




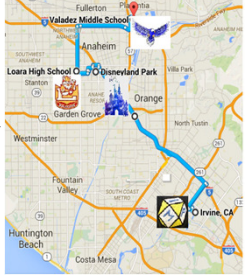
HOOKED ON MODELING

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Introductions

- Richard Quiroz
 - Loara High School Teacher
- Susanna Meza
 - Valadez Middle School Teacher
- Thomas Duarte
 - Anaheim High School Teacher/
 - UC Irvine Math Project



Agenda


- Develop a deeper understanding of mathematical modeling
- Experience a math modeling activity first hand that you can take back to your classroom
- Understand and be able to apply the components of modeling

Jelly Bean Activity



Is this modeling? Why or why not?

- Refer to the Jelly Bean Activity, after looking through the activity was it a modeling task or not.

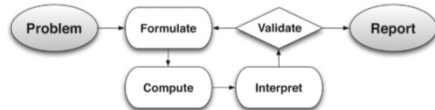


Modeling in the CCSSM

- The CCSSM modeling standards describes six different actions students take over the course of completing a modeling task:
 1. Identifying essential variables in a situation
 2. Formulating models from those variables
 3. Performing operations using those models
 4. Interpreting the results of those operations
 5. Validating the conclusions of those results
 6. Reporting on the conclusions (CCSSI 2010, P. 72-73)

What is Modeling in the CaCCS-M?

- Modeling is the process of choosing and using appropriate mathematics and statistics to analyze empirical situation, to understand them better, and to improve decision-making (p.72 CCSM)
- Modeling differs from Problem Solving in that problems are NOT well-formulated.
- To solve, students will need to select from the data at hand or estimate data that are missing.
- Modeling is the bridge across the “school math” and the “real world”.



Mummy Wrap Activity

- How many rolls (sheets) of toilet paper will you need to wrap the average adult?
- What information will you need to know to get started?



What's next...

- Identifying essential variables in a situation
- Formulating models from those variables
- Performing operations using those models
- Interpreting the results of those operations
- Validating the conclusions of those results
- Reporting on the conclusions

Analyzing the Activity

- How does the problem above represent a modeling task?
- What assumptions were made and what skills were used to complete the task that relate to skills needed in the real-world?
- What scaffolds were in place to help you develop a plan and solve the problem?
- What scaffolds might you put in place to help your students solve the problem?



The Results!

214
Sheets



182
Sheets



Jelly Bean The Second Activity

- How many Jelly Beans are in this jar.
Justify your reasoning.



Components of Activities

- Begins with a **key question**
- **Make sense** of it with mathematics often involving assumptions and approximation
- Clear verbal and written communication throughout often including **multiple representations**
- An interactive (**cycling process**)
- **Reflection** on mathematics used for the modeling process

Why is modeling important

- It's the bridge between the real world and the mathematics we learn in class.
- What is more important the *computation* or the *meaning of the answer*.
 - Is the process more important?
 - Do you need to understand the process to find the answer?
- Integrates multiple math practice standards.
- Modeling provides us with the organized structure and reasoning behind explorations

Additional Resources

- Sample Modeling Task Activities
 - <http://wordpress.unlvcoe.net/wordpress/>
- MEA website
 - mea.cpalms.org
- Dan Meyer – 3 Acts Modeling
 - <http://blog.mrmeyer.com/category/3acts/>

What questions do you have?

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Name _____ Date _____ Period _____

Guess the Number of Jelly Beans

1. Use the data on the whiteboard, to calculate how far each person is off from the number of jelly beans in the jar.

2. Whose guess was the closest and by how much?

3. Whose guess was the furthest and by how much?

4. We want to create a graph that shows the number of jelly beans guessed and the number of jelly beans the guess is off by. Which would we use as the independent variable and which would we use as the dependent? Explain why?

Dependent

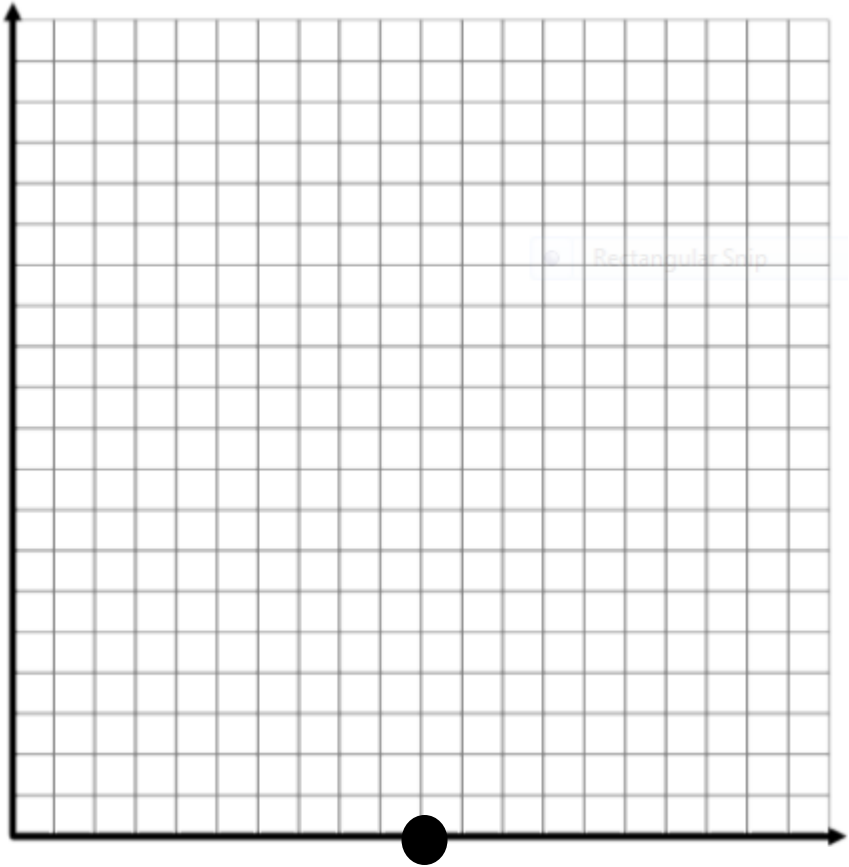
Independent

Explain: _____

5a. Complete the table of values.

Guesses ≤ 321	Number of jelly beans we are off by

b. Graph. Label the independent and dependent quantities and title.



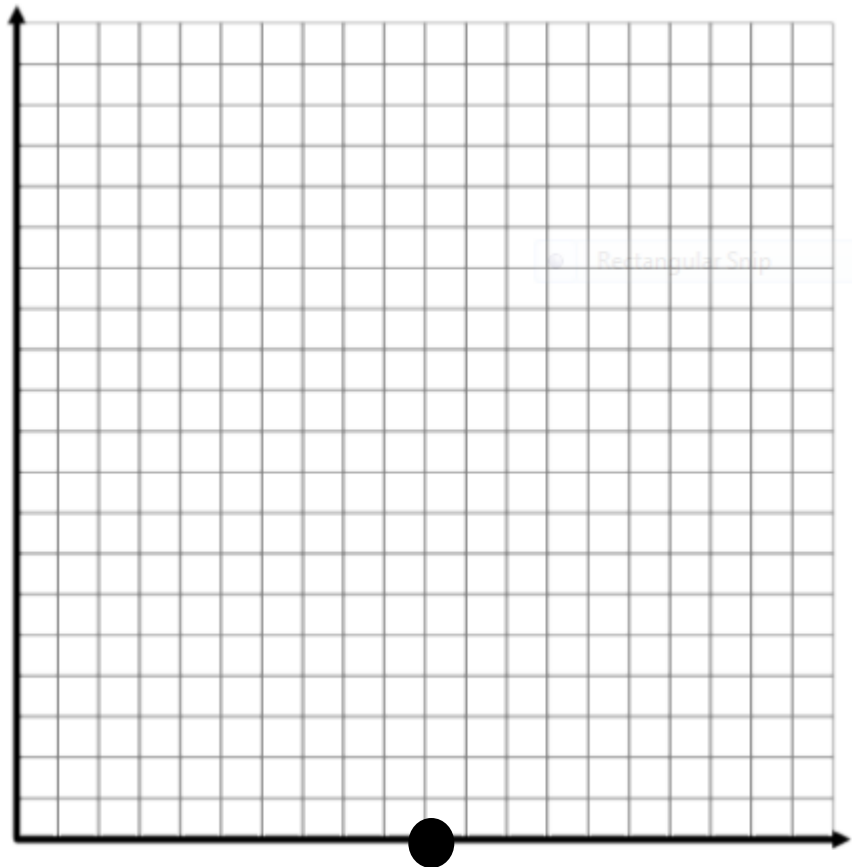
c. Find an equation that represents this situation.

d. Use your equation in c to determine the number of jelly you are off by. If you chose 400 jelly beans does this number make sense? Explain why or why not?

6a. Complete the table of values.

Guesses > 321	Number of jelly beans we are off by.

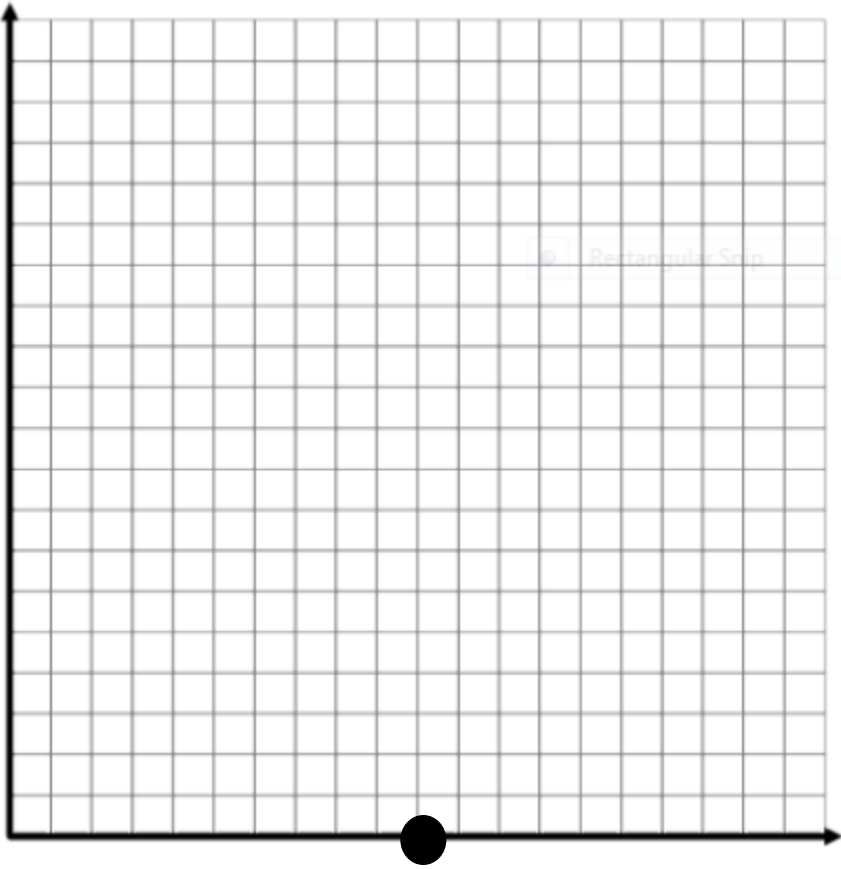
b. Graph. Label the independent and dependent quantities and title.



c. Find an equation that represents this situation.

d. Use your equation in c to determine the number of jelly you are off by. If you chose 200 jelly beans does this number make sense? Explain why or why not?

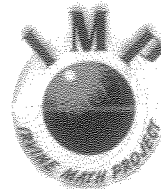
Combine the two previous graphs into one. Label and title.



We can write a function that represents the jelly bean situation as a piecewise function. Write both parts below.

$$f(x) = \begin{cases} \underline{\hspace{10em}} & x \leq 321 \\ \underline{\hspace{10em}} & x > 321 \end{cases}$$

We can also write this function in another way...



Wrap the Mummy

(Sample Modeling Task)

Pam is thirteen (13) today. She is holding a party at which she plans to play the game "Wrap the mummy". In this game, players try to completely cover themselves with toilet paper.



A roll of toilet paper contains 100 feet of paper, 4 inches wide.

How many rolls of toilet paper will you need to wrap a person?

Describe your reasoning as fully as possible, including how you estimated the size of an average person at the party.

Be prepared to justify your reasoning by modeling with the paper!!

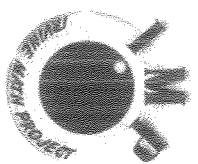
Analyzing the “Wrap the Mummy” Modeling Task

1. How does the problem above represent a modeling task?

2. What skills were used to complete the task that relate to skills needed in the real-world? Provide examples.

3. What scaffolds were in place to help you develop a plan and solve the problem?

4. What scaffolds might you put in place to help your students solve the problem?



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