

BIOMIMICRY

YOUTH DESIGN CHALLENGE

FRAMING THE CLIMATE CHALLENGE



M

MOTIVATE



I

INVESTIGATE



M

MATCH



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INNOVATE



C

COMMUNICATE

WELCOME TO THE YDC'S FRAMING THE CLIMATE CHALLENGE RESOURCE.

The Design Brief for the YDC is written broadly to provide educators with flexibility in instruction and to encourage the creation of diverse solutions by students. However, climate change is a complex topic and it will be essential that you guide your team in selecting a specific aspect of this challenge to focus on. This is known as 'problem definition' and it is a valuable educational part of this project.

Defining problems helps improve students' capacity to break large problems into smaller, more manageable ones, and it can help students apply critical and systems thinking to problem solving. Your setting, learning goals, and student population will determine the extent to which you direct this aspect of the Challenge at the onset. Whatever you decide, it will be important to provide your students with a grounding in the science, causes, and impacts of climate change. Visit the [Climate Change Resources](#) page for links to vetted resources.

OUR RECOMMENDATION: FOCUS ON A LOCAL ISSUE

Selection of a local problem that effects your students, their community, or region can make the challenge more relevant to your students and they are more likely to care about solving it. Consider asking your students to research one or both of the following questions and select a problem to solve that relates specifically to your local community or ecosystem.

- How does/will climate change impact the people and places where we live?
- What impacts do activities in your community have on climate change itself?

One way to identify local impacts of climate change is to conduct an internet search using the phrase, "effects of climate change in [town, state, or region]."

Another way to learn about possible local or regional impacts of climate change is to talk with long-term residents like grandparents or older neighbors. They may have stories and insights about specific problems in the community that have started or gotten worse because of the changing climate. Talking with these residents could help direct your team's selection of a specific problem.

• Resources

- Visit the [Climate Change Resources](#) page of the YDC website for links to interactive maps and information about predicted climate impacts by region.
- Use the [YDC Instructional Storyline](#), "Creating Local Biomimicry Solutions to Global Problems," as a framework to build a project around a local issue. The Storyline provides lesson planning ideas and resources for a project focused on connecting local issues with global climate impacts through the [UN Sustainable Development Goals](#).

FOCUS ON A SPECIFIC SOLUTION TYPE

The design brief addresses two overarching approaches to the climate problem: adaptation (coping with impacts) and mitigation (combating causes). Both types of solutions are essential to addressing the problem of climate change. For the purposes of this Challenge, you and your students might wish to focus on design problems in one category or the other.

- **Climate change mitigation solutions:** Innovations which reduce the emission of greenhouse gases include improvements in energy generation and energy efficiency. Innovations which remove greenhouse gases from the atmosphere directly are also forms of climate change mitigation. Fossil fuel combustion for energy accounts for the vast majority of greenhouse gas emissions. Since humankind uses energy in thousands of ways, there are thousand of opportunities to reduce emissions through improvememnts in energy efficiency, for instance.
- **Climate change adaptation solutions:** Innovations which help people cope with anticipated regional climate change effects can include methods of coping with drought, floods, extreme temperatures, fires, sea level rise, greater climatic variability, etc. Many of these anticipated climatic changes have secondary effects that also require sustainable adaptation strategies, such as improvements addressing agriculture, heating/cooling, pathogen management, etc.
- **Resources**
 - Fourth National Climate Assessment, Volume II.
 - [Chapter 28: Reducing Risks Through Adaptation Actions](#)
 - [Chapter 29: Reducing Risks Through Emissions Mitigation](#)

FOCUS ON A SPECIFIC INDUSTRY OR SECTOR

Climate change causes and impacts are connected directly or indirectly to every field of human endeavor, from building and manufacturing to transportation, energy, agriculture, water supply, human health, and more. Any one of these fields could provide a lens for narrowing the Challenge while connecting it to academic content and your teaching tools.

- **Ideas**
 - Identify an industry or economic sector that has relevance to your coursework and ask your students to research how it is affected by (or directly affects) climate change and create an innovation that improves the situation.
 - Use the United Nations [Sustainable Development Goals](#) (SDGs) as a lens for identifying critical areas for impact. The SDGs are a collection of 17 global goals set by the United Nations.
- **Resources**
 - Environmental Protection Agency, [Climate Change Impacts by Sector](#)
 - The [YDC Instructional Storyline](#), "Creating Local Biomimicry Solutions to Global Problems," provides a framework to build a project around the SDGs. The Storyline provides lesson planning ideas and resources for a project focused on connecting local issues with global climate impacts through Goals.

Guided Free Choice

Provide your team with a variety of resources about climate change causes and impacts and ask them to select the problem they would most like to investigate and solve. This is appropriate for more mature and self-directed students.