# *Sugar Packets*

By Dan Meyer

http://threeacts.mrmeyer.com/sugarpackets/

## Instructor Notes

By Trey Cox

## What is a Three Act Task?

- If you are unfamiliar with Dan Meyer's Three Act Tasks or would like to watch a good overview of how they can be effectively implemented in your classroom, be sure to watch this Youtube video: Three Act Tasks .

- A very good blog produced by Dan Meyer includes valuable information. On the blog he explains his philosophy of the Three Act Task as well as answers questions from classroom teachers can be found at: dy/dan.

- You can find an Excel spreadsheet of Three Act Tasks created or inspired by Dan Meyer can be found here . It includes over 70 lessons you can access from the spreadsheet. Most of the tasks do not include fully fleshed out lessons. That is the goal of the Teacher Notes and Student Handouts that I have created and posted on the AMP Network for your use.

## Overview of Lesson:

The question is simple: How many sugar packets are in a soda bottle? The lesson hooks students immediately with the initial video clip of a man sitting in a restaurant downing packets of sugar one-after-another!

This lesson includes the following documents (find on the AMP Network or on the Dan Meyer website):
- cocacolainfo
- sugar content of a packet of sugar
- Answer video: http://threeacts.mrmeyer.com/sugarpackets/act3/actthree.mov
- Student Activity
- Instructor Notes

## Common Core Standard(s) Addressed:

CCSS.MATH.CONTENT.6.RP.A.3
Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

# Student Activity Guide
By Trey Cox and Shannon Bishop

Watch the "Sugar Packets" Video Labeled Act One:

On your own (without any help from other students):

1) Make a guess as close as you can for how many packets of sugar is in a 20 oz. soda.

2) Make a sensible estimate of how many sugar packets there are in a 20 oz. soda that you know to be too large – What makes you confident that it's too large?

3) Make a sensible estimate for how many sugar packets there are in a 20 oz. soda that you know to be too small – What makes you confident that it's too small?

4) What information do you need to solve this problem? We are not looking for "the answer" but rather what do you need to know in order to get started on the problem?

5) Team up with two or three other students and use the information provided to answer the question: "How many sugar packets are in a 20oz bottle of soda?"

Watch - THE ANSWER!

Over →

In small groups, discuss the following:

6) The relationship between number of grams of sugar in a 20oz soda and number of packets is "proportional." Write, in your own words, what it means to be "proportional."

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Follow up activity/homework:
1. Using proportional reasoning, estimate how much sugar in a 12-ounce can of soda. How much sugar is there in a 44-ounce Thirstbuster?

2. Investigate how much sugar is in a 20-ounce bottle of Mountain Dew, Dr. Pepper, Sprite, and your favorite soda or beverage.

3. What kind of food is equivalent to 50 packets of sugar?

## Instructor Guide

*Preface: This would be used as an introductory lesson to proportional reasoning. Through this activity we will build meaning as to what it means to be proportional and notation would follow this activity in a natural way*

Watch the "Sugar Packets" Video Labeled Act One:
*(In groups or partnerships) Mention how important being able to judge reasonableness is.*

1) Make a guess as close as you can for how many packets of sugar is in a 20 oz. soda.

2) Make a sensible estimate of how many sugar packets there are in a 20 oz. soda that you know to be too large – What makes you confident that it's too large?

3) Make a sensible estimate for how many sugar packets there are in a 20 oz. soda that you know to be too small – What makes you confident that it's too small?

4) What information do you need to solve this problem? We are not looking for "the answer" but rather what do you need to know in order to get started on the problem?
- *Brainstorm out loud as a class, record on white board*
- *Needed information includes:*
    - o *The sugar content of a soda (see cocacolainfo document)*
    - o *The sugar content of a packet of sugar (see sugar info document)*

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After students brainstorm and hopefully request the sugar content of a 20-oz bottle of soda and a packet of sugar, provide the information and ask the students to engage in a discussion of the following question:

Provide Act II – nutritional information for 20oz soda and sugar packets

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5) Team up with two or three other students and use the information provided to answer the question: "How many sugar packets are in a 20oz bottle of soda?"

- *16.25 or 16 ¼ packets of sugar*
- *Have students volunteer answer – ask how they got the answer. Discussion here about the units of the problem and how the units can be seen and used as a verification to correct thought process/procedure.*

    *Scenario 1: "I cross multiplied!"*

Trey Cox & Shannon Bishop 2014

Watch – <span style="color:blue">THE ANSWER!</span>

*Let's focus in on the cross multiplication ones. (Try to have both set-ups on the board). We already know the answer is 16.25, yay – lots of sugar think twice before we order our next coke, but go back to that original equation that you "set up." What if "cross multiply and divide" were outlawed!! How can you reason through this context to still come up with an answer. Think about that in your groups. Get students to see that one value is a multiple of the other and therefore the other must follow the same multiplicative property*

6) This relationship between number of grams of sugar in a 20oz soda and number of packets is "proportional." Write, in your own words, what it means to be "proportional."

- *Think, pair, share in order to establish a class definition*
  - o *To be proportional is for two values to be linked via some constant multiplicative scale factor or multiplier*
- *If time permits: For instance if they say multiplier their definition then ask "what was the multiplier in our soda/sugar packet problem?"*

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Follow up activity/homework: Assume that the ratios/work done in this activity are still true.
4. Using proportional reasoning, estimate how much sugar in a 12-ounce can of soda. How much sugar is there in a 44-ounce Thirstbuster?

5. Investigate how much sugar is in a 20-ounce bottle of Mountain Dew, Dr. Pepper, Sprite, and your favorite soda or beverage.

6. What kind of food is equivalent to 50 packets of sugar?