Science Planning

**Unit 3: Earth’s Weather Patterns and Climate (8-9 weeks)**

**Week 7 Big Idea: Earth’s atmosphere and unequal heating keeps temperatures stable enough to sustain life**

Week 7 –2/17 – 2/18

2/18 YWBAT develop a model and construct an explanation

Success is: students models and explanations should demonstrate the understanding that unequal heating of the earth causes convection currents to form in cells across the globe. These cells create areas of high and low pressure which affects the climate

Phenomena: The Atacama is the driest desert on earth

* We know that the earth is unequally heated due to its spherical shape.
  + If needed, review climate vs. weather
* Display and pass out climate regions map. Students spend a few minutes writing observations.
  + Share as a class
* Turn/guide student attention to the desert zones (specifically the Atacama) What patterns are there?
  + Students should point out that the deserts are all found at 30 degrees north and south
* Pass out blank globe latitude map. Mark the latitudes. Then, point out the 30 degree parallels. Why would there be little rain here? What kind of conditions are required for no rainfall?
  + High air pressure.
  + Why would there be consistently high air pressure here? What would cause that?
* Students watch:
  + <https://www.youtube.com/watch?v=xqM83_og1Fc>
* Teacher leads a model drawing and explanation of Hadley Cells adding high and low pressures according to where the air is heated and rises into the atmosphere, forming low pressure, 0o and 60o latitude, and where air is cool and compresses, forming higher pressures because it is sinking, 30o and 90o latitude
* What does this mean for the Atacama?

2/19 - YWBAT Develop a model and construct explanations

Success is: explanations should demonstrate understanding that the earth's rotation causes patterns in wind direction based on latitude

Phenomena: The Atacama is the driest desert on earth

* Review learning from yesterday: Convection cells form in the atmosphere because the earth is unequally heated. This causes areas of high pressure and areas of low pressure to form.
* Recall reading about pressure systems and that a mass of high pressure next to a mass of low pressure creates wind. (p. 81)
  + Refer to models from yesterday: Which direction would winds blow globally?
* Give out map of global wind currents and discuss: what patterns do you notice? What do you wonder? Why do these patterns exist?
* Watch video: <https://www.youtube.com/watch?v=PDEcAxfSYaI>
* Add winds to the model of cells.
* So what is the core scientific idea here?
  + Write it on your model: The rotation of the earth causes patterns in wind direction based on latitude
* So, what is happening in the Atacama? How might this contribute to dryness?
  + Discuss
* Exit ticket: Write an explanation of the wind patterns seen on the map

2/21 - YWBAT Develop a model and construct explanations

Success is: explanations should demonstrate understanding that the earth's rotation causes patterns in wind direction based on latitude

Phenomena: The Atacama is the driest desert on earth

* Ocean temperatures, currents, and climate
* We know that the wind affects the ocean. How?
* Today, we are going to investigate further what effect the hydrosphere (ocean) might have on the climate and lack of rain in the Atacama
* Pass out map of ocean temperatures.
  + Students make observations and ask questions. Many should connect what they see in the Atacama with the current maps seen yesterday.
* Summarize the concept read in "Global Conveyor Belt" from NewsELA
* Pass out short encyclopedia entry and graphic of current.
* What is going on in the hydrosphere near the Atacama? What effect would come from having cold water on the coast?
  + Discuss
  + Whole class write