

Lab Framework

Text: CORD workbook

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

Short Description: Build the tallest free-standing tower possible from a single sheet of paper

Developed by: Mary Meing

Contact Information: memeing@seattleschools.org

Date: January 2008

LAB TITLE - Paper Tower Contest

LAB PLAN

Lab Objective - To build the tallest free-standing tower possible

Statement of pre-requisite skills needed

- Reading, measuring, communication skills

Vocabulary

- problem solving methods, plan for solution

Materials List

- One piece of 8 1/2" X 11" paper
- One piece of 1/2" x 1 foot scotch tape
- Scissors
- Ruler
- pencil

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

Workplace Skills

- Problem solving skills
- Team work
- Analyze various approaches to problem

GLEs (State Standards) addressed

MATH:

COMPONENT 2.1: Define problems.

2.1.1 Formulate questions to be answered to solve a problem.

2.1.2 Determine what information is missing or extraneous.

COMPONENT 2.2: Construct solutions.

2.2.1 Select and use relevant information to construct solutions

2.2.2 Apply mathematical concepts and procedures from number sense, measurement, geometric sense, probability and statistics, and/or algebraic sense to construct solutions.

COMPONENT 3.1: Analyze information.

3.1.1 Analyze, compare, and integrate mathematical information from multiple sources.

Set-up information

- Each tower must be constructed from the paper and tape supplied by the Host Center. No other materials or substitutions are allowed.

- Contestants have a 45-minute period in which to construct their towers. Any modifications made to tower after the allotted 45-minute period will disqualify the tower. Late arriving students may enter the contest at any time after the 45-minute period has begun, however, they must stop when everyone else stops. No extra time will be allotted to late starters.
- Each tower must be free-standing; it must not be attached to, or lean against any other surface (e.g. floor, wall, desk, etc.)
- Towers must stand for 10 seconds.
- Towers, whether standing straight/erect or sagging/curved, will be measured from base to highest vertical point. Towers that curve or sag may not be straightened and then measured; they will be measured to the highest vertical point while sagging or curving.

Lab organization(Grouping/leadership opportunities/cooperative learning expectations

- Lab will completed in 45 min
- Work in groups of three

Teacher Assessment of student learning

- **First Place:** Tallest tower is completed.
- **Second Place:** Next tallest tower.
- **Third Place:** Next tallest tower.

Summary of learning

- discuss real world application of learning from lab
- opportunity for students to share/present learning

Career Applications

- Engineering, fashion design, carpentry, drafting
-

Washington Applied Math Council

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

LAB TITLE: Paper Tower Contest

STUDENT INSTRUCTIONS:

- Each tower must be constructed from the paper and tape supplied by the Host Center. No other materials or substitutions are allowed.
- Contestants have a 45-minute period in which to construct their towers. Any modifications made to tower after the allotted 45-minute period will disqualify the tower. Late arriving students may enter the contest at any time after the 45-minute period has begun, however, they must stop when everyone else stops. No extra time will be allotted to late starters.
- Each tower must be free-standing; it must not be attached to, or lean against any other surface (e.g. floor, wall, desk, etc.)
- Towers must stand for 10 seconds.
- Towers, whether standing straight/erect or sagging/curved, will be measured from base to highest vertical point. Towers that curve or sag may not be straightened and then measured; they will be measured to the highest vertical point while sagging or curving.

Statement of problem addressed by lab

- How to construct the highest free standing tower

Grouping instructions and roles

- Students will work in groups of three

Procedures

- follow the student instructions listed above

Assessment instructions (peer-teacher)

- **First Place:** Tallest tower is completed.
- **Second Place:** Next tallest tower.

- **Third Place:** Next tallest tower.

Lab Data Collection

Student:

Date:

Unit:

Lab Title:

Criteria: Write the problem/objective in statement form

Data Collection: Record the collected/given data

Calculations: Complete the given calculations to solve for an answer(s)

Summary Statement:

Other Assessment(s)

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