Intended Audience

The following unit of instruction is intended for Roseville High School students enrolled in CP Earth Science. Classes consist mainly of 9th and 10th graders and for most students; it is their first high school science class out side of middle school. Prerequisite knowledge includes basic, fundamental physical science skills and concepts they should have acquired in previous instruction.

Graphic Justifications

Heading Graphic:

I wanted the heading banner for my website to have a look and feel to it that is alluring and engaging; a banner graphic that gives the learner a sense of fascination and wonder. To invoke these feelings, I searched for a font with a specific typography; one that relates to the motion and dynamics of wind. Eventually I came across a “Storm” font which initially did not give me the effect I was looking for. However, after adding some filters to the font, it quickly grew on me and clearly stood out. Other design principles I incorporated into my design was the use of hierarchy, color and typography. I modified the graphic based on feedback I received. Rather than three levels of hierarchy, I simplified the design only to incorporate two levels. Objects that are bigger demand more attention. Using size as a hierarchal tool is an effective way of guiding a viewer’s eye to a particular portion of the page (Jones, 2011). In this case, I wanted my “wind tutorial” text to stand out a greater degree than the “interactive” text. I also wanted to create a banner that utilizes a unique typography or text that would help my students conjure up previous notions of wind in order to get them thinking about the topic. Typography if used in a design correctly is deeply rooted in its overall theme, tone and message (Bailey, 2011). The result was an effective banner and typography that captured the essence of wind.

Conduction and Convection Graphic:

For the conduction and convection graphics, I wanted to show how heat is transferred on a molecular level; and on a level we are all familiar with, henceforth the hot pot of water and blue molecules. While creating the graphics,
I decided to utilize color (red and blue) to better illustrate temperature—mainly cold and heat. To create the molecules, I used a simple circular shape to simplify the concept against a white background. The molecules were properly aligned and given a “glow” filter to make them appear hot and energized. The convection graphic utilizes shape in the form of blue and red arrows which imply direction and motion. To create contrast, a lighter, transparent shade of blue was used for the water inside the pot. After considering feedback from my previous design, and looking at my overall website color scheme; I decided to redo and modify these images to incorporate color. At the same time, I also kept design principles in mind such as proximity, alignment, and shape (Lohr, 2008). The design will be effective due to the text within proper proximity and alignment with the actual visual diagram. Shapes provide the learner with direction and imply a dynamic process (Lohr, 250) The shapes also contribute to the overall atmosphere of the website. The form, color, size and other characteristics for the shapes in a layout can determine its mood and message (Miller, n.d.).

**Land and Sea Breeze Graphics:**

The four daily wind images were created to show how sea and land breezes are generated during the day and night. These winds are the result of the uneven heating that occurs between land and water. Once students have grasped the concept of heat transfer, they begin to understand how winds work on a local, simplistic level. To illustrate these daily winds, I began applying various gradients to the ocean and land to create a sense of depth and space. These gradients also add an element of contrast that helps the learner differentiate between the land, air, and sea. To exaggerate the temperature difference that occurs between land and water, I added temperature readings in close proximity to the land and water. Once again, blue and red colors were used to indicate cold and warm air. To imply direction and motion I used shape in the form of circular arrows. Once again, I wanted to create a sense of mood and atmosphere within my website that was consistent and easy for students to follow. Simplicity is key, and it is an essential element to keep in mind when designing images and graphics. Considering this, you will notice a consistent, straightforward theme within the land and sea breeze diagrams that once again utilize proximity, shape, and alignment (just like the conduction/convection graphics). However, to further simplify my website, and make it more effective, I utilized white space between visual elements. Color and space—specifically white space which can be used to divide text and graphics (Lohr, 2008). The importance of both white space and simplicity shouldn’t be underrated. Used correctly, they can enhance the performance of a web-site, improve readability and make a great first impression (Friedman, 2007).
Coriolis Graphics:

To really understand how winds behave on a global level, students need to learn about the Coriolis Effect. When creating my visuals, I wanted to show how free moving objects, such as wind, are affected by the rotating Earth. To create the Earth I used a blue Circle with a dark blue circular gradient along the outer circle. I then used the pen tool to create the continents, and to be consistent with depth, I applied a gradient to them as well. I then wrapped the text around the north and south poles. Shapes were incorporated into the design process in form of red and yellow arrows. The four Coriolis Effect graphics in my website were modified from the initial design to accommodate feedback. I also designed them so they would stay in harmony with other graphics throughout the website. Based on prior feedback, I made my text stand out more, I also used a different shape for the enclosure of the key and all other diagrams for this lesson. Aside from the modifications, the image will be successful because I used a traditional spectral scheme of colors that are based on Nature (blue for water, white for ice, etc.,) to represent reality based settings. Just like a ski map that uses different colors to label the difficulty of their runs, I used yellow and red arrow labels to indicate wind direction (Lohr, 2008). On the globes, I used a gradient to illustrate depth and to also add some aesthetic appeal. When considering value, I chose a black background to make my image standout and appear slightly brighter to catch the learner’s attention. I also used a shadowing effect on the “red” and “yellow” arial font to add emphasis to the text. Finally, when creating the graphic, I wanted to keep in my previous principles such as the figure and ground concept, CARP, and shapes.

Uneven Heating Diagrams:

Now that students have learned about the Coriolis Effect, they can now begin to learn about the circulation of wind on a global scale. But first, I needed to make an image that showed how sunlight heats the Earth unevenly. To do this, I used my global diagrams from the Coriolis Effect and scaled them to make them larger. Next, I created 3 rectangles with a linear/transparent gradient and filled them in with text to be consistent with proximity. Another red transparent layer was added on top of the Earth to reinforce the concept of ‘Uneven Heating’. I placed these images against a black background to create a natural contrast that makes Earth appear to be in Space. These images are effective for a couple of reasons; for one, it utilizes the figure-ground concept appropriately, not to mention it has been revised to accommodate prior feedback. In the end, I ended up putting the text in all the “beams” of sunlight to avoid confusion. The image also creates a distinctive relationship between the figure and ground. The object of focus in this case the figure, does not compete with the black background—creating an successful element of contrast. An effective and perceptible figure–ground relationship occurs when the eye can identify a figure as an object distinct and separate from its ground or compositional background. This perception is dependent solely on the design principle of contrast (Poulin, 2011). In these three
images, the foreground clearly does not compete with background; keeping the learner’s attention on what matters.

Global Winds Graphic:

The fifth and final lesson is a culmination of all previous lessons. Now that students have learned about the Coriolis Effect and the Earth’s uneven heating, the next logical step is to introduce them to the Earth’s global wind patterns. To craft this graphic, I first scaled the Earth template from previous designs and aligned it on the right side of my stage. To maximize contrast, I then added a layer of white latitude lines on top of the globe along with three distinct colored arrows. The use of shape and proximity are evident by the text boxes adjacent to each prevailing wind pattern. The last and final image is effective because it utilizes numerous design principles such as contrast, alignment, repetition, proximity, shape, typography and the figure/ground concept. The use of shape and proximity are evident by the text boxes adjacent to each prevailing wind pattern. The arrows illustrate alignment and repetition, not to mention shape to represent wind direction. All these design principles result in an effective final diagram for this unit. Modifications from feedback included altering the background color to black (to increase contrast) and changing the shapes around the text boxes so they appear more round and natural.

References


