

Lab Framework

Text: Cord Applied Math

Unit number and title: Unit 1: Learning Problem-Solving Techniques

Short Description: Fire code allows only 25% of walls covered. Is the classroom in code?

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Lab Title **Fire Code**

LAB PLAN

TEACHER: Teacher Prep/ Lesson Plan

- **Lab Objective**

Apply the problem-solving technique
To work as a team
Compare data
Find out if the room is fire code safe

- **Statement of pre-requisite skills needed** (i.e., vocabulary, measurement techniques, formulas, etc.)

Know how to find the area of 2 dimensions: $W \times L$

- **Vocabulary**

None

- **Materials List**

Rulers
Tape measurers
Posters (4 per group)
Markers
Pencils
Calculator
Handouts

- **GLEs (State Standards) addressed**

Math:

- 2.2.1 Select and use relevant information to construct solutions
- 2.2.2 Apply a variety of strategies and approaches to construct solutions.
- 3.2.1 Draw and support conclusions, using inductive or deductive reasoning

Reading:

- 3.2.2 Apply understanding of complex information, including functional documents, to perform a task.

Writing:

- Component 2.2: Writes for different purposes

- **Leadership Skills**

Respect for self and others
Responsibility
Positive work ethic

- **SCAN Skills/Workplace Skill**

Uses graphs to convey information
Approaches mathematical problems with a variety of techniques
Responds to communicated messages appropriately
Organizes ideas and communicates them effectively
Asks questions when needed
Problem solving

- **Set-up information**

Students will need to climb on chairs, please make sure that all students are wearing appropriate clothing and make sure there are no dangerous situations
Remind students how to find area
Remind students that the purpose of the lab is to practice the problem solving techniques.

Remind students what it is like to work as a team. All group members need to participate together to come to a conclusion as a group.

Groups of 6: 4-5 members each.

With specific tasks:

Leader:
Measurer
Recorder
Lab Reporter
Calculator

- **Lab organization(-Grouping/leadership opportunities/cooperative learning expectations; -Timeline required)**

1. Hand out animal shapes: 6 monkeys, 6 lions, 6 snakes, 6 birds, 6 alligators
2. Have similar animals find each other and sit by your group
3. Attendance: 1 minute while students move into groups
4. Introduce Lab and review the 4 steps to problem solving
5. Hand out posters to each group
6. Have them label each poster with the heading of the steps. This at the beginning of the next class and we will be comparing the answers, then come to a class consensus and the teams will be graded accordingly to who finds the most right answer and followings the problems solving techniques the best with proof on the posters.
7. Break each group member into their jobs: Review expectations of each job.
8. Any questions? Clarifications?
9. Let students know that they may rearrange the classroom, but it needs to return to the state it looks right now, perfect, before any one will be excused when the bell rings.
10. Work time till 5 minutes to the end of class. Keep class informed as to how much time is left before clean up.
11. Last 5 minutes clean up.
12. NEXT CLASS DAY:

13. 20-30 minutes to finish posters
14. 10-15 minutes: each group presented posters and how they problem solved this lab. Present their answers.
15. 10 minutes: as a class decide the right answer. What solutions didn't work and why and what solutions worked and why.
16. Essay reflection in Math Journal: 20 minutes
QUESTIONS TO ANSWER IN MATH JOURNAL: see attached

Collect math journals to correct/ Have team leaders fill out evaluations
Is it Ok to post poster?

- **Teacher Assessment of student learning** (scoring guide, rubric)
Students will be assessed on class participation
On the accuracy of their calculations
Also the reflective essay
- **Summary of learning** (to be finished after student completes lab)
Reflective essay: attached
- **Optional activities**
Include the ceiling, doors, omit "boards" or allow boards. Check other classrooms.
- **Career Applications**
Surveyor
Fire marchall
Administer of a school
Contractor

<https://wa-appliedmath.org/>

LAB TITLE: FIRE CODE

STUDENT INSTRUCTIONS:

- **Statement of problem addressed by lab**
Is the class safe? The fire code for Washington State schools states that class room walls can only be covered 25%. Is this class room a fire hazard?
- **Grouping instructions and roles**
Groups of 6: 4-5 members each.
With specific tasks:
 - Leader: Makes sure team is working towards answering question using the problems solving technique
 - Measurer: In charge of the ruler/ measuring tap
 - Recorder: Collects data
 - Lab Reporter: Writes on posters
 - Calculator: Uses calculator and computes data
- **Procedures**
Utilizing teamwork solve the posed question while purposefully applying the 4 step process of problem solving:
 1. **Understand the problem**
 2. **Develop a plan**
 3. **Carry out the plan**
 4. **Check the results**

Make sure to take notes on how your use the process as you go: You will be making posters from this information to present in class.
- **Outcome instructions**
Come together as a class and see how results compare.
- **Assessment instructions** (peer-teacher)
Students will be assessed on the accuracy of their calculations and their conclusion of the lab. The conclusion should include supporting data from their lab as well as a persuasive answer. Also assessment will be done by the team leader to grade the teamwork of each member.

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Lab Data Collection

Student:

Date:

Unit: 1: Learning Problem Solving Techniques

Lab Title: Fire Code

Criteria: Is the class safe? The fire code for Washington State schools states that class room walls can only be covered 25%. Is this class room a fire hazard?

Data Collection/ calculations: On posters as a group to show work in each of the 4 problem solving steps:

1. Understand the problem
2. Develop a plan
3. Carry out the plan
4. Check the results

Other Assessment(s)

Team leader to fill out member evaluations

Math Journal Essay Reflection

Team Leader evaluations:

Member Name:

Job:

How did this person perform their duties:	1	2	3	4	5
Use of class time	1	2	3	4	5
Communication skills	1	2	3	4	5
Listening skills	1	2	3	4	5

MATH JOURNAL ESSAY REFLECTION: In math journals: reflect upon the following questions using proper paragraph form, punctuation, grammar and spelling. One paragraph per question. You may choose to do a concept map or an outline, (prewrite), before you write your essay reflection.

1. What are the four parts of the problem solving technique and explain each.
2. How did this technique help solve the question posed in this lab?

3. What solutions/ ideas worked for your lab and why?
4. What solutions/ ideas didn't work for your lab and why?
5. What do you think your team could have done differently and what could you have done differently on this last lab?
6. In what other ways besides math class could you use this problem solving technique in your life?

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