



Activity 4.2: Faces of Climate Change

Grades 5 – 6

Description: In this activity, students will learn about the social, political, economic, and human impacts of climate change on individuals and communities around the world.

Total Time: Two 45-minute periods

Materials:

- Character cards
- Student handouts
- Butcher paper
- Map or globe (optional)
- Fabric

National Science Education Standards

F #2-4 Science in Personal and Social Perspectives – natural resources, environmental quality, natural and human-induced hazards, science and technology in local, national, and global challenges.

AAAS Benchmarks

7.D, F, G - Human Society – Social Trade-Offs (7D/H1-H2), Social Conflict (7F/H1, H2a), Global Interdependence (7G/H4).

3C/H3 In deciding on proposals to introduce new technologies or curtail existing ones, some key questions arise concerning possible alternatives, who benefits and who suffers, financial and social costs, possible risks, resources used (human, material, or energy), and waste disposal.

Guiding Questions

- How does your character’s life compare to your life?
- How is your character’s life affected by climate change?
- How can people from different perspectives agree on solutions to climate change?

Assessments

- Student writing assignment, “Faces of Climate Change”

Procedure

Day 1

1. Distribute the student handout “Faces of Climate Change.” Have students answer the pre-reading questions (1-3). These questions ask students to reflect on how climate change will affect their lives, and may affect the lives of others.
2. After each student completes the questions, have them discuss their answers with a student next to them, or students at their table.
3. Next, ask students to share their responses with the class. You may wish to summarize their answers on the board, particularly the answers to the question about how students’ and others’ lives are affected by climate change (Question 2) and why the activity is called “Faces of Climate Change” (Question 3).



NOTE: The activity is called “Faces of Climate Change” because it attempts to give a personal face to individuals whose lives are affected by climate change.

4. After this discussion, hand out the character cards. Character cards can be found at the end of this lesson plan. Eight character cards are provided, and each character has a partner with a related perspective on climate change.
5. Partners are as follows:

<i>Card with italicized prompt</i>	<i>Partner</i>
Dr. Devin Jara	Alexa De La Fuente
Mary Catherine Kerrigan	Theo Ikummaq
Catherine Freeman	Jost Rickman
Dr. Annabeth Clark	Dr. Damaris Joro

If you select one character, please make sure to also select that character’s partner.

6. Depending on your class, there are several different ways to facilitate this part of the activity.
 - You may choose one pair of characters to use for the entire class (i.e.: half the students will receive a card for one partner, and the other half will receive the card for the other partner).
 - You may select multiple pairs of partner characters to distribute to the students.
 - Students who have the same character cards may work together during step 6.
 - Students may work one on one with their partner when it is time to pair up.
 - Teams with the same partner cards as one or more other teams may work together as a group.
7. Have the students read through their card and follow the directions on the handout for what to look for while they are reading. Based on student reading levels, you may choose to have students: read on their own, read with a partner who shares the same card, or read each card aloud as a whole class.
8. Students are encouraged to underline words or concepts they have trouble with. You might want students to work in groups with others who have the same card to figure out these concepts, have them look up words in the dictionary or online, or have them ask you or the class for help. You may also want students to look on a map or on the Internet to see where their character lives.
9. After the students have read their card, and done this additional research, have them fill out the next section on the student work page (Questions 4-6).



Day 2:

1. Today, students will be “meeting” their partners and working together to develop solutions for the unique issues that their characters face regarding climate change. One of the partners in each pair of characters has an italicized prompt on the card. Ask the students to raise their hand if they have a sentence on their card in italics. Have one of the students read the prompt aloud, and then ask the students if they think that the comment or question on the card is relevant to their character. You will have multiple “copies” of each character in the classroom, so you can pair up the students, or create larger groups where two students represent one character, and two other students represent their partner. If you are using more than one set of cards, repeat the process of reading the italicized prompts to partner students. A chart of characters and their partners is found above.
2. Once students are in groups based on their characters, have them work on Section 2 of the student work page. This involves getting to know the other character’s life and perspective on climate change.
3. Have the students work together, in character, to develop solutions to their characters’ concerns regarding climate change. Make sure that the students propose solutions that are relevant to their specific characters needs and lifestyle, rather than generic “tips.” For instance, a 50-year-old hunter should not be told to “ride the school bus to save gas.”
4. Have each group write their solutions on a large piece of paper and present their characters and solutions to the class. You could also have the pieces of paper displayed around the room and students could walk around and view each other’s solutions.
5. After students complete the activity, have them complete the “Student Writing Activity: Faces of Climate Change.” This can also be assigned for homework. This activity asks the students to write a journal entry as though they were their character, and reflect upon their meeting with their partner.
6. Have students reflect on the “Faces of Climate Change” activity itself, noting what they learned from the activity, what they enjoyed, and what they would change.
7. Student responses can be collected and graded, and should be added to their portfolios.

Extensions:

- Students can do additional role-playing as their character – dressing up as their character, for instance, or writing a longer creative piece on life as their character.
- Students can craft a video public service announcement through the eyes of their character to introduce others to the unique effects of global climate change. The teacher may also wish for the pair of students that form during Day 2 of the activity to make a presentation instead.
- Additional character cards (30 in total) are available in unit 4 of the high school curriculum, if you would like each student to have his or her own character.



Name: _____ Date: _____ Room: _____

Faces of Climate Change

Part 1: Who are you?

Before you read the card for your character:

1. Think about how you live and the resources you use every day:
 - (a) How do you get to school? How do your parents get to work?
 - (b) What did you have for breakfast? What did you have for dinner last night?
 - (c) What do you do for fun? Do you have a phone? Computer? iPod?
 - (d) Do you heat your home in the winter? Do you cool your home in the summer?

2. Think about other people around the globe. How would they answer these questions? Compare what you think their answers would be to your answers to the questions above:
 - (a) Do you think there are other people in the world who use fewer resources than you? What do you think their life might be like?

 - (b) Do you think there are other people in the world who use more resources than you? What do you think their life might be like?

3. Think about climate.
 - (a) Does climate where you live affect how you live? In what way(s) do you think climate change will affect your life in the future?

 - (b) Do you think there are other people in the world whose lives have been affected by climate change already? What type of lifestyle might they have? How might climate change affect his or her life?



Name: _____ Date: _____ Room: _____

(c) Do you think there are other people in the world whose lives will be less affected by climate change than yours? What type of lifestyle might such a person have, and how will his or her life be affected by climate change?

4. Why do you think this activity is called “Faces of Climate Change”?

While you read the card for your character

Underline any words, phrases, or parts of the card that you have questions about. Put a star next to words, phrases, or sentences that discuss how your character will be affected by climate change.

After you read the card for your character

5. Describe your character’s life: What is his or her name? Where does he or she live? What does he or she do for a living?

6. Explain how your character’s life is affected by climate change.

7. Reflect on your life versus your character’s life: How are they different? How are they similar?



Name: _____ Date: _____ Room: _____

Part 2: We can work it out

Meet with your partner. Each partner should explain who their character is, a bit about their lifestyle, and how their character's life is affected by climate change.

1. Describe your partner's life: What is his or her name? Where does he or she live? What does he or she do for a living?
2. How is your character's life similar to your partner's life? How are they different?
3. How is your character's view about climate change linked to that of your partner's character? Please explain your answer by giving specific examples from the cards.
4. Once you and your partner understand each other's view on climate change, brainstorm solutions to the concerns you both have about climate change. Make sure that the solutions you suggest will help both partners and that they could actually be accomplished. Also, make sure that the solutions you suggest are **specific** to your characters. Write down your solutions below:



CHICAGO BOTANIC GARDEN

Name: _____ **Date:** _____ **Room:** _____

5. Why did you choose these solutions? Why do you think they will work?

Now, write your solutions on a large piece of paper as directed by your teacher to prepare for your presentation.

6. Think back to the title of this activity. Why do you think this activity is called “Faces of Climate Change? Would you like to change your answer from before?



Name: _____ Date: _____ Room: _____

Student Writing Activity: Faces of Climate Change

1. Write a journal entry as though you were your character from “Faces of Climate Change.” Describe meeting with your partner. How did you feel about the meeting? Describe the solutions you and your partner came up with. Are you happy with the solutions? What can you do to start to put those solutions into action?
2. Now, you can be yourself again. What did you learn from the “Faces of Climate Change” activity? What did you like about the activity, and what might you change about the activity?



Mary Catherine Kerrigan – 16 years old

For as long as I can remember, my family has lived in the same house just outside of Fairbanks, Alaska. Eighty percent of the land surface throughout the state has permafrost beneath it. Normally, the soil stays frozen all year long, but it has started to thaw. This has caused our house to sink as the soil gets softer and our house keeps pushing it further down. We are now almost 5 feet underground! We need to move soon or else we might not be able to get everything out.

Physical Impacts

Global – In the Northern Hemisphere, 24 percent of land has permafrost beneath it. As temperatures continue to rise and this soil continues to thaw, it could permanently change the makeup of the land. The amount of permafrost in the Arctic has already decreased 15 percent in the past century. Not only will buildings be affected, but plants and animals as well.

Regional – My neighbors are experiencing the exact same thing as us. What are we going to do? I feel like Alaska is losing one of its defining features. We live so close to Mt. McKinley that I have come to think of it as a member of my family. I see it almost every day. I can't imagine what it will be like to move and not be able to see it again.

Economic Impacts

My family does not have enough money to keep moving. Hopefully, we will find a place that is not as affected by warming temperatures. My grandfather built our home more than 50 years ago on what he thought was solid ground. How can we be sure our next place is not also on permafrost? What will happen to local businesses that sink into the ground? What will they do if all of their customers leave? I read online that for every 4 degrees Celsius increase in temperature, it will cost the global economy up to 3 trillion dollars to make up for what is lost.

Social/Cultural Impacts

Part of the joy of living in Alaska is the connection that you feel with all life on Earth and Earth itself. Now I feel like I am losing that connection. Humans have changed Earth and now it is causing us to change too. *I also feel for native people here and in Canada who rely on animals such as caribou to survive. They will have to change their way of life because of people like me. That is not right at all. I would like to meet one of these people to apologize.*

Ecological Impacts

Not all of Alaska stays permanently frozen underground. Areas where the soil thaws every year create unique habitats with unique organisms. We will lose these species and these environments if something is not done soon. I already have noticed that certain animals don't come around as often as before.



Theo Ikummaq – 53 years old

I am an Inuit hunter. I was born in an igloo near Iglulik, which is located in Northern Canada. My people and I have lived in the Arctic for generations. We live off the land just like our ancestors did. We get everything from Earth and take only what we need. However, not everyone on Earth lives as we do, and now I feel that our way of life is at risk. As temperatures warm, the world around us is changing. We must change along with it or I fear that we will not survive.

Physical Impacts

Global – I fear that areas around the world are experiencing the same thing that I am. I don't think that any of our neighbors in this part of the world would be spared. As ice melts and water levels rise, what will become of these people and their way of life?

Regional – Where is all of the sea ice? It seems that every few years there is less than before. It has seemed like this for the past 30 years. Some areas that used to be frozen well into the summer are now thawing in the spring. Hunting seals has been difficult because they are becoming rare in the area. The landscape is changing.

Economical Impacts

My ancestors relied heavily on animals to get what they needed, and I still do too. However, my family also makes native arts and crafts to be sold to those in the modern world. We already pay more for supplies because of where we live. If the land continues to change and we continue to lose our animals, we will have to pay for even more supplies from the modern world. I can't afford that, because I don't have the money and I don't want to abandon my culture.

Social/Cultural Impacts

Our way of life was already threatened by modern life. Many of the young generation have chosen to leave our villages for modern towns and guaranteed jobs in the mining and oil industries. This angers me because they receive money for polluting the world that I respect. Have they already forgotten what it means to be Inuit? If they will not follow our traditions, then what will become of us? I don't want to be forgotten.

Ecological Impacts

Earth is not the same. The balance is gone. There is less ice, more water, and the animals stay away almost as if they are punishing us. Where are they going? They must have gone where there is more ice. All parts of Earth are connected and now those parts are changing. I don't think the land will ever be the same again.



Alexa De La Fuente – 20 years old

I live on the island chain of the Maldives, which are southeast of India. My country is beautiful. We have many different animals that call our coral reefs home. We rely on the ocean to sustain our lives. My entire family has fished tuna for as long as I can remember. Our island was devastated by the December 26, 2004, tsunami. Now, because of global climate change, we are scared of rising sea levels. We fear our island will disappear because we are the lowest country in the world. Our highest point is only 7 feet above sea level.

Physical Impacts

Global – I read that sea levels rose by about 7 inches in the twentieth century, and that they are predicted to rise 7–23 more inches in the twenty-first century. The shape of Earth’s landmasses will be changed forever.

Regional – As sea levels rise, will I still have a country or will we be wiped off the face of Earth? Our government has looked into purchasing lands in neighboring countries such as India and Sri Lanka, but will this be enough to fit all of my people?

Economic Impacts

So many people in my country rely on the ocean for their livelihood. Our two biggest industries are tourism and fishing. Both of these were significantly affected by the tsunami. If sea levels rise, many of our islands will be under water. Who will visit us then? Will there still be fish to catch? How will we continue to live our lives?

Social/Cultural Impacts

I am concerned about how our way of life will be affected as sea levels continue to rise. I find it ironic that a people who depend so much on the ocean will ultimately lose their way of life because of that very same ocean. If we move to another land, will our culture follow or will it change as we adopt the customs of our new home? I am not only worried, but I am also angered by this. My family has never abused Earth the way I know that people in other countries do, yet my family will be forced to pay for the actions of others. Do they even know what they are doing to us?

Ecological Impacts

The ocean around my country is home to so many unique animals. For example, we are known for the whale shark, which frequents our waters. It is now endangered. Will it survive as the climate continues to change? What will become of our famous coral reefs as glaciers melt and saltwater and fresh water mix?



Dr. Devin Jara – 34 years old

I am a glaciologist, or glacier scientist, in Greenland. Contrary to its name, Greenland actually has many glaciers and is also home to one of the largest—called the Greenland Ice Sheet—that is 2 miles thick and about the size of Mexico. I study an outlet glacier, which is a small extension of a larger glacier. My glacier is currently melting at the edges and falling into Scoresby Sound, which is Greenland’s largest fjord.

Physical Impacts

Global – There is no denying that glaciers are melting all around the world. The proof is in the pictures. If the Greenland Ice Sheet were to melt, sea levels would rise by an estimated 20 feet, which would put many coastal areas completely underwater.

Regional – My own glacier has melted significantly in the past 10 years. In 2005, the water lost from area glaciers was 44 trillion gallons, which is enough to supply the New York metro area for more than a century. To make matters worse, as the melting water falls through the glacier and slides along the bottom it can accelerate a glacier’s movement into the ocean.

Economic Impacts

As water levels rise, what will happen to coastal towns? Floods are already one of the leading causes of storm damage throughout the world. Hurricane Katrina in Louisiana and the tsunami of 2004 that hit Indonesia are recent examples of how devastating floodwaters can be. Many coastal areas are simply not equipped to handle the damage. You don’t hear much about the countries that were affected by the tsunami anymore. Have these areas even recovered yet?

Social/Cultural Impacts

As sea levels rise, where will all of these people go when their homes are under water? As they move inland there will be less space for everyone. What will happen if we run out of space and certain necessities such as food or fuel?

Ecological Impacts

As fresh water enters the oceans, it will mix with saltwater and could potentially change ocean currents. Most people don’t know that ocean currents drive our weather, and if these change, the weather changes too. This could change many environments throughout the world. What will happen to local plant and animal life?



Jost Rickmann - 45 years old

I live in Northern Holland, outside of a town called Waardpolder, on a farm near the coast of the North Sea. I raise dairy cows, and I sell my milk and cream so that it can be made into cheese and yoghurt. Our climate is perfect for producing dairy products due to its cool wet winters and mild summers. We have reclaimed many acres of land from the North Sea by building a series of dikes and seawalls, and have drained the land to produce broad, flat fields that are ideal for grazing dairy cattle. Most of our country is less than 1 meter above sea level, and some areas are several meters below sea level. Our country is small and densely populated, so we must be very efficient in our use of the land and its resources. Most farms in our country are small, but our farm yields are among the highest in the world.

Physical Impacts

Global - We have all read and heard about rising sea levels due to a rise in the average temperature of Earth; world government organizations have said that by the 2100, sea levels will rise by an average of more than .5 meter. As the climate changes and Earth warms, there will be greater threats from more severe storms throughout the world.

Regional - With an area of 41,526 square kilometers, Holland has a population of about 16 million people. If flooding occurs on a mass scale, many people will be displaced from their homes and workplaces. Rising sea levels will destroy our way of life. The people, and the land itself, would be swept away, costing the Dutch their livelihood and possibly their lives.

Economic Impacts

If flooding should occur, land will become scarce. Scarcity increases prices and will cause conflict between differing economic classes of people. If we do have major flooding, wealthier people will be able to keep the lifestyle that they had before, but we have had so many poor immigrants from North Africa and the Middle East, and I am concerned about what the displacement of these poorer people will do to my country. We have many people here in the Netherlands, and we need all the land we have in order to feed them and others in Europe. If the land is under water, we will lose billions of euros in lost agricultural products.

Social/Cultural Impacts

Future environmental conditions will directly impact the Netherlands land mass. Its people and government will have to adapt to rising sea levels by building more and higher dams and seawalls. If the North Sea rises as predicted, and winter storms become more severe, people will have to relocate at least until the waters recede. Migration of entire towns could turn into a long-term issue if our flood control technologies cannot keep up with climate change.

Ecological Impacts

The rate at which the temperature and sea level rises will probably be too high to allow many different plants and animals to adapt or migrate. Many native plant and animal species are threatened with extinction in the Netherlands; new species from other parts of Europe and Western Asia might take over if they can migrate quickly enough. This will change one of the most unique and beautiful aspects of this country forever.



Catherine Freeman – 48 years old

I own and operate A Day Without Sunshine Orchards, a family-owned 1,250-acre orange and grapefruit operation near the Gulf Coast of Florida. By commercial citrus standards, our family’s orchards are considered small; most are owned by large corporations and are in excess of 4,000 acres. The last several years have been tough on us. My orange groves have been hit by severe summer storms, we’ve had hard frosts in the winter, and rising sea levels are causing freshwater aquifers, which are our only source for irrigation water, to become salty. The every-few-year-hurricanes were bad enough, but now they are becoming more frequent and more severe. Our profits are way down, and it’s getting harder and harder to make ends meet. I don’t know how many more years we’ll be able to absorb these financial losses and still stay in business.

Physical Impacts

Global - We all hear so much about global warming, but I’m not completely convinced that it is really happening. Parts of the world seem to be getting cooler, not warmer. And some regions are getting more rain than usual and others less...it just doesn’t make sense to me.

Regional - Here along the Gulf Coast, the biggest issue is water; too much, too little, and in the wrong place at the wrong time. This area’s economy is based on agriculture, and having reliable fresh water sources is essential to grow produce of any kind.

Economic Impacts

Florida produces more than \$7.5 billion worth of produce annually, with citrus production totaling more than \$1.5 billion. If Florida’s weather and climate continue to change like they have over the last ten years or so, we’re going to lose so much money, both in actual values of the crops we produce, and in lost jobs and tax revenues as a result of these agricultural losses. I wonder if farmers in other countries are experiencing the same problems?

Social/Cultural Impacts

It’s getting harder and harder to make the kind of living we’ve become accustomed to. There are times when I think about selling our land to developers and just getting out of the business altogether. My family has been in Florida, growing citrus, for more than 100 years, and we’ve provided good paying, stable jobs to generations of workers. If we get out of the business, what will they all do to make a living?

Ecological Impacts

As small, family-owned, orchard operation, we pride ourselves on being good stewards of the land, and we’ve been able to do that and make a very comfortable living in the process. A portion of our land is kept undeveloped to provide habitats for many native species of plants and animals. But if we go...they’ll go as well.



Dr. Annabeth Clark – 40 years old

I am a physician at Stroger Hospital in Chicago, Illinois. I was just a med student doing my emergency-room rotation during the heat wave in 1995 that killed more than 700 people. Now I am an attending physician and I have recently noticed an increase in deaths due to heat waves. I have seen many people come and go throughout my career, but it is difficult to accept this especially because I feel so helpless. I cannot fix our planet as easily as I can fix a broken bone.

Physical Impacts

Global – The average temperature of Earth has increased since the Industrial Revolution back in the 1850s. The past 25 years have produced temperatures higher than any others in the past 1000 years. Also, high temperatures used to arrive later in the year and not as often as they are now.

Regional – No one in the E.R. wants to relive what happened back in 1995. We simply could not handle all of those people. Urban areas tend to be affected more because concrete absorbs heat during the day and releases it at night, which prevents the cooling that is needed to help people cope with extreme daytime temperatures. In 2003, 35,000 people died in Europe due to a heat wave. Could that happen here?

Economic Impacts

Here at Stroger we help anyone who walks through our doors. If patients cannot afford medical care, the County pays for them by using tax dollars. Many Cook County residents were outraged over the sales tax increase in 2008, and I can only imagine what will happen if more and more people need treatment due to heat-related symptoms. Where will the hospital get its money? Will county residents want to pay to help us again? Will they even be able to?

Social/Cultural Impacts

As usual, it seems like the working-class and poor people of our city will once again be hit the hardest by this new threat of climate change. Cities are usually warmer than the surrounding suburbs or rural areas and many residents in the city simply can't afford air-conditioning. This isn't right. We need people to see that this issue affects us all.

Ecological Impacts

We are fortunate here in Chicago to only be experiencing a rise in heat-related symptoms and not any infectious diseases. I wonder what is happening in tropical locations where disease is already a problem. How will doctors help people who live in areas where diseases such as malaria already take so many lives?



Dr. Damaris Joro – 44 years old

I am a tropical disease doctor working at a site near Mt. Kilimanjaro in Tanzania, Africa. I have personally seen what climate change can do to my patients. Due to the warmer temperatures, insects such as mosquitoes have become more common and malaria is becoming an even bigger problem than it already was. We have also noticed more cases of cholera and African Sleeping Sickness.

Physical Impacts

Global – Waterborne infectious disease will increase throughout the world as temperatures continue to rise. Warmer temperatures mean more insects will survive and be able to lay eggs. It is possible that more generations will be born than in previous years. Also, these insects may live for longer periods of time especially if freezes and frosts that typically decrease populations don't happen as early or as often as they should.

Regional – Malaria has always been a problem, but we have seen more cases lately. Personally, I think the warmer temperatures are to blame. Locals have mentioned that they don't remember the rains being so heavy and so frequent either. I think this may be the reason why cholera has become more widespread since the rainwater brings waste with it down into our valley.

Economic Impacts

As more and more people get sick, how will this affect the local economy? Tourism is popular throughout this country, but especially near Kilimanjaro. Many people want to climb it, and local people help tourists on their quest. Villagers cannot help tourists if they are suffering from malaria. Also, will tourists still want to come here once they realize that disease is on the rise?

Social/Cultural Impacts

I find it difficult to treat my patients as they question why there are so many sick people in their village. These people are not the ones responsible for the increase in temperatures, but they are the ones who are suffering the most.

Ecological Impacts

Can we expect even more types of infectious disease in the future as insects move up here from areas further south? I think this is already happening because of the increase in Sleeping Sickness. The tsetse flies that carry this disease don't usually live around here. Did they come from the south?