'Changing States' Experiment.

Water evaporation happens all around us even though we can't usually see it easily. Both the ocean and our bodies are made up largely of water. We can learn more about our ocean, and ourselves by learning more about water. As water changes state, the processes 'take' (endothermic) and 'release' (exothermic) heat energy. Just as the ocean is cooled by evaporation, so are we. Water molecules are still H_2O, during evaporation as water changes state from liquid form to gas form. As the most highly energized water molecules bouncing around break the weak polar bonds that hold them down as liquid, they enter the air as water vapour. The amount of kinetic (heat) energy left in the water gets smaller as the more energized molecules leave: the water cools proportionally. This change from water to gas, takes heat energy away from the water. If you've ever had a fever you might know how good a damp cloth feels on your forehead. It is the water in the damp cloth that absorbs your heat energy and it is evaporation (heated up, energized H_2O molecules) changing from liquid to vapour, that cools the cloth and you.

We can easily feel evaporation effects using our own bodies' temperature sensors. How cool is that? Lets run a simple qualitative (no exact measurements made) experiment.

1. Wet one hand with warm water (at about body temperature or 37°C).
2. Leave the other hand dry.
3. Then wave your hands around while doing your favorite dance move, for about a minute.
4. After the one-minute dance 'party', compare the temperature of your two hands on your cheeks. Which is cooler?

Reflection

About five minutes later, are your hands the same temperature? Which one is cooler?

Write down what you felt over the time-line of the experiment, noting lingering effects.

Redesign this experiment to make it better – include three points.

How would you redesign the experiment to make it quantitative? In a quantitative experiment, we would record actual measurements of how cold or warm temperatures are with and without evaporation and graph resulting data to see trends, instead of using qualitative feelings.