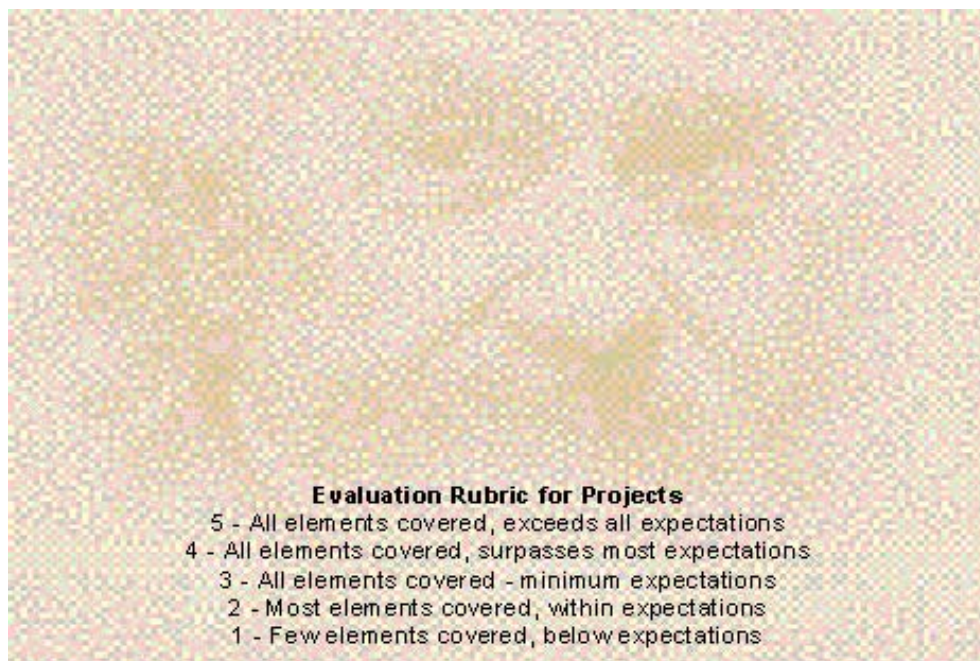




Culminating Project Outlines

<u>Unit</u>	<u>Project</u>	<u>Report</u>
Biological Diversity	Local Conservation Strategy	Scientific Journal
Matter and Chemical Change	Science Lab Safety	Manual
Environmental Chemistry	Public Meeting	Written Submission
Electrical Principles and Technologies	Prototype Model	Design/Specs
Space Exploration	Robotic Arm	Analysis/Feedback





Culminating Project Outline

Unit 1 : Biological Diversity

Description of Project Goal

To design a multimedia presentation (PowerPoint / Video) or Internet-based website, outlining efforts, by recognizable local conservation or environmental groups, to maintain biodiversity.

Organization Suggestions:

(You may also choose another group listed on this website <http://www.rockies.ca/geoec/resources/>)

1. [Ducks Unlimited](#)
2. [CPAWS Education Program](#)
3. [FEESA \(An Environmental Education Society\)](#)
4. [SEEDS Foundation](#)
5. [Calgary Field Naturalists' Society](#)
6. [Science Alberta Foundation](#)

Project Components:

- Compile a day-to-day **Scientific Journal**, which will be handed in after your presentation
- Include in your Journal
 - Research strategies used to identify the strategy you are reporting on
 - Identify the Strategy you will be researching and reporting on, including the
 - Need for the strategy
 - Current conditions
 - Outlook (effectiveness of the strategy)
 - Recommendations for the future
 - Cooperative learning interactions and effectiveness – with your partner
 - Roles and Responsibilities of Partners
 - Other supports/mentors and Contacts utilized
 - What challenges did you face and what modifications did you make throughout the project process, prior to your presentation?
 - What would you do differently next time?
- Presentation not to exceed **5 minutes**

Evaluation Rubric

Presentation	Scientific Journal	Self Evaluation	Peer Evaluation
40%	40%	10%	10%



Culminating Project Outline

Unit 2 : Matter and Chemical Change

Description of Project Goal

To design and produce a functional **Junior High School Lab Safety Guide/Manual**. Prepare a pocket-sized safety guide/manual that can be used by students in the science lab. Include all components covered in the safety section from your textbook as well as all of the additional supporting material that was covered in class. Refer to your notes for details.

Components: (You must include all of the components in your guide/manual)

- Title (Cover) page and Credit (Reference) page
- General Safety Precautions before you begin working in the Science Lab
- Proper Techniques for handling materials in the Science Lab
- Procedures for Handling a Heat Source (natural gas/open flames, hotplates)
- Safety Equipment
- How to identify unknown substances and proper disposal techniques
- W.H.M.I.S.
- Periodic Table (Reference Guide) is optional

Details/Suggestions:

- Manual format can be your own design (remember it should be *pocket-sized*).
- Scientific Illustrations should accompany information.
- Grammatical structure and spelling should reflect Junior High standards.
- Guide/manual should **not** just be a carbon copy of your notes or Textbook.
- Sample experimental reporting procedures, outlining the Scientific Method of Inquiry, should also be included.
- Organize the components into readable 'chunks' of information.

Evaluation Rubric

Student Evaluation (Those who will be using it)	Guide/Manual (Components)	Self-Evaluation
30%	50%	20%



Culminating Project Outline

Unit 3 : Environmental Chemistry

Description of Project Goal

To research and prepare for participation in a public hearing (an environmental role play). Based on the issue, you will research your assigned viewpoint and present your view at the public hearing. You will then help decide what steps to take to resolve the Issue, by the decisions made following the public hearing.

Background

Issue: Vehicular Access through the ‘Weaselhead’ – over or under?

Details can be found at: <http://www.greatwest.ca/ffwd/Issues/2001/1108/news1.htm>

All transportation options for crossing the Weaselhead, in an environmentally sensitive manner, including building a tunnel, an expressway, or a ‘fly-over’ (elevated roadway), should be explored. Several engineers put the tab for a **Tunnel** astronomically higher than the proposed \$350-million estimate.

Roles

Moderator	City Commissioner	Land Developer
Secretary	Public Transportation Rep	Planning/Zoning Representative
Press	Community Leader	Construction Manager
Federal Gov’t (MP)	Homeowner (con)	Construction Worker
Prov. Gov’t (MLA)	Homeowner (pro)	Fish/Wildlife Officer
Mayor	Environmentalist	Fisherman
City Councilor (pro)	Weaselhead Pres. Society	Teacher
City Councilor (con)	Environmental Biologist	Student
Aboriginal Leader	Structural Engineer	Squatter (homeless)

Expectations:

- You are required to research and prepare a speech, outlining your views.
- Presentation of your speech to be limited to 1 minute.
- You will be encouraged to represent your role in a question/answer discussion, following the speeches.
- You will be asked to vote on the issue, based on what you have learned throughout the public hearing role play.

Evaluation Rubric

Presentation	Written Speech	Questions	Answers
30%	30%	15%	15%



Culminating Project Outline

Unit 4 : Electrical Principles and Technologies

Description of Project Goal

To design and construct a **working** model (prototype) of an **electric-powered device** that performs a specific, practical function.

Device Suggestions: (You may choose to do something else – with permission)

- An operating lift (**elevator**) that could provide wheelchair access to an area that is otherwise inaccessible to the disabled.
- A model of a **home security system**, with intruder alerts and light/pressure sensitive devices.
- An automated **zoo enclosure** that keeps species separated
- An **Amusement Park Ride** that raises and lowers a platform
- A '**Rube Goldberg**' automated **Invention**
- A **transportation system** that uses a renewable energy source

Specifications:

- Prototype must be your own design.
- The prototype must be a working model.
- Choice of materials is open
(no commercially-developed kits will be allowed – ie. Lego, Knex, Mechano, etc.)
- Project **Report** (maximum 5 pages) should include:
 - Description and Function of the device (in detail)
 - Electrical Principles and Technologies:

Identify the Electrical (scientific) principles and Technologies you used in the design and construction of your device. This will also allow you to review what you have learned in this unit.

- Energy Transformations that take place
- Design Blueprint (Circuit Diagram)
- Procedural Outline
 - *Construction Details*
 - *List of Materials*
- Troubleshooting throughout the project phases.

Evaluation Rubric

Prototype Model	Project Report	Self Evaluation	Peer Evaluation
30%	40%	15%	15%



Culminating Project Outline

Unit 5 : Space Exploration

Description of Project Goal

To design and construct a **working** model (prototype) of a **robot arm** that can successfully retrieve objects from a specified distance and place them in a specified location.
(**optional**: arm may be electrically powered)

Background:

Canada's most recent contribution to the **International Space Station** was the **2nd generation Canadarm**. This remote device, that '*rides the rails*' on the Space Station, is used to launch and recover satellites, as well as repair and install equipment such as the Hubble Space Telescope. The Canadarm 2 has three primary systems: the remote manipulator system, the mobile base system and the special purpose dexterous manipulator

Specifications:

- Prototype must be your own design.
- Choice of materials is open
(no commercially-developed robotic kits will be allowed – ie. Lego, Knex, Mechano, etc.)
- Objects (different sizes and shapes) will be placed on a table and on the floor directly beneath the table, which is located inside a circle (with a diameter of 4m)
- At no time during the test are you allowed to go inside the circle to move any of the objects.
- You will be given a visual sample of what objects will be used prior to the actual test.
- You will be required to manipulate your robotic arm to relocate each of the objects as directed, during the test phase.
- You will be given a **time limit** to perform each part of the test.
- Project **Report** should include:
 - Design Blueprint
 - Procedural Outline
 - *Construction Details*
 - Troubleshooting
 - Answers to questions which direct you self analysis of this project
 - Feedback sheet from peers

Evaluation Rubric

Model/Test (Effectiveness)
50%

Report: Self-Evaluation/Analysis/Peer Evaluation
50%