# Design Challenge: Name_____

# How can we apply scientific principles to minimize our school community's contribution to global warming?

Phenomenon: Hawaii passed a law committing the State to becoming carbon neutral by 2045. That means Hawaii would emit only as much CO2 as its vegetation takes in.

Can we do it? Now Hawaii is over 90% fossil fuel based – renewables produce 20% of electricity, 1% of ground transportation fuel, and 0% of marine and aviation fuel.

How can our school community contribute in a positive way?

## Brainstorm- what is going on at our school now?

| What are the ways in which our school PRODUCES carbon dioxide emissions? |
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| What are the ways in which our school community REDUCES carbon dioxide? |
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## Define the Problem

**WHAT is the problem you are trying to solve?**

Using the ideas you brainstormed above, decide on a problem you can solve that meets the criteria in the chart below:

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|---|---|
| Describe the problem you want to solve. | |
| How does this problem relate to carbon dioxide levels, either through emissions or reductions? | |
| What data could you collect about the current state of this problem? | |
| What are some possible changes your school community could make to positively impact this issue? | |
| How can you measure or observe the changes in your possible solution? | |

# Develop a Plan for Data Collection

| Describe a detailed plan for collecting data on the current situation. | |
|---|---|
| How will you collect it? | |
| When and for how long? | |
| What materials would you need? | |

In the space below, draw or insert a blank data table that you will use to collect your data. Do you need to collect multiple sets of data and average your results?

## Collect Data

Complete your plan for collecting data by recording it into the chart you created above.

Describe any challenges you had in collecting your data.

Describe any circumstances that might have affected the data you collected. For example, did the weather, day of the week, time of day, or other factors affect your data?

## Graph Data

Create a graph of your data by hand or using a spreadsheet and insert below.

# Design a Solution

| What are 3 possible solutions that would create positive change in your school community and directly impact the problem you identified? | How could you observe or measure the change these solutions would bring about? (relate this back to your original data collection- what would change if your solution were successful) |
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| Choose the solution that your group will try based on feasibility, ability to measure results, or personal interest. Create a detailed plan below for implementation using the prompts. | |
|---|---|
| What is your proposed solution? Write a detailed plan. | |
| What resources will you need to enact your solution? | |
| Whose help or permission will you need in order to act and what is your plan for contacting them? | |
| How and when will you measure your results? | |

## Evaluate Your Solution

Document how your group implemented your solution.  You may also insert photos or videos as evidence.

Measure your results: collect qualitative and quantitative data on the results of your solution. Insert data table, graph, and descriptions below.

## Share your Results

What would be the best way to tell your school community about your problem and solution? Infographic? TED Talk? Video? Presentation?

| What information do you feel is most important to share so your school community understands the problem and the solution? |
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| |

As a group, create your documentation.  Insert link below or attach documentation.

## Reflection

Describe what worked well in your design solution and what you would do next time to make your solution even more effective.

Discuss the challenges with your solution and how you might solve them.

How could your solution be applied outside your school community? In Hawaii? Globally?

Describe three elements from other groups' solutions that worked well and why.

Thinking about the solutions from all groups, describe how you could combine the best elements of multiple designs for a more comprehensive plan for your school.