



## Achievements and Competencies

### Learning Outcomes

Grades 7-9	Grades 10-12
Atoms and Elements	Chemical Reactions
	Thermochemistry

Achievements and Competencies are based on the Common Framework of Science Learning Outcomes (K-12) set by the Canadian Council of Ministers of Education (1997).

### Specific Expectations

#### **Grade 9**

##### PHYSICAL SCIENCE

###### Atoms and elements

208-7 Formulate operational definitions of major variables and other aspects of their investigations (e.g., provide operational definitions for mass, charge, electrons, protons, neutrons, nucleus, atoms, molecules, elements, compounds, neutral, positive, negative, ions, isotopes and periodic table).

Using a chain of mousetraps and golf balls to demonstrate a nuclear fission reaction, the students will be able to visualise and formulate a definition for neutrons, atoms, molecules and nuclear fission.

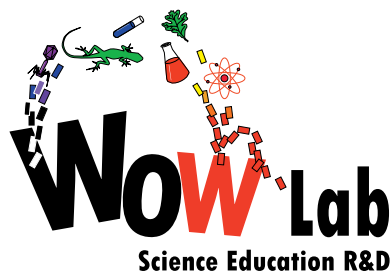
#### **Grade 10**

##### PHYSICAL SCIENCE

###### Chemical reactions

214-5 Interpret patterns and trends in data, and infer or calculate linear and nonlinear relationships among variables (e.g., determine the effect of increasing the concentration of a reactant on the rate of reaction).

The students will be able to investigate and propose how the rate of reaction will be effected by increasing the concentration of reactants using golf balls and mousetraps.



a WOW Lab  
**BLUEPRINT**

## Nuclear Mousetraps - Achievements and Competencies

**Grade 11 & 12**

CHEMISTRY

Thermochemistry

324-3 Calculate and compare the energy involved in changes of state and that in chemical reactions.

The activity will allow students to understand that when a neutron is fired at the nucleus of an atom, the atom will break apart. With each step of the chain reaction, the number of atoms that split increases exponentially. The chain reaction happens very quickly and the amount of energy that can be produced from such a reaction is very large.