Experiencing density with hot and cold water

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Materials

- A tray (or use a sink if one is nearby)
- 2 identical glasses
- Some cardboard
- Food coloring
- Very cold water
- Hot water

STEP 1: Cold water

1. Pour the cold water into the glass to the rim to fill the glass up.

2. Add a few drops of blue food colouring in the cold water to make it stand out.

3. Move the glass to the tray.

STEP 2: Hot water

1. Pour the hot water into the other glass to the rim to fill and even just overflowing, so there is a lot of water tension.

2. Add a few drops of red food colouring in the hot water to make it stand out.

3. Move the glass to the tray next to the other glass.

STEP 3: Density comparison

1. Put the cardboard on top of the glass which contains hot water and push it down.

2. Turn the glass upside down.

3. Remove your hand from the cardboard carefully and if you pushed the cardboard hard enough it shouldn't have any air, so the cardboard would stick to the glass.

4. Place the glass of hot water with the sticky cardboard onto the cold-water glass so we have cold water at the bottom and hot water at the top.

5. Carefully remove out the cardboard placed in between the two glasses.

DISCUSSION

It can therefore be seen that cold water always stays at the bottom while hot water stays at the top and therefore the two waters do not mix. This is due to the fact that cold water is denser than hot water. This does not mean that cold water is heavier. It means that the cold water particles are more compacted than the hot water particles.