

## Plant Investigation B—Hydroponics

For centuries, people have known about plants that can grow in water. The Aztecs had floating water gardens 1,000 years ago. Marco Polo reported about 750 years ago that the Chinese were growing plants in water, and it might have been done even longer ago in ancient Egypt and Mesopotamia. In 1937, the method of growing agricultural plants with their roots in water, not in soil, was named *hydroponics*. The water that the plants grow in has tiny amounts of nutrients mixed in. At Walt Disney World’s Epcot® theme park in Florida, many plants are grown hydroponically in greenhouses. In fact, they had a single tomato plant that set a world record, producing over 32,000 tomatoes in one year, and the roots never touched a bit of soil! Hydroponics is used in many places to grow food such as lettuce, tomatoes, and cucumbers, and is especially important where there isn’t much land that’s good for growing crops.



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## Plant Investigation C—How Much Water?

Scientists have investigated the percentage of water that makes up a tree. In order to do this, they compare how much the tree weighs when alive to how much it weighs when it is cut down and totally dried out. It isn’t easy to weigh an entire huge tree, including the roots. In some cases, scientists measure the height and width of the tree to help them estimate the weight. Scientists have determined that different kinds of trees are made up of different percentages of water, but many are nearly 50% water. Scientists have also found that carbon in the wood makes up at least 50% of the weight of the tree.

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## Plant Investigation D—Extra CO<sub>2</sub>

Scientists conducted investigations in which plants in a greenhouse were given extra carbon dioxide (CO<sub>2</sub>). A greenhouse is a building with clear walls used for growing plants. Because the plants were in an enclosed space, scientists could change the mixture of gases in the air around the plants. When scientists increased the CO<sub>2</sub> in the air, the plants grew larger than they did with less CO<sub>2</sub>. These plants also needed extra water and nutrients. However, out in nature—not in greenhouses—increased CO<sub>2</sub> in the air is not generally good for plants. Plants don’t often have the extra water and nutrients they would need to use this extra CO<sub>2</sub>. Extra CO<sub>2</sub> in the air also causes changes in temperature, which can harm plants and other organisms.

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