Activity 1: What do you know about climate change?

Activity Summary

This first brainstorming activity is designed to encourage students to activate their prior knowledge of climate change from an objective point of view and to get a better understanding of the overall knowledge shared by the group. It is important to remember that while more than 97% of scientists who publish work in academic journals agree that it is highly likely that human activity is responsible for global warming (and this number continues to rise), there will always be skeptics and those who deny this reality. To see a list of scientific groups that agree that humans are contributing to global warming, visit the NASA's climate change website at https://climate.nasa.gov/scientific-consensus/.

Duration: 60 minutes

Learning outcomes	**Competency outcomes**
• Describe the various ways that human activity and technology impact both balance and interactions in the environment • Describe the effect of human activity on greenhouse gas (GHG) emissions • Define the vocabulary associated with climate change	• Critical thinking • Research • Communication • Collaboration

Material:

- ❑ 3 packs of sticky notes in 3 different colours (e.g. 4 green, 4 yellow and 4 red per student)
- ❑ Sharpie-style markers (1 per student)
- ❑ Climate change infographic
- ❑ *Adapting to our Changing Climate in Canada* poster (also available on the Natural Resources Canada website > Climate change publications, at http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/images/assess/2016/adaptation_poster_e.jpg)
- ❑ Computer with Internet access and projector
- ❑ Internet access for students (optional)
- ❑ Copies of the **Student BLM: What are Greenhouse Gases (GHG) and what do they do?**

What to do:

1. In order to help students think objectively, ask them the following question:

   Over the last several years, we've seen that while there are many people who are concerned about the alarming effects of climate change and its impact on our environment, others still argue that climate change is an exaggerated phenomenon and that there is no reason to panic. What do you think about this?

2. In order to answer this question in detail, students must first answer the question: *What do you know about climate change?* (It is important that they give **their personal interpretations** regarding what they have seen or heard themselves).

3. Hand out 3 to 4 sticky notes in each colour to the students so that they can note down everything that they have seen or heard about climate change. They may note down as many statements about climate change as they like, but just one statement per sticky note:
   - Green sticky notes: "factual" statements (with explanations as to why they have no doubts about their veracity);
   - Yellow sticky notes: statements that they are not sure about or which are unproven (with explanations); and
   - Red sticky notes: statements about things they have seen or heard which they believe to be false (with explanations).

4. Divide the table or wall into three distinct sections (columns: the green column should contain "factual statements", the yellow column "unproven statements" and the red column "false statements"). Explain to the students that they can come up and stick their Sticky notes in the appropriate column once they've finished writing their climate change statement.

5. Once all students have finished writing down their statements and have stuck the sticky notes in the appropriate columns, take a look at the distribution of the colours on the table or wall and ask the students what their first impressions are.
   - Are there more yellow, green or red notes?
   - What do you notice?

6. **With the students**, try to create new categories for more sticky notes (e.g. causes, effects, consequences, actions). Assign a few sticky notes to groups of two students and ask them to put those notes into different categories.

7. Ask them to take it in turns to read some of the explanations given for the climate change statements and initiate a class discussion regarding the various explanations that the class has come up with for each category (green, red, yellow statements).

8. In order to connect the students' explanations to current information on climate change, hand out student notebooks to each student. Ask them to each note down 1 to 2 statements in each category that they would like to learn more about.

9. To help them with their research, show them:
   - The collection of infographics included in this kit
   - The *Adapting to our Changing Climate in Canada* poster (also available on the Natural Resources Canada website > Climate change publications, at http://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/images/assess/2016/adaptation_poster_e.jpg)
   - A video illustrating what climate change is, such as *How does climate change affect biodiversity?* (California Academy of Sciences) https://www.youtube.com/watch?v=XFmovUAWQUQ
   - The website Skeptical Science (https://skepticalscience.com) which explores the concepts that people are skeptical about.
   - Copies of the **Student BLM: What are Greenhouse Gases (GHG) and what do they do?**

10. Finally, ask students the following: Based on your observations and explanations, what conclusions can we come to?

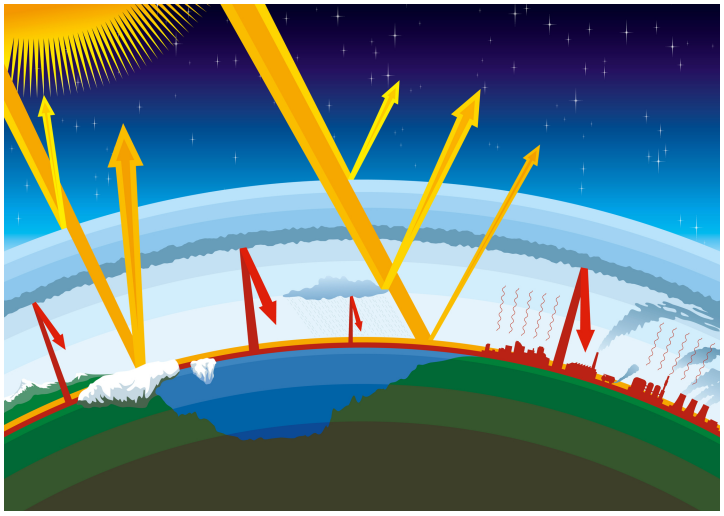
How are falsehoods spread? The Serengeti Strategy

In the same way that a group lions will attempt to isolate a zebra on the outskirts of its group so that they can capture it more easily, a scientist may be targeted by individuals who mobilize their resources to attack and weaken him or her. The fight to defend themselves will take up a lot of the scientist's energy and resources. The strategy succeeds not only in isolating a scientist from his or her colleagues (easier to attack an individual than to attack a group), but also serves as a warning to other scientists seeking to make their studies public. This strategy has been used to discredit Rachel Carson (effects of DDT on the environment) as well as the scientists who revealed the truth about the harmful effects of tobacco consumption.

Mann, M. E. (2015). The Serengeti strategy: How special interests try to intimidate scientists, and how best to fight back. *Bulletin of the Atomic Scientists*, *71*(1), 33-45. http://www.meteo.psu.edu/holocene/public_html/Mann/articles/articles/MannBullAtomSci15.pdf

Name: _____ **Date:** _____

Activity 1–Student BLM: What are Greenhouse Gases (GHG) and what do they do?



a) Look at the picture above. In your own words, describe the role played by greenhouse gases on the Earth.

b) Are GHGs good for life on Earth or not? Explain.

c) Research the following greenhouse gases and note where they come from.

	Natural sources	**Man-made/anthropogenic sources (caused by humans)**
Carbon dioxide (CO_2)		
Methane (CH_4)		
Water vapour		
Nitrous oxide (N_20)		
Chlorofluorocarbon (CFC)		