

Name: _____ Class ____ Date: _____

Golf Ball Bridges

Learner Objectives:

- Construct, test and evaluate a structural device or system
- Propose methods to improve the structural stability of a design

Key Terms:

Structure

Load

Mass structure

Forces

Design

Frame structure

Background Information: Designers face many challenges when planning a new project. One of the first is that the design must fulfill specific criteria or specifications for the job.

Purpose: In this investigation, you will work in a group of 3 to build a free standing bridge with a track capable of supporting a rolling golf ball. Your bridge must at least 30 cm long and the track must be at least 5 cm above the surface of the desks. It must also meet the additional specifications described on page 276.

Materials:

15-20 large plastic
straws

15 small paper clips
60 cm of masking tape

1 golf ball
Scissors

Procedure:

1. You will be given one period to plan your bridge design. At the end of this period, your group will hand in a labeled drawing / diagram of your design.
2. You will have 30 minutes to build your bridge and test your design. The golf ball must successfully roll from one side of the bridge to the other at least three times in a row.

This investigation / activity has been adapted from:

Bullard J, Krupa G, Krupa M, et al. *Science Focus 7*. Toronto, ON: McGraw-Hill Ryerson.

3. Your bridge will be evaluated by your group, your peers and your teacher, according to how well it meets the required specifications.

4. Individually, you will complete the evaluation questions on p. 277 of your text. You will be graded on your responses to these questions.

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Science 7 - Golf Ball Bridge

Design:

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Data:

Trial 1

Trial 2

Trial 3

Trial 4

Trial 5

This section must be handed in individually. You will be graded on your responses.

Evaluation:

1. Did your bridge pass the golf ball test? If not, explain what happened.
2. Did your bridge meet all of the structural specifications? Explain why or why not.
3. Which design specifications were the most difficult to meet? Why?
4. Describe at least three changes you would make to your design if given the chance to re-construct your bridge. Explain the reason for each change.

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Change 1:

Reason:

Change 2:

Reason:

Change 3:

Reason:

5. What other materials would you consider using if you were to do this project again with the same list of specifications? Why would you choose those materials?

6. If your bridge was actually being built across a deep river gorge and the track had to support a heavy freight train rather than a golf ball, what additional things would you have to consider? List at least 3 additional considerations and explain why they would be important to the design and construction process.

Consideration 1:

Consideration 2:

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Consideration 3:

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