Lesson 5: Why Water is Essential for Growth of A Community

Lesson Overview: This lesson will explain the importance of water in the early development of communities, particularly Orange County, and how access to water for irrigation and transportation purposes often meant the difference between growth and stagnation for a settlement.

Expected Learning Outcomes:

In this lesson, students will be able to:

- Discuss the importance of access to water for the development of a new community.
- Identify the reasons why some of the cities in early Orange County grew rapidly and others more slowly, citing examples from the lesson.
- Explain how irrigation works and why it is critical for agriculture.

Correlations to California's Content Standards:

- History-Social Studies: 3.1; 3.3; 3.5; 4.1; 4.4
- English-Language Arts (Listening and Speaking): 3.1
- English-Language Arts (Written and Oral Language Conventions): 3.1
- Sciences (Life Sciences): 3.3; 3.5
- Mathematics (Mathematical Reasoning): 3.1; 3.2; 3.3

Materials:

- Photos:
  - SAVI Irrigation ditch, around 1910
  - Anaheim "street sprinkler" wagon, ca. late 1800s/early 1900s
- Small paper cups, one for each student (supplied by teacher)
- Five empty plastic milk jugs or water pitchers (supplied by teacher)
- Stopwatch (or classroom clock)
- Copy of this lesson's *My Orange County* history book page for each student
- Copy of "Water Maze" worksheet for each student

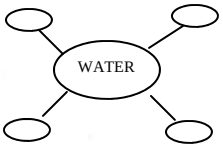
Target Vocabulary:

Write these words on the board before each lesson to reinforce key lesson concepts:

- artesian wells
- canals
- ditches
- irrigation

Starting The Lesson – Activating Prior Knowledge:

- Review teacher background information for this lesson plan. Set up Class Activity under "The Lesson – Learning Together."
- Brainstorming Map based on Water:



Teacher writes the word WATER on the board, circles it, and then asks students to think of ways in which water is used.

- Examples may include drinking, watering plants, transportation/boats, bathing. When an answer is given, write it on the board, circle it, and connect it back to the cluster word, WATER.
- Teacher concludes activity by affirming the importance of water for daily life.

The Lesson ~ Learning Together

- Make connection to previous lessons (#3: Making Things Grow and #4 How Communities are Formed) by explaining that as the new communities grew, their dependence on water – for agriculture, transportation, and personal use – grew as well. This need for water often caused disputes between neighboring communities.

- Discuss with students problems that come with determining water rights. (e.g., Is the owner the person who used the water source first? Or, is the owner the person who owns land on or closest to the water source?)
- Explain how some of the communities, like Placentia and Garden Grove, struggled to successfully secure ample water supplies and, consequently, developed slowly. Others, however, like Anaheim, Tustin, Santa Ana and Orange, found ways to get the water they needed through the construction of ditches, canals, irrigation systems and ports. These communities flourished.
- Show the class the photos of the Anaheim irrigation ditch and the water sprinkler wagon.
- Game: Grapevine Rescue!* The purpose of this game is to explain the concept of irrigation and demonstrate how its use increases agricultural productivity and efficiency.
- Part One:
  - Fill a pitcher with water. Distribute a small paper cup to each student.
  - Explain to the students that they will be participating in a role play game where each of them will be a grapevine needing to be watered. It is a dry, hot day and if any vines go too long without water, they will die. Explain that you are the farmer who is responsible for watering the crops.
  - Tell students that a cup half full of water represents the amount of water needed to save the grapevine for the game. But the challenge is that all the students — "the thirsty grapevines" — need water at the same time. The longer each vine has to wait, the more it will shrivel and possibly die.
  - Tell students to pretend they are talking grapevines and, when the timer starts, they must verbally report their condition (e.g., "Help! I need water!, "I'm so thirsty," "Please hurry, I'm shriveling up!").
  - Start the timer. Begin to fill students' cups half full, refilling pitcher as needed.
  - Once all of the cups are half full, stop the timer and ask students how long it took to "irrigate" the vines and how much damage was done to the crops while waiting for water.
  - Brainstorm with students on how the grapevines could be watered faster and more efficiently. If necessary, guide them to say "more farmers/pitchers." Explain concept of irrigation.
- Part Two:
  - Ask for 5 student volunteers to be "irrigators" and have them fill their pitchers. Simultaneously, have students empty their cups and explain that they will once again be thirsty grapevines.
  - Explain that the "irrigators" will be in charge of watering the grapevines now (filling each cup half full.) The grapevines, once again, can vocalize their need for water. Ask students what they expect will happen this time and why.
  - Start the clock. Time how long it takes the "irrigators" to fill all student cups half full.

- Class Discussion:
  - Which method, one farmer or several "irrigators," got water to the grapevines faster? Why?
  - Compare the two ways the grapevines were watered. Which grapevines do you think would eventually produce more (or better) crops? Why?

** This game was adapted in part from an irrigation lesson plan developed by the Bureau of Reclamation, Mid-Atlantic Region.*

Check for Understanding/Assessment:

My Orange County history book page:

- Distribute page to each student. Either

alone, in small groups or as a class, students will complete the sentences using target vocabulary words from the lesson. Review with students and have them self-correct.

- Students add this page to their *My Orange* County history book.

Beyond The Lesson – Extension Activity

- Distribute "Water Maze" worksheet to each student. Students must help the water follow a path from its source to its final destination.

Teacher Background

Water is essential for agriculture, and a dependable water supply was vital for the growth and success of early Orange County communities. Beginning in the 1850s, vast **irrigation** systems (a way of supplying dry land with water by means of ditches, streams or pipes) were built across the county, and thousands of wells were put down. Conflicts over water rights were not uncommon, with armed men sometimes patrolling the irrigation ditches, and huge lawsuits that stretched on for years.

The first irrigation ditches in the area were built by the missionaries in the late 18th Century. Some of the *rancheros* also built irrigation systems for their ranchos. Many of the early communities in Orange County relied on irrigation water brought in **ditches** and **canals** from the Santa Ana River, the Santiago Creek or other local streams. One of the largest systems was developed by the Santa Ana Valley Irrigation Company, which served Orange, Santa Ana and Tustin. Across the river, the Anaheim Union Water Company brought water to that community. These were joint stock companies, controlled by the local landowners, and developed for the common good.

In other areas, water was easily available from wells. In some areas, **artesian wells** (natural underground springs) were common, where the water would rise up in the wells without any pumping. These artesian wells gave Fountain Valley its name.

Communities that did not have a secure water supply often grew more slowly. Towns like Garden Grove, Placentia and La Habra – though settled early – did not really develop as quickly as others because they lacked a secure water supply.

But in other areas, such as the lowlands between Costa Mesa and Huntington Beach, there was too much water, spread out in swamps and marshes. Beginning in the early 1900s, drainage ditches were built in these areas to carry the excess water out to sea, opening up thousands of acres of new farmland.

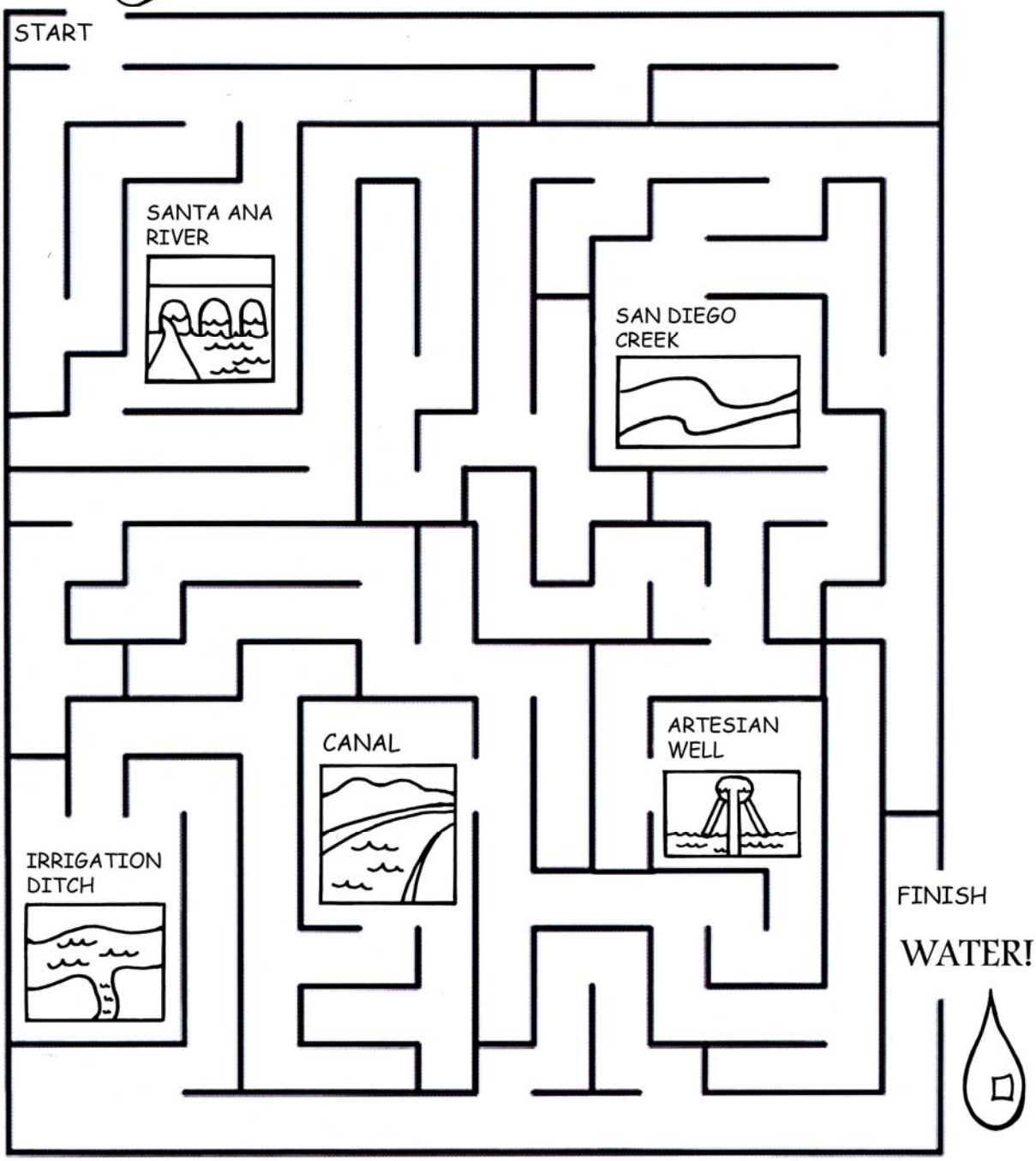
Battles over water were commonplace in the early days of the county, and the entities formed by communities to manage their water issues (water companies, districts, etc.) were often in constant negotiations and heated debates. Did the water belong to the first person to use it? Or did everyone along the water's route have a right to what flowed past?

In the late 19th century, there were several major lawsuits over water rights in Orange County. Some dragged on for years, like Anaheim's lawsuit against the Santa Ana Valley Irrigation Company on the opposite side of the river. Anaheim claimed a prior right to the Santa Ana River, since they had built a ditch to the river in the 1850s. The SAVI argued that they held riparian rights, since their members actually owned the land along the river. In the end, the State Supreme Court ruled in favor of the SAVI, and the two sides agreed to divide the waters of the river 50/50 as they entered the county.

Then in the 1890s, settlers along the Santiago Creek sued The Irvine Company to guarantee their fair share of water from the creek. Again, eventually a joint-use agreement was hammered out, and in 1931 Irvine Lake was constructed to store the winter rains and run-off for use all year-round.

Worksheet ~ Water Maze (Lesson 5)

Water is extremely important in the development of communities.
Help OC find his way through the water maze. Make sure he goes through all the important water stops along the way.



Water Irrigation Crew (Lesson 5)

Lesson 5:
Santa Ana Valley Irrigation ditch crew, Olive, CA, ca. 1910

Anaheim Sprinkler Wagon (Lesson 5)

Lesson 5:
Anaheim "street sprinkler" wagon, ca. late 1800s

My Orange County History Book

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MAIN CANAL OF THE SANTA ANA VALLEY IRRIGATION CO.

Directions: Using the vocabulary words from this lesson, fill in the sentences below. Use each word only once.

irrigation • canals • ditches • artesian wells

1. Natural underground springs that produce water are called

   _____ _____.

2. Using streams, ditches or pipes to supply water to dry land is called

   _____.

3. To get water to crops and homes, farmers built _____ that could transport water from one place to another.

4. Anaheim was one of the first towns to dig irrigation _____ to get water to crops more quickly.