

Understanding Climate Change

Draft resource for Generation Global

This resource is still in draft form – teachers using it are requested to send any feedback or suggestions to helpdesk@generation.global

Understanding Climate Change

This resource supports enquiry-based learning about climate change for young people. It explores climate change causes and effects and encourages young people to critically engage with conversations about climate from their personal perspectives and experiences. The resources in this module allow young people to explore discussions around the topic, as well as supports young people to identify what influences cause people to think a certain way about climate change, consider action steps, and their roles and responsibilities within their communities in dialogue and activities involving climate.

This module has three components:

- 1) A **research** component, encouraging students to increase their knowledge about scientific definitions of climate change, the effects that climate change has on communities and natural world, and the influences that cause differing opinions about climate change. Students will consider the climate crisis through the lens of the SDGs – Sustainability Development Goals.
- 2) A **reflective** component, where students are encouraged to explore the impacts of climate change at a local level, through personal research and reflection, as well as engagement with inter-generational learning.
- 3) A **critical thinking** component, where students engage with several moral issues concerning climate change. Climate change impacts on a global and local level. Students will be asked to think about future society, and to examine who and what is responsible for climate change.

All components should be explored to prepare for a Generation Global video conference, team topics, or classroom dialogues where students will be able to engage in dialogue with peers across the world who will have different perspectives and experiences of climate change.

As always, Generation Global encourages educators to approach these materials creatively, and to adapt the materials according to what will be relevant for their education settings. Climate change is an issue that is often presented in textbooks as a single story, but, it has many stories that are different depending on culture and geographical location, and these materials allow students to explore that diversity. Students being well prepared to speak from their own perspectives will contribute to high quality dialogue conversation in videoconferences, digital dialogue, and in the classroom.

ADDITIONAL RESOURCES FOR EDUCATORS

National Geographic, 'Global Warming 101'

<https://www.youtube.com/watch?v=oJAbATJCugs>

National Geographic, 'What is the natural greenhouse gas effect?'

<https://www.youtube.com/watch?v=bpa0aFY--pE>

Sustainable Development Goals Resources

<https://docs.google.com/spreadsheets/d/1OZjGLuYIY8i-0wVFAZBHZYz4XcEzVDIdqfA7u75HkxA/edit#gid=1904088469>

compiled and managed by Connie Rensink, <https://www.somethingmoreglobal.org/>

Lesson 1: Defining Climate Change

60 minutes – please note that all time amounts are suggested

Purpose

The purpose of this lesson is for students to understand and define climate change by identifying the differences between the terms ‘climate’ and ‘weather’, by using research materials that describe different causes and predicted effects of climate change. Students will be encouraged to explore the urgency of addressing climate change in a variety of contexts. At the end of the lesson students will be able to describe climate change and its effects in their own words.

Assessment Criteria

- Definitions of climate and weather
- Identify various causes of climate change and predicted effects
- Identify categorization of urgency for the effects of climate change

Resources/ Materials

- NASA ‘Effects on Climate’ (webpage) <https://climate.nasa.gov/effects/> or print each article separately for students to have a physical copy
- Spider gram template
- Diamond 9 template

Sources Cited

NASA ‘What’s the difference between weather and climate?’ (webpage)
https://www.nasa.gov/mission_pages/noaa-n/climate/climate_weather.html

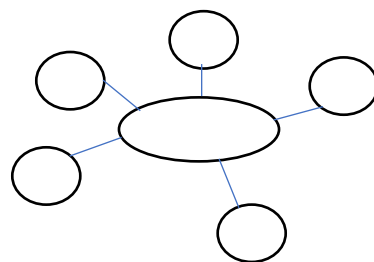
Activity 1: Definition of Climate Change (20 minutes)

Arrange students into 7 different groups of as near equal size as possible.

Part A – Brainstorm Definitions (10 minutes)

Using the spider gram template ask students to write ‘climate change’ in the centre circle. Then, in groups students will have 10 minutes to fill in the smaller circles in the template with answers to the following questions/statements:

- What is climate change?
- Where are you heard ‘climate change’ before?
- Why is it important?
- Examples of climate change



Ensure equal participation by telling students to pass the paper around the group to ensure that each person takes a turn in writing answers. Students should ensure that they listen to one another’s responses within the group, and do not repeat any answers – only add new ones. Lines and circles may always be added to the spider gram.

Part B – Climate vs. Weather

Designate one side of the room to represent 'Climate' and the opposite side 'Weather'

Returning to working together as a whole class, ask students to stand up. After each statement students need to decide if it's about climate change or weather and then should move to the corresponding labelled side of the room

- It's hotter outside in the summer than it is in the spring (climate)
- A blizzard (weather)
- A rainstorm (weather)
- All glaciers are melting /receding (climate)
- A flood caused by unseasonal rain (climate)
- Last year it was warmer in the month of November than it was this year (climate)
- A sunny day in April (weather)

Rotate asking at least 2 individual students to explain why they are choosing to stand in their particular place each time before revealing the answer.

The difference between climate and weather is about time. Climate is a continued difference in the environment or a noticeable change in climate behaviour over a period of time. Weather is the condition of the atmosphere over a short period of time. For example, a snowstorm that lasts 2 days during the winter would be weather – it has a beginning and an end and is happening during the typical snow season. An example of climate change would be if it started to snow for 2 days during the summer, or if over time, summers became less and less hot.

Students should return to their 7 brainstorm groups and write a definition of the difference between Climate Change and Weather in their own words.

Activity 2: Impacts of Climate Change

Each group is then assigned a title article from the resources from [NASA.gov Effects on Climate](https://www.nasa.gov/effects-on-climate). With this resource, please consider which will work better for your classroom – working directly from the online resources or printing out each article for the groups.

1. Temperatures will continue to rise
2. Frost free season
3. Changes in precipitation patterns
4. More droughts and heatwaves
5. Hurricanes will become stronger
6. Sea level will rise by 1-4 feet
7. Arctic likely to become ice free

Groups should be asked to read their assigned article and then add their **new** findings to their spider gram.

Then each group will share out a summary of the mini article they read. The share out should be presented by a different speaker than for the spider gram activity.

In groups, ask students to assess the causes and effects they have listed on their spider gram, and based on what they have learned about the definition of climate change work together on a

Diamond 9 sheet. The Diamond 9 asks students to organize 9 environmental issues they have learned about so far from most urgent to least urgent, beginning with the most urgent or pressing issue at the top of the page. (10 minutes)

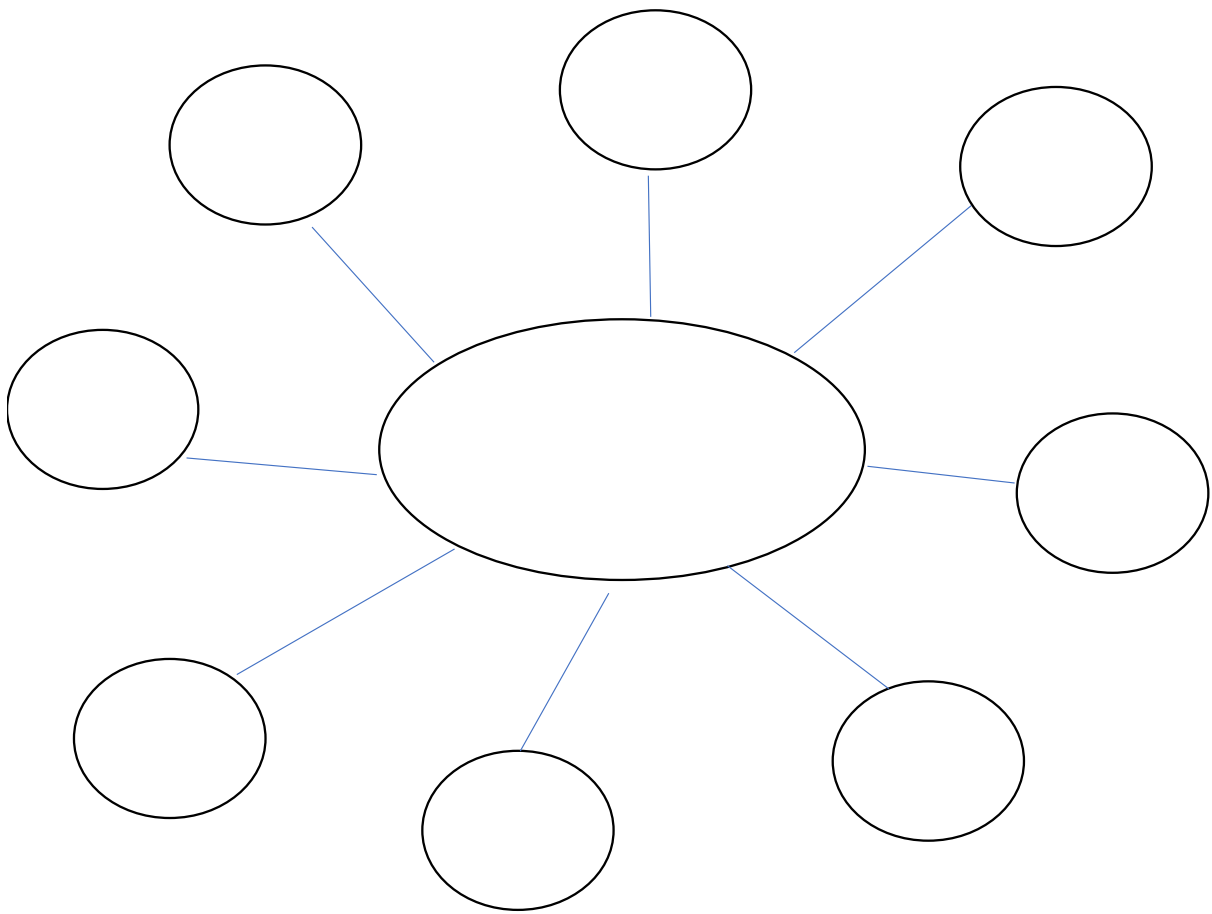
Ensure that one student does not dominate the group by setting clear expectations – each person will take turns adding one idea to the sheet OR moving one of the ideas already on the sheet. If a student moves an idea that is already there, they must justify that choice (“I’m moving this here because...”). When all 9 are organized, students should continue until everyone is happy with the priorities established. It is not about getting this done as quickly as possible.

Reflection (10 minutes)

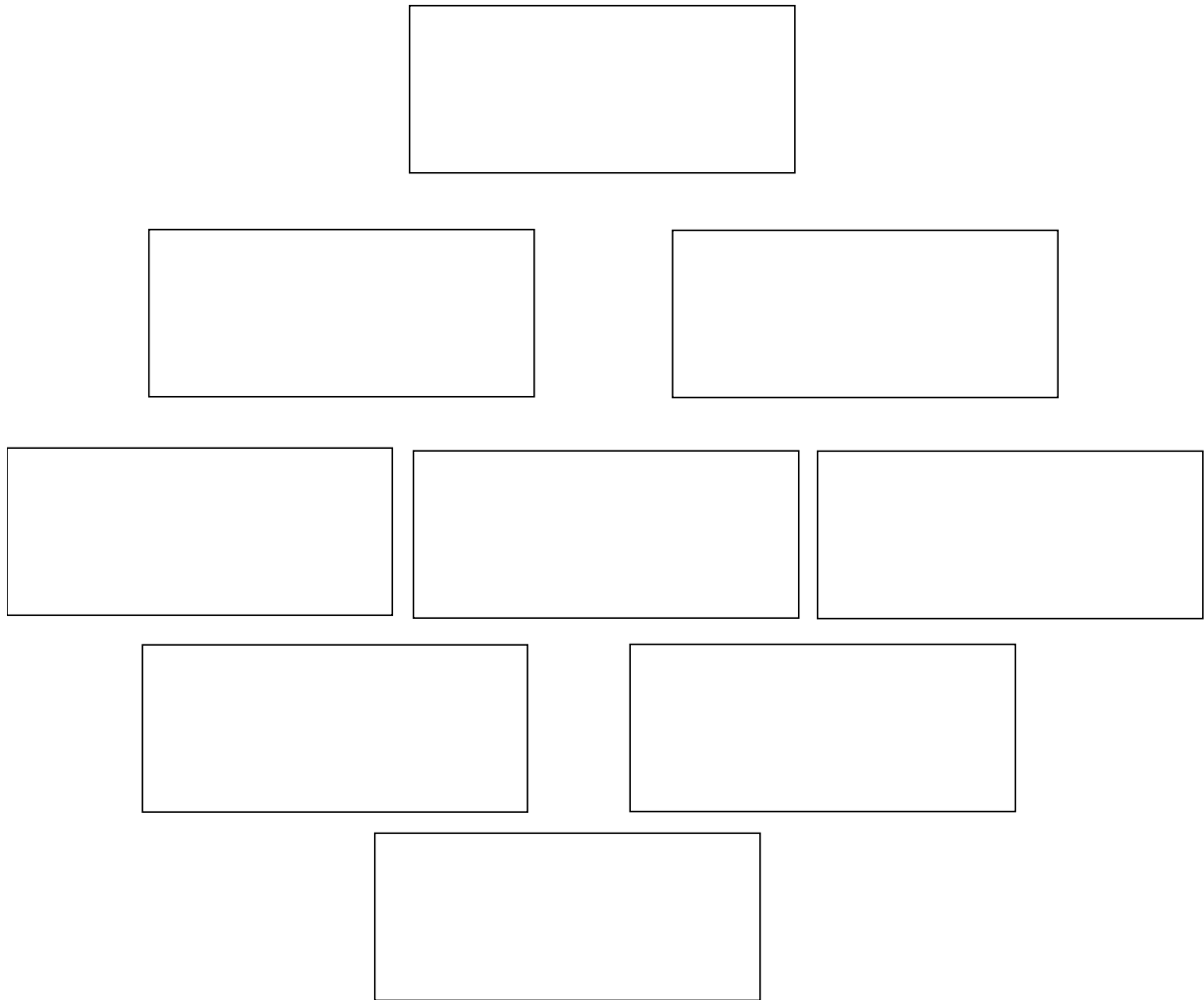
At the end of the lesson ask students to practice reflecting upon the new information they gained during the reading and organizing. Give students the option of thinking about one of the following questions – write an individual answer first, and then share with a partner.

- What is something you learned today that surprised you?
- Did you change your mind about anything around climate change, weather, or impacts of climate change?
- Did you learn something new from someone in the room? What did you learn?

Spider gram Template



Diamond 9 Template



Lesson 2: Impacts of Climate Change

60 minutes (suggested)

Purpose

The purpose of this lesson is to encourage students to consider the interrelated nature of climate change. Although climate change, in its most basic form results from the warming temperature of the earth, the changing climate will also have secondary effects on food systems, political instability, gender and racial equality, biodiversity, the rise of extremist ideologies, as well as broader socio-economic impacts.

Assessment Criteria

- Identification of impacts of climate change
- Explain the sustainable development goals and how they relate to climate change
- Identify categorization of urgency for the effects of climate change
- Understand the connected causes and effects of climate change

Resources/ Materials

- NASA 'Effects on Climate' (webpage) <https://climate.nasa.gov/effects/>
- Diamond 9 template

Cards with SDGs to be printed - https://docs.google.com/document/d/1V12dHH8bDe1QGsf9UaybKDD0BZaHW_YiD9unbdB7tc/edit?ts=5acbc3eb – use pages 6-10 compiled and managed by Connie Rensink: <https://www.somethingmoreglobal.org/>

Activity 1: Urgency of Climate Change Continued (20 minutes)

Returning to the Diamond 9 urgency plans from the first lesson. Students will now need to work together as a class to create 1 singular Diamond 9 organizer. Ask students to set the 7 Diamond 9 organizers in a common space of the room so that all the different arrangements can be seen.

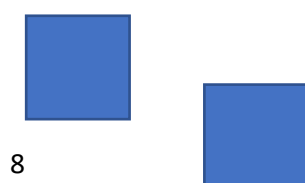
Ask groups to briefly explain to the class why they're arranged their Diamond 9 in the way they have and then encourage discussion about it. Do the groups have different Diamond 9 arrangements? Why? Encourage students to challenge each other and remind them that the purpose of the exercise is not to convince the other of their point of view, but rather, to understand the other perspective. Then using their newfound perspectives ask students to gather together as a class to create one new Diamond 9. This will require collaboration, listening, and critical thinking skills.

Activity 2: Sustainable Development Goals (35 minutes) (SDG)

Part A: Review the Sustainable Development Goals as a group (excluding Climate Action) as a group. Ask students to vote if each goal is related to climate change. Record student responses on a visual representation such as a large piece of paper using sticky notes or sticky dots to demonstrate the number of votes given. (10 minutes)

Ex.

This SDG is connected to climate change



This SDG is not connected to climate change



Eventually, there will be a visual representation of whether or not students think the SDGs are connected to climate change.

Part B: Arrange students into groups of 4-5 (ensure that these are different groups to those from last lesson). Assign each group of students an SDG to read through and decide together if the SDG relates to climate change or not. (10 minutes)

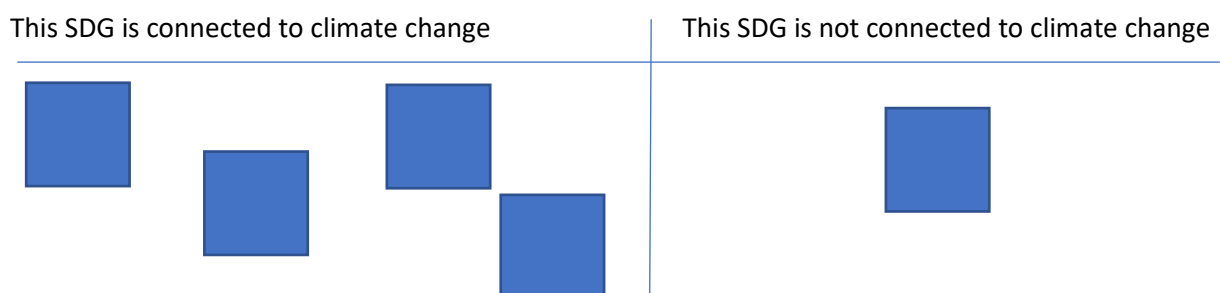
For example: is SDG 5, 'gender equality', effected by climate change? In many places, women and girls bear the burden of fetching water for their families and spend significant amounts of time daily hauling water from distant sources. Water scarcity, caused by the changing climate, might mean that women and girls must travel further, thus spending more time collecting water, therefore missing out on education¹ Note: there might not be a link between the changing climate and a particular SDG.

Part C: Each group of students then gives a 1-2 minute explanation of the way that their SDG relates to climate change. Students who are listening should ask the group questions to challenge their position. The goal of the questioning is practice respectful challenge, listening, and open-mindedness. (15 minutes)

Reflection:

Returning the visual organizer from the beginning of the introduction to SDGs ask students if they still agree with their original placements if the SDGs relate to climate change or not. Remind students that it is okay to change their mind and explain why they want to do so.

Ex.



Eventually, there will be a visual representation of whether or not students think the SDGs are connected to climate change. Based upon this, students should reflect together on the relationship between the SDGS and climate change as a full group and then write a personal reflection of their point of view independently.

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http://www.un.org/womenwatch/feature/climate_change/downloads/Women_and_Climate_Change_Factsheet.pdf

Homework task – in preparation for the next lesson – interview a parent or grandparent (or senior relative or friend) about their memories of your locality and the climate. Do they remember more or less pollution, were winters colder or summers warmer, were rivers fuller and cleaner, were glaciers longer and deeper, were storms or floods more or less common, was air quality better or worse? How do they remember these things in a **personal** way?

Lesson 3: Who is responsible?

60 minutes (suggested)

Purpose:

This activity focuses on establishing who is responsible for climate change and some of the next steps students can take towards having conversations about the topic in their communities. As well as considering the different agents involved in climate change (e.g. individuals, corporations, consumers, governments), it encourages students to consider the difference between responsibility and blame.

Assessment Criteria

Students provide examples of climate change issues in their own community and then dialogue in their group to decide how this relates to global issues, and where responsibility might lie by using a problem tree graphic and engaging in conversation with each other.

Materials

Problem Tree

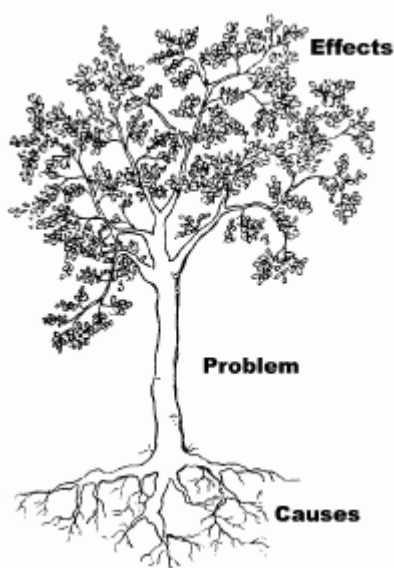
Activity 1: Our Community (30 minutes)

Ask students to find examples of climate change from their local communities. Use the homework task from the previous lesson to prepare students to discuss this by having had discussions with older relatives. What are the issues their region faces because of climate change? Is anything being done to address the issue?

Ask each student/pair/group to consider the following questions:

- 1) What is the issue? What issues do they face because of the changing climate?
- 2) How have the lives of people had to change to accommodate this change?
- 3) What are the implications of continued change for the future?
- 4) What needs to happen for them to not be affected negatively?
- 5) How do they feel about the conversations that they had?

Activity 2: Cause & Responsibility (30 minutes)



Using the list of climate change issues affecting the community ask students to break out into groups and decide who or what is responsible for the different issues. This will cause students to widen their understandings from a micro to a macro level. *For example, an issue could be schools closing due to flooding. What causes the flooding? The erosion of riverbanks in the community. What causes the riverbanks to erode? What steps can be taken from the local level to that can influence change on the global level?*

In their groups ask students to create a **problem tree** diagram. Beginning with the problem listed as the middle of the tree. Students will then decide what the “root” causes of the problem are and label the roots of the tree as such. Then the branches and leaves will be labelled to list the effects of the problem. The ground below the roots are where students can decide the

causes and responsibility. Looking at the tree asks groups to consider if there is a link between those effects (branches) and who is responsible (ground).

The goal of this is for students to recognize how changes in their local communities can make positive change for the global community. Students will also need to practice dialogue with one another, use credible sources, and practice respectful challenge to decide where the responsibility lies for different examples of climate change.

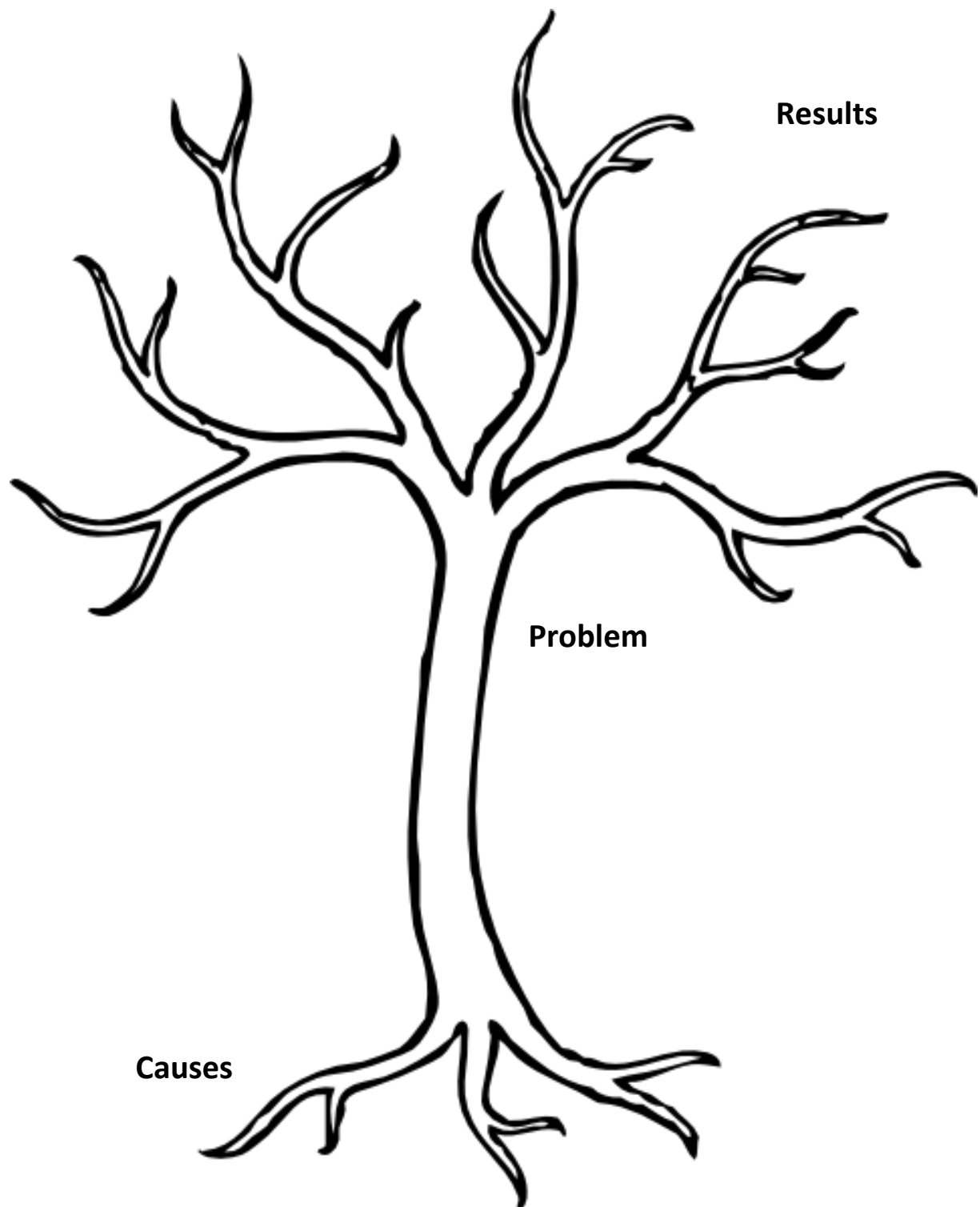
Interview Guide

Interview a parent or grandparent (or senior relative or friend) about the memories they have about the climate they grew up in. Students should begin by introducing themselves and explaining that they are conducting this interview so that they can understand any change in their climate.

Questions to ask interviewees might include:

1. Do you remember more or less pollution in the water and air from when you were my age?
2. Were winters colder or summers warmer when you were younger?
3. If you lived near water, what was it like? Was there more or less clean water?
4. Were rainstorms or floods more or less common?
5. Have you noticed a change in air quality?
6. Do you think the climate has changed around you?

Problem tree



Lesson 4: What influences opinions about climate change?

60 minutes (suggested)

Purpose

Students reflect on the influences that have informed their opinions about climate, from both their local and global community. Students will be able to identify various opinions about climate change.

Assessment Criteria

- Students can articulate key sources that influence opinions on climate change
- Students can prioritise sources of information and understand why some sources might be more credible than others.

Materials

- Information Plate *from Power of Narrative*
- Is It News? *from Power of Narrative*
- Deciphering Sources *from Difficult Dialogue*
- Interview Guide

Activity 1: Information Plate (15 minutes)

Ask students to complete the 'information plate' organizer. To begin ask student to quickly write down a list of climate change opinion influencers (social media, politicians, family, beliefs, personal values, etc) then using the list, create a pie chart on the 'information plate' the organizer asks students to mark percentages of where their information regarding climate change comes from and it's influences. Ask students to then pair up and share their plates with a partner.

Activity 2: Deciphering Sources (25 minutes)

Ask students to complete the Is It News? worksheet from Generation Global's Power of Narrative resource. This resource is designed to help students to develop vocabulary to express where news and information comes from. Ask students to independently write the definitions for each term, and then as a class review the correct definitions together.

Ask students to create a chart of sources of information about Climate Change. Rate sources on a scale of the extent to which they are supported by science.

Examples: Climate Change – Wikipedia articles, NASA, National Resources Defense Council, National Geographic, The Guardian, The New York Times, etc. Educators can add localized news sources.

Then using either the RAVEN methodology from Essentials of Dialogue, or the How Sure Am I? organizer from Difficult Dialogue resource, ask students to rate the opinions they have heard about involving climate change, the source, and then reasons why the source may or may not be reliable.

Activity 3: Differing Views on Climate Change (20 minutes)

When engaging in dialogue about climate change it's important to remember that while some opinions are supported by the bulk of scientific opinion, others are entirely unsupported, and indeed often run contra to science. It is important to emphasise to students that, for this reason, this topic is slightly different to other dialogue topics – in terms of the knowledge, there is clearly a right answer.

Process:

- Can dialogue be used to help proponents of opposing views about climate change to understand one another?
- Can you think of any types of differing opinions in your community about climate change? Do you think that some of these are opinions are stronger than others – why is this?

Reflection – work with a partner to design a poster to help peers in school to make better decisions about where they get their information about climate change (and other issues).

How Sure Am I?

R – Reputation – Is this a trusted source?

A – Ability to see – is this person well informed about the subject?

V – Vested interest – do they stand to gain?

E – Expertise - is the source from an appropriate background, or with the right knowledge

N – Neutrality – Do they acknowledge different points of view?

| STATEMENT ABOUT THE ISSUE | SOURCE OF INFORMATION | WHY I MIGHT TRUST THIS SOURCE | WHY I SHOULD QUESTION THIS SOURCE |
|---|-----------------------------------|--|--|
| Climate change is not real | Political leader in my country | Our leaders should be well-informed and looking out for our best interests | This leader has been lobbied by interests that will lose money from changes in energy investment. |
| Climate change is not real – God will protect us. | Religious believers in my family. | They're my family | Other people in the same tradition say that their religious belief inspires them to protect the environment as stewards. |
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Lesson 5: Preparation for Dialogue

60 minutes (suggested)

Purpose:

Students will also have opportunity to reflect upon what they have learned from the climate change module and prepare for dialogue about the topic through video conferencing or digital dialogue.

Assessment Criteria

Students will have completed the human outline, video conference, and team topic organizers.

Materials

- Human Outline *Power of Narrative*

Activity 1 – Preparation for Dialogue 20/30 mins

Ask students to reflect upon their research about climate change in their own locality – being able to discuss these, adding lots of personal detail will be an important part of the dialogue that they will be having with their global peers.

Consider

- What is the issue?
- How have things changed?
- How do I, and other people in my community feel about it?
- What are we trying to do to resolve the issue?

Students could also make a resource to share in advance with their global partners – make a short film, or photostory about the issues that affect them / video some grandparents talking about changes that they've seen – even make a google map of their locality - attach pictures and text to inform their partners about the issues. (<https://www.google.co.uk/maps/about/mymaps/>)

Activity 2 Human Outline – What am I doing about climate change? (35 minutes)

Ask students to complete the Human Outline activity. Students will independently write on the human outline the ways in which they think, speak, act, and feel about climate change. What are they doing about climate change? (15 minutes)

Find a partner and trade Human Outline papers. Looking at your partners paper write down 4 things the person shown could do about climate change. Get your paper back and reflect. Write 1 action step. (20 minutes)

Key Questions for Dialogue –

- What does Climate change look like where I live?
- How do I feel about what I've learned about Climate Change?
- What am I going to do to address the challenges of Climate Change?
- What do I want others to know about Climate Change?

Lesson 6: Reflection

60 minutes (suggested)

Purpose:

Students will also have opportunity to summarize what they have learned from the climate change module. Students will be able to practice reflecting and asking questions with a partner or small group.

Assessment Criteria

Students will have completed the human outline, video conference, and team topic organizers.

Materials

- KWL Chart *Essentials of Dialogue*
- WWW/EBI *Essentials of Dialogue*
- Problem tree sheets from previous lessons

Activity 1 - Revisiting the Problem Tree (15 minutes)

Ask students to review their problems trees again. Ask students to use the problem tree organizer again, but this time to analyse the influences they have discovered that effect the understanding of climate change.

Activity 2

- What is my definition of climate change?
- What did I learn during the climate change module that helps me to form my definition?
- How does what I do affect the global issue of climate change?
- What would I say to someone who doesn't share the same opinion about climate change?
- What has influenced my understanding of climate change?
- Is climate change important to me? Why?

*Before a videoconference or team topic blog, ask students to complete the **K** and **W** portions of the **KWL** chart. **What I Know**, **What I Want to Know**, **What I Learned** – save the **What I Learned** for after the video conference.*

Reflection

At the end of the climate change module, ask students to have an ending reflection with one another. Students can practice this reflection by completing the videoconference reflection tool **What Went Well** and **Even Better If** for both personal and group. Reflecting on the entire experience of the Climate Change module.