WOW Lab
Science Education R&D

Achievements and Competencies

Learning Outcomes

Grades 7-9	Grades 10-12
Reproduction	Genetic continuity
	Evolution, change, and diversity

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

LIFE SCIENCE

Reproduction
    305-5 Discuss factors that may lead to changes in a cell's genetic information.

The students will be introduced to mutations and discuss how they affect the survival of the cars.
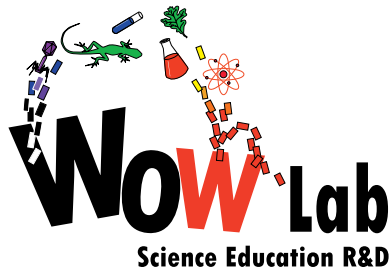
Grades 11-12

LIFE SCIENCE

Genetic continuity
    315-6 Describe factors that may lead to mutations in a cell's genetic information.

    315-7 Predict the effects of mutations on protein synthesis, phenotypes and heredity.

Within the population of cars, students will identify hereditary, acquired and neutral mutations and describe how they affect the phenotypes of the individual cars.

LIFE SCIENCE

Evolution, change and diversity

> 316-3 Analyse evolutionary mechanisms such as natural selection, genetic variation, genetic drift, artificial selection and biotechnology, and their effects on biodiversity and extinction.

A variety of evolutionary mechanisms will be illustrated throughout this activity:

Natural Selection: as the cars go through the obstacles (environment), some of them will have a greater chance of surviving. This is because some individuals have traits that are beneficial for survival in a given environment and are more likely to survive and pass on the advantageous traits to the next generation.

Genetic Variation: although all the cars will be built from Lego and K-Nex pieces and have a similar structure, there will be a range of variation within the population. Students will observe that different traits can be disadvantageous or advantageous depending on the environment and that genetic variability is key to the survival of species.

Genetic Recombination: during the Reproduction stage of the activity, students will recombine their cars, so that each pair of cars will shuffle their alleles (Lego and K-Nex pieces) to create the next generation.