

Important Concepts . . .

Preview Review



Science

Grade 7

W3 - Lesson 2: Structural Forms

Important Concepts of Grade 7 Science

W1 - Lesson 1	Interactions and Interdependencies
W1 - Lesson 2	Nutrient Cycles, Energy Flows, and Changes in Ecosystems
W1 - Lesson 3A	Environmental Impacts of Human Activities
W1 - Lesson 3B	The Particle Model of Matter, Temperature, Heat, and Change of State
W1 - Lesson 4	Heat Transfer
W1 - Lesson 5	Understanding Heat and Temperature in Nature and Technology
W1- Quiz	
W2 - Lesson 1	Life Processes and Structure of Plants
W2 - Lesson 2	Plant Propagation and Reproduction
W2 - Lesson 3	Plant Needs and Growing Conditions
W2 - Lesson 4	Role of Plants and Controlling Plant Growth
W2 - Lesson 5	Review of Plant Management
W2 - Quiz	
W3 - Lesson 1	Forces on and within Structures
W3 - Lesson 2	Structural Forms
W3 - Lesson 3A	Materials Used in Structures
W3 - Lesson 3B	Rocks, Weathering, and Erosion - The Rock Cycle
W3 - Lesson 4	Plate Tectonics and Related Events
W3 - Lesson 5	Fossils
W3 - Quiz	

Materials Required.

Textbook:
Science in Action 7

Science Grade 7

Version 5

Preview/Review W3 - Lesson 2

Publisher: Alberta Distance Learning Centre

In-House Teacher: Barb Philips

Reviewer: Norene Pinder

Project Coordinator: Dennis McCarthy

Preview/Review Publishing Coordinating Team: Nina Johnson,

Laura Renkema, and Donna Silgard



The Alberta Distance Learning Centre has an Internet site that you may find useful. The address is as follows: <http://www.adlc.ca>

The use of the Internet is optional. Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

ALL RIGHTS RESERVED

Copyright © 2007, by Alberta Distance Learning Centre, 4601-63 Avenue, Barrhead, Alberta, Canada, T7N 1P4. Additional copies may be obtained from the Alberta Distance Learning Centre.

No part of this courseware may be reproduced or transmitted in any form, electronic or mechanical, including photocopying (unless otherwise indicated), recording, or any information storage and retrieval system, without the written permission of Alberta Distance Learning Centre.

Every effort has been made both to provide proper acknowledgement of the original source and to comply with copyright law. If cases are identified where this effort has been unsuccessful, please notify Alberta Distance Learning Centre so that appropriate corrective action can be taken.

IT IS STRICTLY PROHIBITED TO COPY ANY PART OF THESE MATERIALS UNDER THE TERMS OF A LICENCE FROM A COLLECTIVE OR A LICENSING BODY.

Preview/Review Concepts for Grade Seven Science



***W3 - Lesson 2:
Structural Forms***

OBJECTIVES

By the end of this lesson, you should be able to

- name and describe the basic building shapes
- describe how materials can be strengthened
- explain different ways of joining parts

GLOSSARY

beam - flat, narrow structure supported at its ends

bonding - hooking two surfaces together with a different material between them

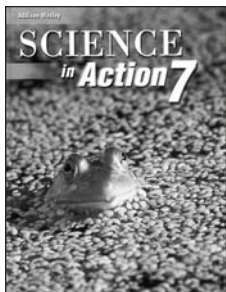
column - a vertical support structure

corrugation - material with wave-like ridges or folds, e.g. corrugated cardboard

W3 - Lesson 2: Structural Forms

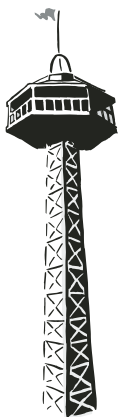
Typically, we see structures in many different shapes. Even among those built for the same purpose, a great variety of shapes is possible.

Shapes and Forms for Building



Read pages 290 to 291 and 301 to 303 of *Science in Action 7*. Although numerous shapes can be used in structures, some are stronger than others. As a result, those shapes are commonly used when making objects. Some shapes that are seen frequently in structures are triangles, arches, domes, beams, and columns.

1. If you had only single beams to support a load, which way would you position them for greatest strength – flat, or on edge?



2. Why are arches stronger than columns and beams?

3. What is a simple way of strengthening a rectangular-shaped gate?



4. How could you use triangles to make a strong roof?

5. Why might you use an I-beam rather than a solid beam to fit in the same space?

6. If you could make two equally strong bridges, one a truss bridge, and the other an arch bridge, which would you choose and why?

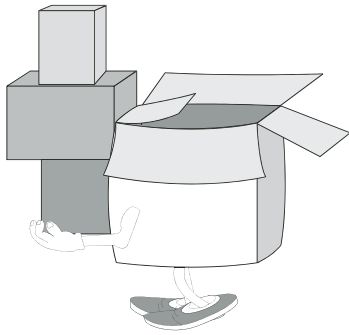
7. Describe a caudileur.

Strengthening Materials



Sometimes materials are formed in ways that will strengthen them. For example, a reasonably firm material such as cardboard or plastic can be strengthened by **corrugating** it. That means one layer of it is folded into a number of triangles. The folded layer is then often attached between two flat layers of the same material. Another method of strengthening a material is **lamination**, or bonding multiple layers of it together. Read pages 329, 330, and 332 of the textbook.

8. Name a piece of sports equipment that is made stronger through lamination.



9. Where might you find corrugated material in buildings?

10. What type of force does a strut on a sign resist? (Hint: See picture on page 330 of your textbook.)

Joining Parts

Structures are rarely made of just one part. This leads to the need to join the parts in ways that allow them to work properly for as long as needed. The type of join must suit the use of the object. Some joints rely on friction and others on bonding, to hold parts together. Some joints are rigid or fixed; they do not move. Others are flexible and can move. Read pages 313 to 315 and 318 of *Science in Action 7*.

11. How does the force of friction create strong joints?



12. How does a bond work to hold parts together?

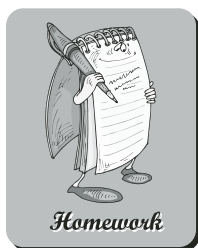
13. What are two different ways you could join the parts of a cupboard?

14. Give an example of a fixed joint.

15. Give an example of a moveable joint.

16. If you had your choice of a nail or a screw to join two parts securely together, which would you use and why?





Homework

17. Experiment with some materials you have around home, such as paper, straws or toothpicks. Make a simple structures such as a bridge using the shapes you learned about. Sketch it and describe how it performed when a load was put on it.

