centre de
développement
pédagogique
pour la formation générale
en science et technologie

DESIGNING A DEMONSTRATION DEVICE

AND

BUILDING A MODEL

WORKING DOCUMENT

APRIL 2006

SPECIFICATIONS FOR DESIGNING A DEMONSTRATION DEVICE

OVERALL FUNCTION

Using a single pouring, the device should demonstrate and compare the effect of an acid solution on distinct samples of sedimentary and igneous soils.

Human specifications:

- The device must be user friendly
- The directions for use must be included
- The device should not exceed the shipping box dimensions
- The device should produce a quick and clear demonstration of the effect

Physical specifications:

- No restrictions.

Technical specifications:

The device:

- should withstand shipping.
- must have a draining system and allow for the replacement of the soil samples
- must be stable on a horizontal surface
- should be built to permit replacement of certain components when needed, after normal use.

Industrial specifications:

The device must:

- be built entirely using the material and equipment available in a science and technology classroom.

Note : Adhesive tapes and elastics are not allowed as technical connections.

Economic specifications:

- The device must cost less than $4.00.

SPECIFICATIONS FOR BUILDING A MODEL

OVERALL FUNCTION

The model must represent and explain the problem: Why is acid precipitation affecting the flora and fauna of the north shore of the St. Lawrence River more than that of the south shore?

Human specifications:

The model must:

- be portable and not exceed the following dimensions:
  100 mm (H) x 300 mm (L) x 220 mm (W/D)

Physical specifications:

The model must:

- represent the topographic relief of both shores of the St. Lawrence River
- show at least one lake on each shore
- provide explanations.

Technical specifications:

The model must:

- be three dimensional
- be stable on a horizontal surface.

Industrial specifications:

The model must:

- be built entirely using the material and equipment available in a science and technology classroom.

Economic specifications:

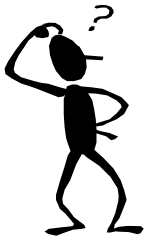
- The device must cost less than $4.00.

C-1 Seeks answers or solutions to scientific or technological problems

Evaluation Criteria
- Appropriate representation of the situation
- Development of a suitable procedure for the situation
- Appropriate implementation of the procedure
- Development of relevant conclusions, explanations or solutions

You should regroup in teams of four. Your team must build the shipping box, design a demonstration device and a model according to the provided specifications.

The work should be equally shared among the team members and traces of your work should be registered in this notebook.



What do I know?

How does one notice the effect of an acid solution on a soil sample?

_____

_____

_____

What are the essential elements involved in the acid rain problem in the province of Quebec?

_____

_____

_____

_____

Planning the work

Sharing the tasks among the team members

NAME	RESPONSIBILITIES

Write down, in a chronological order, the steps of your work procedure. For every step, you should state whether it is individual or team work.

DEMONSTRATION DEVICE

In your own words, what should your device do?

_____

_____

_____

Illustrate your ideas. Justify the choices and adjustments needed during the design process and while building the prototype.

Continued…

MODEL

Make a list of both the elements required on your model, and how you will represent these concepts (means of representation). Justify your choices and list any adjustments made during the assembly stage.

CONCEPT TO REPRESENT	MEANS OF REPRESENTATION	ADJUSTMENTS AND JUSTIFICATIONS

FINAL SKETCH AND SPECIFICATIONS OF THE DEMONSTRATION DEVICE: