The Amazing Water Trick

Do hot water and cold water mix?

What do I need?

- Two identical small, wide-mouthed jars (baby food jars are perfect)
- Hot water
- Cold water
- Food coloring
- Index cards or squares of waxed paper
- Scissors
- A large, shallow baking pan (if you don't have one, do this activity in the sink--it can be messy)

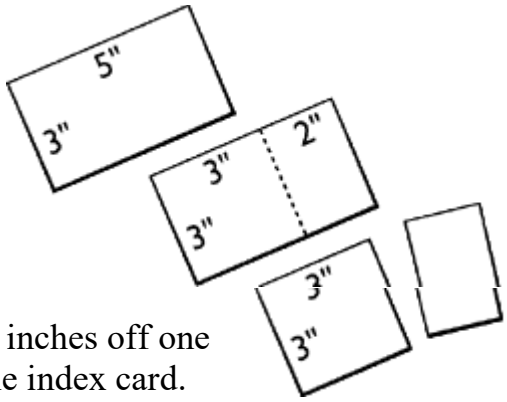
Tips for Home Scientists

This experiment can be tricky--and messy. You may want to practice step 6. Get a grown-up to help.

What do I do?

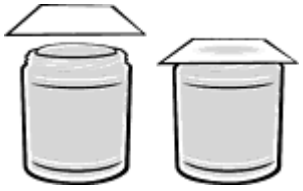
1 Fill one of the jars with very hot tap water. Add a drop of red food coloring. What happens to the drop? Watch for a minute, then put the red jar into the baking pan.

2 Fill the other jar with cold water. Add a drop of blue food coloring. What happens to that drop?

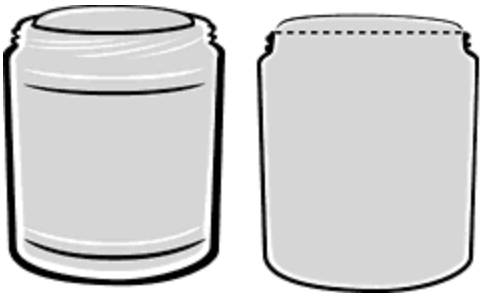


3 Cut about 2 inches off one short side of the index card. You should end up with a square about 3 inches on a side.

4 Slowly add more water to the blue jar until you can see a bulge of water over the rim of the jar.



5 Lay the square card carefully onto the top of the blue jar. Tap the card gently with your finger. (Don't poke it. You want the card to be flat and form a seal with the water and the jar.)



6 This part is very tricky. You may want to practice it a few times over the sink with a jar of plain water. Pick up the blue jar and turn it straight upside-down. You don't need to put your hand on the card. The water will hold the card in place. (Just flip the jar over. Don't hesitate. If the jar is tilted but not turned over completely, the water will gush out and make a mess.)

7 Put the upside-down blue jar right on top of the red jar.

8 Have someone hold onto both jars while you very slowly and carefully pull the card out.

9 What happens? What color is the water in the top jar? What color is the water in the bottom jar?

10 Empty both jars. Rinse them. Repeat steps 1 through 6--but put the jar with the blue-colored cold water in the baking pan and put the card on top of the jar with the red-colored hot water. Turn the red jar upside-down and put it on top of the blue jar

11 Slowly pull out the index card. What happens? What color is the water in the top jar? What color is the water in the bottom jar?

AFTER performing the procedure... *Use one of the sentence starters to help you express their observations clearly.*

"During, the investigation, I noticed... when the two liquids met" or "When the liquids mixed together _____*."*

POST LAB Directions-Record responses in the chart on the left side- output page.

1.) Describe your first reaction when the liquids met.

2.) Draw your observation. Label the liquids and contents.

3.) What did you notice happened when the two liquids met?

What's Going On?

What if I don't have any baby food jars?
If you don't have any baby food jars and you don't have a baby who will empty some jars for you, we suggest that you buy a jar of strained peaches or applesauce baby food. You can empty the jars over vanilla ice cream for a tasty dessert or mix them in a blender with milk and ice to make a smoothie. If you don't want to buy baby food, we have also done this experiment using two identical small, clear, drinking glasses. You just have to make sure that the mouths of the glasses match up perfectly, without a leak.

Why does the water mix so quickly when the glass of hot water is on the bottom?

If you've already made a **Salt Volcano** or a **Glitter Globe**, you probably know that some liquids float on top of other liquids. Oil floats on water. Alcohol floats on oil. That's because these liquids have different densities. Whenever you put together two liquids that don't mix, the liquid that is less dense will float on top of the denser liquid. A drop of oil weighs less than a drop of water the same size. The oil is less dense than the water, so it rises to the top.

When you heat up water, the water molecules start moving around faster and faster. They bounce off each other and move farther apart. Because there's more space between the molecules, a volume of hot water has fewer molecules in it and weighs a little bit less than the same volume of cold water. So hot water is less dense than cold water. When you put the two together with the hot water on the bottom, the hot water rises to the top, mixing with the cold water along the way and creating purple water.

Why doesn't the water mix when the hot water is on top?
When the cold water is on the bottom, the hot water doesn't have to rise--it's already on top. The cold blue water stays on the bottom and the hot red water stays on top.

How can I experiment further?
What do you think would happen if you tried this experiment with a jar of salt water on top and a jar of water without salt on the bottom? Try it and see. Use food coloring to color the salt water a different color than the plain water so that you can see what happens.