

Calculate CO₂ Emissions

Class/Grade: Grade 5-8

ACTIVITY GOAL:

Build awareness on the air pollution at schools and how this may impact students' environment and health.

CURRICULUM EXPECTATIONS:

Health and Physical Education - Healthy Living
Grade 6: C3.1

Science and Technology - Understanding Life Systems
Grade 5: 1.1, 1.2, 2.2
Grade 7: 1.1, 1.2, 3.8

Science and Technology - Understanding Earth and Space
Grade 5: 1.1, 1.2

Mathematics
Grade 5-8: Number Sense and Numeration, Measurement

FOUNDATIONS:

Social and Physical Environments
Student Engagement
Curriculum, Teaching, Learning

LEARNING/LESSON ACTIVITY DESCRIPTION:

Calculate the average CO₂ emissions from idling vehicles.

REQUIRED RESOURCES:

For more detailed information: <http://www.nrcan.gc.ca/energy/efficiency/communities-infrastructure/transportation/idling/4457>

INSTRUCTIONS:

Setting the Stage

Define and discuss active travel with the students (active transportation is any form of human powered travel such as walking, biking, rollerblading, skateboarding, etc.). Show the class the poster on page 9 and discuss the benefits of active school travel on the environment.

Activity

Using the formulas below, have each student calculate the CO₂ emissions from an average vehicle that idles 3, 6, 9 minutes using the following variables:

Idle fuel flow is 1.8 L/hr and CO₂ emission factor is 2.3 kg/L.

You can also calculate the cost of idling vehicles by using current gas prices (\$/L).

Formulas

Idle fuel use (L/year) = (idle fuel flow) × (idle time per day) × (days in year)

Idle CO₂ emissions (kg/year) = (idle fuel use) × (CO₂ emission factor)

Idle fuel cost (\$/year) = (idle fuel use) × (cost of fuel)

An extended question could ask how much CO₂ emissions can be prevented if everyone in class were idle free (no idling, 0 minutes).

CO₂ savings = (CO₂ emissions (kg/year) per vehicle) × (number of vehicles)

ASSESSMENT:

Teachers can decide on how they would like to assess their students.

Students should be able to understand the consequences of idling vehicles and derive quantitative estimates of fuel use and CO₂ emissions.

ACTIVITY TWEETS

- 1) Want to know the costs of idling vehicles? Get your children to find out by using math formulas to calculate the CO₂ emissions from idling vehicles with the Calculating CO₂ Emissions school activity!

NOTES:
