

Background science

Water covers more than 70% of the Earth's surface, and all living things need water to survive. The water cycle is nature's way of purifying, circulating, and replenishing water.

There are four basic steps in the water cycle*:

1. Evaporation: When heat from the sun turns liquid water into gaseous water vapor, causing it to rise into the air.
2. Condensation: When gaseous water vapor cools at high elevations and becomes liquid (or solid) again
3. Precipitation: When liquid water (e.g., rain) or solid water (e.g., snow) falls to the ground.
4. Collection: When large amounts of water gather in oceans, lakes, rivers, and streams

* Other steps sometimes listed as part of the water cycle include *transpiration*, which is when [trees give off water from their leaves](#), and *sublimation*, which is when water in solid form (e.g., ice) converts directly to a gas without passing through the liquid stage. The demonstration described only focuses on the four main steps.

Materials needed for the water cycle demonstration

To create your own water cycle demonstration, you will need to gather the following materials:

- A large, preferably clear container for holding your “ocean” water
- A small container to collect the “rain” that falls
- Warm or hot water (keep kids safe! the hotter the water the faster the demonstration will finish, but safety is more important than finishing quickly)
- Salt
- Plastic cling wrap
- Ice

How to conduct the water cycle demonstration

Step 1: Pour the warm or hot water into your large container and add plenty of salt. Stir well to make your “ocean.” (We start with warm or hot water to speed up the evaporation phase of the water cycle.)

Step 2: Place a small container in the middle of your larger container. This is where you will “collect” the rain that falls.

Step 3: Cover the top of your container with plastic cling wrap. This will provide a place for your water to condense into “clouds.”

Step 4: Grab some ice. Place several ice cubes in the center of the cling wrap covering the top of your container. The cool ice in the “sky” will cause the evaporated water to condense when it rises up.

Step 5: Wait several minutes. The exact amount of time you need to wait will depend on how hot your water was, among other things.

However, after several minutes you should see water condensing into “clouds” on the underside of the plastic cling wrap.

Step 6: Once enough water has condensed into “clouds,” precipitation will begin. Water will drip from the plastic cling wrap back into your ocean. Some of that water will hopefully fall into the small container you placed into the middle of your “ocean.”

Step 7: Once you have collected sufficient rain water into your small container, take a drink. Notice how it isn’t salty compared to the “ocean water” you began with. That is because only the ocean water evaporates, not the salt that is in it. Thus, rain water is okay to drink even if it originally came from the salty ocean.