Tampa's Demand for Water

Water is the most vital compound necessary for human life. When we reach for a bottle of water, rarely do we think of the amazing cyclic journey that delicious thirst quenching beverage took.

evaporation

The Water Cycle in our Ecology

Water runs through a complex cycle and is one of four cycles found in our ecology. Water can enter the cycle at any one of five points; **evaporation, condensation, precipitation, percolation** and **transpiration** and be incorporated into the **Hillsborough River**, our primary water source. Our sun is the driving force of the entire water cycle, it is the conduit for **evaporation**, one of the five parts of the cycle. While the sun evaporates water from every available source on tthe planet, eighty six percent of the global evaporation occurs from our oceans, like Tampa Bay and the Gulf of Mexico. This causes a cooling effect known as evaporation cooling. The sun heats the water in the bay and other bodies of water, transforming it to water vapor.

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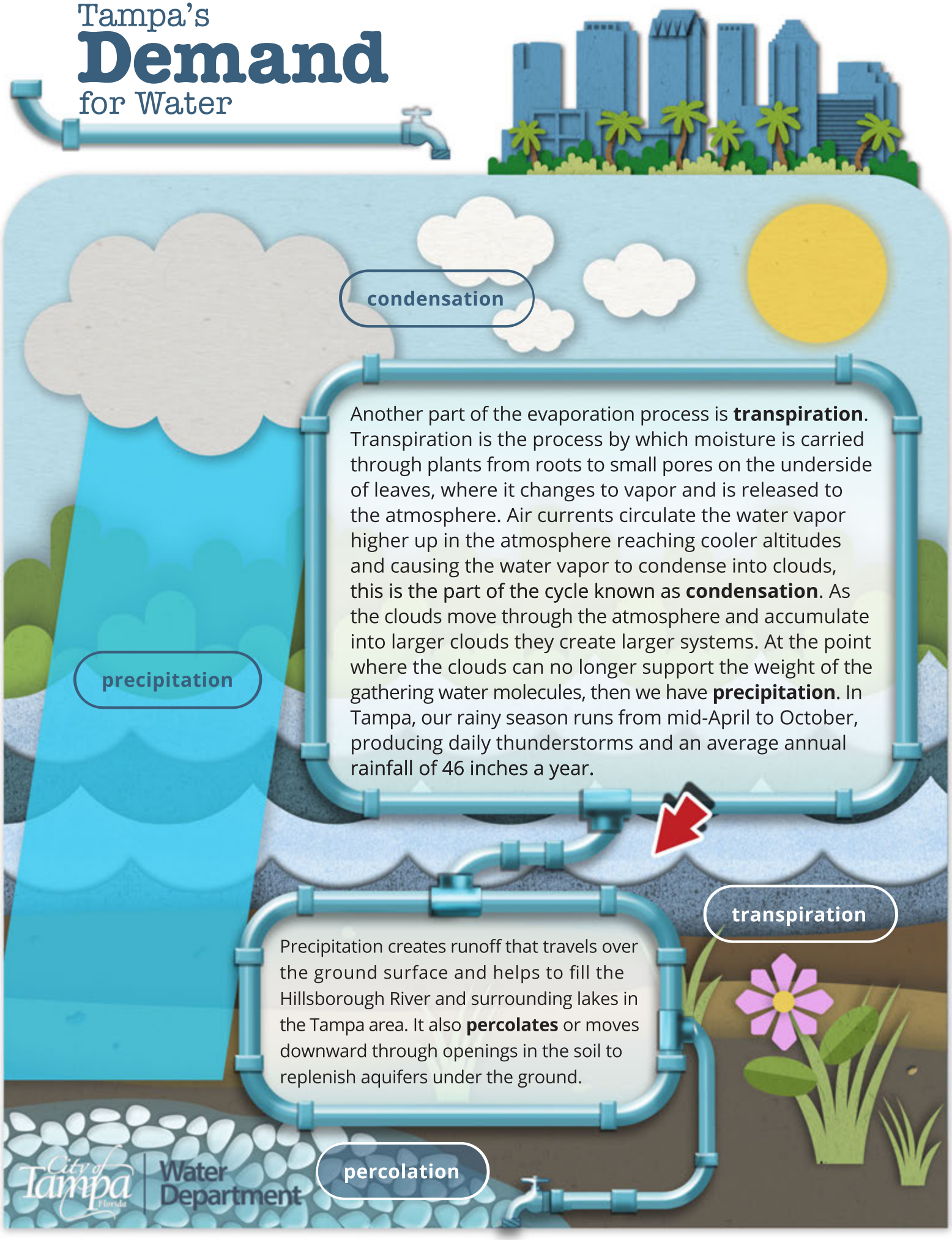

Another part of the evaporation process is **transpiration**. Transpiration is the process by which moisture is carried through plants from roots to small pores on the underside of leaves, where it changes to vapor and is released to the atmosphere. Air currents circulate the water vapor higher up in the atmosphere reaching cooler altitudes and causing the water vapor to condense into clouds, this is the part of the cycle known as **condensation**. As the clouds move through the atmosphere and accumulate into larger clouds they create larger systems. At the point where the clouds can no longer support the weight of the gathering water molecules, then we have **precipitation**. In Tampa, our rainy season runs from mid-April to October, producing daily thunderstorms and an average annual rainfall of 46 inches a year.

Precipitation creates runoff that travels over the ground surface and helps to fill the Hillsborough River and surrounding lakes in the Tampa area. It also **percolates** or moves downward through openings in the soil to replenish aquifers under the ground.

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During times of extreme drought the water supply dwindles. Generally, rainfall is related to the amount of water vapor in the atmosphere, combined with the upward forcing of the air mass containing that water vapor. If either of these are reduced, the result is a **drought**. This can be triggered by an above average prevalence of high pressure systems, winds carrying continental, rather than oceanic, air masses. Ridges of high pressure areas form with behaviors that prevent or restrict the developing of thunderstorm activity or rainfall over one certain region. Oceanic and atmospheric weather cycles such as the El Niño-Southern Oscillation (ENSO) make drought a regular recurring feature of the in the bay area. Often times Tampa experiences both the El Niño and its opposite – La Niña – weather patterns. Activities in the Tampa area can also trigger a drought. Overfarming, excessive irrigation, deforestation, and erosion adversely impact the ability of the land to capture and hold water.

Ninety seven percent of the world's water is salt water, leaving only three percent as freshwater. Freshwater is a renewable resource yet the supply is steadily decreasing. Water demand in the Tampa area increases each year as our population increases. As you know now, our primary source of water is the Hillsborough River, but we also rely on alternate sources of water like well water, lakes and reclaimed water. Since the demand for water is ever increasing and our supply is limited it is more important now that we conserve the water we have. As individuals, we can do things such as avoiding excessive watering of the lawn, high efficiency washers, dryers and hot water heaters, low flow toilets, avoiding washing the car, and things as simple as taking a shower instead of bath.

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Experiment:

Develop a garden and tracks its progress to see if growth rate has a linear relationship with rainfall.

Step 1

You will need a control and a variable plant to track the progress of growth over a set amount of time.

Step 2

Track the growth in centimeters of your variable in relationship with the daily reported rainfall (cm). Track the growth of your control in relationship to daily watering in mililiters.

Step 3

Determine if rainfall has a linear or nonlinear rainfall relationship to growth of garden.

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