

Name: \_\_\_\_\_

## Hot Air Rises—Cold Air Sinks

### **HOT RISES—COLD SINKS**

In these two videos, Jared demonstrates the principle that hot air rises and cold air sinks.

When air is heated, its molecules gain energy, move faster, bump into each other harder, and get pushed farther apart. In other words, the heated air expands. This makes hot air less dense (lighter) than cold air. So, it rises-up and floats on top of the denser (heavier) cold air.

In the first video, Jared demonstrates how *hot* air rises and *cold* air sinks by showing that hot-water rises and cold-water sinks.

Hot Rises/Cold Sinks: <https://www.youtube.com/watch?v=bN7E6FCuMbY>

For the purposes of Jared's demonstration, water and air behave similarly. Both are fluids—i.e. they aren't rigid like solids; they flow. Their molecules can move around and tumble about. Both air and water expand when heated and become less dense. Their molecules move closer together when cold and farther apart when hot.

***more   color   closely   cold   hot   loosely   less***

1. In the demonstration, Jared uses water instead of air because he can \_\_\_\_\_ the water so you could see what's going on.
2. He drops a *blue* ice-cube and an open bottle of *red* hot-water into a tank of room-temperature water. The \_\_\_\_\_ water floats on top of the room-temperature water, and the \_\_\_\_\_ water sinks to the bottom of the tank.
3. The molecules of the *cold* water are \_\_\_\_\_ packed together, forming a \_\_\_\_\_ dense layer of *cold* water at the bottom of the tank.
4. The molecules of the *hot* water were more \_\_\_\_\_ packed, forming a \_\_\_\_\_ dense layer of *hot* water at the top of the tank

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In the next video, Jared uses a balloon to demonstrate once more that hot-air rises and cold-air sinks.

Hot Air Rises: <https://www.youtube.com/watch?v=ZPErStqSSMk>

In this demonstration, Jared has a bottle with air in it. He's put a balloon on top of the bottle to capture the hot air as it rises.

***collapses rises-up slower space faster spread-out closer***

1. When Jared puts the bottle in a pot of hot water, some of the air in the bottle \_\_\_\_\_ into the balloon on top.
2. When he then puts the bottle into a bowl of ice water, and the air in the balloon sinks down again into the bottle, and the balloon \_\_\_\_\_.
3. Heating the bottle makes the air inside expand. The heat causes the air molecules to move \_\_\_\_\_, bump into each other harder, and \_\_\_\_\_.
4. Cooling the bottle makes the air inside contract. The cool air molecules move \_\_\_\_\_. They don't need as \_\_\_\_\_ now because they aren't bumping into each other as often or as hard as they were. So, they stay \_\_\_\_\_ together.

