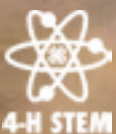




Wonderful Wind



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Wonderful Wind

OVERVIEW

You may remember from our weather camp our discussion about wind and how the wind works to help create and form tornadoes. The wind can also be transformed into energy which you will learn more about later in this camp. Today lets cover some wind power basics.

When gases (like air) warm up, atoms and molecules will move faster spreading out and rising, decreasing the density allowing it to rise. That is why steam off a pot always goes upward. Cold air will slow atoms down and bring them closer together, making them more dense so cold air sinks and stays lower. Since warm air rises it leaves behind an area of low pressure. Why does this happen?

It's due to **density** and **diffusion** and it happens all the time. **Diffusion** is defined as the act of spreading or allowing to spread freely. **Density** is defined as the degree of compactness of a substance.

When warm air rises, cold air moves in, replacing the warm air creating wind. Winter brings higher temperature gradients especially with cold fronts moving in which can cause higher wind speeds then normal because the cold air moving in is at a lower temperature than the air being displaced.

Temperature gradient describes the temperature difference between two points. A higher temperature gradient has increased pressure differences between air masses and a higher wind speed. High pressure zones cause clear skies and sunny days. Low pressure zone has light, warm air and usually causes clouds and rain.

Have you been to the beach? Was it windy when you went? Have you noticed why the wind changes direction at night?

This is because during the day the sun warms up land faster than it can the sea creating an air current pushing from the sea to land. The opposite happens at night. Land will lose heat faster than the sea does so it creates an air current pulling wind out to sea from land. Lets try this out and see how it works in today's activity.



ACTIVITY

MATERIALS NEEDED

Two metal pans

Ice

Sand

Candle

Cardboard box (if necessary to block a draft of air or wind)



MATERIALS NEEDED

Step 1: Set up in an area where you will be free from any drafts. I need to make a draft free space. You can make a three sided screen by cutting off one side of a cardboard box.

Step 2: Pour sand into one of the pans and put it in the oven to heat it up. 300 degrees for 5 to 8 minutes.

Step 3: Now fill the second pan with ice.

Step 4: Place the two pans side by side in your draft free space. (note put your hot pan on a pot holder)

Step 5: Place the candle in the middle of the two pans. Then light it and blow it out. Observe and note which direction the smoke flew.

When you set the pans side by side you are creating a mini low pressure zone. The air is flowing from the high pressure zone(your hot sand) to the low pressure zone (ice cubes) to even out. This is why there is almost always a breeze at the beach.

