RANKING CLIMATE CHANGE CAUSES

Lesson Plan for Grades 5-12 - 30-45 minutes
Prepared by [Climate Change Connection](#)

LEARNING OUTCOMES

Please see the document titled "Ranking CC Causes Learning Outcomes" for grade 5-12 curriculum outcomes.

MATERIALS

Each student or group of 2-3 students should have: a copy of the Ranking Climate Change Causes worksheet, a pair of scissors, and a glue stick

BACKGROUND

Humans & Climate Change

Scientific evidence shows us that carbon dioxide (CO_2) concentrations in the atmosphere have increased substantially since industrialization. Using fossil fuels has become an increasingly central part of our lives. We rely on fossil fuels for everything from driving our cars, to heating our homes, to producing everyday products. As a result, CO_2 concentrations have increased approximately 30% since pre-industrial times. This has resulted in a strengthening of the *greenhouse effect*, which has played a critical role in warming our planet.

Humans are also causing changes to our planet through other means, such as land use change. Trees, which are a valuable carbon sink, are being cleared at increasing rates to make room for urban development, human settlement, and agricultural purposes. By removing these valuable carbon sinks, we are contributing to warming even more.

Greenhouse Gases (GHGs)

Some of the gases in Earth's atmosphere, such as water vapour and carbon dioxide, play an important role in influencing the Earth's average temperature. These gases are referred to as greenhouse gases, because they act like the glass on a greenhouse. They allow solar radiation in through the atmosphere, but prevent the escape of some counter radiation back out into space. These greenhouse gases absorb counter radiation and emit it back towards the Earth, causing a warming of the lower atmosphere.

ACTIVITY

1. Discuss the concept of human contribution to climate change. Encourage students to identify ways in which they believe people contribute to a changing climate.
2. Have students work in pairs or groups to complete the worksheet.
3. Upon completion, discuss students' choices. Note: there is no one right answer.

ANSWER KEY

Please note there is no one right answer to the worksheet. This activity is designed to create conversations amongst students. Answers may vary based on whether students are considering these climate change causes on a local, national, or global scale.

For answers related to Manitoba, one solution may follow the greenhouse gas emissions (below), using the following information sourced from our website at www.climatechangeconnection.org.

In 2016, Manitoba's GHG emissions came from these sectors and in these proportions: (NOTE: These numbers may not add up correctly due to rounding.)
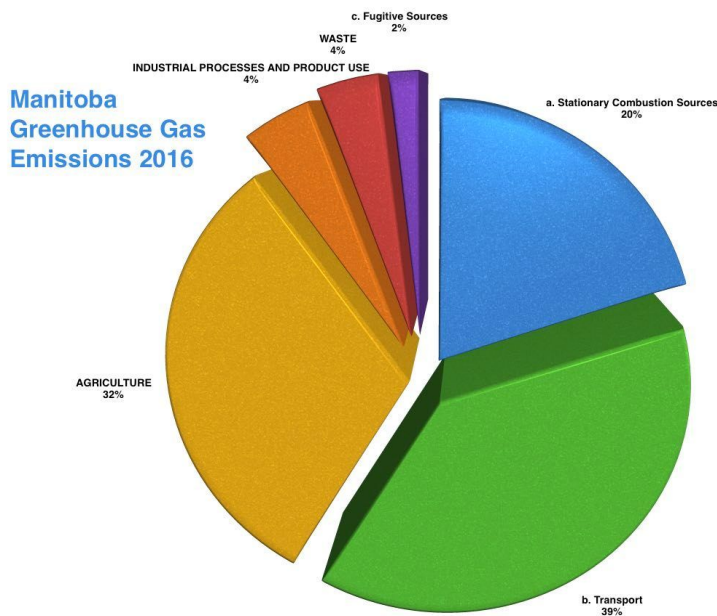
Data source: Environment Canada, Canada's Greenhouse Gas Inventory, http://www.ec.gc.ca/ges-ghg
Chart by: Climate Change Connection, http://climatechangeconnection.org

39% – Transportation: moving people and goods

32% – Agriculture: mostly methane (CH4) from livestock and nitrous oxide (N2O) from soils

20% – Stationary combustion: energy used for residential and commercial heating, in electricity generation, in the oil and gas industry, and in the manufacturing and construction industries

4% – Waste disposal: mostly methane (CH4) from landfills

4% – Industrial processes

2% – Fugitive sources: the release of GHGs from the production, processing, transmission, storage, and use of fossil fuels (e.g. flaring)