**Climate and the Interaction of Earth Systems**

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**NGSS Performance Expectations:**

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| --- | --- |
| ESS2-6. | Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates |
| ESS2-2. | Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth systems |
| ESS2-4. | Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate |

**NGSS Disciplinary Core Ideas:**

ESS2.C: The Roles of Water in Earth’s Surface Processes

* The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns.

ESS2.D : Weather and Climate

* Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.
* The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents.

**NGSS Science and Engineering Practices:**

* Developing and Using Models
* Analyzing and Interpreting Data
* Constructing Explanations
* Engaging in Argument from Evidence
* Obtaining, Evaluating and Communicating Information

**NGSS Cross Cutting Concepts**

* Patterns
* Systems and System Models
* Energy and Matter
* Stability and Change

**Roller Coasters and Climate Change**

A group of investors want to build America’s next great theme park. The syndicate is looking at several possible sites for the theme park:

* Washington D.C.
* Wichita, Kansas
* Sacramento, California
* San Francisco Bay Area, California

While some of the investors are interested in putting the theme park near the ocean because they think they will attract more vacationers that way. Other investors are concerned about the effect the ocean will have on the weather at the theme park. They think they will get fewer customers if the weather is too wet or cold. Many of the investors are worried about climate change. These investors want to invest for the long term, and are concerned about how the climate might change at the theme park over then next 50 years.

Your team of earth science consultants has been hired to investigate the effect the ocean might have on the theme park, now and in the future. Your job is to:

1. Find out how being near or far from the ocean could affect the climate of the four proposed theme park sites.
2. Find out how climate change might affect each of the sites.
3. Make a recommendation of where the investors should put their theme park, based on your investigation.

To help you in your investigation, our earth science consulting company must first develop of model to explain the relationship between the ocean and climate.