

Lesson 4 36 Minutes (plus optional sections)

Outcomes | Alberta Grade 6 Science Curriculum

- Climate change can affect migration patterns.
- Responsible management of energy resources includes minimal disruption to nature.
- Climate change can affect weather and extreme weather events.
- Describe possible effects of climate change on land, plants, humans, and other animals.

Pre-Flight Checklist

- Device and projector set up to <https://climategamechangers.ca/student/climate-change-101/>.
- Cue video in Movement Break section to start at 1:53 - <https://www.youtube.com/watch?v=L4U4H5xLCoM>.
- Organize students into elbow partners; partners they can quickly turn to and share a brief conversation.

Time	Learning Opportunity
1 min	https://climategamechangers.ca/student/climate-change-101/ Today we will look at the last two sections: “Impact on Plants and Animals” and “How is the Landscape Changing”. (students could choose first section)
10 min	(Click on “Impact on Plants and Animals”). Turn to your elbow partner and take a guess as to how plants and animals might be impacted. We are going to hear from an American atmosphere scientist – the good news is that we share the same atmosphere, so her research should apply to us too! (Click on “Can Animals Adapt? Listen to the first 13 seconds, then skip to 2:34 and play to 2:57 “high elevations in the Rocky Mountains”. Draw a mountain on the board and place a pika halfway up one side.) What does the pika do as the climate around him warms? (Moves higher – erase and redraw pika.) What happens the next year as it warms up a bit more? (Moves higher – redraw). What is the eventual problem? (They get to the top and run out of space to move up) Let’s see if you are correct. (Continue video from 2:57, stop at 3:08). Plants are important to us because they breathe out so much what? (oxygen). What do plants need to breath in? (carbon dioxide - CO2) So wouldn’t plants and farmers be happy about more CO2 in the atmosphere for their crops? You are going to

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Time	Learning Opportunity
(cont.)	answer that with your elbow partner in two minutes so listen carefully to our atmospheric scientist. (Play 3:08 to 4:37 or 5:30 if you have time.) Tell your partner why farmers might not be happy with more CO ₂ in the atmosphere. (Drought, skinnier plants, weed proliferation, invasive species.)
4 min	Back to the “Impact on Plants and Animals” section, let’s look at the “Impact on Animals”. (Click, read the first two paragraphs in the legend, and tell students there is more information on the data if they want to look later. You can zoom in on your area if you like.) What do the pink, blue, and yellow represent? (Mammals, birds, amphibians.) Have a look at the ways in which animals might migrate. Turn to your elbow partner and tell them what you notice. (Many possible observations.)
4 min	MOVEMENT BREAK Going back to <u>Climate 101</u> , we are now going to look at “How is the Landscape Changing”. Name a form of extreme weather (list on board, stop at four or five.) (Hurricane, tornado, flood, drought, fire might be considered) (Designate areas of the classroom for each item on the board). Pick the one you are most interested in and quietly go to your given area of the class. If you think climate change is causing more of those in recent times, go back to your seat now. If you think climate change is not causing more of them, go back to your seat now. If you are unsure or have a different answer, go back to your seat now.
11 min	Who was right? How are we supposed to know whether climate change is causing is causing these? To help us understand, we will head back to “How is the Landscape Changing” and look up to the sky for “Extreme Weather” (click, start at 1:53, pause at 2:28 to look at graph) Fact or opinion? Hold up your sign (F). With your elbow partner, put the information from these two graphs into one factual statement – synthesize. (There were more extreme weather events from 2000–2010 than there were in the 80’s.) What is the little white box at the bottom right and why is it important? (It is the source of the data. Help students understand all solid science will have readily available sources. If you see something that says “80% of teachers are actually insane” and there is no source, you should not trust or repeat it!

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Time	Learning Opportunity
(cont.)	<p>(Continue video, stop at 3:30 "...increased her chances of getting lung cancer) Wait, what? What does climate change have to do with lung cancer? (Help them to figure out this great parallel. If they are capable, let them discuss it with their elbow partners). Can we 100% blame lung cancer on smoking? (no). Can we 100% blame climate change on burning fossil fuels? (no). (Play, pause at 4:28 "extreme weather will only get more extreme). Does this science tell us that climate change causes extreme weather events? (no). What does it tell us? (that it is making them more extreme). Pay close attention to these next few seconds because you are going to answer his question with your elbow partner. (play 4:28-4:35) That is your question... listen to it one more time. (Discuss with your partners) What did you and your partner think? (share a few). Here is a really interesting question to discuss with your partner: back to lung cancer... is there any point in blaming lung cancer on smoking if there is not 100% certainty that smoking is the cause? (Discuss and share a few). Does that same answer apply to extreme weather because it probably exacerbates extreme weather?</p>
Optional 3 min	<p>CRITICAL THINKING Does the habit of smoking make a person bad? (of course not). Should they consider changing their habit for their health? (yes). Is there a parallel with climate change? (maybe some people/organizations have bad habits but that does not make them evil... but could they try to make a healthier choice?)</p>
Optional 5 min	<p>DIGGING DEEPER Continuing in the "How is the Landscape Changing" section, what are the main three components of the water cycle? (evaporation, condensation, precipitation) Let's look at "Less Open Water" (click). Look at this graphic of climate change impacts. Ask your elbow partner: What here interferes with the water cycle? (more melt, less groundwater, more use, etc.) So, what is the big deal? The water cycle is a closed system, so it's not like we are going to lose it. Where is more of the water ending up? (oceans). So, oceans are gaining, from where? (warmer north, glaciers melting). Tell your elbow partner about a problem that might result from that. (losing coastline, flooding, etc.)</p>

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Time	Learning Opportunity
5 min	<p>The final section of Climate 101 that we are going to look at is “Results of human impact” (click, click on “deselect all” in the lower left). This is a cool interactive map. This tool is about to show you hundreds of scientific studies around climate change. I will go through the topics of these studies, and you put up your hand when I get to one that interests you. Atmosphere, Cold, Snow and Ice,... (pick the topic with the most hands up). OK, you chose “Storm” (click on “Storm”) so now you can see a whole bunch of studies concerning storms. Let’s look at one of those. There is not a study on this topic in Canada so we will pick this one right in the middle of the USA. (click on red hexagon in central USA). First we see the title of the research: US hurricane damages, 1900-2018. Next, we can read a short summary of the research. (read) And finally, what do we see at the bottom? (reference that we can just click on). Facts or opinions here? (F). OK, I am going to zoom back out (- key) (click in ocean to get rid of previous study info) to look at the whole world. Notice that each study has been coloured red, blue, or grey. Look at the legend with your elbow partner and tell them what that means. (share) Now I am going to go back over to the categories and click on another one – Wildfire. Notice that more studies appear. When I click on “select all”, every study they have shows up. (click) Turn to your elbow partner and tell them what you notice about the colour trend and what that means. (some show no human influence on climate change, but the majority involve human influence)</p> <p>Look at one grey, one red, one blue. Select all. Look at the whole world... tell your EP what you notice. (some involve no human influence on climate change, a few are inconclusive, and the majority agree that there is human influence found) So, what is science generally telling us? (we are exacerbating climate change)</p>
1 min	<p>A famous author and speaker named Margaret Meade said, “Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.”</p> <p>Think about how that might apply to the issue of climate change. Talk with someone at home about the quote.</p>