



Connecticut Academic/Career Development Integration Activity

Title **Packaging Possibilities***
Subject **Geometry**

Grade Level(s) 9-12

CT Content Standard: Geometry and Measurement

3.3 Develop and apply units, systems, formulas, and appropriate tools to estimate and measure.

3.3.a Solve a variety of problems involving one-, two-, and three-dimensional measurements using geometric relationships and trigonometric ratios.

3.3.a.4 Use two-dimensional representations and formal and informal methods to solve surface-area and volume problems.

National Career Development Guidelines Goal/Indicator

Career Management GOAL CM4. Master academic, occupational, and general employability skills in order to obtain, create, maintain, and/or advance your employment.

Indicator CM4.A3. Demonstrate attainment of general employability skills and personal qualities needed for success in school and employment (e.g., critical thinking; problem solving; resource, information, and technology management; interpersonal skills; honesty; and dependability).

Career Development Objectives

1. The student will determine the impact on volume when the shape and dimensions of a box are changed.
2. The student will recognize that problem solving is a 21st Century skill.
3. The student will successfully demonstrate the ability to solve a real world problem dealing with geometry.

Assessment

1. The student will determine the impact on volume when the shape and dimensions of a box are changed.
2. The student will complete the *Packaging Possibilities* worksheet.
3. The student will recognize that problem solving is a 21st Century skill that can be used in many occupations. (Class discussion, Teacher observation.)

* Adapted by Donna Didsbury and Alyson Dougherty from *Career Development Tool Kit*, Linda Kobylarz & Associates, 2001. Used with permission.

Preparation

- Prior Learning—Instruction in solving problems related to surface area and volume, familiarity with employability skills
- Handouts/Worksheets— *Packaging Possibilities* worksheet
- Resources/Materials—writing materials, materials to make prototype package (paper, scissors, tape) Optional: Bring in or ask students to bring in creative packaging of coffee or tea (for example: The Republic of Teas packages in cylinders, Celestial Seasonings, Tazo and Yogi Tea package in different dimension boxes, Stash loose tea is packaged in a bag. Starbucks and Dunkin Donuts Coffee is packaged in bags while Folgers is packaged in a plastic canister). O*Net (<http://online.onetcenter.org>), or CT Department of Labor (CT DOL) (www.ctjobsandcareers.org) *CT Career Paths* booklet (<http://www.ctdol.state.ct.us/lmi/crpaths.htm>), or other career information system. Extend the assignment and show students how the display of products is connected to the packaging with this package design website. (<http://pack-design.com/ibhp.htm>). Make the connection between packaging and manufacturing with *Manufacture Your Future Teacher's Guide* published by CBIA. (<http://www.nextgenmfg.org/Teachers/ManFuture%20teachers%20guide%20kit.cfm>)
- Time Required—90 minutes

Procedures

Part One (60 minutes)

- In this activity, students will practice solving problems dealing with area and volume. They will see how the thought processes and skills they use in solving math problems are employability skills they can use in almost any job.
- Review with students the process for finding the volume of a three-dimensional object.
- Give students a copy of the *Packaging Possibilities* handout. Review the directions with them. They are to imagine that they are working for a company that sells coffee and tea. The marketing department wants to explore some new packaging that will catch the eye of customers. The students are to design new packaging for the coffee or tea. The packaging can be of any shape, but it must fit on a standard size shelf (12" high). They will create 2 new packaging designs.
- Discuss with students different types of packaging that already exist for coffee and tea. Suggest having students bring in packaging examples before the class. Ask students about the advantages and disadvantages of these designs. Would they be easy to mass produce in an assembly line? Does the packaging catch the attention of customers? Does the packaging help differentiate the product, like branding? Does the packaging affect the quality of the product (think freshness and individually wrapped tea bags)? Is the packaging environmentally friendly?
- Give students time to complete the assignment.
- Optional: Extend the assignment and have students make posters showing the new packaging possibilities.

Part Two — Career Development Connections (30 minutes)

- Begin by reminding students that problem solving is a valuable employability skill.
- Brainstorm with students some of the occupations where problem solving, investigating, and finding solutions are important skills. Make a list on the board.
- What other employability skills helped them to complete the assignment? (For example: knowledge of math, reasoning, creative thinking, and decision-making.)
- Optional: Have students use the O*Net, CT DOL, or other career information system to research an occupation of interest and see what employability skills are key. Which of those skills are students learning to use in the math class?

Crosswalks**Key 21st Century Skills**

Thinking Skills—Problem-solving, decision-making, critical thinking, reasoning

Packaging Possibilities

Name _____ Date _____

Directions: Imagine you are working for a company that sells coffee and tea. The marketing department wants to explore some new packaging that will catch the eye of customers. You are to design new packaging for either coffee or tea. The packaging can be of any shape, but it must fit on a standard size shelf (12" high). Create 2 new packaging designs and explain why you chose that design. Show each design in a sketch or prototype, with its dimensions, and volume below.

Part 1 Original Packaging

Original Packaging Dimensions: 3" x 5.5" x 2.5"

Compute the surface area and volume of the original packaging and show your work.

Surface area of original packaging _____

Volume of original packaging _____

Part 2 New Packaging Designs

Design A

Dimensions _____

Surface Area _____

Volume _____

Sketch your Design A on the back of this sheet of paper, or create a prototype (either to scale, or scaled down) of your design.

What are the advantages of your design A and why would your company want to use it as the new packaging?

Design B

Dimensions _____

Surface Area _____

Volume _____

Sketch your Design B on the back of this sheet of paper, or create a prototype (either to scale, or scaled down) of your design.

What are the advantages of your design B and why would your company want to use it as the new packaging?