

# CAREER READINESS SKILL: CRITICAL THINKING AND PROBLEM SOLVING

## Health Science

**Module Title/Topic:** Critical Thinking and Problem Solving/Is that a fact?

**Overview/Annotation:** In this lesson you will learn the difference in facts and inferences. You will use facts to make inferences in order to solve problems and you will justify your conclusions.

**Essential Question(s):**

How do you use observation and inference to form conclusions in everyday life?

**Learning Objective(s):** You will:

1. Differentiate between fact and inference.
2. Observe and evaluate facts to determine inferences.
3. Hypothesize reasons to explain facts.

**Materials, Equipment, and Technology Resources:**

Computer, printer, Internet access, dictionary, worksheets, and rubrics.

**Procedures/Activities:** You will:

1. Define the following words: observation, fact, inference, hypothesis, and logic.
2. Exercise your logic skills by following the directions to complete the Sudoku puzzle on **Worksheet #1**.
3. Complete the activities on **Worksheet #2** using the facts at the top of the handout.
4. Complete **Worksheet #3**.
5. Write a one page paper (12 font, single space, 1 inch margins) thoroughly explaining how you came to your conclusion. What inferences did you make from the facts? Which facts were the most enlightening? You are allowed to explain up to two possible conclusions as long as both are justified in your writing.
6. Prepare a presentation detailing the statistics in **Worksheet #2 and #3**. Insert bar graphs to show each statistical chart given. The presentation should list your hypothesis and demonstrate a rational progression of how you reached your conclusion. You should have pictures, animations and transitions. You will present this to the class at a time designated by your instructor. Your presentation should be between 4 – 5 minutes in length. You may use Microsoft PowerPoint, [www.prezi.com](http://www.prezi.com), [www.animoto.com](http://www.animoto.com) or [www.xtranormal.com](http://www.xtranormal.com) to create your presentation.

**Assessment Strategies:**

Use the attached grading tool, **Rubric #1**, to score your presentation and other module components.

# Worksheet #1

## Critical Thinking and Problem Solving PBL

Simply fill in the blank spaces with the numbers 1 – 9.  
Every row, column and 3 x 3 box must contain all nine digits with no number repeated.

	8						4	
	2			1		8	3	
	1	9	4	6				
					1			
7		6				5	2	
2		1	6		7	3		4
	5						9	3
			9					2
9				3	5	4		

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## Worksheet #2

### Critical Thinking and Problem Solving PBL

In one day the following deaths occurred.

■ <b>Total Population:</b>	<b>2224 (1503 died)</b>
■ <b>Wealthy</b>	<b>329 (132 died)</b>
■ <b>Middle Class</b>	<b>285 (154 died)</b>
■ <b>Poor</b>	<b>710 (533 died)</b>
■ <b>Other/Unknown</b>	<b>900 (684 died)</b>

1. Use Microsoft Excel to make a pie chart of the above statistics. Staple it to this handout.
2. What do you hypothesize is the possible cause of death based on the facts?
3. Thoroughly explain why this is a valid hypothesis based on the facts above.

## Worksheet #3

### Critical Thinking and Problem Solving PBL

#### Now add these statistics

- 94% Wealthy Women and Children Survived
- 81% Middle Class Women and Children Survived
- 47% Poor Women and Children Survived
- 87% Other/Unknown Women and Children Survived

List two observations

- 1.
- 2.

What do you infer from these observations?

#### Now add these statistics

- 69% Wealthy Men Died
- 90% Middle Class Men Died
- 86% Poor Men Died
- 78% Other/Unknown Men Died

List two observations.

- 1.
- 2.

What do you infer from these observations?

What is your hypothesis about the cause of death now?

Is it different than your first hypothesis?

Why or why not?

# Rubric #1

## Grading Tool for Critical Thinking and Problem Solving PBL

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

Procedure number	Procedure	Points Possible	Points Subtracted	Grade
1.	Definitions	5		
2.	Worksheet 1	10		
3.	Worksheet 2	10		
4.	Worksheet 3	10		
5.	<p style="text-align: center;">Essay</p> <ul style="list-style-type: none"> <li>• Organization (beginning, body, and conclusion that demonstrate a clear strategy and progresses in order)</li> <li>• Hypothesis (stated clearly)</li> <li>• Justification (thoroughly explains how you developed your hypothesis)</li> <li>• Style (sentences are mature. Writer avoids jargon and sexist language. Paper is enjoyable and interesting)</li> <li>• Points will be <b>subtracted</b> for grammar, spelling and format errors</li> </ul>	30		
6.	<p style="text-align: center;">Presentation</p> <ul style="list-style-type: none"> <li>• Hypothesis (stated clearly)</li> <li>• Represents statistics through bar graphs</li> <li>• Demonstrates a rationale progression of how you reached your conclusion</li> <li>• Includes pictures, animations, transitions</li> <li>• Between 4-5 minutes in length</li> <li>• Points will be <b>subtracted</b> for grammar, spelling and format errors</li> </ul>	35		
		100		

## Teacher Resource Page

### Critical Thinking and Problem Solving PBL

Puzzle Solution:

6	8	5	3	7	2	1	4	9
4	2	7	5	1	9	8	3	6
3	1	9	4	6	8	2	7	5
5	3	8	2	4	1	9	6	7
7	4	6	8	9	3	5	2	1
2	9	1	6	5	7	3	8	4
8	5	4	1	2	6	7	9	3
1	7	3	9	8	4	6	5	2
9	6	2	7	3	5	4	1	8

Sudoku No. 30454

The actual cause of the statistics used in this activity.

- Survivor Rates on the **Titanic**:

- | Passengers:  | Women | Children | Men | Total |
|--------------|-------|----------|-----|-------|
| First Class  | 94%   | 31%      | 60% |       |
| Second Class | 81%   | 10%      | 44% |       |
| Third Class  | 47%   | 14%      | 25% |       |
| Crew         | 87%   | 22%      | 24% |       |

Total Survivability: 31.6%

The differences in the deaths of the wealthy versus poor are caused by the location of the cabins. The poor passengers were below decks and had less of a chance to get above the water line in time. They were also less likely to be placed in life boats. Women survived at a higher rate because women and children were placed in life boats first. Students that said “man-made disaster” can be considered correct. (This is at your discretion)