

WEEK ONE - Activity Two - The Lady and the Tiger

(~60 minutes)

A puzzle has the ability to pull children into the subject of math. A story even more so. Let's combine the two.

1. The Story

We start this activity by reading a condensed version of Frank Stockton's classic tale "The Lady or the Tiger". One source online:

[http://www.flippedoutteaching.com/lessons/eng2/unitX/Lady%20or%20the%20Tiger,%20The%20\(easy%20version\).pdf](http://www.flippedoutteaching.com/lessons/eng2/unitX/Lady%20or%20the%20Tiger,%20The%20(easy%20version).pdf)

After the story, we discuss the word "Ambiguity", since the children are fascinated and frustrated by the fact that the author does not give an answer to the question "Did the accused man open the door with the lady behind it, or the door with the tiger behind it?". Life is often ambiguous ("Is a white lie evil?" "What is the trade-off between humility and confidence?"). If you have time, children enjoy a discussion of the "grey areas" between two truths. At this age, they are just beginning to fathom "shades of grey".

We think of math as a place safe from ambiguity, but is it? There are many ways to see a problem, many ways to solve a problem. Try this activity from NCTM about multiple correct answers:

https://www.nctm.org/Publications/Teaching-Children-Mathematics/Blog/The-power-of-having-more-than-one-right-answer_-_Ambiguity-in-math-class/

2. The Puzzle

Now suppose the fabled king in the story was persuaded by his advisors to make his court more fair. Instead of random chance, the convict would be given information to help him decide which door to chose.

Let's try 2 situations that a convict might face. There are 2 doors, each has a sign on it. The sign gives information that might help the convict find the lady and save his own life. The 2 puzzles are illustrated below.

We simply give students paper and turn them loose on these puzzles. Some students will prefer writing out their thinking, some will sit in silence, just thinking. Others will be afraid to start working. To ease the process of exploration, we use Table For Three.

Table for Three:

1. Give a minute or two for students to work alone in silence. Even if they feel they've got a solution, they may not talk; they must write down their solution instead.

- When you notice students getting fidgety, or looking like their done, call "time". Have students move with their paper and pencil to any table in the room, building a group of three (allow groups of 4 for flexibility). Let them talk through their solutions for a very short time (45 seconds?), then call "time" again. Have students move to a new table for 3 with ALL NEW classmates. Give them another 45 seconds, then call time and have them move to a third table with all new people. This time, give more time (as needed) for discussion. (The "new people" rule is difficult. The first groups will be friends-based affinity groups, but by the 3rd grouping, the groups will have a very random composition.)
- In this 3rd grouping, tell students they must agree on a solution to each of the 2 puzzles. Each student must write down their common solutions (provide new paper if needed) and submit it. Have them fold up their paper and then collect the papers in a hat or bowl.
- Pull out one of the folded solutions at random. Project it on a document camera or write it up. Discussion: Do NOT say "correct" or "incorrect". Let a couple students briefly explain why they agree or disagree. Encourage/reward *listening* and clear explanations.
- Discuss *feelings*. How did that feel? Did your feelings change? When? Why?

Puzzles: Where is the lady???

1. One sign is true, and one is false.

DOOR 1. IN THIS ROOM THERE IS A LADY, AND IN THE OTHER ROOM THERE IS A TIGER.	DOOR 2. IN ONE OF THESE ROOMS THERE IS A LADY, AND IN ONE OF THESE ROOMS THERE IS A TIGER.
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2. Now, either both signs are true, or both are false.

DOOR 1. AT LEAST ONE OF THESE ROOMS CONTAINS A LADY.	DOOR 2. A TIGER IS IN THE OTHER ROOM
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Solving Puzzle 1:

It is fine if you *record* a student's thinking in a Truth Table, but don't say Yes or No - let them decide. For puzzle #1, if someone says "If the first sign is true, then the 2nd sign is true, too, so that doesn't work", write the table below. Ask "Why does that not work?", to elicit that it breaks the given rule of one false, one true.

door 1	door 2
T	T

Elicit *language* around the next step. If sign one is false, then there is a lady in Room 2, and the 2nd sign is true. Hey! That works! High five :)

door 1	door 2
T	T
F	T

Puzzle 2:

Either the signs are both true, or both false:

door 1	door 2
T	T
F	F

If Sign One is false, then there is no lady, but we know there is a lady, so cross that out. Therefore, both signs are true, and the lady is in Room 2. (Why? - Make sure you think this through first!)

Don't require truth tables, just model your own thinking that way. Some students like them, other students prefer a more verbal approach.

Praise/reward the class for its perseverance in this task!