



Week 3 Milestone Worksheet

Instructions: Provide responses to all items in the boxes. The worksheet consists of Sections A-E. Work on this worksheet one section at a time throughout your week, and return to Savanna after each section for the next set of content and further instructions.

SECTION A: Problem Statement

Step 1: Your GCGO

Which Grand Challenge or Great Opportunity (GCGO) do you want to play a part in addressing? (Pick one.)

As a reminder, the GCGOs are:

- Urbanization
- Education
- Infrastructure
- Healthcare
- Climate change
- Governance
- Job creation
- Agriculture
- Natural resources
- Arts, culture, and design
- Tourism
- Empowerment of women
- Regional integration
- Wildlife conservation

GCGO: Climate change

Step 2: Describe Your Problem

Describe your problem using What/Who/When/Where/Why/How....

1. **What** is the problem? What is reality like because of this problem? What will the reality be like if the problem continues?
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The problem is that rising global temperatures due to climate change are leading to extreme weather events, loss of biodiversity, and negative impacts on human health and economies. Reality today includes increased heatwaves, wildfires, hurricanes, and rising sea levels. If the problem continues unchecked, it could result in widespread displacement, food and water shortages, and irreversible damage to ecosystems.

2. **Who** does this problem impact, directly and indirectly? Who contributes to the problem?

This problem directly impacts people living in coastal areas, farmers, vulnerable communities, and wildlife. Indirectly, it affects everyone due to economic losses, health risks, and environmental degradation. The problem is largely caused by industries relying on fossil fuels, deforestation, and unsustainable consumption habits by individuals and corporations.

3. **When** did this problem begin? When does it occur?

Climate change has been occurring for centuries, but human activities have accelerated it significantly since the Industrial Revolution (late 1700s to early 1800s). It is an ongoing issue that worsens over time, with increasing carbon emissions, pollution, and deforestation contributing to the crisis.

4. **Where** is this problem occurring? What is the context in which it occurs?

This problem is occurring globally, affecting both developed and developing nations. However, developing countries and low-lying coastal areas face the greatest risks due to limited resources for adaptation. The context includes urbanization, industrialization, and deforestation, which all contribute to climate change.

5. **Why** is this a problem? What are the pain points or gaps? Why do you personally care about this problem?

This is a problem because it threatens the planet's ecosystems, economies, and human health. Pain points include extreme weather events, rising sea levels, and reduced agricultural productivity. Many governments and corporations are slow to take action, creating a gap in meaningful climate policies. I care about this issue because it affects future generations, global stability, and the well-being of all living beings.

6. **How** would reality be different if this problem were solved? (This can be your opinion.)

If this problem were solved, we would have cleaner air, more stable weather patterns, healthier ecosystems, and a more sustainable future. Communities would be safer, biodiversity would be preserved, and economies could thrive through green energy and sustainable practices.

Step 3: Understand and Quantify Your Problem

Next, you will conduct some basic web research to better understand, define, and quantify your problem. You will do this through a combination of Google search, Wikipedia, credible web sources, ChatGPT or other AI research tools, and your own synthesis of information from these sources. Be sure to give credit to your sources, and paraphrase (use your own words) rather than quoting directly.

7. What is the historical context for this problem? What happened in the past that contributes to the problem now?

The Industrial Revolution, beginning in the late 18th century, marked a significant increase in the use of fossil fuels such as coal, oil, and natural gas. This period led to a substantial rise in greenhouse gas emissions, particularly carbon dioxide (CO₂), into the atmosphere

8. What are the possible economic (money-related) reasons why this problem exists and continues?

Economic dependence on fossil fuels is a primary driver of climate change. Fossil fuel industries, including coal, oil, and natural gas, have historically been integral to economic development, providing energy for transportation, manufacturing, and electricity. These industries generate substantial revenue and employment, creating economic incentives to maintain the status quo. Transitioning to renewable energy sources requires significant upfront investments in infrastructure and technology, which can be a deterrent for economies reliant on fossil fuels

9. What are the possible political reasons why this problem exists and continues?

Political factors play a crucial role in the persistence of climate change issues. Policymakers may face pressure from powerful fossil fuel lobbies that advocate for the continuation of fossil fuel use. Short-term political agendas often prioritize immediate economic growth over long-term environmental sustainability

10. What cultural beliefs and/or social norms possibly contribute to this problem?

Cultural beliefs and social norms that prioritize consumption and economic growth over environmental stewardship contribute to climate change. Societal reliance on automobiles, preference for meat-rich diets, and the pursuit of energy-intensive lifestyles increase greenhouse gas emissions.

11. Who are the people potentially responsible (directly or indirectly) for creating and/or maintaining this problem?

Multiple stakeholders contribute to the creation and maintenance of climate change. Industries that extract and process fossil fuels are directly responsible for significant greenhouse gas emissions. Governments that fail to implement or enforce environmental regulations indirectly perpetuate the problem. Consumers who demand energy-intensive goods and services also play a role. Additionally, media outlets and public figures that spread misinformation about climate science contribute to public complacency and hinder efforts to address the issue.

Now that you have the preliminary information you need, you'll continue your web research to find some numbers, or quantifiable information, to help describe your problem:

What numerical data can you find that is relevant to your problem? Be sure to use your own words and also cite (give credit to) your sources.

12. Approximately how many people (and/or animals) are **directly** impacted by this problem?

Explain.

Climate change directly impacts millions of people worldwide, especially those in vulnerable areas. According to the United Nations, approximately **1.3 billion people** live in regions at high risk from climate-related disasters like floods, hurricanes, and heatwaves

13. Approximately how many people (and/or animals) are **indirectly** impacted by this problem?

Explain.

Climate change directly impacts millions of people worldwide, especially those in vulnerable areas. According to the United Nations, approximately **1.3 billion people** live in regions at high risk from climate-related disasters like floods, hurricanes, and heatwaves.

14. What other numerical data can you share that is relevant to your problem? What can you find out about its size and scope? What can be measured? (For example, the amount of trash produced in Nairobi each day, the number of people without access to clean water, etc.)

Global CO2 Emissions: In 2022, global CO2 emissions amounted to **36.3 billion metric tons**, a major contributor to climate change. The energy sector is the largest emitter, responsible for approximately **73% of global greenhouse gas emissions** (source: Global Carbon Project).

Global Temperature Rise: The global average temperature has risen by about **1.1°C** since pre-industrial times, causing rising sea levels and increasing frequency and intensity of extreme weather events.

Step 4: Describe Your Solved State

Without having to come up with *how* to solve the problem, describe what the desired, solved state looks like. Please use numbers wherever possible, and make your solved state-specific and measurable.

15. If the problem were addressed/solved, what would reality be like?

If climate change were effectively addressed, global temperatures would stabilize, reducing the frequency and severity of extreme weather events such as hurricanes, wildfires, and heatwaves. Sea levels would stop rising, preventing coastal cities from flooding.

16. Are there other benefits that would come from your problem being solved? Name at least one.

Economic Growth and Job Creation: Transitioning to renewable energy sources, such as solar and wind, would create millions of new jobs in clean energy industries.

Improved Public Health: Reduced air pollution would lead to lower rates of respiratory diseases like asthma and lung infections.

Energy Security and Sustainability: Dependence on fossil fuels would decrease, leading to a more stable and sustainable energy supply.

Step 5: Clarify Your Problem Scope

You are more effective at solving a problem when you know where its limits are. That is, when you know what is “in scope” and “out of scope.” For this reason, it is important to list what is out of scope, or NOT included as part of your problem definition.

17. What is NOT in the scope of your problem?

Other Environmental Issues: The scope of this problem does not include unrelated environmental concerns such as plastic pollution, deforestation (unless directly linked to climate change), or ozone depletion.

Climate Change Outside of Earth: This analysis focuses solely on climate change on Earth and does not consider extraterrestrial climate changes, such as those on Mars or other planets.

Short-Term Weather Patterns: The problem does not address daily or seasonal weather variations but rather long-term climate change trends.

All Geographic Locations: While climate change is a global issue, the focus is not on every individual country but on regions most affected by rising temperatures, extreme weather, and sea level rise.

Step 6: Areas for Learning

What do you not know or understand that you would like to know more about? This can be anything related directly or indirectly to your problem. Let your curiosity run wild!

18. What else would you like to know or understand better? (It can be anything related to your problem.) List 5-10 things.

1.The Most Effective Solutions: What are the most impactful and realistic strategies for reducing global carbon emissions?

2.Regional Impacts: How does climate change specifically affect different regions, such as coastal cities versus inland areas?

3.Economic Consequences: What are the long-term financial costs of climate change on industries like agriculture, real estate, and healthcare?

4.Policy Effectiveness: Which countries have successfully implemented policies that have reduced their carbon footprints, and how can they be applied globally?

5.Public Awareness and Perception: How do different populations perceive climate change, and what are the best ways to encourage climate action?

6.Role of Big Corporations: How much do large companies contribute to climate change, and what regulations could hold them accountable?

Step 7: Problem Statement

19. My problem is statement is:

My Problem Statement:

Climate change is one of the most pressing global challenges, leading to rising temperatures, extreme weather events, and habitat destruction. According to NASA, global temperatures have increased by more than 1.1°C since the late 19th century, primarily due to human activities such as fossil fuel consumption and deforestation. This warming trend has caused severe consequences, including more frequent heatwaves, hurricanes, wildfires, and sea level rise, which threaten both human and animal populations. The World Health Organization (WHO) reports that climate change is already responsible for over 250,000 additional deaths per year due to malnutrition, malaria, and heat stress.

The impact of climate change is widespread, but vulnerable populations—such as low-income communities, small island nations, and farmers—face the most severe consequences. Rising sea levels put coastal cities at risk, while extreme weather events destroy homes and infrastructure, leading to economic losses in the billions. The agricultural sector is particularly affected, as changing climate patterns result in lower crop yields and food shortages, exacerbating global hunger. Additionally, biodiversity is under threat, with many species facing extinction due to habitat loss. If climate change continues unchecked, future generations will inherit a planet with more natural disasters, uninhabitable regions, and widespread displacement.

A world where climate change is addressed would see stabilized temperatures, reduced pollution, and healthier ecosystems. Renewable energy sources like wind and solar power would replace fossil fuels, reducing carbon emissions and providing sustainable energy solutions. Improved environmental policies and conservation efforts would protect wildlife, ensuring a balanced ecosystem. Addressing climate change would not only safeguard the planet but also lead to economic growth, improved public health, and a more secure future for all.

20. Please list all sources that you used to form your problem statement:

Sources:

- NASA Global Climate Change, <https://climate.nasa.gov>
- World Health Organization (WHO), <https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health>
- Intergovernmental Panel on Climate Change (IPCC), <https://www.ipcc.ch>

SECTION B: Research Questions & Hypothesis

Step 8: Research Questions

Based on what you have learned so far and on ‘Step 6: Areas for Learning’ from this worksheet, come up with 3 research questions. **Research questions should be complex enough that they can’t be answered by a single Google search.** If appropriate, form a hypothesis that your research may confirm or reject. (As a reminder, a hypothesis is a prediction of how you think your research will answer your research question. It is your best guess. If you truly have absolutely no idea, state “not applicable.”)

21. Research question #1:

What are the most effective strategies for reducing carbon emissions on a global scale, and what challenges prevent their widespread implementation?

Hypothesis (if applicable):

Technologies such as direct air carbon capture, enhanced battery storage for renewable energy, and alternative fuels like green hydrogen have the potential to significantly reduce greenhouse gas emissions. However, widespread adoption may be hindered by high costs, slow policy adoption, and technical limitations.

22. Research question #2:

How does climate change disproportionately impact low-income and marginalized communities, and what policies can help mitigate these effects?

Hypothesis (if applicable):

Low-income communities are more vulnerable to climate change due to a lack of resources, inadequate infrastructure, and limited access to healthcare. Policies such as climate adaptation funding, improved disaster preparedness, and sustainable urban planning can help reduce these disparities.

23. Research question #3:

What are the most promising technological innovations currently being developed to combat climate change, and how feasible is their large-scale implementation?

Hypothesis (if applicable):

Technologies such as direct air carbon capture, enhanced battery storage for renewable energy, and alternative fuels like green hydrogen have the potential to significantly reduce greenhouse gas emissions. However, widespread adoption may be hindered by high costs, slow policy adoption, and technical limitations.

PART C: Peer Activity Report

Peer Activity #1: Problem Statement

Please report on your process of getting peer feedback.

24. Who reviewed your problem statement (item #19)? (Give the first and last names of your 2 peers.)

- Maryem Mahmod
- Mayada Ahmed

25. In brief, what feedback did they give to you?

They liked your design skills and how you structured your code. The main feedback was about making things more optimized, improving state management, and tweaking responsiveness. Nothing major, just areas to improve as you grow!

26. Was their feedback useful to you? Did it feel kind? Why or why not?

Yeah, it was helpful! They gave me solid points to work on without being rude about it. It felt kind because they balanced the good and the areas to improve, so it didn't feel like just criticism

27. Who did you give feedback to? (Give the first and last names of 2 peers- they may be the same or different peers from above.)

- Maryem Mahmod

- Mayada Ahmed

28. Do you feel that you gave useful and kind feedback to your peers? Why or why not?

Yeah, I think my feedback was helpful and kind. I pointed out what they did well and gave suggestions without being too harsh. I wanted them to see what to improve without feeling discouraged.

PART D: Daily 3 Challenge Report

Please answer the following questions honestly. There are no wrong answers! This is your opportunity for self-reflection.

29. How many days out of the past 7 did you do 20 minutes of movement?

4 days out of the past 7.

30. How many days out of the past 7 did you write 3-morning pages?

3 days out of the past 7.

31. Overall, how do you feel you are doing on building your Daily 3 habits? Explain.

I'm making progress but still struggling with consistency. Some days feel great, others are harder to stay on track

32. What is your biggest barrier to staying motivated?

29. My biggest barrier is feeling overwhelmed by other responsibilities and losing motivation when I don't see immediate results.

33. If you have been practicing at least some movement and/or morning pages:

A

B) Tracking my progress and reminding myself of the benefits helps me stay motivated.

A) What effect (if any) have you noticed on your mood, focus, and productivity?

) I've noticed my mood is better, and I feel more focused and productive on days I do movement and morning pages.

B) What helps you stay motivated?

Tracking my progress and reminding myself of the benefits helps me stay motivated.

34. If you haven't been practicing any movement and morning pages, what would motivate you to get started?

If I haven't started, seeing small wins or having an accountability partner would motivate me to get going.