Making Podcasts to Assess Student Learning

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A Few Uses of Podcasting in Our Mathematics Classrooms:

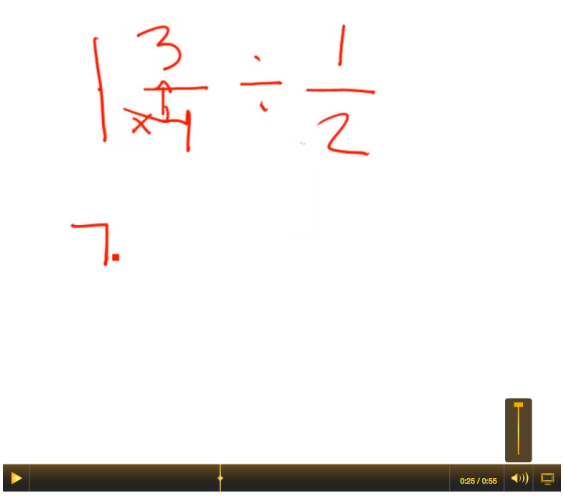
- Gauge and Improve Conceptual and Procedural Understanding
- Ability to Communicate/Use the Language of Mathematics
- Use Reflective Thinking
- Demonstrate Mathematical Modeling Strategies

Present the following problem as though you were explaining it to a student. The podcast will record what you say as well as what you write/draw on the screen.

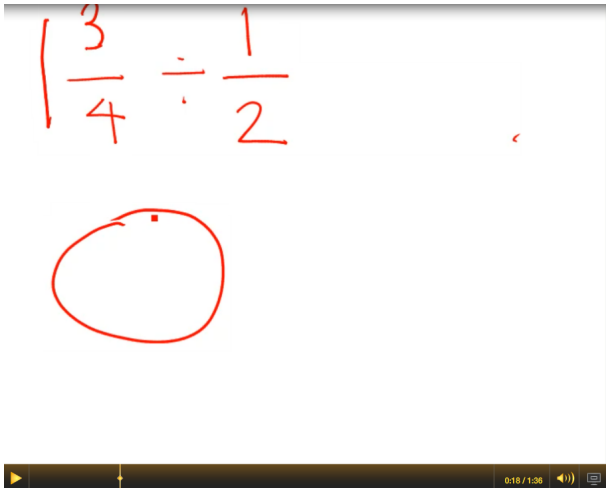
$$1\frac{3}{4} \div \frac{1}{2}$$

Turn and Talk to Your Neighbors...

Student 1:



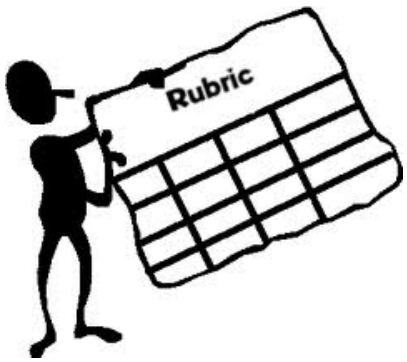
Student 2:



Rubric Designed to Assess...

- Procedural Fluency
  Computational Accuracy/Fluency
  Strategy Used
  Number of Representation

- Conceptual Understanding
  Vocabulary
  Depth of Explanation



A later iteration of the same task...

Watch 3 sample podcasts.
Make notes to yourself about positive and negative aspects of each podcast.
Make note of anything you would want to be sure to do if you were making a similar podcast.

Later in the year...

Did you do what told yourself to do?

Scaffolding Towards Successful Podcasting in the Algebra Classroom

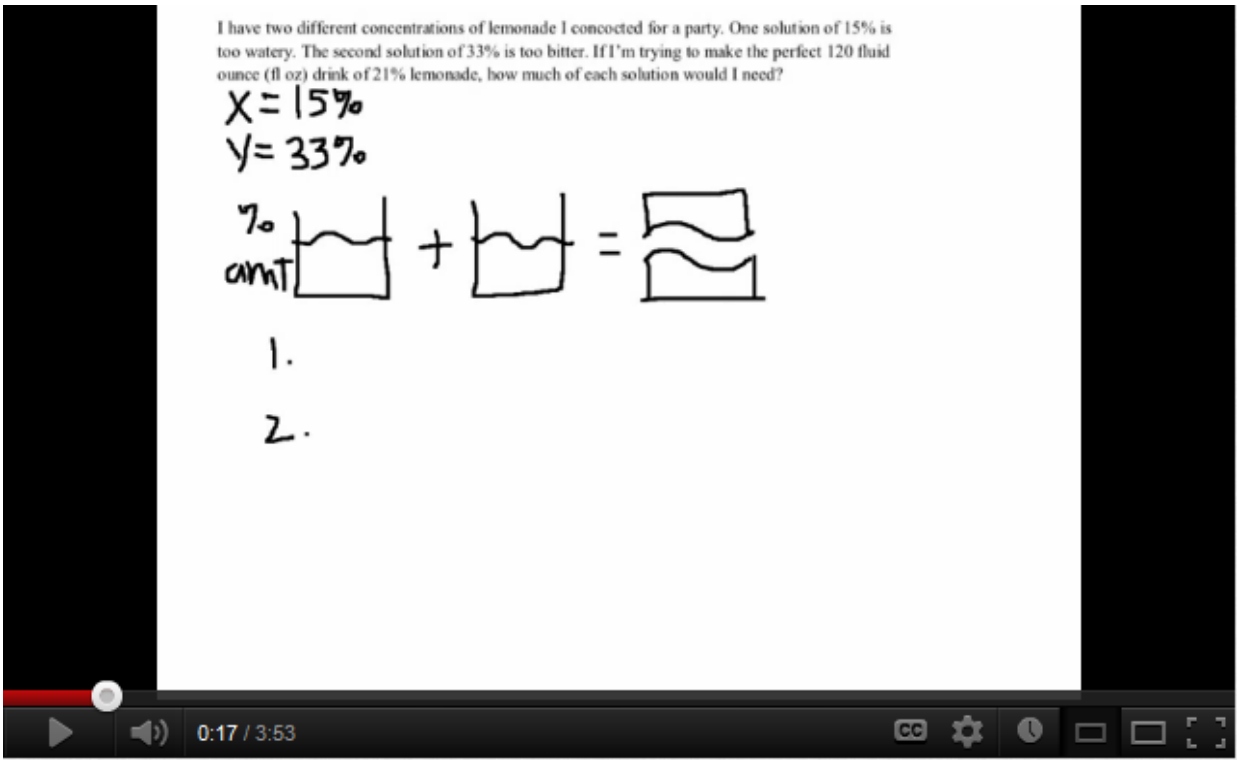
- Present homework problems to class
  - Focus on vocabulary
  - Build confidence
- Create a problem similar to a homework task
- Use a Storyboard to detail essential "math talk"

Sample Storyboard from an Algebra Class

Problem: I have two different concentrations of lemonade I concocted for a party. One solution of 15% is too watery. The second solution of 33% is too bitter. If I'm trying to make the perfect 120 fluid ounce (fl oz) of 21% lemonade, how much of each solution would I need?	**Answer:** x = 80 fl oz of a 15% solution y = 40 fl oz of a 33% solution
MoreInfo: (formulas, rules, etc) Polynomial x Binomial	**Vocab:** (complete definitions) 1 variable multiplied by 2 variables

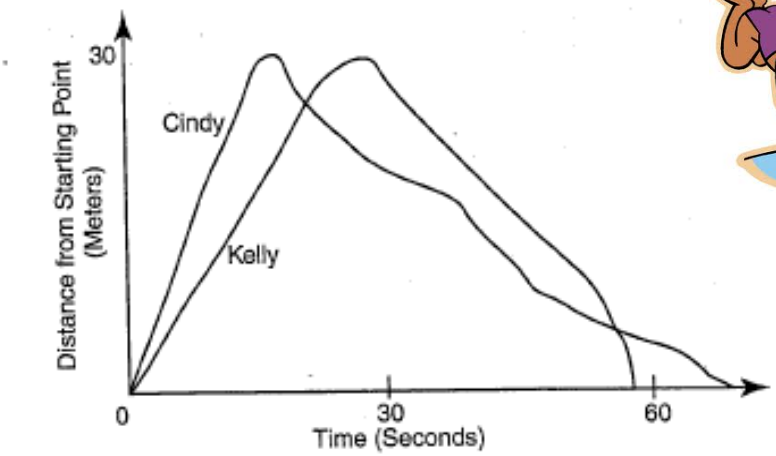
Step-by-Step Solution (math)	Step-by-Step Solution (in words)
x = 15% lemonade solution y = 33% lemonade solution  1. $x + y = 120$ 2. $0.15x + 0.33y = .21(120)$ $x + y = 120 \rightarrow y = (120 - x)$ $0.15x + 0.33(120 - x) = .21(120)$ $.15x + 39.6 - .33x = 25.2$ $-39.6 \quad -39.6$ $.15x - .33x = -14.4$ $\frac{-.18x}{-.18} = \frac{-14.4}{-.18}$ $x = 80$ fl oz $y = 120 - x$ $= 120 - 80$ $= 40$ fl oz	1. We have to read the problem completely. 2. Next we have to define the variables. 3. Then we need to create two equations → the bucket method will help us create them. 4. Use substitution to solve the equations but first we have to get one variable alone. 5. Solve for x. Label. 6. Take your answer from x and put it back into the first equation. 7. Solve for y. Label.

	Excellent
Preparation	Completed podcast story board with both visual representations and written math steps
Content Knowledge	All mathematical steps are correct; problem-solving and critical thinking are modeled
Problem	Created a unique, appropriate, challenging problem
Solution	All steps clearly explained; other possible strategies were shown and explained
Vocabulary	Utilizes appropriate terminology throughout podcast
Clarity	Clear voice and handwriting that others can easily follow

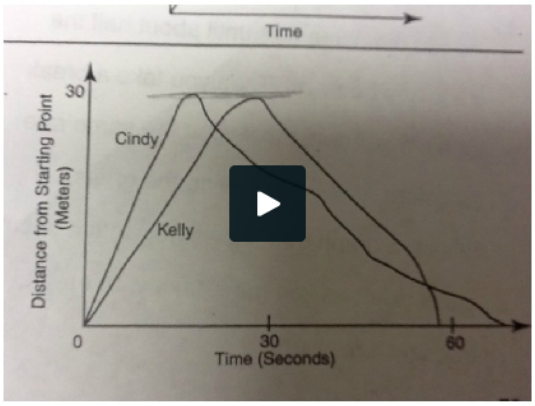

I have two different concentrations of lemonade I concocted for a party. One solution of 15% is too watery. The second solution of 33% is too bitter. If I'm trying to make the perfect 120 fluid ounce (fl oz) drink of 21% lemonade, how much of each solution would I need?
X = 15%
Y = 33%
% amT
1.
2.
0:17 / 3:53

Graphical Interpretation

Graphs can be used to depict the story of a race. Here is a graph that represents a swimming race that occurred between two middle-grades students. Write a story that describes what happened in this race.



From Navigating Through Algebra in Grades 6-8, NCTM


Time
30
Distance from Starting Point (Meters)
Cindy
Kelly
0
30
60
Time (Seconds)

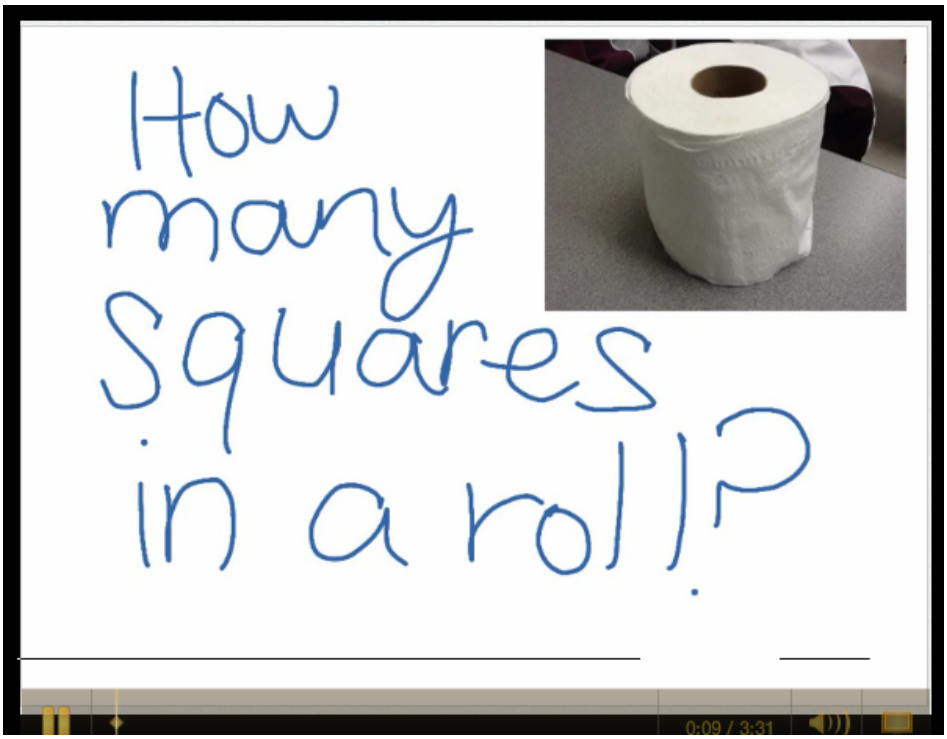
embed

share

Mathematical Modeling

How Many Squares Are On A Roll of Toilet Paper?

How Many Leaves Are On A Tree?


How many squares in a roll?
0:09 / 3:31

iPad Podcast Presentation Rubric

Component	Proficient (5-4 points)	Nearing Proficient (3-1 points)
Content: Assumptions, Modeling strategy, Calculations, and Results	Demonstrates a full understanding of the topic and is clear, concise, and correct. Appropriate mathematical vocabulary is used throughout the podcast Includes all required content components (assumptions, strategy, calculation, results)	Demonstrates some understanding of some of the topic, is correct, but lacks clarity. Inappropriate mathematical vocabulary is evident in the podcast Includes most required content components.
Coherence	Podcast content is clearly outlined and organized. The concepts are presented coherently and succinctly Conclusion clearly summarizes key information.	Podcast outline does not clearly express the content or is unorganized. The concepts are presented, but the presentation lacks coherence. Conclusion vaguely summarizes key information
Creativity	Delivery is interesting and polished. At least one picture or diagram is utilized.	Delivery is somewhat interesting or is unpolished. No picture or diagram is utilized.
Collaboration	All team members contributed equally to the finished product.	Not all team members contributed to the finished product.

Pre-Service Teachers look at Precalc Student Solutions

PST's...

1. Solve the Tasks; Discuss likely errors or stumbling blocks.

2. Create a storyboard for the problem.

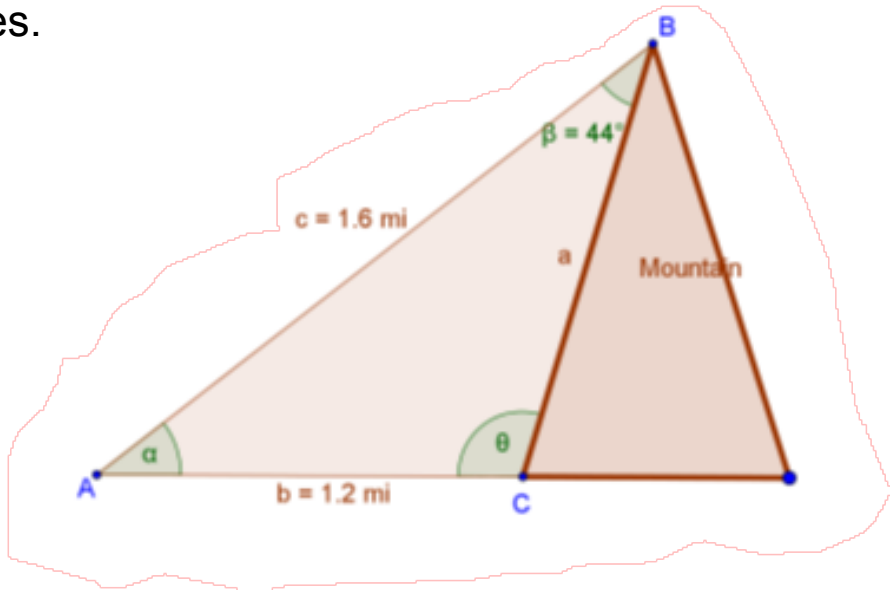
3. Watch sample podcasts from "novices" (Precalc students). Make note of actual errors or stumbling blocks.

4. Reflect and revise storyboard

Sample Problems

1. Find all solutions to $x^3 + 8i = 0$.

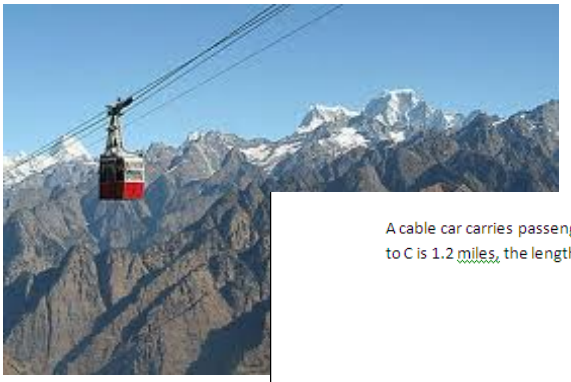
2. A cable car carries passengers from point A to point B, and angle β is known to be 44° The distance from A to C is 1.2 miles, and the length of the cable car ride is 1.6 miles. Find the obtuse angle θ in degrees.



Storyboard

Here's What
I Will Write on
The Screen

Here's What
I Will Say



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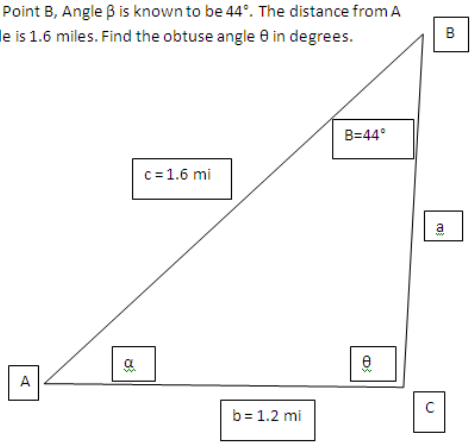

0:02 / 2:19

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Technology We Use to Create Podcasts:

Jing (Free)

ShowMe - iPad App (Free)

Explain Everything - iPad App ($2.99)

SMART Board

Thank you for coming.
Questions?

Contact: Heather Mathison
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