Name: _____

Captivating Convection: Transferring Heat from the Sun

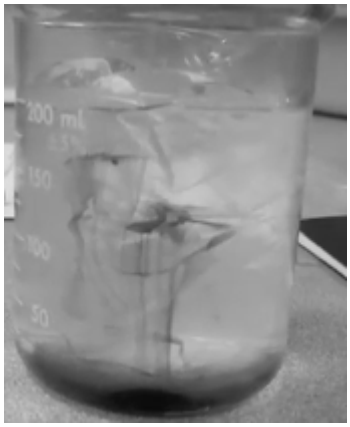
Have you ever wondered how heat from the sun reaches different places? One reason some of the heat from the sun gets transferred is through a process called convection! **Convection** is like a secret messenger that carries heat energy from one place to another.

Here's how it works: The sun sends out rays of light that warm up the air and land. When the air gets hot, it starts to rise up because it becomes lighter than the cool air around it. It's like a balloon floating up in the sky!

As the warm air rises, it leaves a space behind. Cool air rushes in to fill that space. This creates a cycle of movement called **convection**. It's like a big dance between hot and cool air!

But how does this convection dance help move heat energy from the sun? Well, when the warm air rises, it carries the heat energy with it. It's like the warm air gives the heat energy a piggyback ride! As the warm air moves up, it takes the heat energy to new places.

Once the warm air reaches higher in the sky, it starts to cool down. Cool air is heavier and likes to sink. So, the cooled-down air starts to sink back down to the ground. As it sinks, it brings the heat energy back down too.



This cycle of rising and sinking air happens all the time, creating a continuous flow of heat energy. It's like a never-ending conveyor belt, moving heat from the sun to different places on Earth.

We can see convection happening in many ways. Have you ever noticed steam rising from a hot cup of cocoa? That's convection in action! The heat from the cocoa warms up the air above it, making it rise and create steam. It's the same idea as the sun warming up the air and creating convection.

So, the next time you feel the warmth of the sun or see steam rising, remember that convection is one-way heat from the sun gets moved from place to place.

Let's explore how convection works. We can see it by heating up water. Follow the instructions below.

1. We have three beakers of water.
2. Beaker number 1 is filled with water that has just been sitting here at room temp.
3. Drop a few drops of food coloring into the water. Time it for one minute to see how quickly the food coloring moves and colors the water.
4. Estimate how much of the water in the beaker got colored by food coloring. _____

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5. Let's get beaker number 2. This one has been sitting in the fridge for a while and is filled with cold water.
6. Drop a few drops of food coloring into the water. Time it for one minute to see how quickly the food coloring moved and colored the water.
7. Estimate how much of the water in the beaker got colored by food coloring. _____

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8. Let's get beaker number 3. I have been heating this beaker up so don't touch it. It could burn.
9. Place a few drops of food coloring into the water. Time it for one minute to see how quickly the food coloring moved and colored the water.
10. Estimate how much of the water in the beaker got colored by food coloring.

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11. Which beaker moved the food coloring around the quickest? _____

12. What process moved the food coloring around?_____

Color each beaker with the amount of colored water you observed.

Beaker 1: Tap Beaker 2: Cold Beaker 3: Hot