

The West the Railroads Made

A Railroads Lesson Plan

The Time Machine

by [Gwen Perkins](#)

This may be used as a What's the Big Idea? Classroom-Based Assessment for elementary school students.

Summary:

In this lesson plan, students will examine how factors like time and distance played into successful railroad planning. They will examine the problem of time and how inexact measuring could lead to problems, sometime fatal, with the running of the railroad.

November 18, 1883 was the "Day of Two Noons", a day on which many influential railroads resolved fifty-six different American time standards into just four standard time zones. This was done so that trains could follow a set schedule, thus avoiding accidents and arriving at stations at a set time. This curricula examines the importance of this innovation and the impact of time and the creation of time zones (or standards) on people in the West.

Essential Academic Learning Requirements (EALRs):

This lesson plan satisfies the following EALRs: History 2.1.1, 2.2.1, and Social Studies skills 3.1.2d. [Click here](#) to print out the material for your reference.

CBA Scoring Rubric and Notes:

The Office of State Public Instruction has created a scoring rubric for the What's the Big Idea? Classroom-Based Assessment. [Click here](#) to download and print this rubric for your information.

Essential Questions for Students:

- Why were time zones created?
- What were the potential consequences of not measuring accurate time?
- What role did the coming of the railroad play in the invention of time standards?










Wellington, Washington, located near Stevens Pass in the Cascade Mountains, was the site of one of the worst train disasters in U.S. railroad history. On March 1, 1910, two Great Northern trains were swept off the tracks by an avalanche.

Washington Historical Society Collections.

DOWNLOAD AREA

Download the PDFs required for this lesson plan:

-  [The Lesson Plan](#)
-  [Primary Source Documents](#)
-  [Secondary Source Documents](#)
-  [Student Worksheets](#)
-  [Other Teacher Materials](#)
-  [Maps](#)
-  [Rubrics](#)

Essential Understandings:

- Ideas and technology have enormous impact on the values, beliefs, and/or attitudes of people.
- Time standards were created as a response to the railroad's need to measure exact time. Inaccurate measurements and poor planning had a significant impact not only on the public perception of the railroad but also on the lives of passengers and crew.
- The railroad had a significant impact not only on our concept of time, but on how goods and people reached the West.

Primary Sources for Student Understanding:

1. [Koch & Oakley Railroad Navigation Guide, 1891](#)
2. [Pacific Coast official railway and steamship guide, 1893](#)
3. [Chicago and Atlantic Railway timetable, 1886](#)
4. [Map of U.S. Time Zones](#)

Primary Sources: A piece of evidence created during the time period under investigation by someone who participated in, witnessed, or commented upon the events that you are studying. It is a surviving record of past events such as photographs, diaries, or artifacts.

Secondary Sources for Student Understanding:

1. [Keeping Time](#)

Materials Needed (for optional Water Clock activity):

1. Paper cup
2. Glass or clear plastic container
3. Thumbtack
4. Masking tape
5. Markers
6. Water
7. Wristwatch or classroom clock for time adjustment

Secondary Sources: Books, articles, essays, and lectures created, often using primary sources, that describe and interpret a time period after events have taken place.

Instructions for Teachers:

SESSION ONE

Part I.

Prepare yourself by reading through the materials provided for this lesson plan. You may wish to use this lesson plan as part of a larger unit on westward expansion or in connection with science or mathematics activities.

Part II.

Give students an overview of the task ahead of them. Explain to them that they will be looking at how transportation and time changes resulted in differences in the ways that people lived and thought about their lives. In order to complete their final project, students will need to gather facts and analyze situations to decide what will result in the best choices for the activity that they will design.

SESSION TWO (OPTIONAL)

One of the concepts for students to understand is the idea that time was not measured universally prior to the creation of time standards. The activity below provides a way to introduce this idea to students through practical application, allowing them to experience variations in time measurement with a "hands-on" activity.

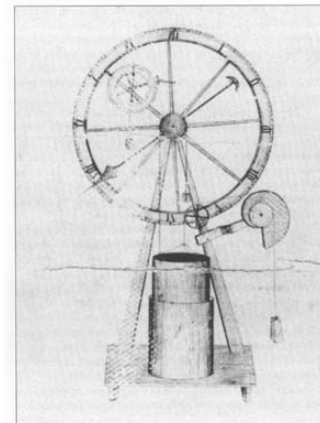
With your students, you will be making an early time measurement device. This device, known as a water clock, was used to measure time through the regulated movement of

water. This is only one of the many ways that time was measured prior to the advent of the mechanical clock. Water clocks continued to be used after the creation of the mechanical clock.

To engage in this activity, please assemble the following materials for use with your students: one paper cup, glass jar or clear plastic container to collect water, a thumbtack, masking tape, markers, water and a timing device. (A wristwatch or classroom clock will work.)

Perform the following:

- Use the thumbtack to poke a small hole in the bottom of the paper cup. This hole should be in the center of the cup.
- Over a sink or covered surface (this will be messy!), put water in the paper cup.
- Enlarge the size of the hole as needed so that the water drips from the cup at an even rate. You may ask students to time the falling of the water, either with a watch or by counting at an even pace.
- Place the cup on top of the glass jar or container. Make sure that the neck of the jar is narrow enough to keep the cup from falling in. (If you have difficulty finding a jar to fit this purpose, consider washing out a 2-liter soda bottle for use in this activity.)
- Have one student measure out a strip of masking tape.
- Place the tape so that it lines up vertically with the neck of the bottle. Explain to students that they will be measuring how much of the container is filled with water. Time one minute and have a student mark the clock. After this point, use a watch or timer to mark the clock at specific intervals of your choosing (5 minutes, 30 minutes, 1 hour).
- After students have marked and observed the clock in motion, begin the discussion.



This image of a water clock was drawn by John Muir in the late 19th century. Courtesy of the Wisconsin State Historical Society Collections.

Points for Discussion:

- *What did you observe about this clock? How is it different from other clocks that you have used?*
- *How did we “set” this clock?*
- *Do you think that if we built 2 different clocks in this classroom at the same time, that they would keep the same time? Why or why not?*
- *Do you think that if we built a water clock here in Washington that it would keep the same time as someone building a water clock at the same time in New York? (Stress to students the variations that can occur when relying on measurements created by different sets of hands. Point out the hole in the cup, for instance, and ask how widening or narrowing it might affect someone’s perception of time.)*

SESSION THREE

As a class, discuss what might happen if everyone in the room had their watches set to different times. Brainstorm a list of consequences- you might ask, for instance, what kind of effect that might have on planning a birthday party or to getting to school on time.

After students have had a chance to consider this idea, provide them with the [What’s the Big Idea?](#) graphic organizer and the [Timeline worksheet](#). Explain to them that they will be using this to keep track of their own ideas as they read.

Project the following map on your classroom wall or provide a copy for students to examine.

Map of U.S. time zones

Ask students to look at the five time zones in continental North America. You may wish to point to them and read the names aloud to the students: Eastern, Central, Mountain, Pacific, and Atlantic.

Discuss the following:

- *Where are the different time zones located? Are they right next to each other?*
- *Can you think of any reason that time zones would have been placed where they are? Who placed them there, anyhow?*
- *Where do you think the names of these time zones came from?*

Prior to 1883, high noon varied from place to place as the earth revolved around the sun. Once noon could be established by observing the sun at its apex in the sky, the other twenty-three hours of local time could be set. As noon varied, so did local time.

Reveal to students that they will be finding the answers to these questions in their next assignment. In class or as homework, ask students to read the following essay and do the accompanying worksheet:

Keeping Time

Keeping Time Worksheet

Remind them to use their graphic organizer and timeline throughout the activity to keep track of how these changes affected people. You may wish to explain to students that they will be putting this into practice the next day.

SESSION FOUR

Bring the class together and discuss some of their discoveries about time zones. Repeat some of the questions asked in session three and introduce the following discussion points:

- *What was the "Day of Two Noons"? Why was it important?*
- *How did things change when time standards introduced?*
- *What is a timetable? Have you seen one before? How is it used?*

Pass out copies of the [railroad timetable packet](#). Ask them to look through the different examples of timetables and consider what each company is trying to promote in its description of service. After they have had a chance to examine the different primary sources, suggest that they note the page with a train schedule. What things do they notice about it?

As homework, assign the [timetable worksheet](#). Remind them to keep their graphic organizers handy in case they find any useful pieces of information for their final paper.

Railroad Timetables

Timetable worksheet

SESSION FIVE

Bring the class together and explain to them that they will be using the materials they have gathered to write a one-page essay about their discoveries on time. As support for their essay, remind them to use their worksheets in gathering information. Take a few moments to review and reflect some of the facts that they have learned, focusing on how they think the creation of time standards affected both people in Washington and across the United States.

Tell students that they will need to use their graphic organizer as a starting point, explaining how this outline will help them guide the paper that they are to write.

You may wish to work with a librarian to schedule a research session for the class and use the CBA as an opportunity to strengthen and enrich your students' skills in using sources. Research strategies can also be utilized to assist students in this process, such as the "Incredible Shrinking Notes" exercise at http://www.education-world.com/a_lesson/03/lp322-02.shtml.

POSSIBLE EXTENSION ACTIVITIES

- Take the concept of how time changed history and build upon it to look at other periods in our history. The Lewis and Clark expedition can be used as one example of how long journeys were, prior to the invention of technology. This lesson plan can be used to bridge a lesson about Lewis and Clark with more modern topics in Washington state.
- Have students build other types of clocks and make comparisons between them. Two possible options would be a sand clock (or hourglass) or a sundial. Examinations of how the different clocks worked and their use by different peoples could be incorporated into a science curriculum or used to talk about time in a cross-cultural context for social studies. One internet resource for the evolution of time measurement through the ages is the NIST Physics Laboratory's "A Walk through Time" online exhibit, located at: <http://physics.nist.gov/GenInt/Time/time.html>.
- Use a History Lab field trip at the Washington State History Museum to fully build on the concept of time and the "Tools of the History Trade". Visit the History Lab website to fully explore possible student activities that engage them with this topic.