

a WOW Lab

BLUEPRINT

The Siphontific Method

Quebec - Achievements and Competencies

Learning Outcomes

Cycle 1 (Gr. 7-8)
Forces and motion

The Quebec Achievements and Competencies are based on the Progression of Learning Outcomes derived from the Quebec Education Plan set by the Ministère de l'Éducation, du Loisir et du Sport.

Specific Expectations

GENERAL EDUCATION PATH

CYCLE 1 (Gr. 7-8) — Secondary 1 and 2

TECHNOLOGICAL WORLD

- B. Mechanical engineering
 - 1. Forces and motion
 - b. Effects of a force
 - i) Explains the effects of a force in a technical object (change in the motion of an object, distortion of a material)

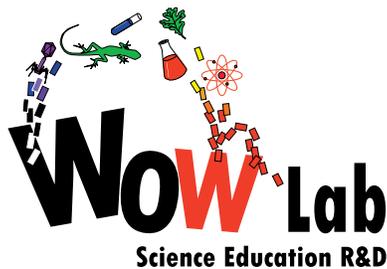
In this activity, students will observe water travelling through tubes in a siphon. The water travels against gravity, first travelling upwards from a higher reservoir, and then back down to a lower one. Students will change certain variables, such as height or tube diameter, in the siphon and note the change in the speed at which the water travels. They can discuss the forces of gravity, and atmospheric pressure, and their roles in this experiment.

APPLIED GENERAL EDUCATION PATH

CYCLE 1 (Gr. 7-8) — Secondary 1 and 2

TECHNOLOGICAL WORLD

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 - 1. Forces and motion
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Techniques

A. Technology

2. Manufacturing

f. Assembling and disassembling

- i) Identifies and gathers the parts and hardware
- ii) Chooses the appropriate tools

B) Science

a. Safely using laboratory materials and equipment

- i) Uses laboratory materials and equipment safely (e.g. allows hotplate to cool, uses beaker tongs)

d. Using measuring instruments

- i) Adopts the appropriate position for reading an instrument

C) Techniques common to Science and Technology

a. Verifying the repeatability, accuracy and sensitivity of measuring instruments

- i) Takes the same measurement several times to check the repeatability of the instrument used

Strategies

A. EXPLORATION STRATEGIES

6. Formulating questions

7. Putting forward hypotheses (e.g. individually, in teams, as a class)

9. Anticipating the results of his or her approach

10. Imagining solutions to a problem in light of his or her explanations

11. Taking into account the constraints involved in solving a problem or making an object (e.g. specifications, available resources, time allotted)

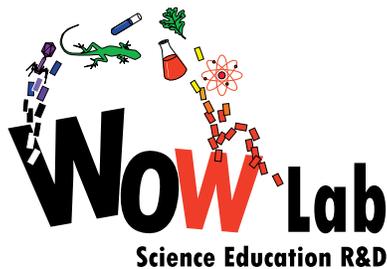
12. Examining his or her mistakes in order to identify their source

13. Using different types of reasoning (e.g. induction, deduction, inference, comparison, classification)

14. Using empirical approaches (e.g. trial and error, analysis, exploration using one's senses)

15. Ensuring that the procedure is appropriate and safe and making the necessary adjustments

16. Collecting as much scientific, technological and contextual information as possible to define a problem or predict patterns



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B. INSTRUMENTATION STRATEGIES

4. Using different tools for recording information (e.g. diagrams, notes, graphs, procedures, logbook)
5. Using a variety of observational techniques and tools
6. Selecting suitable techniques or tools for observation

C. ANALYTICAL STRATEGIES

1. Identifying the constraints and important elements related to the problem-solving situation
2. Dividing a complex problem into simpler subproblems
3. Using different types of reasoning (e.g. inductive and deductive reasoning, comparison, classification, prioritization) in order to process information
4. Reasoning by analogy in order to process information and adapt scientific and technological knowledge

D. COMMUNICATION STRATEGIES

2. Organizing information for a presentation (e.g. tables, diagrams, graphs)
3. Exchanging information
4. Comparing different possible explanations for or solutions to a problem in order to assess their relevance (e.g. full-group discussion)
5. Using tools to display information in various formats (e.g. data tables, graphs, diagrams)