

Passive Solar Home Design Project

This semester, you'll be working on a major project that will incorporate our learning of the greenhouse effect, climate change, weather, wind, climate, energy from the sun, reflection and absorption of heat, architecture, and engineering.

Our driving question for this project is:

How can we design a home that is comfortable in all conditions without the use of electricity?

You're going to answer that question by completing a few parts to this project

1. Justification website – Your goal in this assignment is to **create a website that justifies why you would want to design a home without electricity**. Your website must include at least three multimedia pieces (graphs, pictures, videos) and link to all of your sources. Your website must address the following topics and demonstrate your understanding:
 - a. Carbon Cycle
 - b. What happens to the Sun's Energy
 - c. Greenhouse effect
 - d. Climate change
 - e. Ways of generating electricity (coal, natural gas, solar, wind, etc.)
 - f. Economic impact of electricity
 - g. Any other reasons you can come up with.
 - h. Passive solar design

2. Site selection – For this assignment, you must gather weather, climate, and seasonal data for three sites around the San Marin campus. Based on this data, you must **select one site to build your structure**. You will submit your data and your decision on a site on another page on your website that includes photos of your site options. This page must have information about:
 - a. Temperature
 - b. Humidity
 - c. Sun vs. shade
 - d. Sun angle in relation to seasons
 - e. Climate
 - f. Precipitation
 - g. Wind patterns

3. Building Design – Now it's time to design your structure. You will take the information you've gathered about your site and use it to **design a passive solar structure**. All of your design will be documented and entered as another page of your website. It will include:
 - a. Blueprints that are drawn to scale for all surfaces.
 - b. Key features of your design and how they'll help the structure.
 - c. The materials you've selected and why you chose those materials based on their absorption and reflection.
 - d. A scale model of your structure, built using representative materials at around 1/10 size.
 - e. Extra Credit: A list of necessary materials including cost estimates.