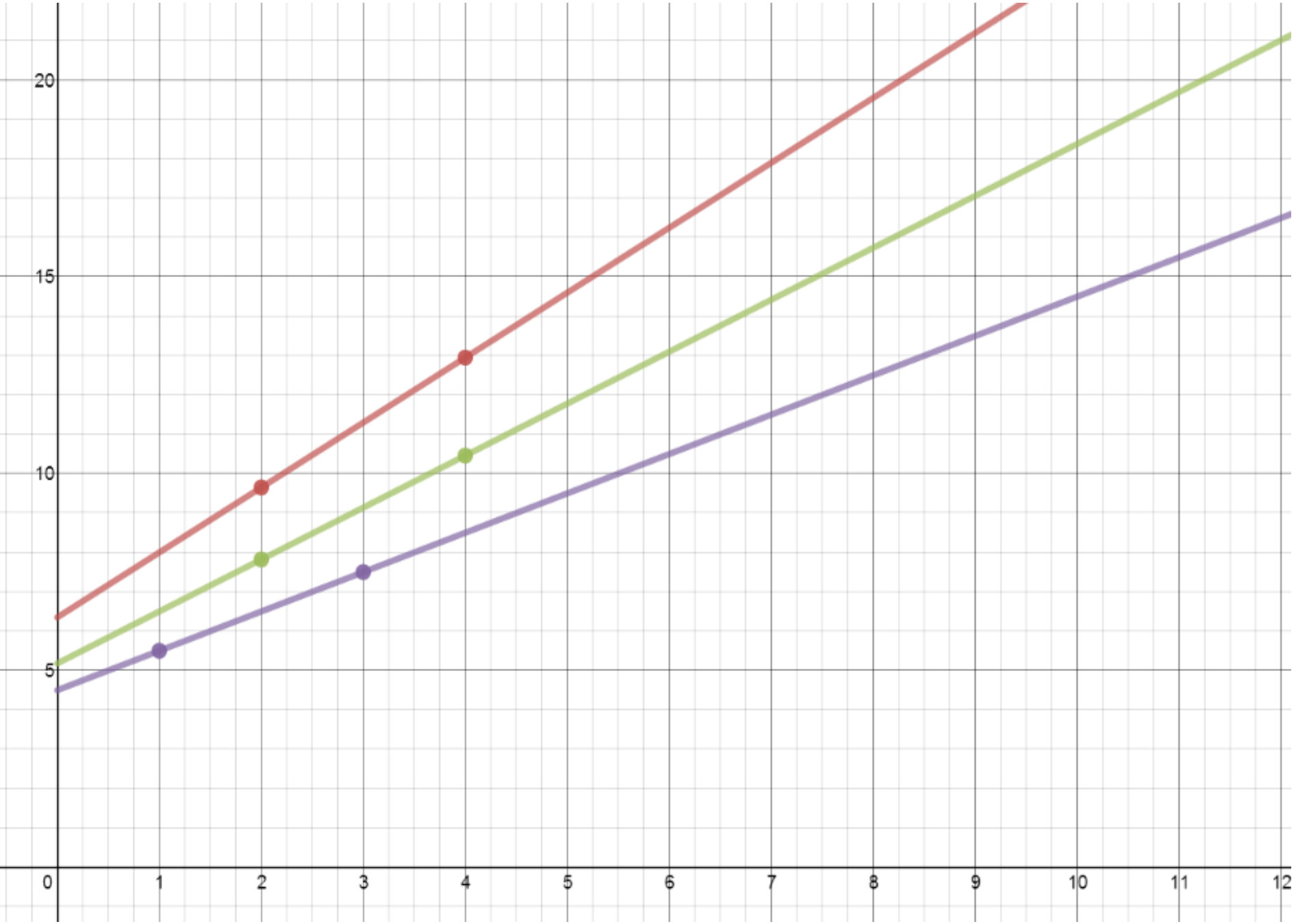
CHOOSE TOPPINGS

CHOOSE MEATS

- [x] Pepperoni — Normal
- [ ] Italian Sausage
- [ ] Sliced Italian Sausage
- [ ] Beef
- [ ] Philly Steak
- [ ] Ham
- [ ] Bacon
- [ ] Salami
- [ ] Premium Chicken

CHOOSE NON-MEATS

- [ ] Cheddar Cheese
- [ ] Feta Cheese
- [ ] Shredded Parmesan Asiago
- [ ] Shredded Provolone Cheese
- [ ] Banana Peppers
- [ ] Black Olives
- [ ] Green Olives
- [ ] Green Peppers
- [x] Jalapeno Peppers — Normal
- [x] Mushrooms — Normal
- [ ] Pineapple
- [ ] Onions
- [ ] Roasted Red Peppers


20
15
10
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1
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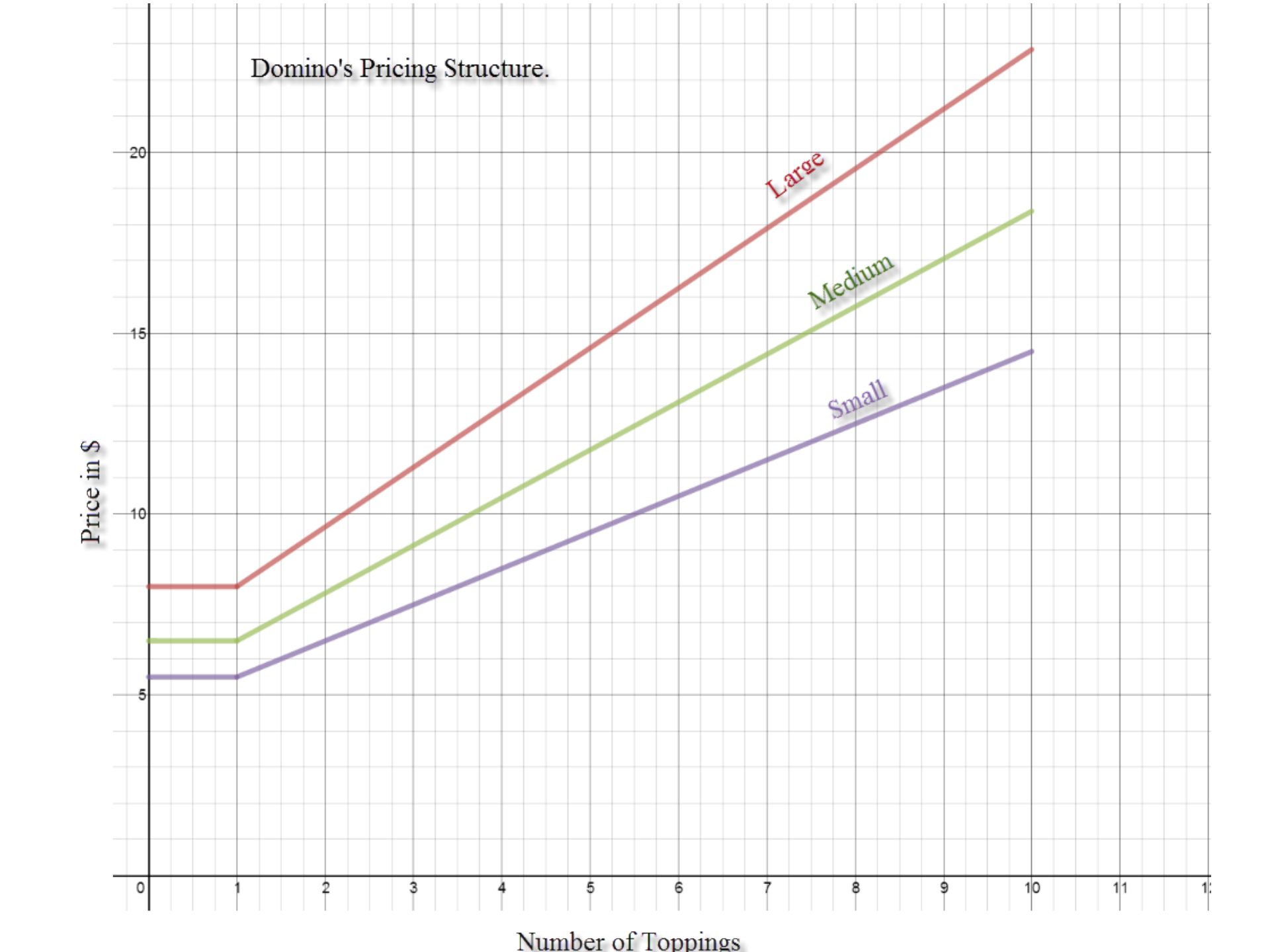
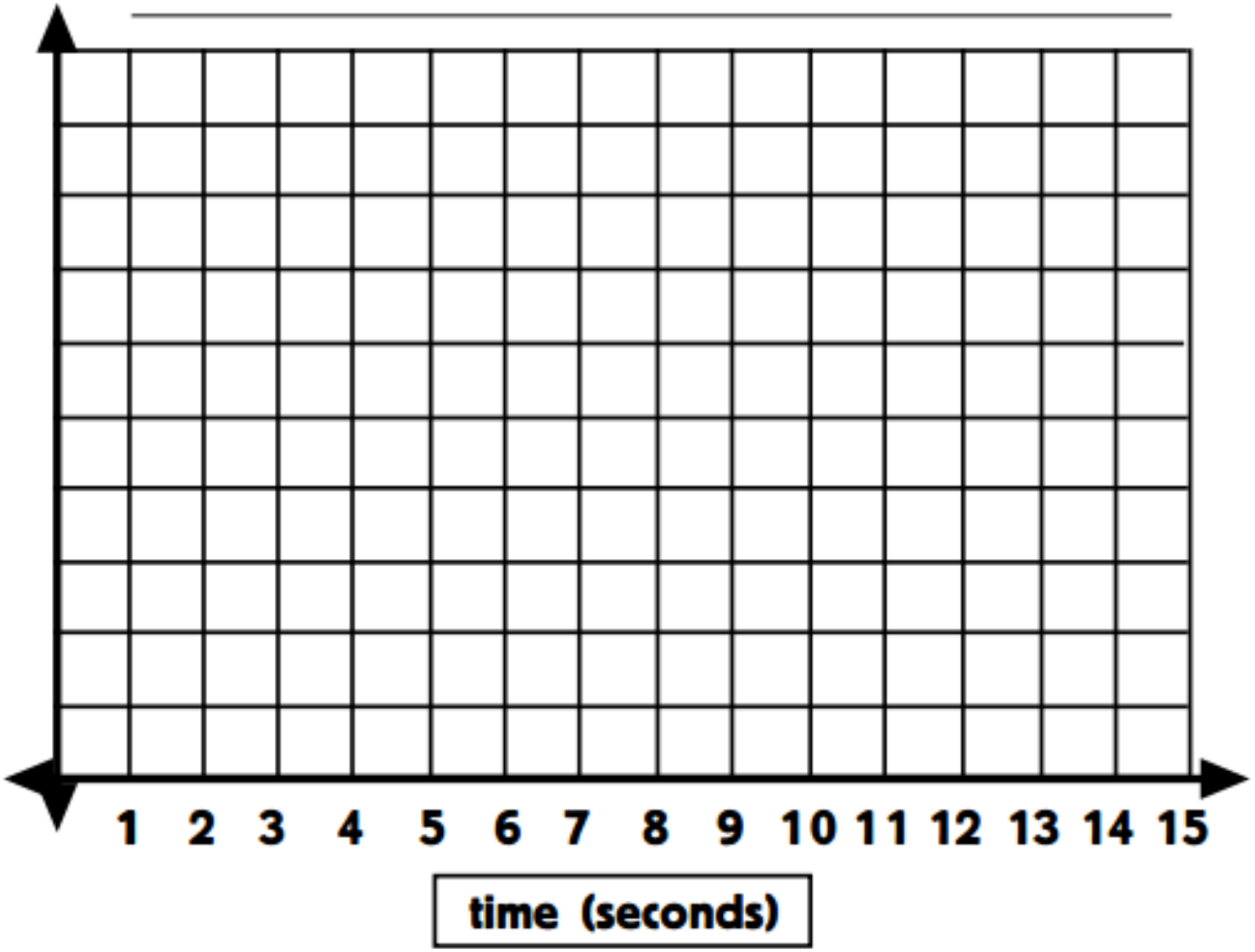

Domino's Pricing Structure.
Large
Medium
Small
Price in $
20
15
10
5
0
1
2
3
4
5
6
7
8
9
10
11
Number of Toppings

Functions

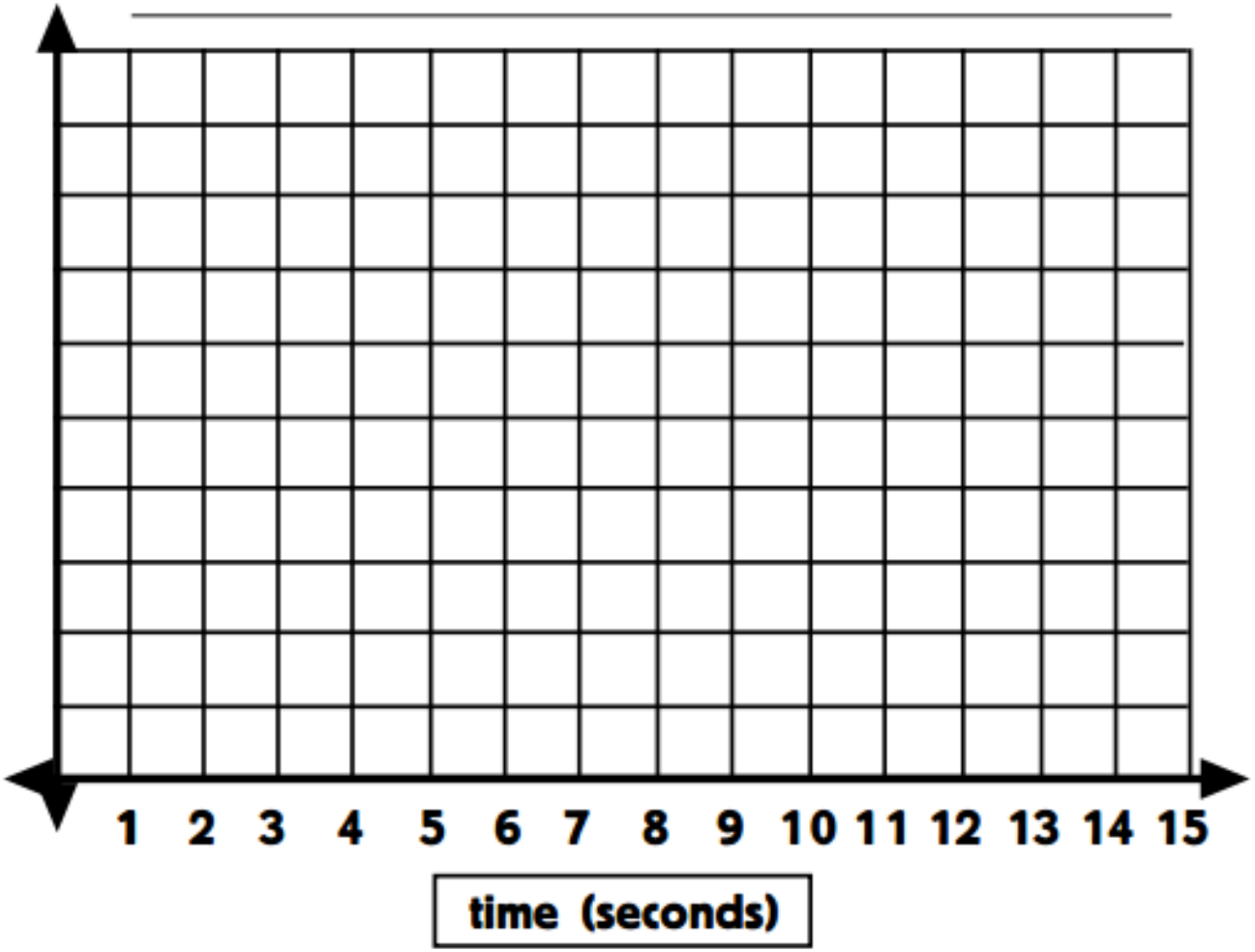
GRAPHING STORIES




distance from bench
kenneth j lawler


distance from bench
kenneth j lawler

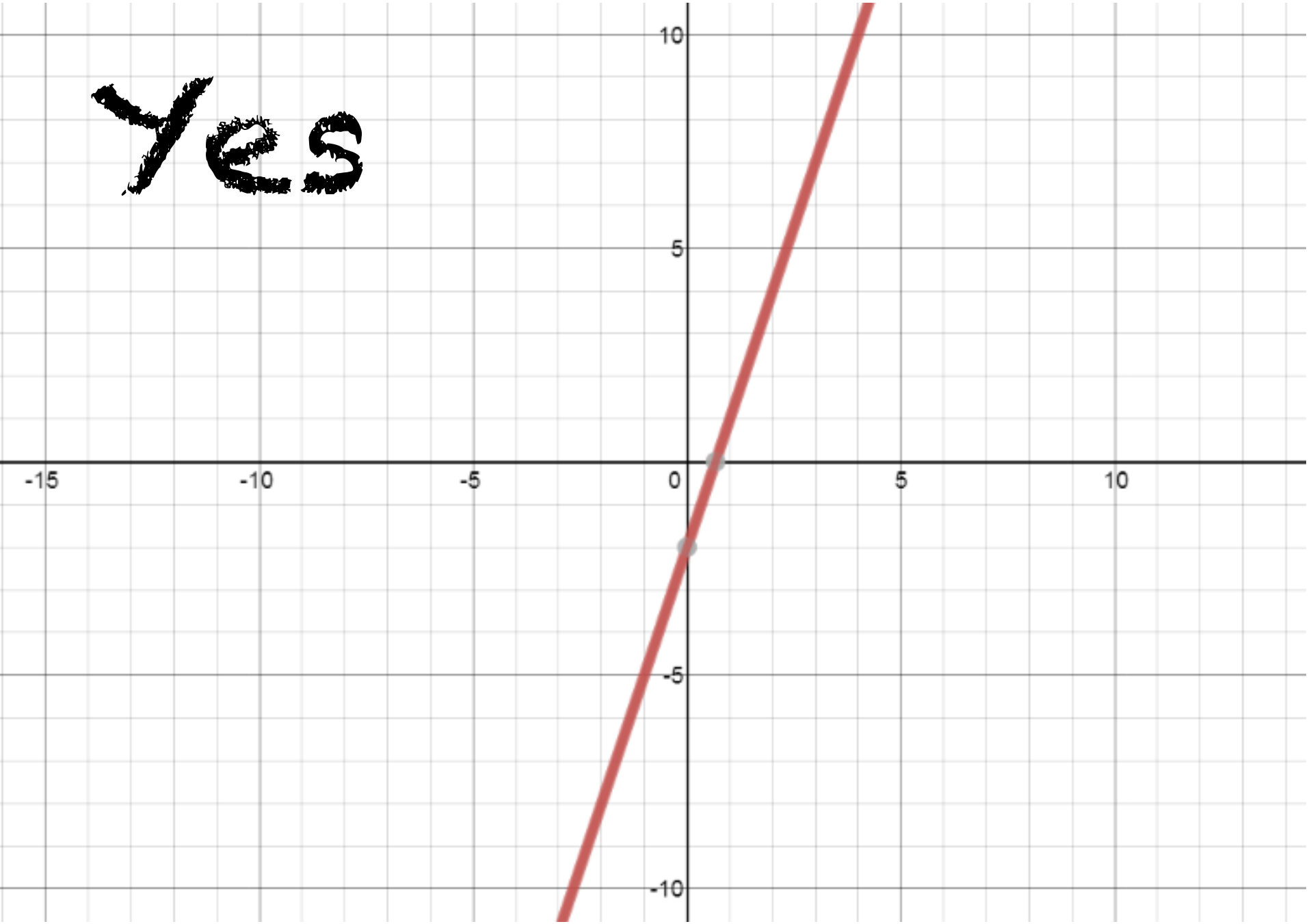
GRAPHING STORIES




distance from home plate
liam johnston

SHORT EXPLORE

Yes or No?


Yes
10
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-15
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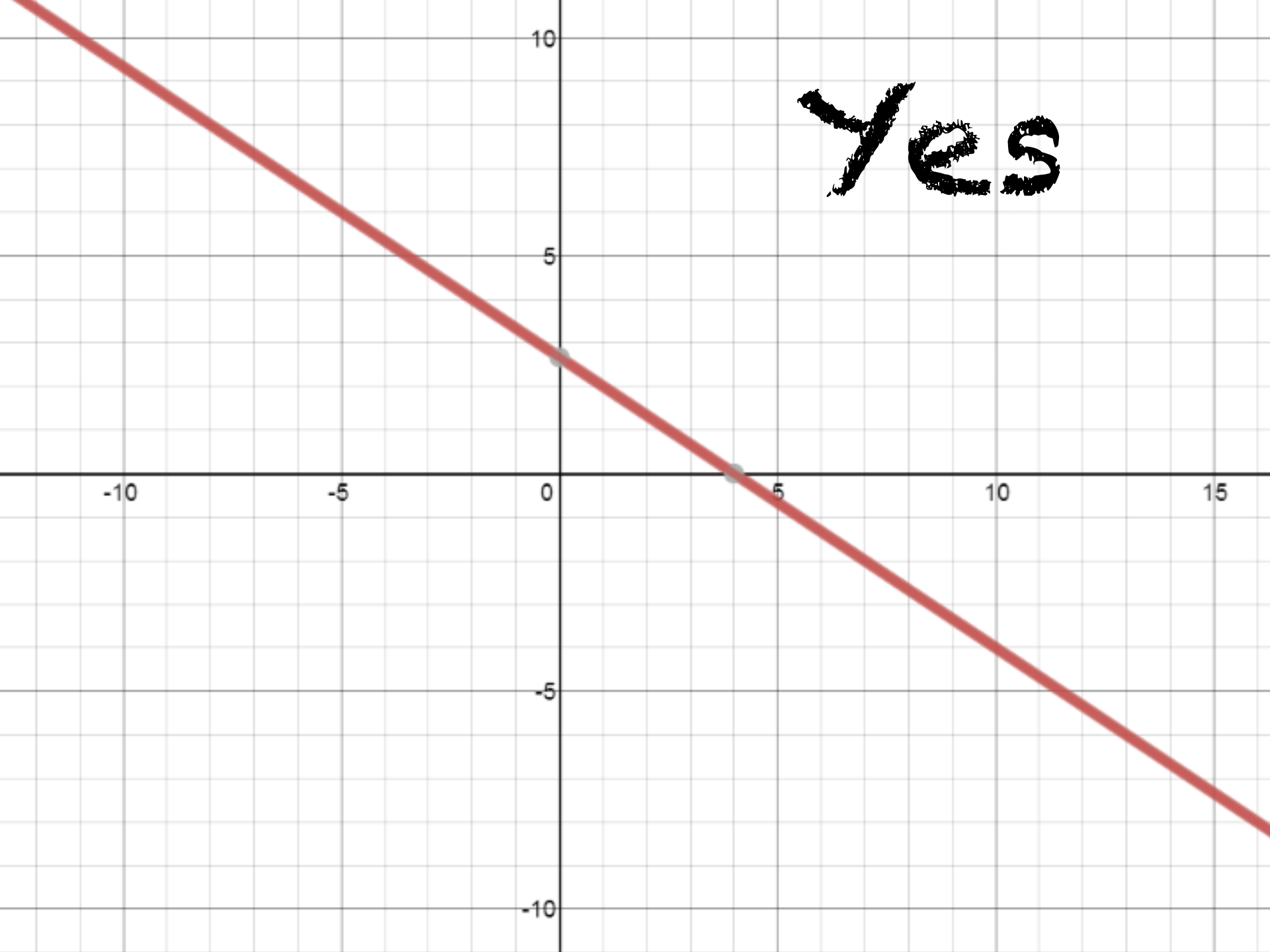
-5
-10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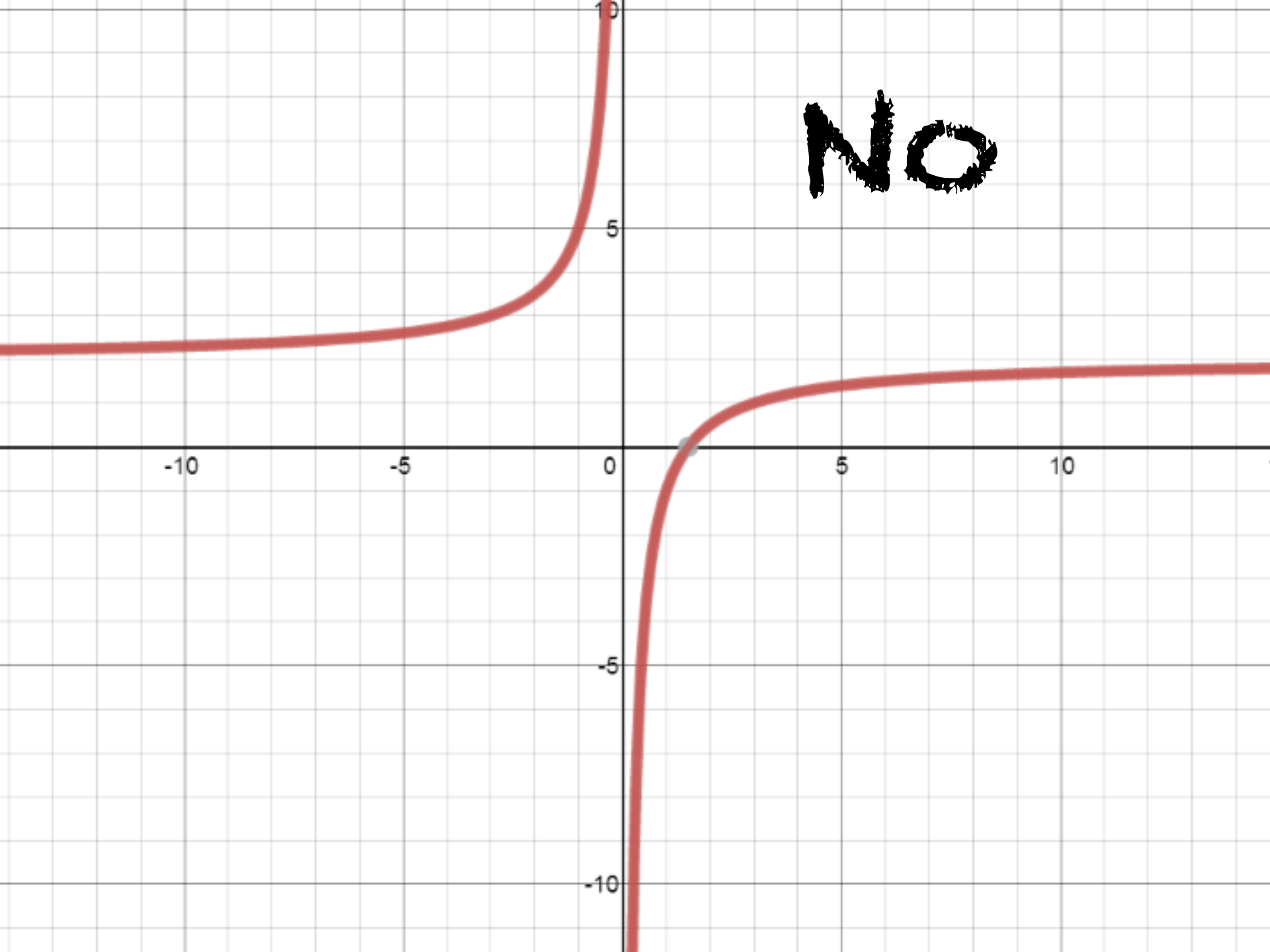
-5
-10
Yes


No
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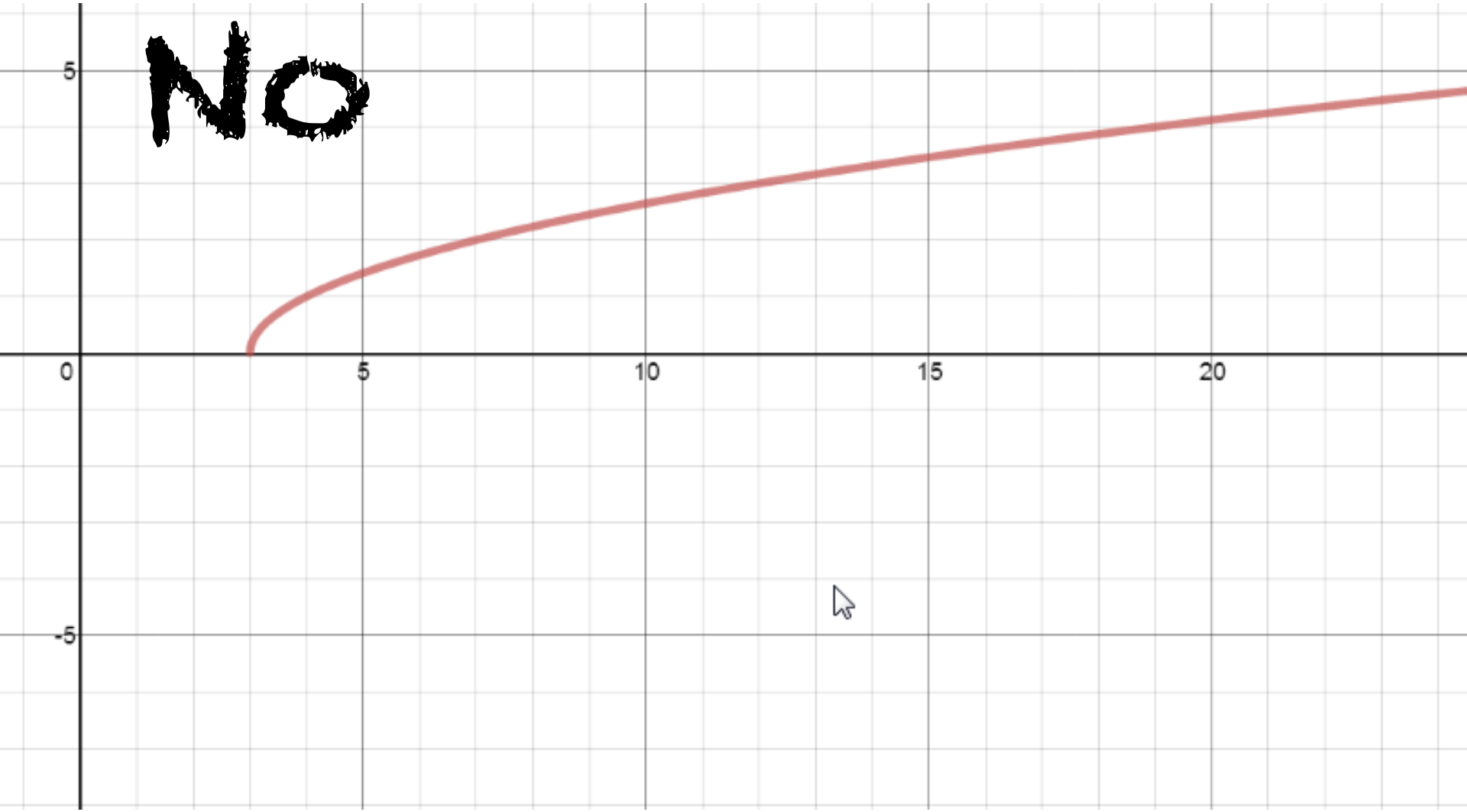
-10


No
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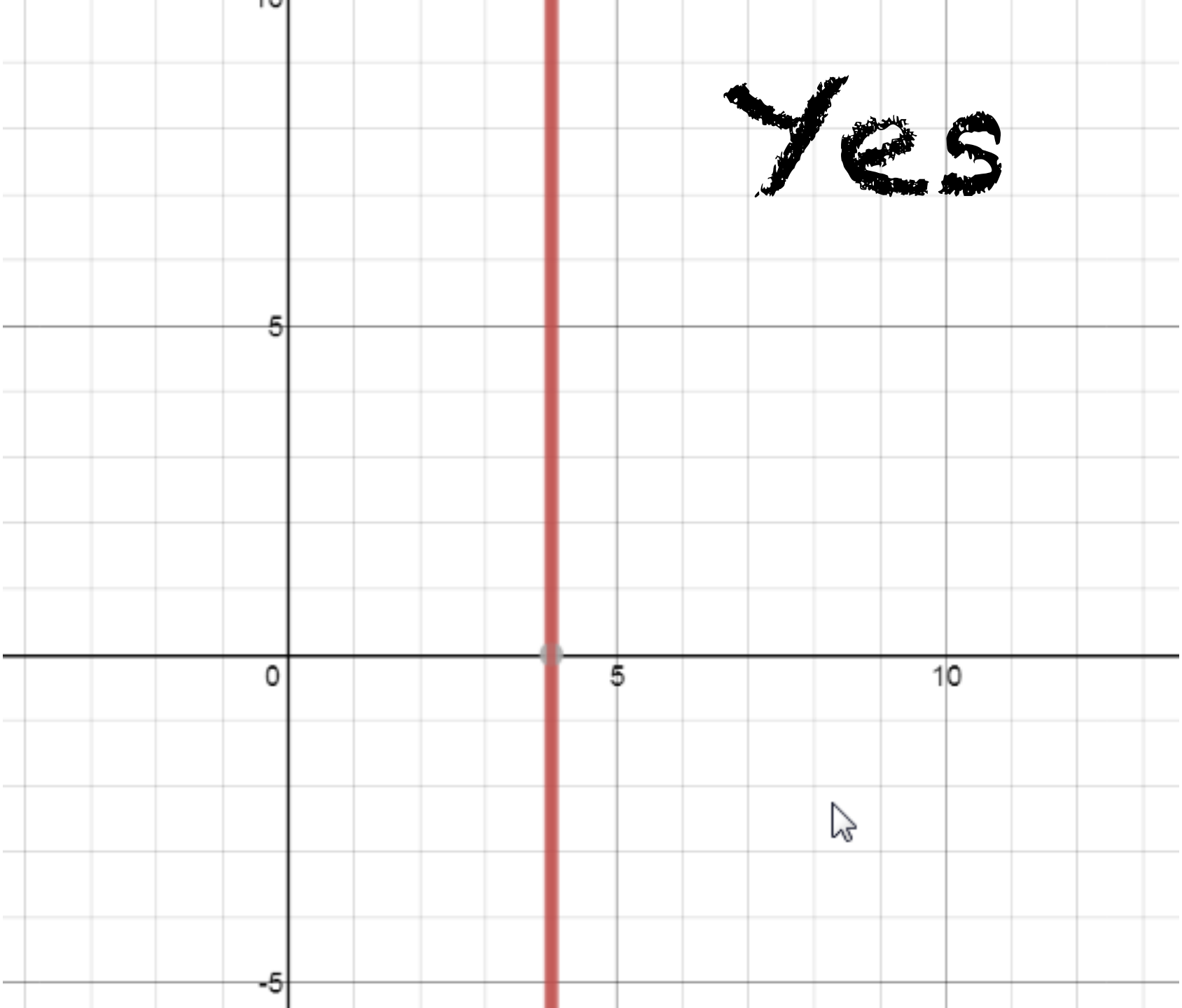
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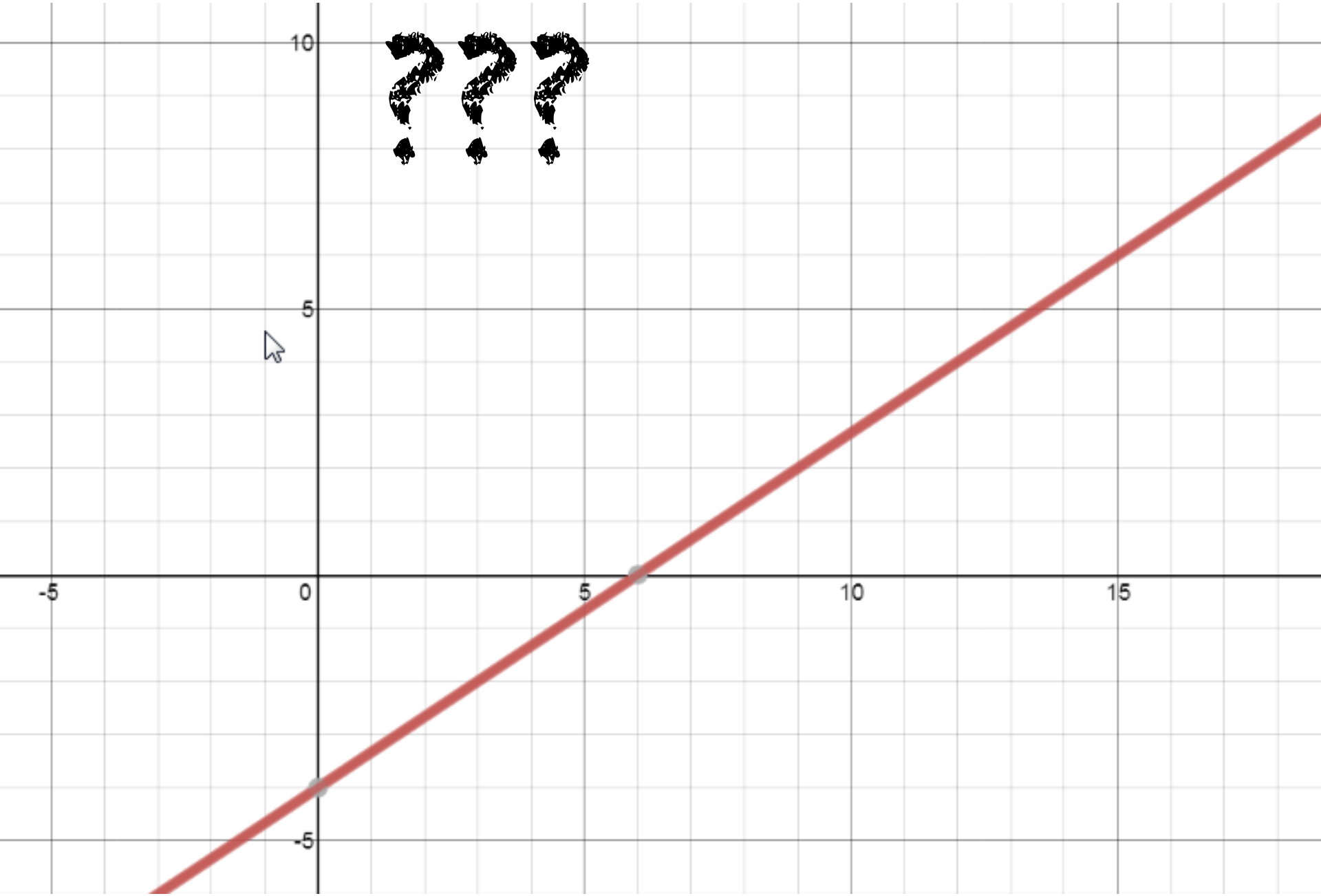
-5
Yes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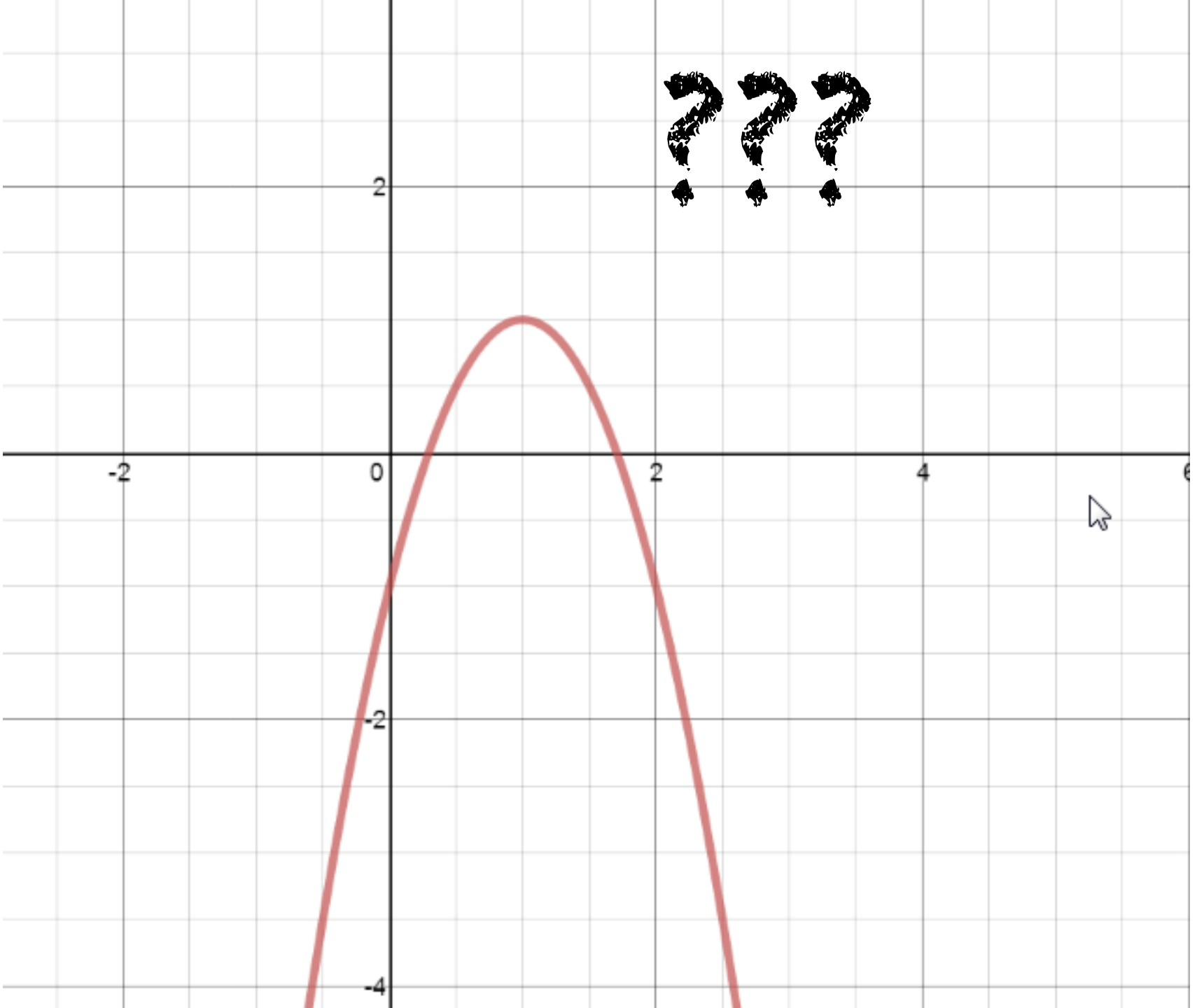
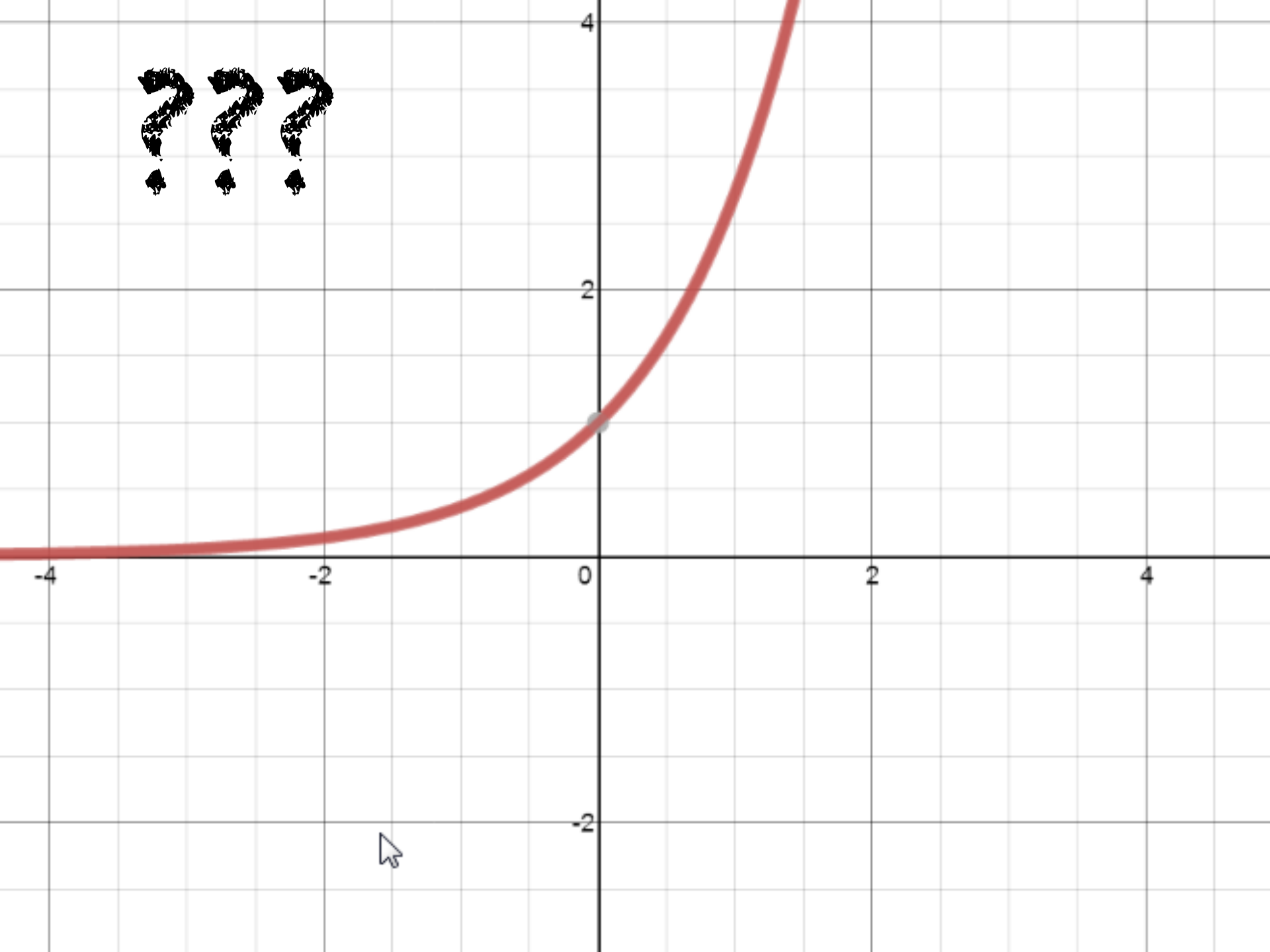
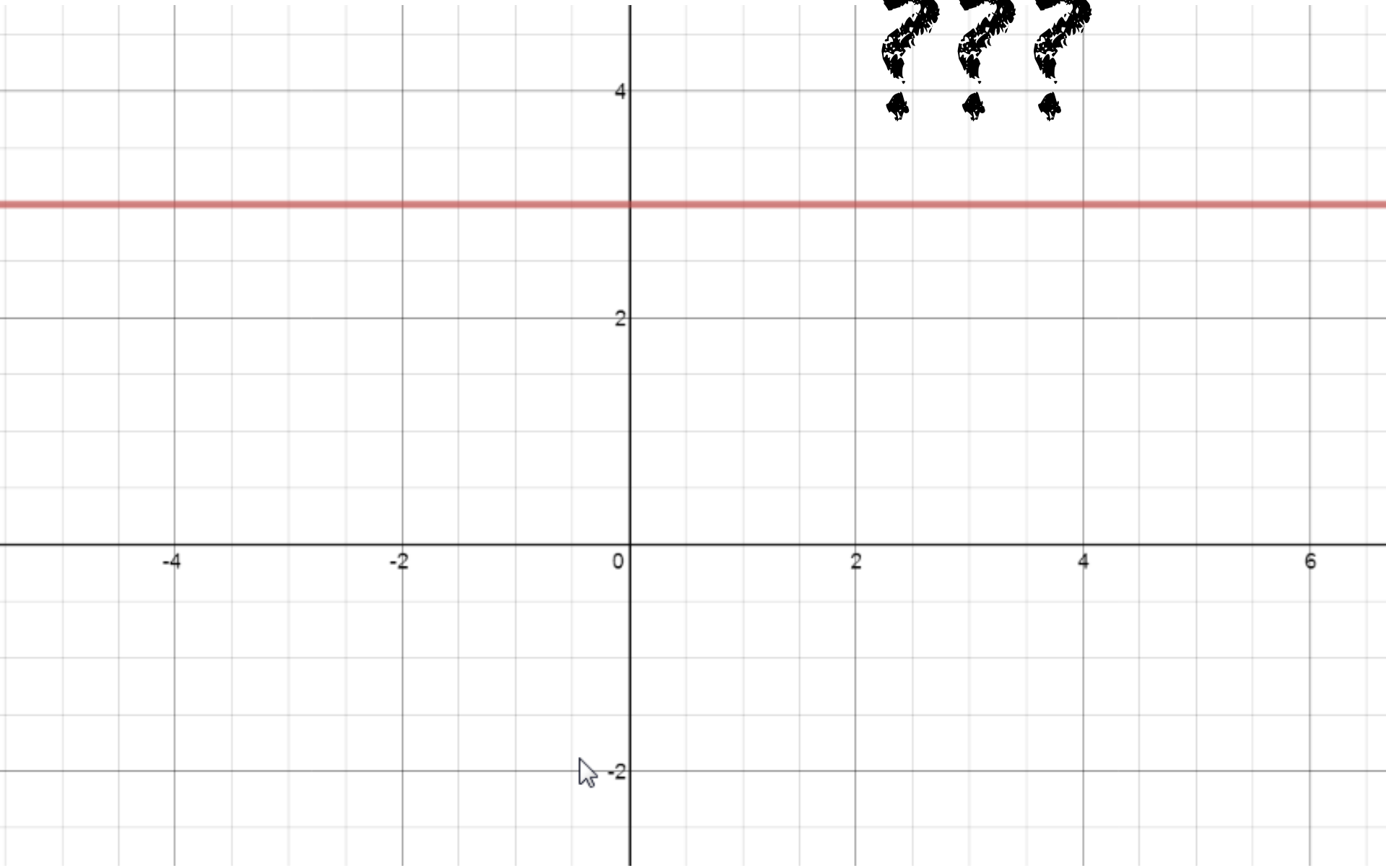
-5
0
5
10
15
-5


???
2
-2
0
2
4
-2
-4


???
4
2
-2
-4
-2
0
2
4


4
2
-4
-2
0
2
4
6
-2

Less than 7 minutes.

$2x - 3y = 8$

Yes

$3/x + y = 9$

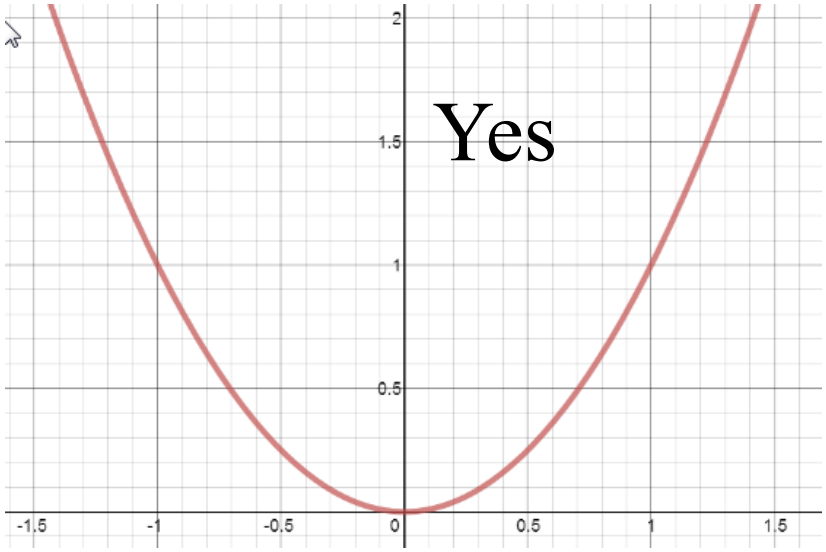
No

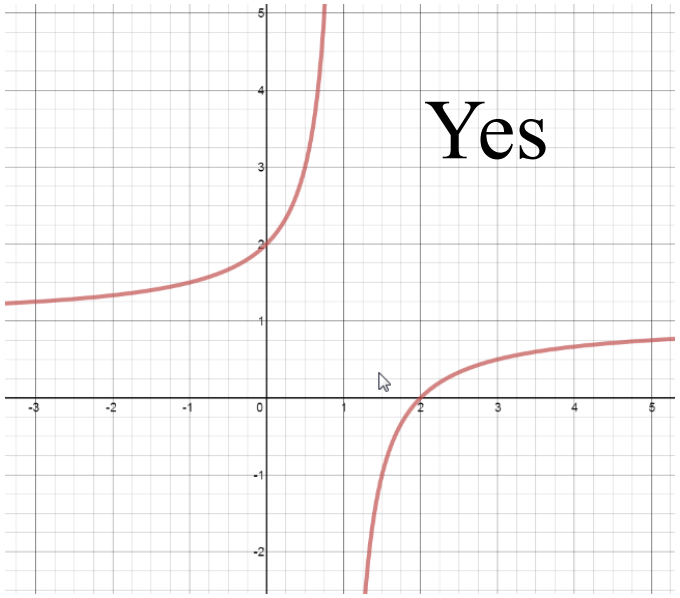
$3x^2 - 5y = 9$

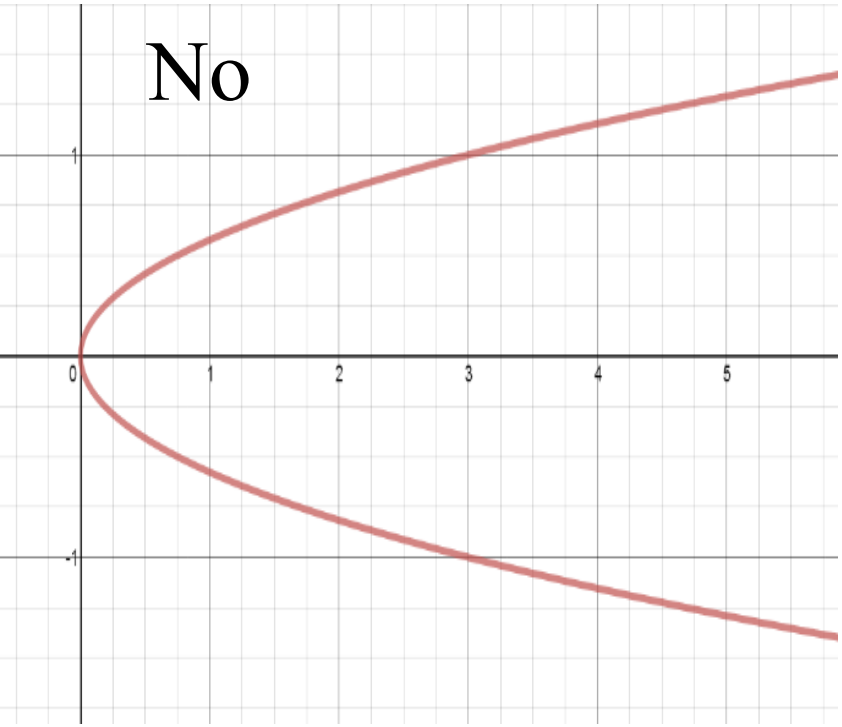
No

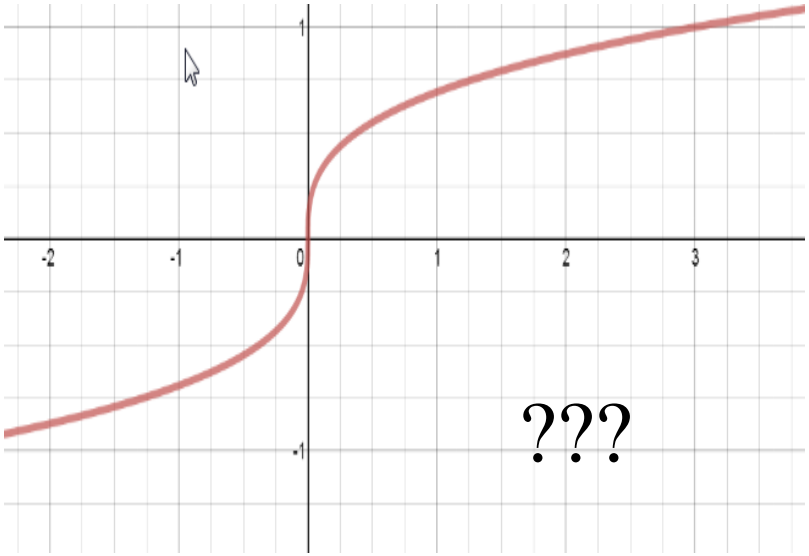
$4x^{-1} + 2y = 9$

???


Yes

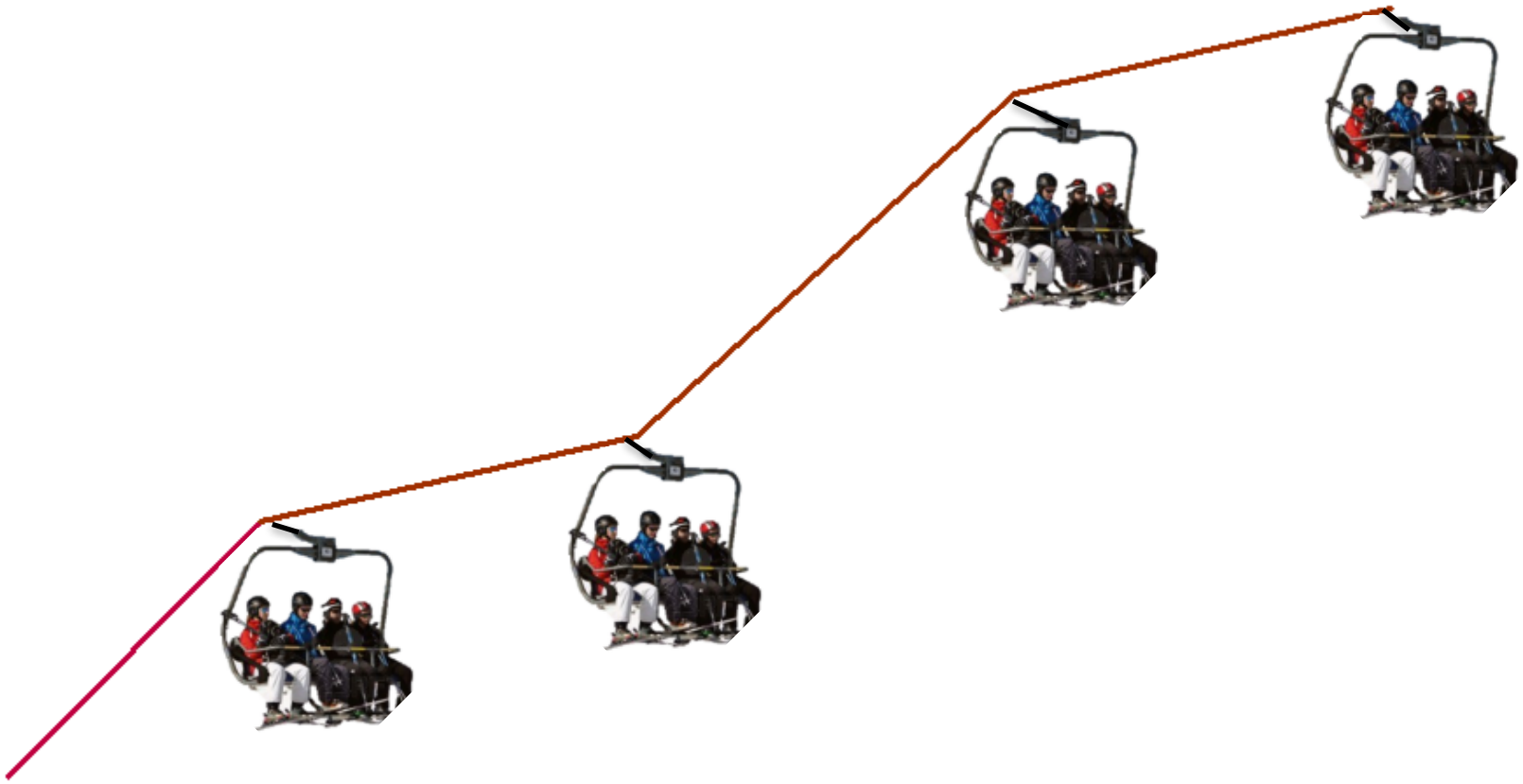

Yes

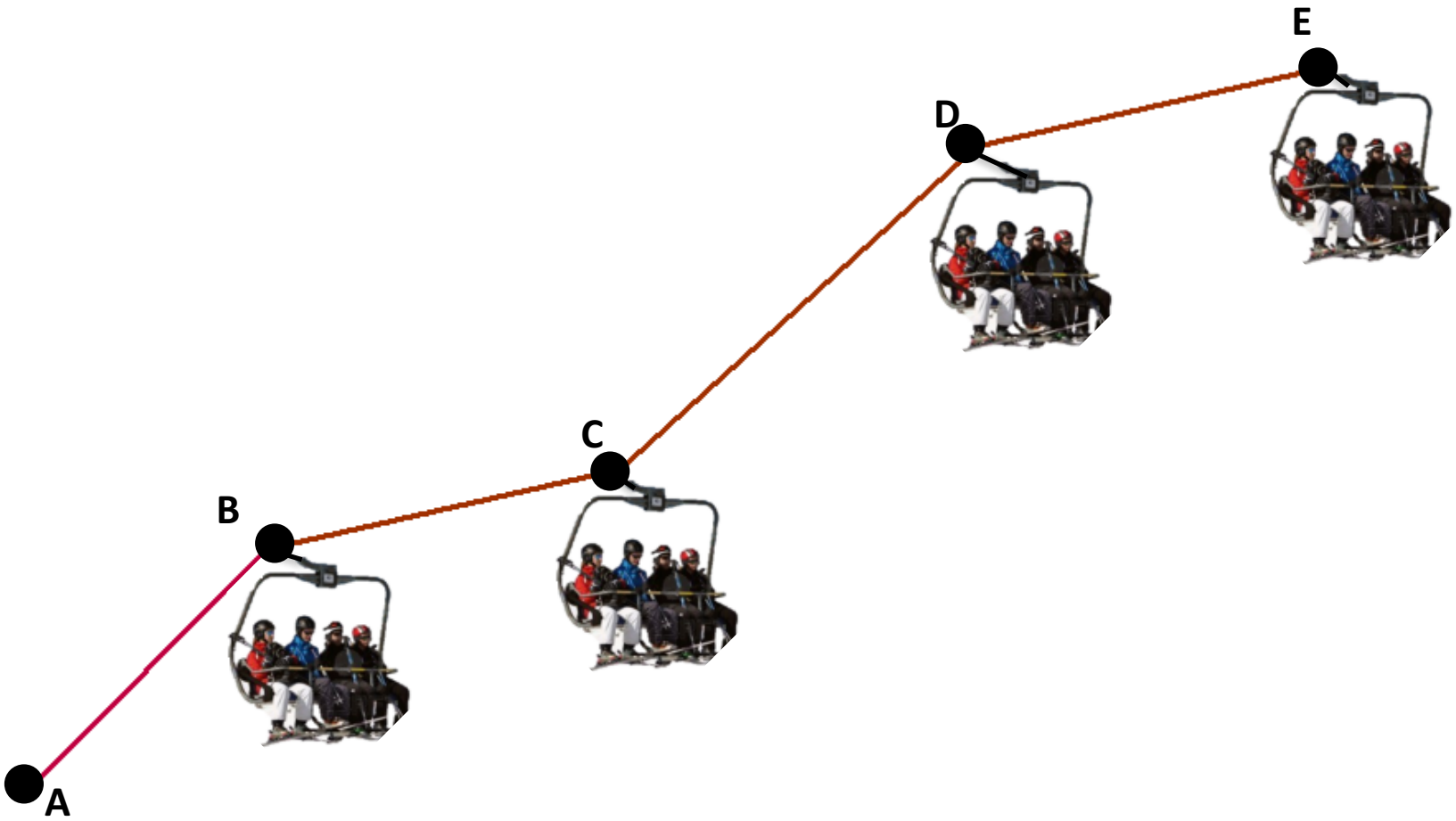

No


???

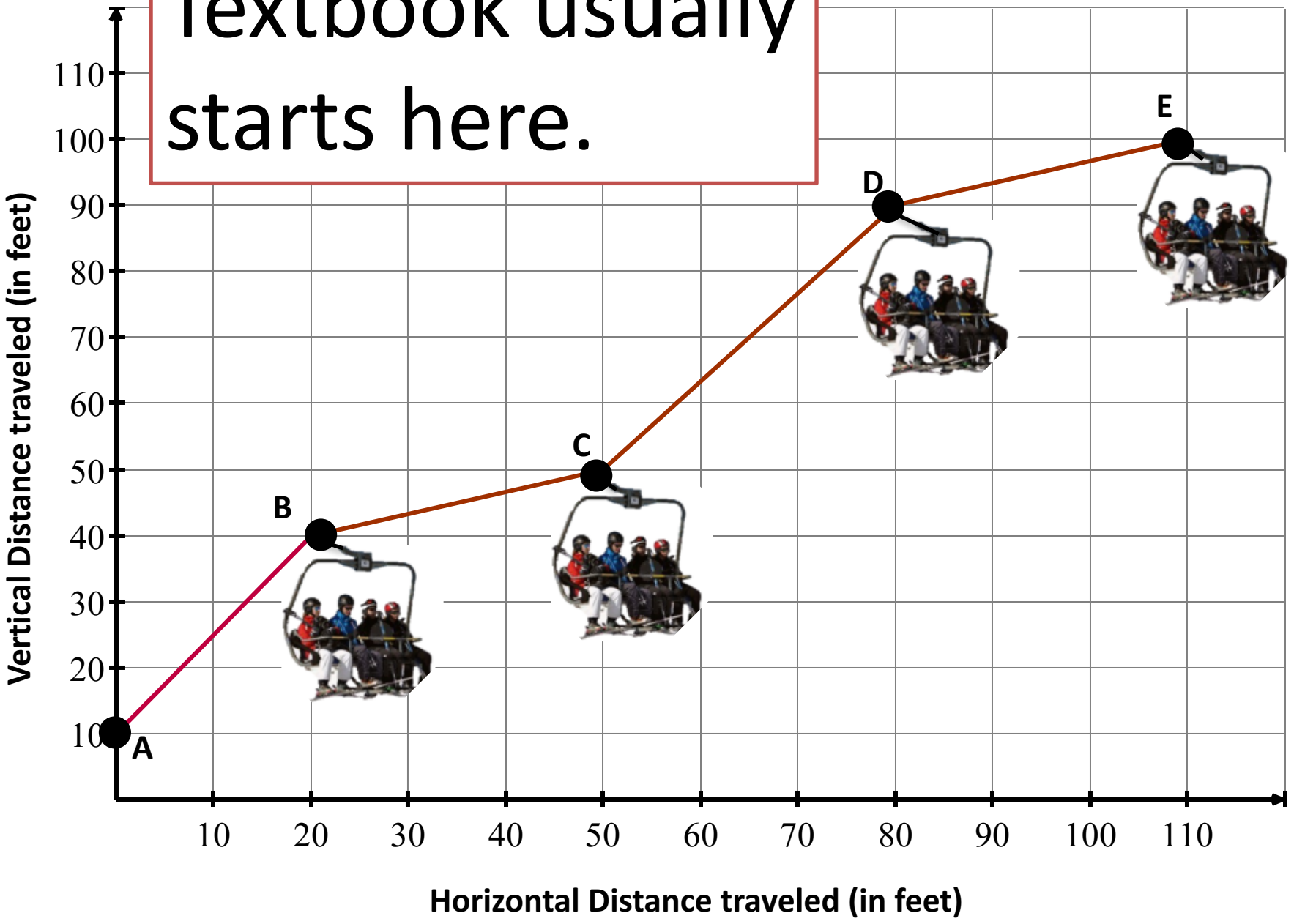
Removing the scaffolding of Textbook problems

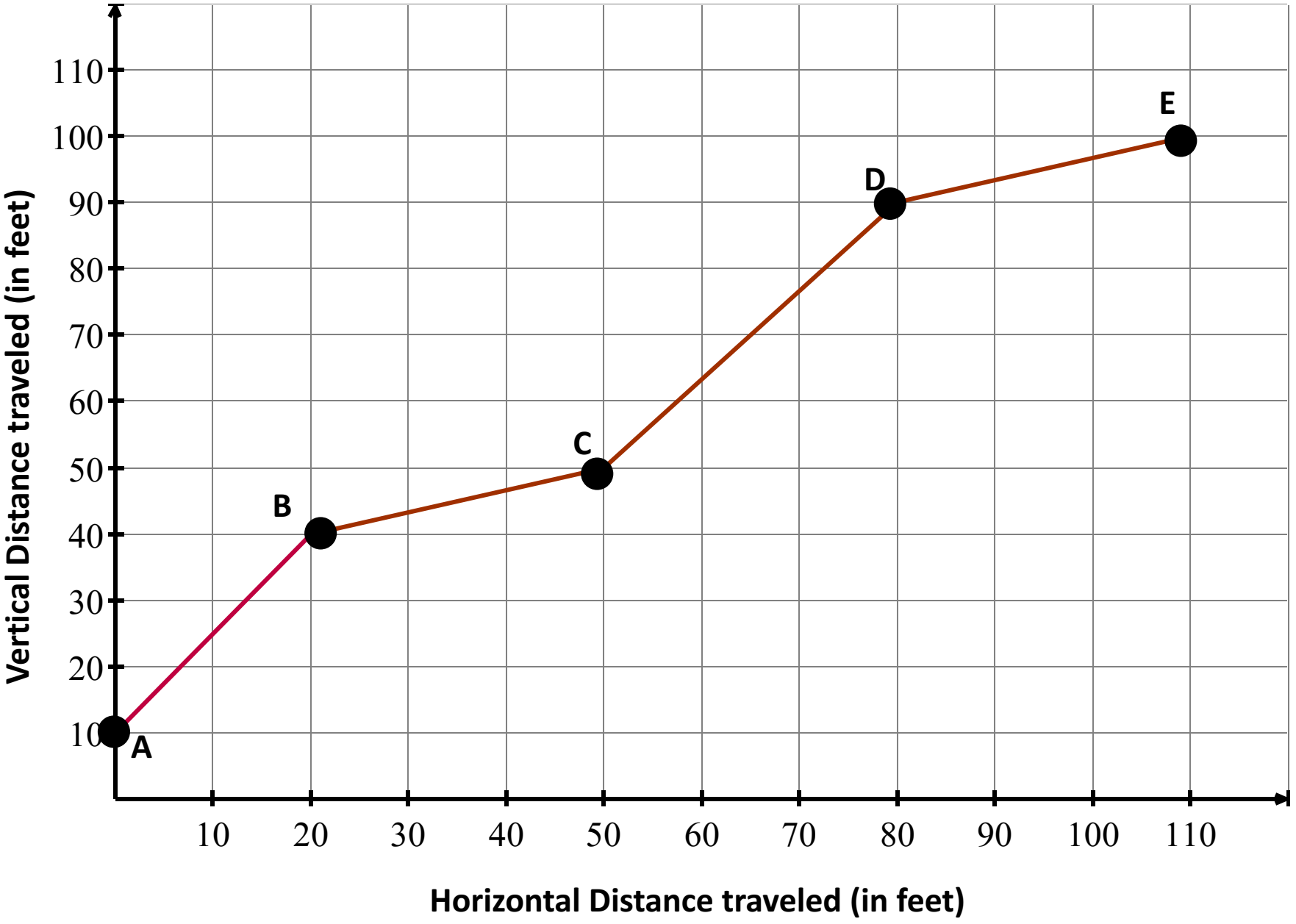
Which section is the steepest?




A
B
C
D
E

Textbook usually starts here.




Vertical Distance traveled (in feet)
110
100
90
80
70
60
50
40
30
20
10
A
B
C
D
E
10
20
30
40
50
60
70
80
90
100
110
Horizontal Distance traveled (in feet)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course settings

modify

Unit 1

- Course Home
- Syllabus
- Announcements
- Videos
  - Introduction
  - Unit 1
  - Unit 2
  - Unit 3
  - Unit 4
- Homework
- Practice tests
- Quizzes & Tests

Section 1.8

PowerPoint Notes Order of Operations | Distributive Pro

Video Lecture Examples Order of Operations | Distribut

Video Lecture Order of Operations | Distributive Proper

Section 2.1

PowerPoint Notes Solving 1-step equations

Video Lecture Examples for Solving 1-step equations

Video Lecture Solving 1-step equations

Section 2.2

PowerPoint Notes for Solving multi-step equations

Video Lecture Examples for Solving multi-step equation

Example 2

Solve

A. $5x = 20$

$\frac{5x}{5} = \frac{20}{5}$

$x = 4$

$\left(\frac{1}{5}\right)5x = 20\left(\frac{1}{5}\right)$

$x =$

B. $3x = 13$

C. $-2x = -10$

D. $-6x = 9$

Example 5b

Given the equation y = -3x + 2, complete the table below. Write the final points as ordered pairs.

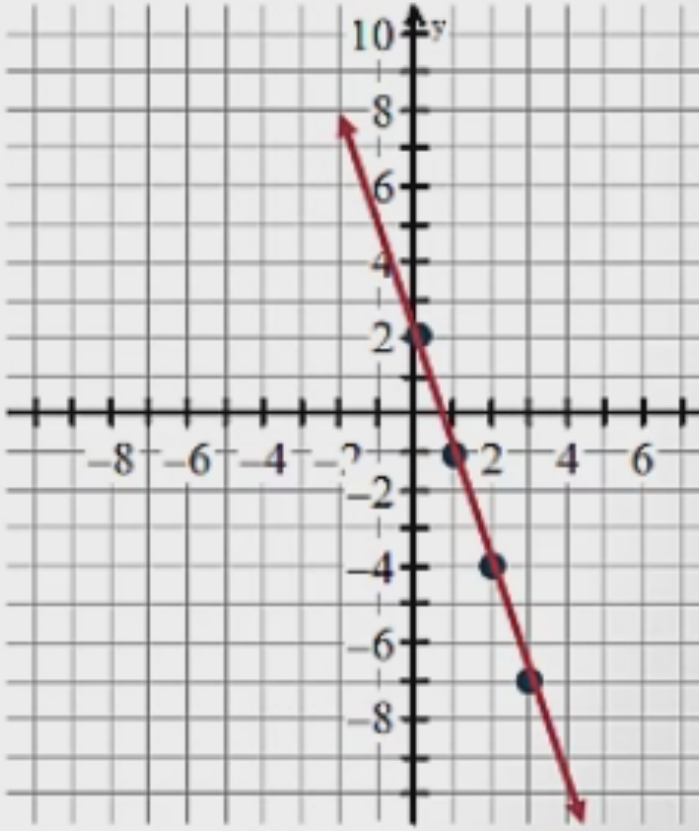
x	y
0	2
1	-1
2	-4
3	-7

y = -3(0) + 2 = 2 (0, 2)

y = -3(1) + 2 = -1 (1, -1)

y = -3(2) + 2 = -4 (2, -4)

y = -3(3) + 2 = -7 (3, -7)



Example 2

Graph the equation $4x - 2y = 12$ by finding the x and y-intercepts.

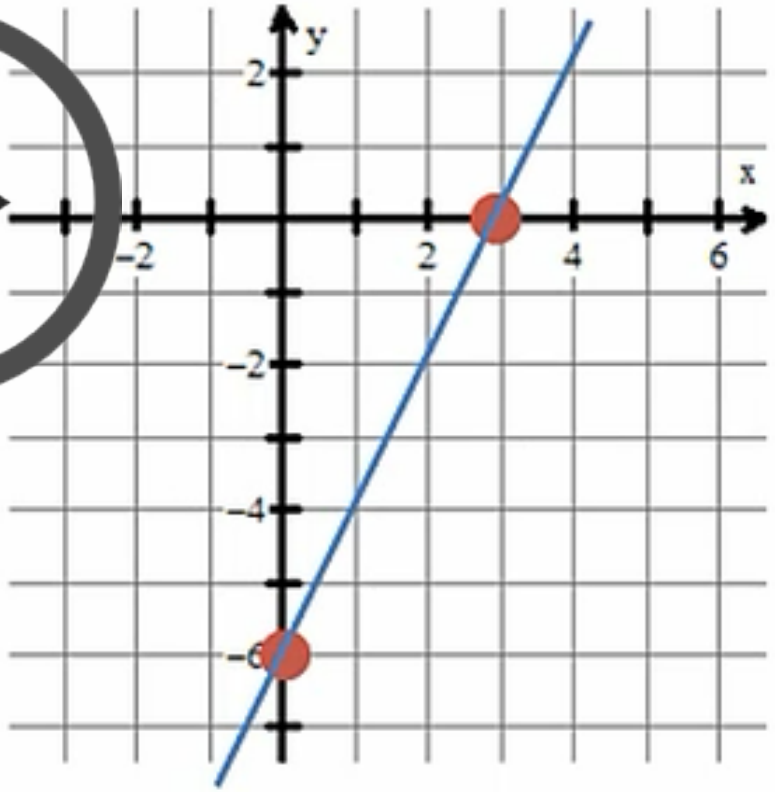
$4x - 2y = 12$

$y = -6$

x	y
0	-6
3	0

$4x = 12$

$x = 3$

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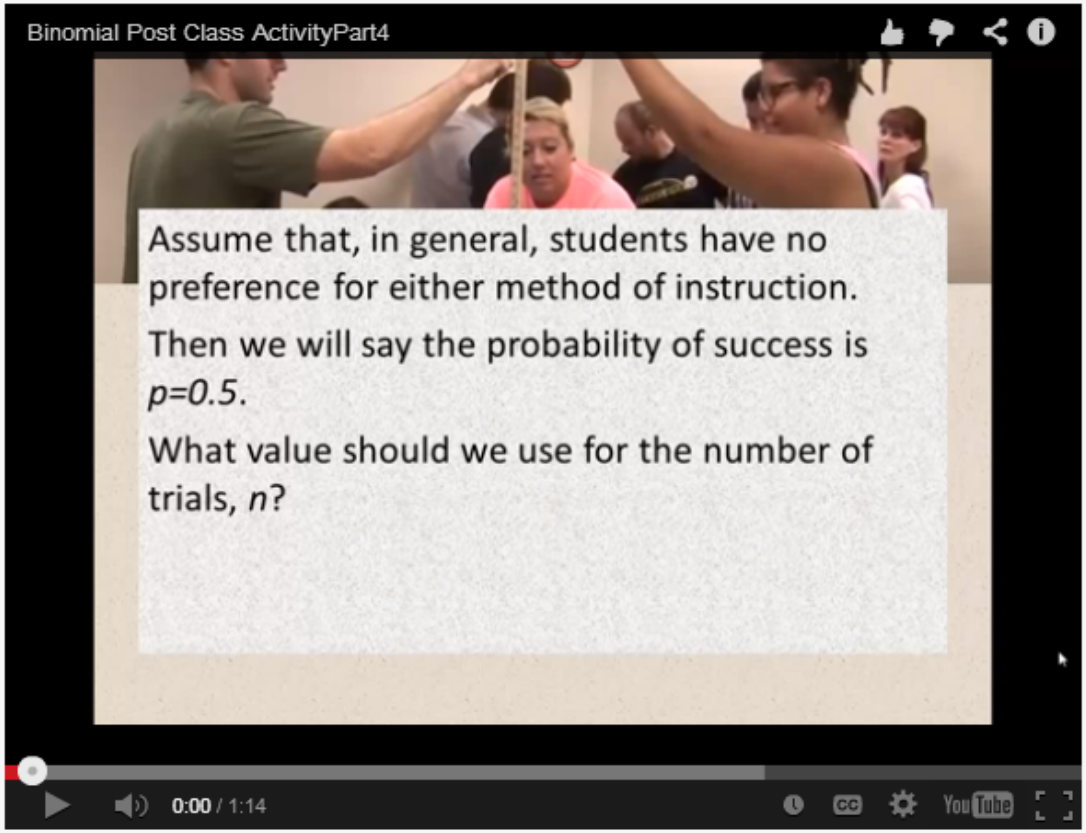
Unlimited Questions and responses

Mobile Friendly

Binomial Post Class Video

* Required

Part 4



What is the probability that exactly 15 students out of the 20 surveyed prefer activities? *
Round to 4 decimal places.

« Back | Continue »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TM

Cumulative Relative Freq Plot - Quiz

Est. Length: 2:00:00 **Scott McDaniel:** Attempt 1

Questions

0 of 2 questions saved

Page 1:

1 2

Legend

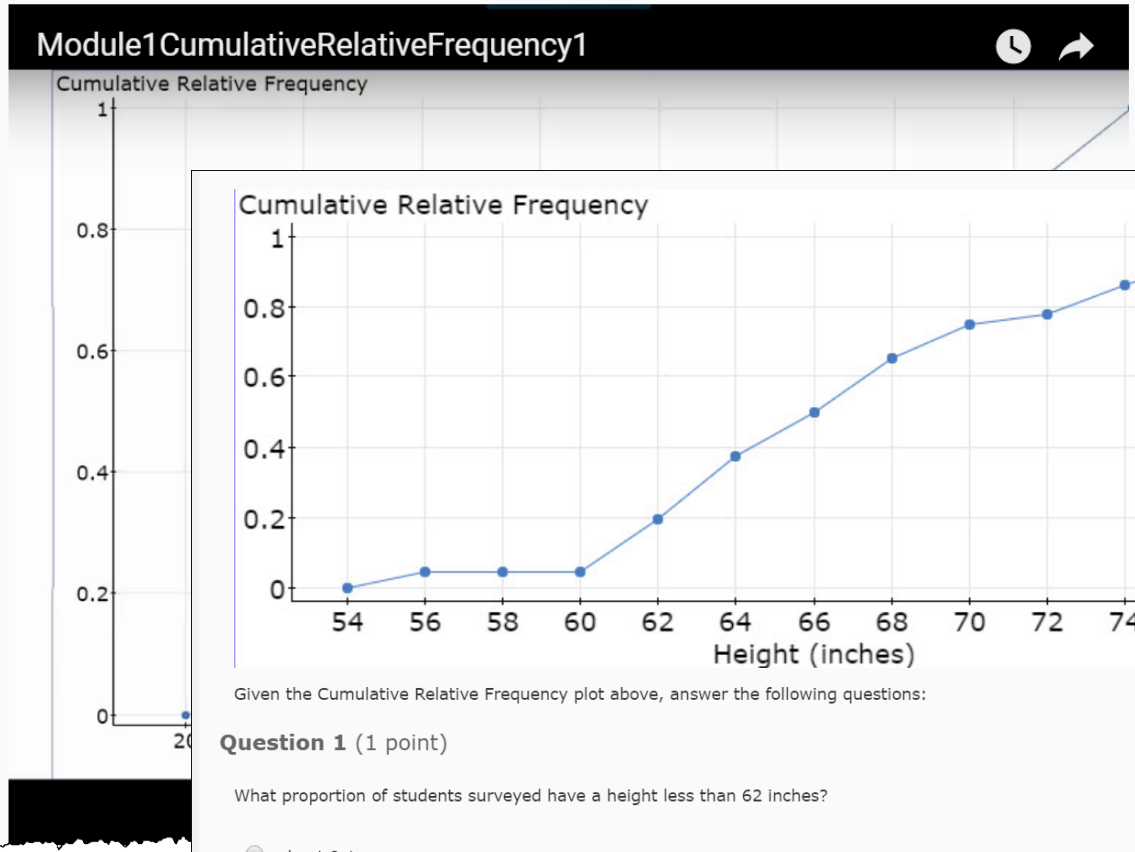
- Saved Response
- Unsaved Response
- Info Item

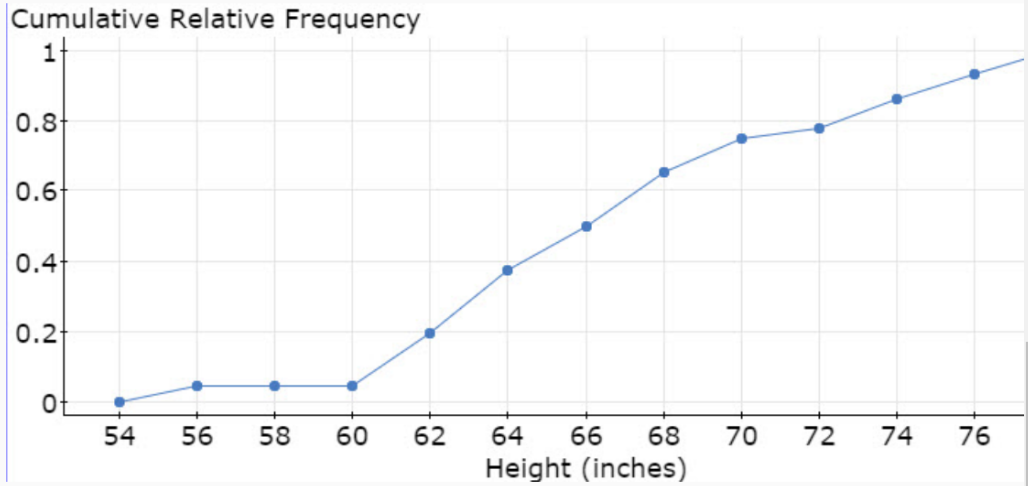
Quiz Status

Quiz Started

Note: It is recommended that you save your response as you complete each question.

Information





Given the Cumulative Relative Frequency plot above, answer the following questions:

Question 1 (1 point)

What proportion of students surveyed have a height less than 62 inches?

- about 0.1
- about 0.2
- about 0.3
- It cannot be determined from the graph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pyramid of pennies

by Dan Meyer

prologue

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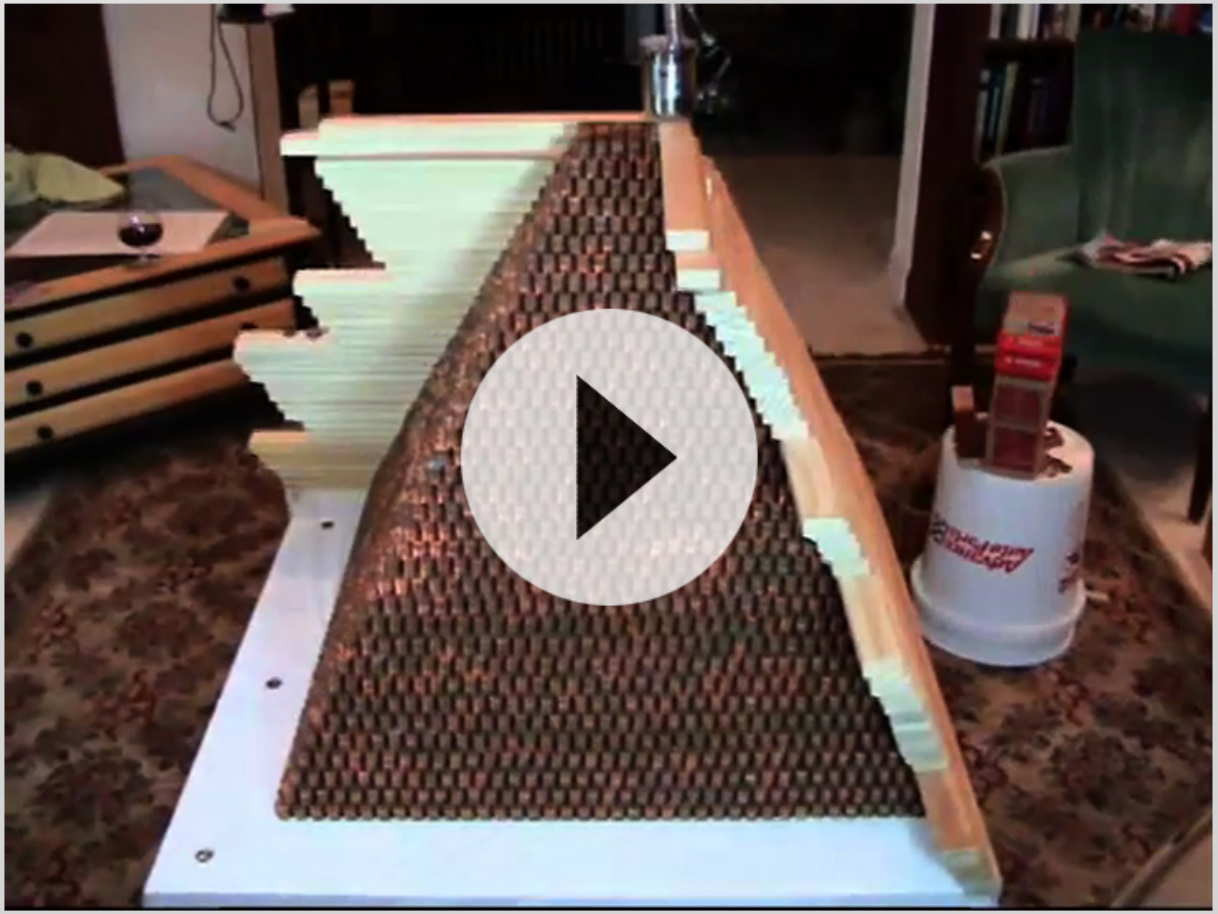
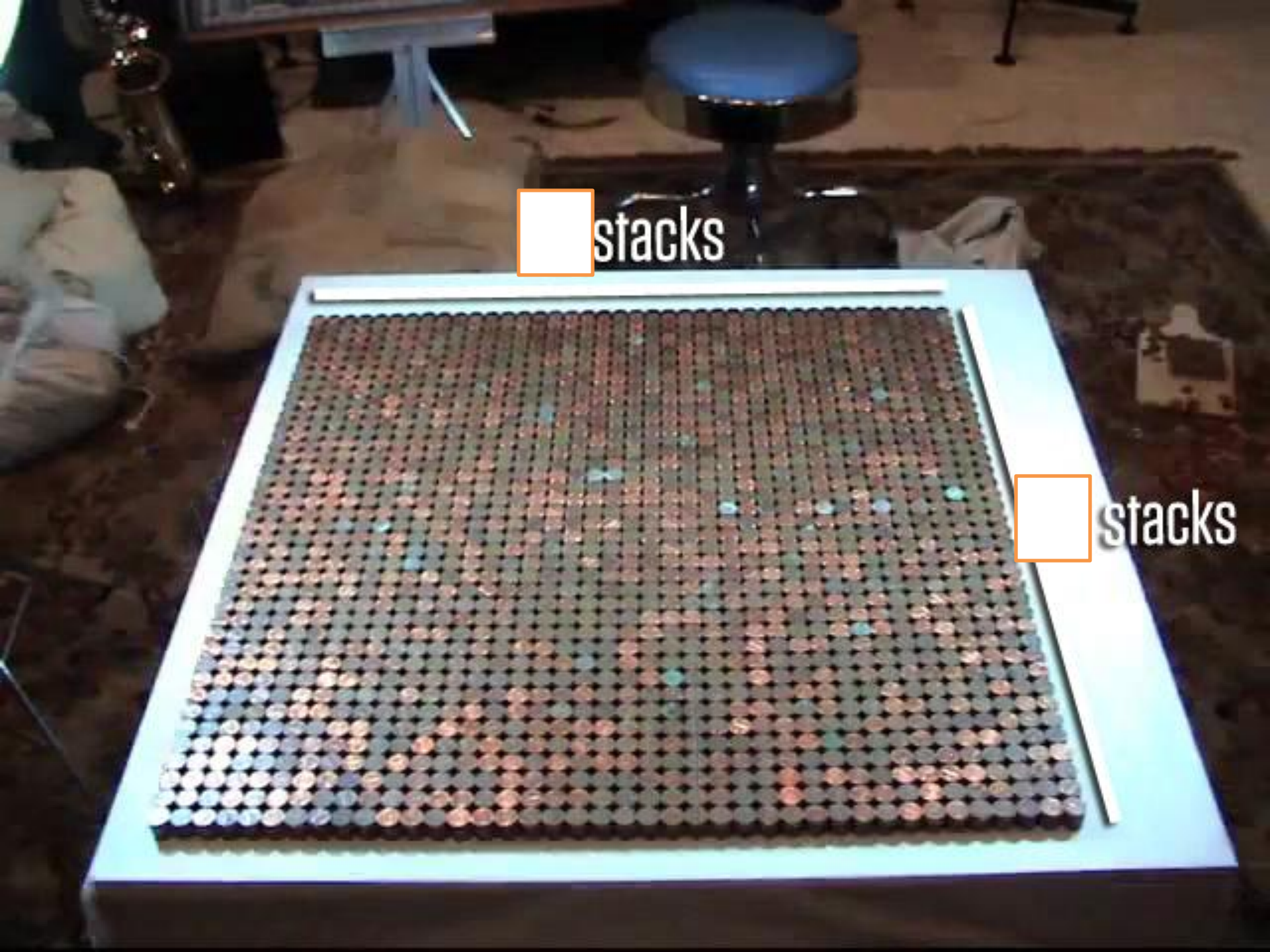
act one




stacks
stacks


pennies

$$P_n = \sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6} = \frac{2n^3 + 3n^2 + n}{67}$$

Sequel #1:

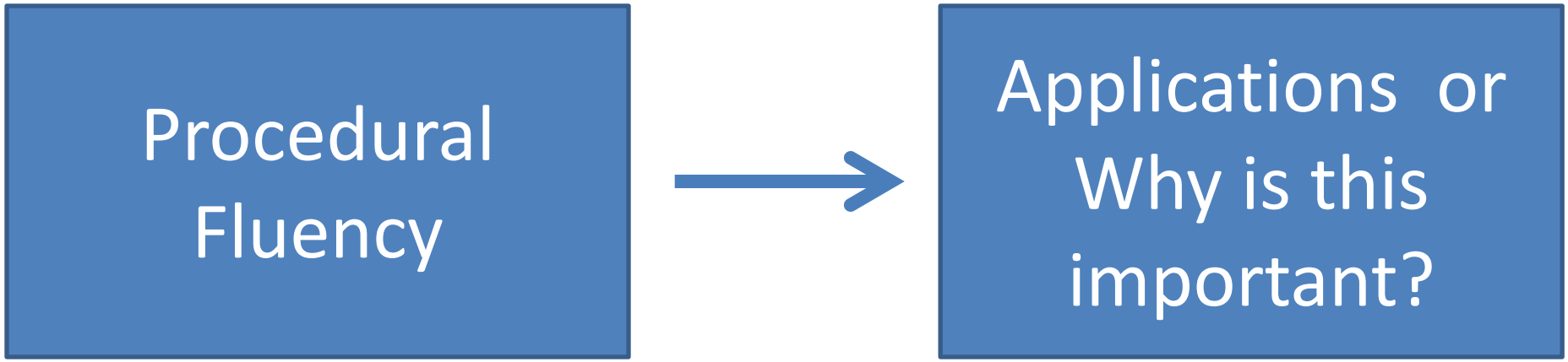
I have $**1,000,000,000** in pennies, how big of a pyramid can I make?

Sequel #2:

Give groups of students a dollar in pennies. See how fast they can assemble seven stacks of thirteen pennies. Then ask them to use that as a sample to determine how long it would take them to build the entire pyramid.

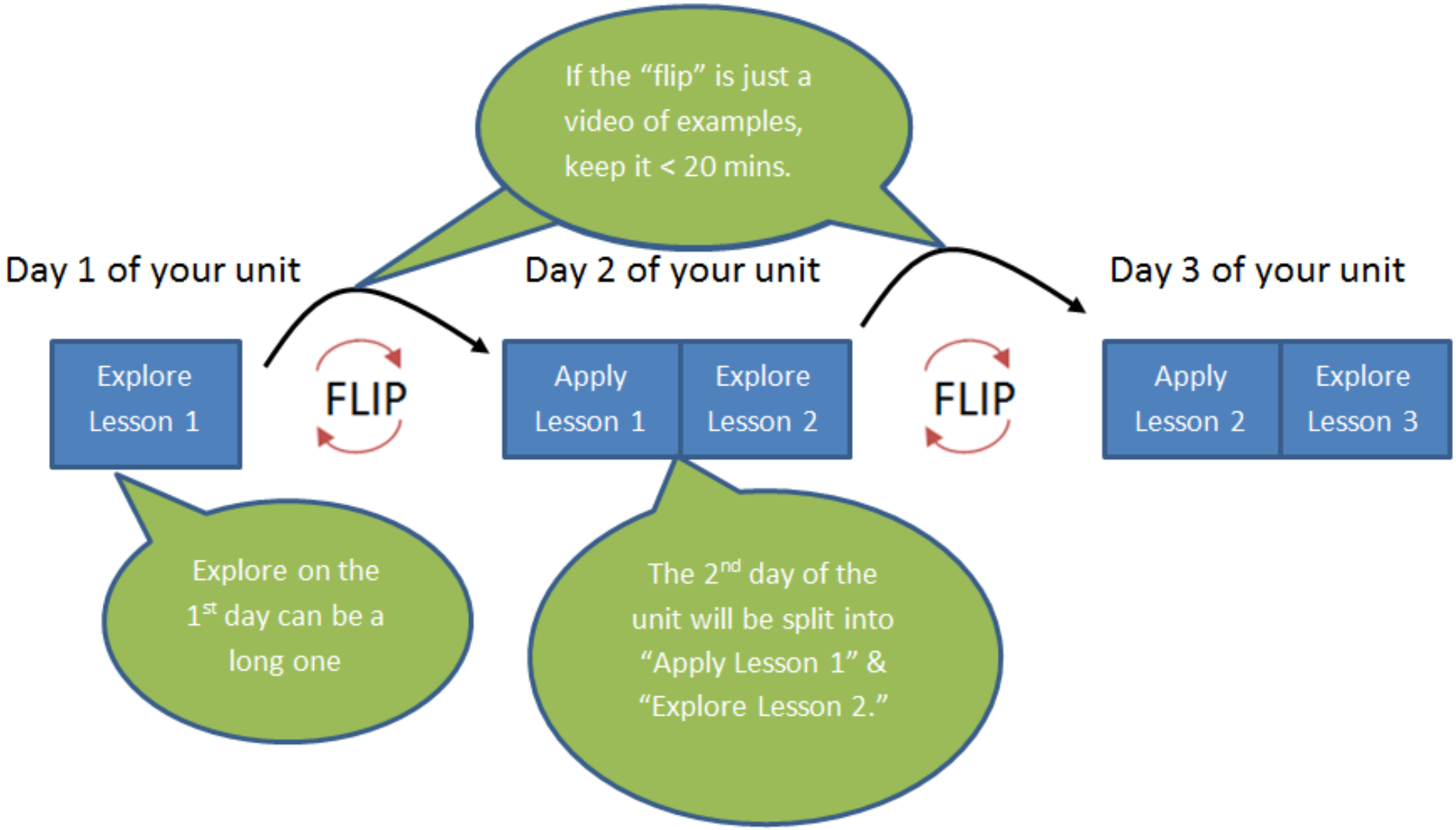
Sequel #3:

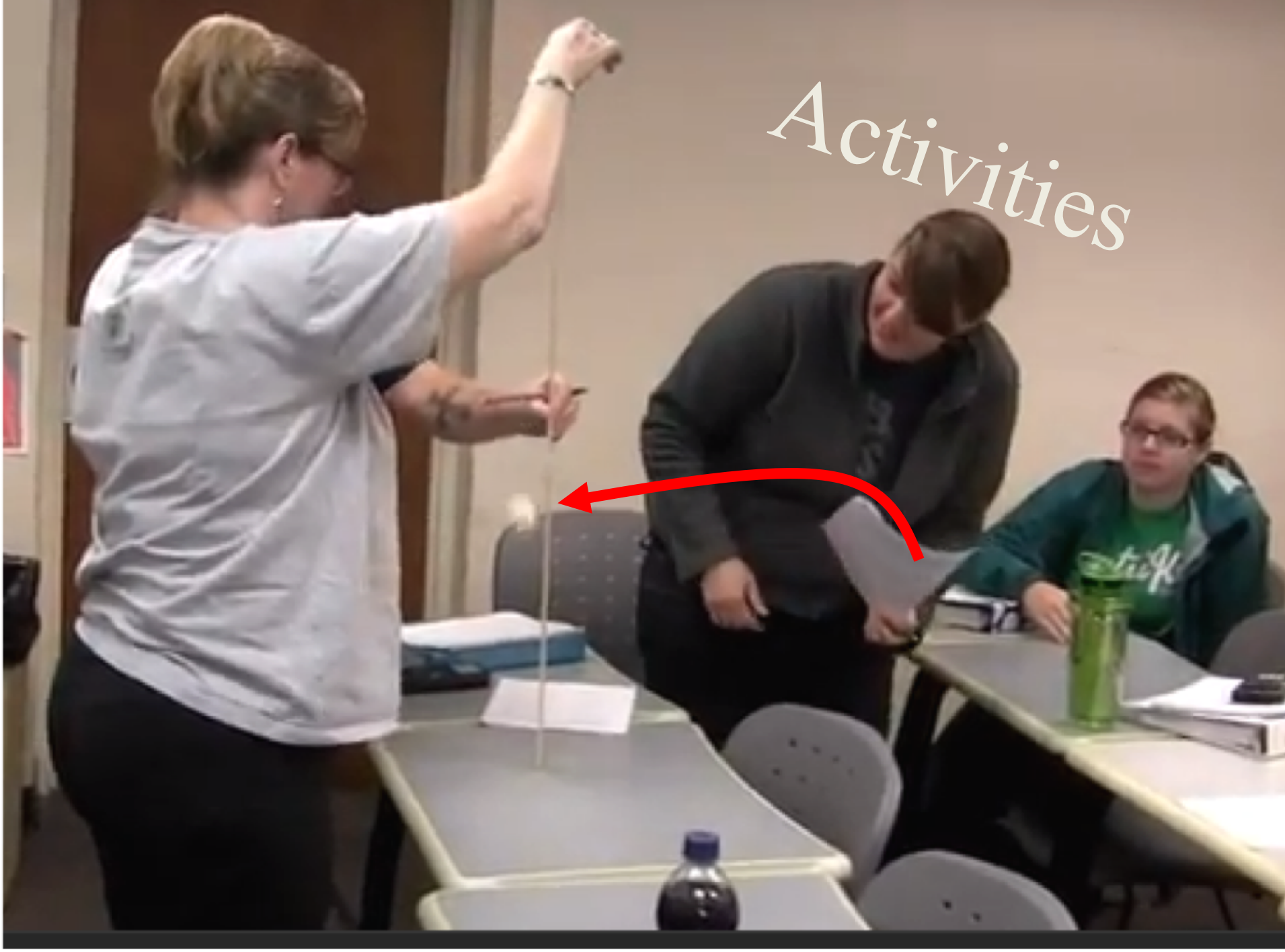
How heavy is the pyramid?


Procedural Fluency
Applications or Why is this important?

Applications or Why is this important?

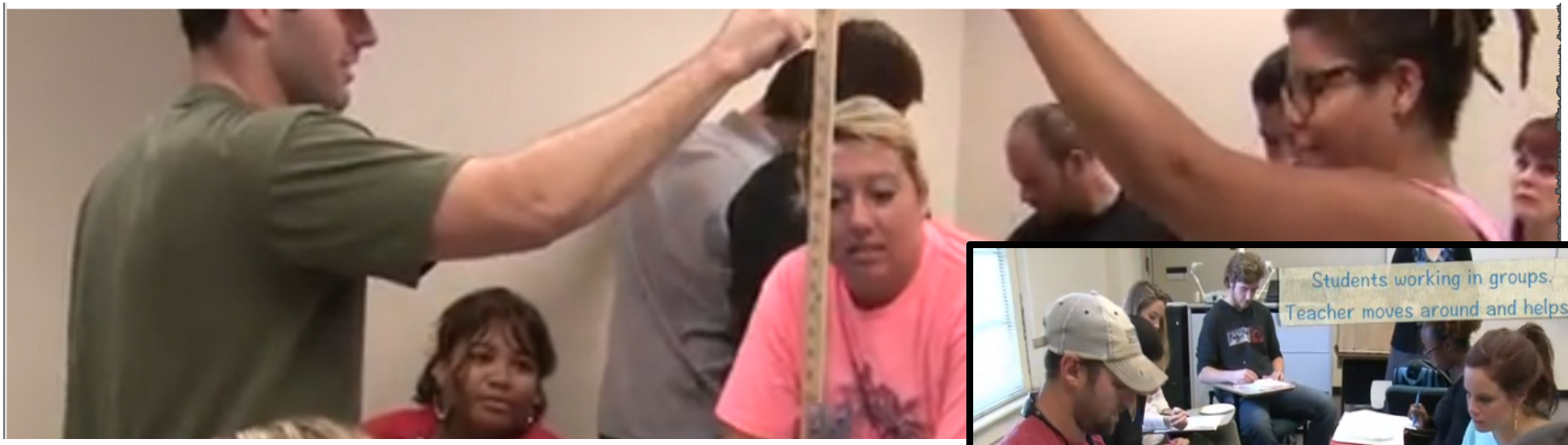
Procedural Fluency


If the "flip" is just a video of examples, keep it < 20 mins.
Day 1 of your unit
Day 2 of your unit
Day 3 of your unit
Explore Lesson 1
FLIP
Apply Lesson 1
Explore Lesson 2
FLIP
Apply Lesson 2
Explore Lesson 3
Explore on the 1st day can be a long one
The 2nd day of the unit will be split into "Apply Lesson 1" & "Explore Lesson 2."


Activities

What is the biggest success?

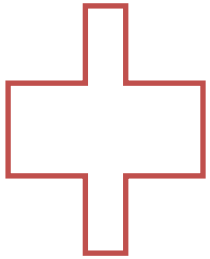
Significant increase in student-to-student and student to teacher interactions



Challenges

- Ensuring that students complete the out-of-class assignments
- Not having enough class time; Students tend to master precisely what is done in class.
- Helping students change from the way they are used to learning to the new structure

Hardware and Software

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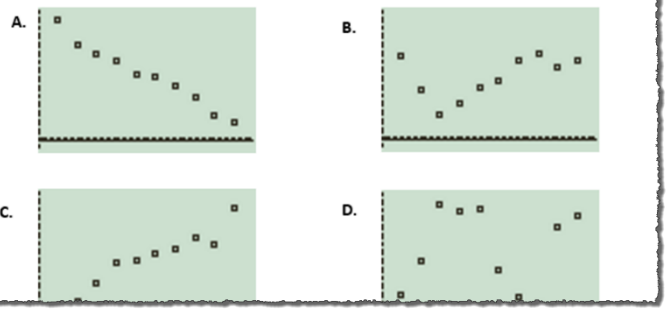
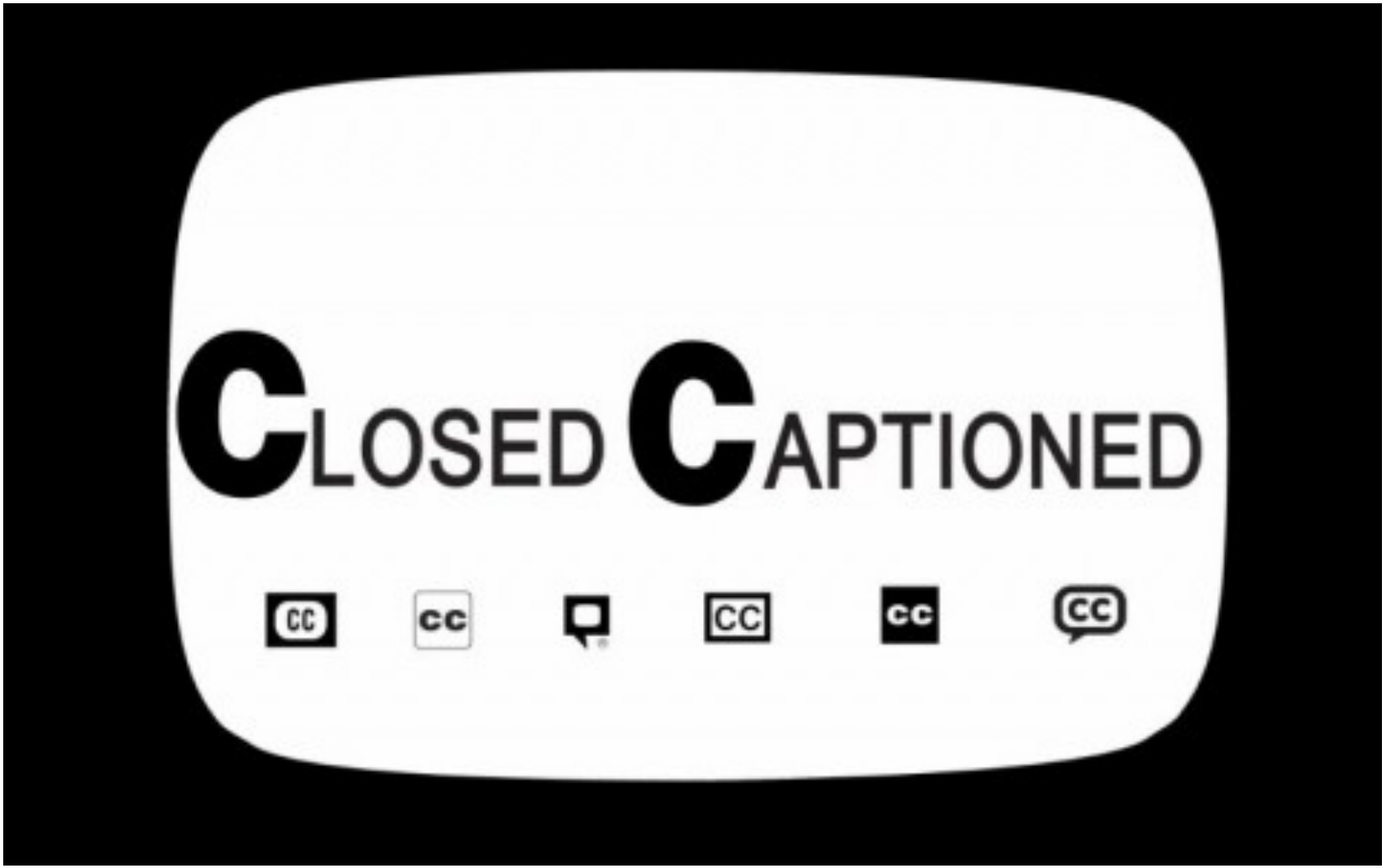
Recommendation

What type of data was collected? *

- Categorical/Qualitative
- Numerical/Quantitative

Which scatterplot corresponds to a data set with $r = -0.98$?

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Any Questions?