Integrating Climate Change into Classroom Instruction

Competency

Educators will engage students in learning about climate change and how to devise solutions. Educators will share their learning experiences with students' families or community members.

Key Method

Educators will connect climate change topics to the current curriculum and/or standards and create engaging lesson plans to support learning. Educators will share learnings and results with their students' families or the local community and reflect on the process.

Method Components

Talking About Climate Change with Students Based on Stages of Development

Talking with students about a complicated topic like climate change can be challenging, especially when their ages and level of understanding are different. But despite these differences, you should remain hopeful, stay focused, and empower your students with the knowledge that their actions can make a difference in the fight against climate change.

Consider this starting place: Begin the discussion with students by relating common and familiar things—like their water, the weather, food sources, gardens, and local parks—to climate change and the environment.

When discussing climate change with young students, it is important to focus on the impact of greenhouse gases on the environment, the role of renewable energy, and the importance of conservation. For middle school students, it is essential to emphasize the scientific evidence behind climate change and its consequences. You can also explore ways that students can take action to reduce their carbon footprint. Finally, you can engage high school students in more in-depth discussions about the policies of climate change, such as international agreements, government policies, and the role of activism.

No matter the subject, you can present this information and have these discussions with your students. It could mean it is testing water samples in a science lab, interpreting data in a math class, or assigning nonfiction reading on the impact of greenhouse gases in an English class.

Preschool (3-5 years old)

Students at this age are doing a lot of play-based learning that builds humor, empathy, and resilience. They are learning how to play on their own and follow their interests.

Questions like these can help spark discussions with young learners:

- What kinds of animals and plants are there in the world around us? What do these animals and plants need to survive?
- What songs, activities, and games help us explore nature around us (water, soil, air, etc.)?
- What types of weather do we experience and how do we dress differently for each one?
- What stories are there about the people who take care of animals and plants?
- How can we reuse items to play with and find new purposes for them?

These are some questions for you to consider:

- How can you set up stations for students to explore nature through play?
- How can the class work together to learn about plants and animals?
- How can you incorporate fun like stories, songs, and games to teach students about nature?
- How can you give students more opportunities to be outside?

Find lesson plans here: Subject to Climate: K-12 Climate Change Lessons by Teachers

School Age (6-11 years old)

The developmental stage of children ages 6-11 is known as the middle childhood period. During this time, children are continuing to develop their cognitive, social, emotional, and physical skills. They are becoming more independent, exploring their environment, and developing their own interests and personalities. Children in this age group are also able to think more logically and understand complex concepts, making it an ideal time to introduce topics like climate change.

These students are eager to learn new information and can engage in meaningful conversations about the environment and their role in protecting it. While it is important to approach discussions about climate change with sensitivity and age-appropriate language, these students are capable of understanding basic concepts and can be encouraged to take action to protect the environment.

Questions like these can help you guide students through discussions on this topic:

- How do we know the climate is changing?
- How will climate change affect the planet?
- What role do I want to play in protecting the Earth?
- How will climate change affect the planet?

These are some questions for you to consider:

- What language and concepts are most important?
- How can you avoid overwhelming your students?
- What language and concepts are appropriate for your student's developmental level?
- What actions could your students take to reduce waste, conserve energy, and use renewable resources, like solar and wind power?
- How can visual aids—such as pictures, diagrams, and video—help illustrate the concepts of climate change and environmental impact?
- How can you make learning about climate change interactive and engaging?
- How can you encourage children to ask questions and share their own ideas about how they can help?
- What are ways your students can take action—recycle, plant trees, reduce their carbon footprint?
- What is the positive impact that small actions can have on the environment?
- How can your students become responsible global citizens?
- How can your students share what they learn with their friends, community, and family in a way that creates awareness about climate change and inspires others to act?

Find lesson plans here: Subject to Climate: K-12 Climate Change Lessons by Teachers

Adolescents (12-18 years old)

During these years, teens are developing their sense of self and identifying their role in society. Students in this age group are learning how to be true to themselves, how to develop a positive personal identity, and what their responsibility is to the world around them. Their lives are less centered around family as they explore other groups and living in society.

Consider questions like these when planning climate change lessons for this age group:

- What personal responsibility and morality do they have around areas of climate action?
- What role can teens play in addressing and advocating for climate solutions? How can they support climate action now?
- Who are the climate and environmental activists that are their age?
- How does the environment affect our development of personal identity?
- How is the local community affected by and already acting on climate issues and solutions?
- How is the larger global community working on or affected by climate issues?
- How does climate action connect to other issues and topics?

These are some questions for you to consider:

- How can you model your thinking about identity?
- What role can you play in your community when it comes to climate change?
- What is your role with others who are acting to mitigate climate change?
- How can you provide space and psychological safety for adolescent students to explore these questions?

Find lesson plans here: Subject to Climate: K-12 Climate Change Lessons by Teachers

Young Adults (19-25 years old)

Young adults in this age group are exploring how to combat loneliness and isolation and how to form strong relationships with others. With this in mind, you can provide opportunities for these students to connect with their community and collaborate with classmates to build social skills. They are more focused on self-knowledge and self-realization, and they are developing moral independence as well as a new understanding of the complexity of the world around them.

These questions can help you discuss this topic with young adults:

- What does a healthy relationship with the environment look like?
- How can we connect with other people across our community (locally, regionally, and globally) through climate action work?
- How can being part of climate action impact our mental or physical health?

These are some questions for you to consider:

- How can you offer your support to students as individuals to mentor them in their exploration of these questions?
- How can you help students navigate the complexity of climate action and their moral responsibility to address it in a way that builds community?

Integrating Social-Emotional Learning Skills into Climate Change Lessons

Social-emotional learning (SEL) skills are often best taught through experiences and practice opportunities. Climate action provides a perfect vehicle for developing SEL skills.

These are examples and ideas for each of the CASEL 5. The CASEL 5 addresses five broad and interrelated areas of competence and highlights examples for each: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making.

Social Awareness: Through climate change issues and solutions, it is easy to explore looking at others' perspectives on various solutions and empathizing with others as you learn about the needs in your local community and from a global perspective. Students can appreciate and express gratitude for what they have and what systems or organizations help them to have where others around the world might not.

Self-Management: Since this topic can evoke a lot of emotions, it is an opportunity to practice managing emotions and stress. Additionally, to help empower students, there are several opportunities in this work to set goals, plan next steps, demonstrate courage, and work with others to enact change.

Relationship Skills: Climate issues are often addressed through collective action. With that in mind, there are many opportunities for students to be active and gain new skills, including building positive relationships with others (peers, partners, community members, etc.), practicing teamwork, and learning about problem-solving, conflict resolution, leadership development, and more.

Self-Awareness: As students become more self-aware, they can learn about their place in the world. Acting on these issues would involve important SEL skills. Those skills may involve developing interests in being part of their community; refining a growth mindset; understanding the links between feelings, values, and thoughts, which is important for persuasion and self-reflection; and even examining prejudice within systems that create or address climate issues.

Responsible Decision-Making: The easiest SEL category to address with climate action is responsible decision-making. For students who are learning about climate issues and solutions, creating their own solutions to the problem can seem doable. They are also practicing how to form reasoned judgments to persuade others about their solution, thinking about the consequences of their actions and those of others related to climate, using critical thinking skills to evaluate information and ideas, and thinking about their own impact and role on the world around them.

Best Practices for Integrating Climate Change into Classroom Instruction

As educators, we know there are best practices for teaching that apply to all situations. Here are some best practices for integrating climate action into classroom instruction. They can be combined with your favorite strategies.

- When mapping out a unit of study, do backward planning to identify what skills and standards you want students to develop over the course of your unit and where climate action can provide a natural vehicle for practicing those skills in a real-world application.

- Keep the conversation and activities grounded in science and facts by providing articles, books, videos, and other resources that are scientific in nature or share perspectives of people and their work using primary sources. Focus on these five key messages from the Yale Program on Climate Change Communication: “It's real. It's us. It's bad. Scientists agree. There’s hope..”

- Let students lead the work by inviting them to make observations, ask questions, and then find answers to the questions and topics that most interest them. When you let students lead and create space for them, you facilitate inquiry and empower them to be change agents in their community. As an educator, this is a time to step aside and guide your students in developing skills that are connected to state standards as they explore the topic.

    - Kath Murdoch, an experienced educator and author of “The Power of Inquiry” (2015), created the following inquiry cycle:
        - Tune in;
        - Find out;
        - Sort out;
        - Go further; and
        - Reflect and act.
    - At the heart of all this, inquiry is building skills and dispositions for research, collaboration, communication, thinking, and self-management.

- Build on and create space for students to share their prior knowledge or experience on this topic. Help students identify and connect what they are learning about climate change to their lives and communities.

- Identify local issues, groups, and individuals who could help students explore the topic further. Consider who is already doing the work (especially those from underserved communities who have been combating the negative impact of climate change) and how to share their work. Share best practices and perspectives from these and other communities and individuals who are already working for change.

- Explore climate change issues and their urgency, but always conclude with hopeful forward-thinking solutions and change that’s possible when everyone takes action. Students need to know that climate change doesn’t mean doom and that they are never too young to be change agents at school, at home, in their community, and in the world.

- Apply a racial and social justice lens by reflecting on how some students may disproportionately experience the effects of climate change based on race, class, language, ability, and other factors. Keep this context in mind, and make sure you consider your audience when planning any classroom activities or lessons.

- Climate change is a topic that can span all disciplines. We know students learn and retain information best when they have opportunities to make interdisciplinary connections. How can you collaborate with colleagues (e.g., another educator, your librarian, your cafeteria manager) to help create opportunities for interdisciplinary learning and real-world application of knowledge and skills? How can you incorporate physical education, art,

music, and other subjects as a way for students to express their learning and their thinking on the topic?

- We know students at all levels need their learning to be personal, so consider how you can connect the issues of climate action to health factors (air, water, soil, etc.). How can you draw connections between the health of the environment and your own physical and mental health?

- Make sure the content and resources throughout the unit are accessible to students based on their developmental needs, emotional intelligence, and content skill levels. To do this, collaborate with your special education team, English language learner team, and anyone else who supports students to ensure you have a variety of differentiated resources to scaffolded learning for every student to engage in the exploration.

- Consider what opportunities are available to you to help students get out in the environment and nature so that they can see the impact it has on them (write poetry outside in a green space, go on a field trip to a local nature preserve, volunteer in a community garden, watch a caterpillar turn into a butterfly, adopt and care for a class pet).

Messaging for Other Audiences

It is important to think about how you will message classroom connections to climate action before integrating it into your unit of study. Talking about climate change with families and communities can be daunting; it is a complex, controversial, and often politicized issue. However, it is essential to engage with diverse groups of people to raise awareness and inspire action.

You can learn more about this in the **Community Outreach for Climate Change** micro-credential.

Supporting Rationale and Research

K12 Climate Action Commission. (2021). K12 Climate Action Plan 2021. The Aspen Institute: Washington, DC.

Agrawal-Hardin, N., and Green, M. (October 10, 2022). "Why education must lead in addressing climate change." The Hechinger Report.

Akopian, N., Faggert, M., and Schifter, L. (2022). K12 Education and Climate Provisions in the Inflation Reduction Act. The Aspen Institute: Washington, DC.

Katz, E., Neuberger, J., and Schifter, L. (2022). Education and Climate Provisions in the Infrastructure Investment and Jobs Act. The Aspen Institute: Washington, DC

Katz, E., Schifter, L. and La Pinta, A. (2020). A State Policy Landscape: K12 Climate Action. The Aspen Institute: Washington, DC.

Resources

General Resources for Climate Change

SubjectToClimate: Teaching About Climate Change

Climate Literacy: The Essential Principles of Climate Science

Climate Action Plan-Equity

Climate Change Education Hub

K-12 Education Action Plan

The Most Important Thing You Can Do To Fight Climate Change: Talk About It.

New Jersey Climate Change Standards

Probable Futures website

Questions to Help You Start Taking Action

Research and resources from the Harvard Center for Climate Health and the Global Environment.

United Nations: What Is Climate Change?

Yale Center for Climate Communications

K-12 Teaching Resources

A MODEL FOR DESIGNING A JOURNEY OF INQUIRY

Menu of Climate Solutions - This Is Planet Ed

SubjectToClimate Lesson Plans

Turnitaroundcards.org

Under The Sky We Make

Preschool (3-5 years old)

Activities | NASA Climate Kids

Earth Day Books for Little Learners - Pocket of Preschool

21 Earth Day Activities For Preschoolers

30 Earth Day Activities for Preschool-Aged Kids - Teaching Expertise

Start Learning | Kids Against Climate Change

School Age (6-11 years old)

A Guide to Climate Change for Kids

Activities | NASA Climate Kids

40+ Multicultural Children's Books for Earth Day - Colours of Us

Start Learning | Kids Against Climate Change

What is climate change? facts for kids

Adolescence (12-18 years old)

Climate Effects on Health | CDC

Climate Change and Health Equity | SAMHSA

Climate Change and Health - PAHO/WHO | Pan American Health Organization

Maps · Probable Futures

Voices and stories from around the world | United Nations

Young Adults (18-25 years old)

Audubon

Climate Stories Project

Language Shouldn't Be a Barrier to Climate Action | Sophia Kianni | TED Countdown

Maps of Probably Features

MIT's Climate Primer

5 New Climate Books to Empower Teens and Help Turn Anxiety into Action |

The New Era of Environmental Science | Milton Muldrow | TEDxDover

School strike for climate - save the world by changing the rules | Greta Thunberg | TEDxStockholm

Supriya Patel: Why Youth Will Defeat the Climate Crisis | TED Talk

Turnitaroundcards.org

Young climate activists demand action and inspire hope | UNICEF

Young People are the Solution to Climate Change | Vish Dhar | TEDxPhillipsAcademyAndover

Messaging

Digital Toolkit: Climate Action

Questions to Help You Start Taking Action - This Is Planet Ed

Submission Guidelines & Evaluation Criteria

To earn this micro-credential, you must receive a passing score in Parts 1 and 3 and be proficient in all components in Part 2.

Part 1. Overview Questions (Provides Context)

(400-600 words)
Do not include any information that will make you identifiable to your reviewers.

Please answer all of the following questions:

1. What are your personal beliefs about climate change and how can they affect your teaching?
2. What skills, knowledge, and experiences do your students already possess about this topic of exploration? Can you build on them? What skills, knowledge, and experiences do you want to support students in growing throughout the unit of study?
3. Describe your school community. Do you work in an urban, suburban, or rural community? What are the policies about climate change? What are the school demographics?
4. What grade do you teach? Do you work with any special populations?
5. What are the equity issues that climate change has impacted in your community?

6. What is your comfort level with teaching climate change topics to your students? What challenges do you think you may face?

Passing:
The educator answers all three questions in detail, providing examples, a clear understanding of their students' needs and abilities, and how local stakeholders, individuals, and groups could enhance their learning potential.

Part 2. Work Examples/Artifacts/Evidence

To earn this micro-credential, please submit the following four artifacts as evidence of your learning. See the rubric for the passing score.

Do not include any information that will make you or your students identifiable to your reviewers.

Artifact 1: Make Curriculum Connections
Look at your existing curriculum and/or content standards, and consider these questions:

- What are natural connections you can make between the required curriculum and climate change?
- What skills and standards could be best practiced in conjunction with climate action issues?
- How might your current curriculum map and/or standards be supplemented with resources that highlight stories and exploration of climate issues and solutions?

Create a mind map that shows the connections between your curriculum/content standards and climate change topics. Feel free to organize your mind map in whatever way makes sense to you, just make sure everything is clearly labeled with enough detail that the reviewers will be able to understand it.

Artifact 2: Develop a Lesson Plan
Review your mind map and choose one area to develop into a lesson plan that is appropriate for your grade level. You may create a new lesson, adapt a lesson that you are already using, or find a lesson on one of the websites listed in the Resources section of this micro-credential. (Note: The Subject to Climate website provides lesson plans for all age groups and subjects!)

Your lesson plan needs to include the following:

- Content objective/goal;
- Climate change objective/goal;
- Description of how you will introduce this lesson (big ideas, vocabulary words);
- Description of the student activity (how students will apply, analyze, or synthesize their learning);
- List of materials/resources you will need;
- Description of how you will scaffold for English language learners and exceptional students; and
- Description of how you will assess student learning.

Artifact 3: Identify Resources for Inquiry

Identify 6-10 resources that would be helpful and appropriate for your students. For each resource, provide the following:

1. Name of the resource;
2. Brief explanation of why you chose that resource; and
3. A picture/screenshot or link to the resource.

Choose at least three different types of resources, such as articles, stories, books, poems, artwork, songs, videos, websites, WebQuests, activities, educational technology, field trips, and guest speakers.

Artifact 4: Create Sample Targeted Communication

Create a message to one of the groups below that explains your unit of study:

- Families
- Community

Include these in your message:

- A description of your lesson
- A description of what the students will be doing and why
- Your contact information in case there are questions
- How families and the community can support your students

Your message may take these forms:

- Email
- Newsletter
- Video
- Community newspaper article
- Blog post
- Flyer

Part 2. Rubric

	Proficient	**Basic**	**Developing**
Artifact 1: Make Curriculum Connections	Mind Map makes clear connections between standards/ curriculum and climate action topics that are appropriate for the developmental stage of the learners. Mind Map has clearly labeled topics and curriculum connections. There are details so that the reviewer can understand the concepts.	Connections between standards/ curriculum and climate action topics may or may not be clear or appropriate for the developmental stage of the learners.	Connections between standards/ curriculum and climate action topics are unclear and are not appropriate for the developmental stage of the learners.
Artifact 2: Develop a Lesson Plan	Detailed lesson plan includes: - Content objective/goal; - Climate change objective/goal; - Description of how you will introduce this lesson (big ideas, vocabulary words);	Lesson plan includes some of the following: - Content objective/goal; - Climate change objective/goal; - Description of how you will introduce this lesson (big ideas, vocabulary words);	Lesson plan is missing most of the following: - Content objective/goal; - Climate change objective/goal; - Description of how you will introduce this lesson (big ideas, vocabulary words);

	- Description of student activity (how students will apply, analyze, or synthesize their learning); - List of materials/ resources that you will need; - Description of how you will scaffold for ELL or exceptional students; and - Description of how you will assess student learning	- Description of student activity (how students will apply, analyze, or synthesize their learning); - List of materials/ resources that you will need; - Description of how you will scaffold for ELL or exceptional students; or - Description of how you will assess student learning	- Description of student activity (how students will apply, analyze, or synthesize their learning); - List of materials/ resources that you will need; - Description of how you will scaffold for ELL or exceptional students; and - Description of how you will assess student learning
Artifact 3: Identify Resources for Inquiry	6-10 resources are identified. Each resource includes: - The name of the resource; - A brief explanation of why you chose that resource; and - A picture/ screenshot or a link to the resource. All resources are helpful and appropriate for your students.	Less than six resources are identified. Parts of the information are missing (picture, description, and/or the reason for choosing). and/or Resources are not age-appropriate or related to the topic. and/or	Less than four resources are identified. Only one part of the information is included (picture, description, and/or the reason for choosing). and/or Resources are not age-appropriate, and they are unrelated to the content. and/or

	At least three different types of resources are included.	Only one or two different types of resources are included.	Only one type of resource is Included.
Artifact 4: Create Sample and Targeted Communication	Sample communication demonstrates an understanding of the targeted audience, uses some of the suggested messaging strategies, as appropriate, and is clear. Includes all the following: - Description of your lesson; - What the students will be doing and why; - Contact information in case of questions; and - How families and communities can support your students	Sample communication shows some understanding of the targeted audience, it may or may not be clear, and it attempts to use some of the suggested messaging strategies. Includes some of the following: - Description of your lesson; - What the students will be doing and why; - Contact information in case of questions; or - How families and communities can support your students	Sample communication may be unclear, does not demonstrate an understanding of the targeted audience, and/or it may not use suggested messaging strategies. Most of the following is missing: - Description of your lesson; - What the students will be doing and why; - Contact information in case of questions; or - How families and communities can support your students

Part 3. Reflection

(400-500 words each)

For tips on writing a good reflection, review this resource:
How Do I Write a Good Personal Reflection?

Do not include any information that will make you identifiable to your reviewers.

Answer all of the following questions:

1. What was the greatest success of your work on this micro-credential?
2. How did students react to your lesson?
3. What challenges did you face? How did you address them?
4. How will you continue to integrate climate change into your lesson plans?

Passing:
The educator answers all questions and includes examples and/or anecdotes. Answers are detailed and well-reasoned with clear plans for the continued development of ideas.