

# Supporting Preservice Teachers' Creation of Culturally Responsive 3 Act Tasks

Dr. Carrie S. Cutler, University of Houston, [cscutler@central.uh.edu](mailto:cscutler@central.uh.edu)

## ACT ONE

Video, picture or math story that gets students excited about the math. Students **notice and wonder**. Students also start to figure out where the math is. Act One gives the students very little information and uses as few words as possible. Activates schema.

## ACT TWO

Students are given **pieces of information** needed to solve the problem using the visual from Act One. Students work toward solving the problem, developing understanding and refining estimates.

## ACT THREE

Students get the **last pieces of information** needed to solve the problem, solve it, and discuss how they solved the problem.

### Sequence of Mathematical Modeling in Three Act Tasks

1. What do you notice?
2. What do you wonder?
3. Teacher asks: What do you need to know? Students discuss.
4. Make a Too-low estimate. Make a Too-high estimate.
5. Make a reasonable estimate based on what you see and know.
6. Act Two reveals more information. Students revise estimates.
7. Act Three reveals the final piece of information needed to solve. Students use mathematical modeling (mental math, drawings, reasoning) to find an answer then discuss strategies.

### Three Act Tasks Resources

- [U Houston Math 3-Act Tasks](#)
- [Robert Kaplinsky's Lessons](#)
- [Graham Fletcher 3-Act Tasks](#)
- [Dan Meyer's 3-Act Tasks](#)

### Story Board to Plan Your Three Act Task

Title:

Main Question:

|       |          |       |                 |       |
|-------|----------|-------|-----------------|-------|
| Act 1 | Estimate | Act 2 | Refine Estimate | Act 3 |
|-------|----------|-------|-----------------|-------|

**In Class Rehearsal: Peer Evaluation Rubric and Feedback Look Fors**

- Modeling with Mathematics (M)
  - Act 1 doesn't give too much away but grabs attention.
  - Act 2 gives just a bit more information to adjust estimate but not enough to solve.
  - Act 3 gives the final piece of information needed to solve.
- Creativity (C)
  - Title doesn't give away the main question but is enticing.
  - Context is culturally relevant and age appropriate.
- Video Presentation (V)
  - Pacing is good.
  - Shows numbers and labels as necessary for clarity at the solving stage.
  - Group members' first names and last initial only.
  - Acts are clearly labeled so we know when to pause.

**Comments**

| Mathematical Modeling (M) | Creativity (C) | Video format & Presentation (V) | Other |
|---------------------------|----------------|---------------------------------|-------|
|                           |                |                                 |       |

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Name of Three Act Task \_\_\_\_\_

**ACT 1** 1. What do you notice?

2. What do you wonder?

3. Main Question:

4. Estimate

Low Estimate

High Estimate



Put your best estimate on the line and label it.

5. What information do you need to solve the problem?

**ACT 2** Record the new information.

Give a better estimate \_\_\_\_\_

**ACT 3** Work the problem on the back of the paper.

Answer.

Name: \_\_\_\_\_

Estimate

Draw a picture to show your thinking:

Use numbers to show your thinking:

Answer:

Links to a few 3 Act Tasks from [UHouston Math](#)

The channel contains more than 260 3 Act Tasks! These are just a few to explore. Please subscribe.

| Title   | Big Question   | Notes  |
|---|--|--|
| <b>Counting</b>                                     |  |  |
| <a href="#">The Lucky Dragon</a>                    | How many red envelopes are there in all?   | Counting on, Vietnamese/Chinese New Year                     |
| <a href="#">Crazy for Craisins</a>                  | How many craisins are in the pile?   | Counting in sets, healthy snacks                             |
| <a href="#">Free Ice Cream</a>                      | How many students left the classroom to get free ice cream?                                  | Counting in groups, estimation, number sense, school         |
| <a href="#">Piñata Party</a>                        | How many Swee-Tarts fit in the piñata?   | Multiplication, capacity, piñatas                            |
| <a href="#">Let Go of My Legos</a>                  | How many Legos are in the claw machine?  | Skip counting by 2, Legos®                                   |
| <a href="#">Eat More Chicken Nuggets</a>            | How many nuggets were eaten?   | Counting back, subtraction, Chick Fil A                      |
| <a href="#">Picafresa</a>                           | How many picafrasas fit in the barrilito?  | Counting, Mexican candy                                      |
| <a href="#">Life is Like a Box of Chocolates</a>    | How many chocolates come in a package?   | Counting, candy  |
| <a href="#">Potluck Trouble</a>                     | Do I have enough banh to serve 20 people one dumpling each?                                  | Arrays, Vietnamese dumplings                                 |
| <a href="#">Whole Lotta Donut Holes</a>             | How many donut holes fit in the box?   | Arrays, repeated addition, donuts                            |
| <a href="#">Give Me Chips</a>                       | How many bags of chips can you buy?  | Coin values, hot Cheetos                                     |
| <a href="#">Juice Be Yourself</a>                   | How many juice boxes did kids drink on the trip?   | Subtraction, number composition/decomposition, juice drinks  |
| <a href="#">Dancer Bobby Pins</a>                   | How many bobby pins did the ballet dancer use in her hair?                                   | Place value, addition, counting, number sense, dance         |
| <b>Multiplication and Division</b>                  |  |  |
| <a href="#">That Gummy Bear is HOW Big?</a>         | How many small gummy bears does the big gummy bear weigh?                                    | Converting units of measure, candy                           |
| <a href="#">Lego-Mania</a>                          | How many brown squares can fit on the blue rectangle?  | Area model, Legos®   |
| <a href="#">Sum Gum</a>                             | How many packages of gum fit in the box?   | Multidigit multiplication, Mexican candy                     |
| <a href="#">Ay Mi Chicle</a>                        | How many chicles fit in the box?   | Arrays, Mexican candy  |
| <a href="#">Rico Chicle (Rich Gum)</a>              | How many packets of Canel's gum are in the box?  | Arrays, Mexican candy  |
| <a href="#">The Child is Hungry</a>                 | How many eggs did the child take?  | Volume, area model, Mandalorian                              |
| <a href="#">Potluck Trouble</a>                     | Do I have enough banh to serve 20 people if each person eats one dumpling?                   | Arrays, Vietnamese dumplings                                 |
| <a href="#">Dum Dum Drop</a>                        | How many Dum Dums fit in the piñata?   | Set model, piñata  |
| <a href="#">Card Slots</a>                          | How many trading cards fit in the binder?  | Arrays, Pokémon trading cards                                |
| <a href="#">Oreo Ready to Count Calories?</a>       | How many calories are in the jumbo Oreo cookie?  | Algebraic reasoning, Oreos                                   |
| <a href="#">Building Beacons</a>                    | How many blocks are needed for the whole beacon?   | Arrays, perfect squares, Roblox                              |
| <a href="#">Penguin Sharing</a>                     | If three penguins share a pack of mini M&Ms equally, how many candies will each penguin get? | Equal shares, division, skip counting, stop motion animation |
| <a href="#">Paper on Fire</a>                       | How many hot fries will fit on the sheet of paper?   | Length x width formula, Flaming Cheetos                      |
| <a href="#">Let's Fill the Space Among Us</a>       | How many Among Us fit on the paper?  | Composing shapes area, Among Us game                         |
| <a href="#">¡Dale, Dale, Dale! – Piñata Mystery</a> | How many Duvalin are in the piñata?  | Arrays, Mexican candies, piñata                              |

|   |   |   |
|---|---|---|
| <a href="#">The Lost Pokémon</a>              | How many trading cards are in the binder?   | Arrays, trading cards, Pokémon                          |
| <a href="#">Crazy Creepers</a>                | How many Creepers does it take to cover the whole page?                             | Area with nonstandard units, Minecraft                  |
| <a href="#">Find the Tamarind</a>             | How many tamarind candies are needed to fill up the area of the construction paper? | Area with nonstandard units, Mexican candy              |
| <a href="#">Loteria: La Rosa</a>              | How many beans it takes to fully cover the loteria (lottery) card?                  | Area using nonstandard units                            |
| <a href="#">The Very Hungry Corgi</a>         | How many pieces of dog food does it take to cover a floor tile?                     | Arrays, dogs  |
| <a href="#">Let's Fill the Space Among Us</a> | How many Among Us fit on the paper?   | Arrays, Among Us  |
| <a href="#">Marzapan Yum Yum Yum</a>          | How many marzapan fit in the box?   | Counting in sets, arrays, Mexican candy                 |
| <a href="#">Crazy Bananas</a>                 | How many bananas did he buy with a \$5 bill?  | Multiplying and dividing with decimals and money, fruit |
| <a href="#">Canel's Chewing Gum</a>           | How many gum packets fit on the bottom layer of the box?                            | Area, Mexican gum                                       |

### Capacity and Volume

|   |   |   |
|---|---|---|
| <a href="#">Drizzle Drizzle</a>                     | How long will it take for the drizzle to fill the jug?        | Volume, time, proportional reasoning, backyard play                             |
| <a href="#">Lego My Box</a>                         | How many Legos fit in the box?                                | Volume of rectangular prism, Legos®   |
| <a href="#">De La Rosa Rows</a>                     | How many Marzapan are in the box?                             | Volume of rectangular prism, Mexican candy                                      |
| <a href="#">Build a Marble Run</a>                  | How many marbles fit in the clear cup?                        | Estimation, marble runs, Build a Bear Boxes                                     |
| <a href="#">Does This Tik Tok Hack Really Work?</a> | Can you get three tall Starbucks drinks for the price of one? | Liquid capacity, proportional reasoning, fractions, digital skepticism, Tik Tok |

### Fractions

|                                      |   |  |
|--------------------------------------|---|--|
| <a href="#">Kiwi Slices</a>          | How many whole kiwis are in the bowl?   | Concrete models for fractions, fruit                               |
| <a href="#">Hot Cocoa Perfección</a> | How many fourths does it take to make 3 mugs of cocoa?                                    | Fractions, iterating, Mexican cocoa                                |
| <a href="#">Fortnite Pizza</a>       | How should the pizza be partitioned so everyone gets some of the kind of pizza they want? | Whole partitioned into fourths and fifths, equal shares, Fortnite  |
| <a href="#">DIY Pizza Party</a>      | How many slices of pepperoni are on the whole pizza?                                      | Fractions, iterating, counting in sets, felt pieces and Claymation |

### Measurement

|  |  |  |
|--|--|--|
| <a href="#">Minion Math</a>            | How tall is the minion?                                  | Linear measurement with nonstandard units, Minions |
| <a href="#">Ash's Ketchup</a>          | How much ketchup did Pikachu put on Ash's meal? (weight) | Converting units of measure, Pokémon               |
| <a href="#">Squishies on the Couch</a> | How many squishmallows fit on the couch?                 | Standard units of measure, stuffed animals         |

### Three-Act Task Assignment Submission Form

Note: Each creator must submit this form and their own reflection on enactment with students to receive full credit for the project.

Your Name: \_\_\_\_\_ Partner (if any): \_\_\_\_\_

Google Drive Link: \_\_\_\_\_

Catchy Title: \_\_\_\_\_

Suggested Grade Level(s): \_\_\_\_\_

Main Math Learning Focus: \_\_\_\_\_

Main Question: \_\_\_\_\_

Explanation of Cultural Relevance:

## Reflection on Enactment with Students

Signature of Mentor Teacher \_\_\_\_\_

How does the context you selected for your Three-Act Task and the learning objective work together to support student thinking?

Describe in detail what happened as students completed the Three-Act Task. (This should be at least 2 pages typed, double spaced).

Explain the strategies students used to solve the problem?

What did you learn about children's mathematical thinking from this assignment? Connect to the ideas from our course such as reasoning strategies, counting concepts, place value, etc.