

# water resources

## Chapter 4 Notes

### Lesson 1: Water on Earth

- Our bodies are made up of 60-75% water. We need to drink plenty of water to stay healthy.
- **All living things need water in order to survive.**
- Earth is the only planet in our solar system covered by liquid water.
- Water is found **on**, **below**, and **above** the Earth's surface.
- Oceans and seas cover about 70% of Earth's surface.
- Salt in the ocean is a result of runoff from land. As runoff flows, it dissolves salt out of soil and rock, carrying it and other minerals to sea.
- Ocean water is salty; it has about 3.5% dissolved salts.
- Fresh water contains very little salt.
- 97% of Earth's water supply is salty and therefore, undrinkable.
- Desalination is any process that removes salt from salt water. Make sure to watch the podcast, "Desalination Animation."
- Two methods of desalination are distillation and reverse osmosis.
- Desalination plants are very expensive to run and they produce brine, an extremely salty waste.
- Okay, 3% of Earth's water *is* drinkable, **but** 2.1% of that is locked up in glaciers and polar ice caps! Yikes! That leaves us with **less than** 1% for drinking, cooking and growing food, showering (a daily necessity☺), etc.
- There are 2 main sources of fresh water: Groundwater and surface water.
- Groundwater is water that collects in spaces and cracks in rocks and soil underground.
- Dig deep enough, even in the desert, and you'll eventually find water.
- Groundwater is difficult to reach. When it is found, it must be pumped to the surface. Not an easy task!
- Guess what? **MOST** of the fresh water we can use is **UNDERGROUND!**
- Surface water, on the other hand, is easier to obtain---no drilling or pumping necessary. ☺
- Examples of surface water are lakes, ponds, rivers, and streams.
- Lakes are bodies of water surrounded by land. Discuss with your family a lake that you have visited.
- Ponds are small lakes. Discuss with your family a pond that you have visited.
- A river is a body of water that flows downhill in a channel. Discuss with your family a river that you have visited.
- A stream is just a small river. Discuss with your family a stream that you have visited.
- Fresh water is not distributed evenly over earth's surface.
- Pollution can damage the water supply.
- Harmful materials and chemicals may find their way into lakes and rivers, making water unsafe for drinking.
- Ground water can also become polluted

- Polluted water is difficult (sometimes impossible) to clean up.
- We have to do our part to keep our water clean and pollutant free. Dinner table discussion: How can we keep our water clean?

## Lesson 2: Water to Everyone

- Communities get fresh water from both underground sources and surface sources.
- The **Colorado River**, along California's south eastern border, provides much of the water for communities in **southern California**.
- **Central California** receives most of its fresh water from the **San Joaquin-Sacramento River** system.
- **The Problem:** Only **35%** of **rain and snow** becomes runoff that supplies rivers and lakes. Even worse, in the hot, dry areas of California, rain water evaporates into thin air or is soaked up by plants' thirsty roots. But wait, there's more bad news: Most precipitation falls between October-April. Crops still need water throughout spring and summer. How do we fix this?
- **The Solution:** **Reservoirs** are helpful because they are built to collect and store water throughout the year and irrigate crops. Some reservoirs are natural lakes or ponds, but many have been man-made by building dams across rivers. **Aqueducts** are a man-made system of channels, pipes, and tunnels that are capable stretching several miles to bring water to dry places. **Wells** can tap into **aquifers** (natural layer of rock or soil through which water moves easily) to bring fresh water to the surface. **Springs** (a natural flow of water from underground) supply fresh water.
- **Note:** if too much groundwater is used the water table may sink, wells may run dry, and the land may actually sink.
- Water straight from a river, lake, or reservoir is not usually clean and safe enough to drink. Water must be treated or cleaned using several steps. Then, from a pumping station, water flows to homes and businesses. We use the treated water for drinking, cooking, bathing, doing laundry, etc. The wastewater goes into the sewer system where it is carried to a sewage treatment plant. Harmful microorganisms and chemicals are removed from the water before it is reclaimed.

## Lesson 3: Conserving Fresh Water

- Californian's get most of their water from the Sacramento-San Joaquin River system and the Colorado River.
- As you know, in California, we use lots of water, and water should be conserved in order to make fresh water supplies last longer.
- Since California has the largest population out of the 50 states, conserving water is essential to our state's continuing prosperity.
- California's average rainfall and snowfall is 23 inches. **Two thirds** of the rainfall in our state falls in the **northern** part of the state.
- Due to the arid climate, much of **southern California** receives only **10 inches of rainfall per year**. That is certainly not enough to supply water to everyone. Also, keep in mind that hundreds of thousands of people are moving to California every year. Water is *always* in high demand.

designed a huge system of canals, pipes, aqueducts, dams, pumps, and reservoirs. These systems transfer water from our **wet north** to our **dry south**. Without this water transfer, farming would probably not exist in southern California.

- The 238 mile long Los Angeles Aqueduct, built about 100 years ago, still brings 80% of Los Angeles's water.
- The California State Water Project sends water to the people of southern California, as well as to more than 1 million acres of farmland.
- Have you ever borrowed water from anyone? Well, the state of California did. It had to use more than its fair share of water from the Colorado River, but here's the problem: The Colorado River supplies water to six other states and parts of Mexico. So when California borrowed water it was only a temporary fix, not a permanent solution.
- In 2000, the Federal government and the states sharing the Colorado River's water reached an agreement called the 4.4 Plan (The "4.4" is named for California's allotment of water from the Colorado River which is 4.4 million acre-feet). By 2015, California is expected to use no more than the water it is allotted (given) from the Colorado River.
- Here are some of the measures to use river water more efficiently:
  - Laws and practices that cut back water use (here's where we can do our part)
  - Lining canals to stop leaks
  - Applying for water-saving irrigation methods
  - Calls on farmers to stop growing crops in parts of the Imperial Valley
- Much of California's water is used to irrigate farms. During irrigation a lot of water is wasted. Newer methods, such as drip irrigation, use less water and ensure that the water reaches the crops.
- Recycling waste water, also called water reclamation, allows for 50-75% of the water to be reused for watering lawns, plants, wash cars, etc.
- Older toilets are being replaced with newer ones that use less water. Gallons upon gallons can be saved per household. Water-saver shower heads also cut down on household water waste.
- Think about the ways you and your family can conserve water. 😊