

**Elizabeth Jorden
Choteau Elementary School**

GRADE LEVEL: 5

THREAD: Living in Nature

UNIT: Observing and Measuring with Thoreau

ESSENTIAL QUESTIONS:

- What is a surveyor?
- Why were many explorers also surveyors?
- How does measuring allow an observer to become more familiar with a natural environment?
- Which units of measurement are useful in observing nature?
- Which tools are useful in measuring a natural environment?

VOCABULARY:

observation
survey/ surveyor
data
customary units
metric units

MATERIALS

If You Spent a Day with Thoreau at Walden Pond by Robert Burleigh

Student journals

Images from Concord Museum website found at <https://concordlibrary.org/special-collections/thoreau-surveys/>

(permission needed to publish)

Excerpts from Thoreau's journals from The Walden Woods Project found at <https://www.walden.org/collection/journals/>

Tape measures

Stop watches

Thermometers

Measuring cups or beakers

OBJECTIVES: TSW..

- Identify measurement units and information conveyed in Thoreau's land surveys

- Design an investigation of an aspect observed in the natural environment that can be measured
- Create a data table in student journal
- Convert units to display data in two measurement intervals
- Reflect and write a journal entry on insights gained from focusing observations as a qualitative measurement

CC STANDARDS:

1. Convert like measurement units within a given measurement system.

CCSS.MATH.CONTENT.5.MD.A.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

2. CCSS.ELA-LITERACY.W.5.10

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

ASSESSMENT:

Self checking rubric

	yes	no
I have designed an investigation that measures something I notice in nature		
I created a 3 column data table in my journal, titled it, and labeled each column with measurement units		
I have converted measurement units to a common interval (Example: 2 min = 120 seconds or 5 feet 6 inches = 66 inches)		
My data is recorded neatly in my journal		
I have included a journal entry reflecting on how measurement investigation		

EXTENSIONS/ RETEACHING OPPORTUNITIES:

- Pair or create small groups rather than individual investigations
- Graph data tables
- Include maps of natural area observed

- Research early and modern surveying technologies to compare and contrast
- Invite a surveyor to speak to class

GUIDING QUOTES

“Surveying the Tommy Wheeler farm.... The philosopher is so forced to recognize principles which long study might not detect. And the naturalist even will stumble upon some new and unexpected flower or animal.” - Thoreau

“How important is a constant intercourse with nature and the contemplation of natural phenomena to the preservation of moral and intellectual health! The discipline of schools of of business can never impart such serenity to the mind.” - Thoreau

LESSON #1 Introduction to Thoreau as an Observer

- Read If You Spent a Day with Thoreau at Walden Pond as a class read aloud and discuss or have students research more about Henry David Thoreau
- Show students examples of Thoreau’s journals from on-line resources.
- Have students quick write what they remember about Thoreau in their own journals

LESSON #2 Thoreau as Surveyor

- Display examples of Thoreau’s surveys and discuss what he measured, why surveyors were needed, and why surveyors would become keen observers of the natural world.
- Brainstorm what surveyors might observe and tools needed to measure.
- Display classroom measuring tools and discuss what they each measure and their units.
- Create a class anchor chart showing measurement conversions for each measurement tool (Example $1000\text{mL} = 1\text{ L}$) Discuss metric and customary units.
- Introduce self-assessment rubric and have students paste in journal.
- Take students outside with their journals and ask them to write an entry about something in the natural world that they could observe and measure with the tools available. (Examples: listen and time intervals of a woodpecker’s tapping, measure snow depth at different locations, find the mass of different shapes of rocks)

LESSON #3

- Prepare for investigations outside by carrying out a teacher designed investigation showing how to set up data table with 3 columns using measurement conversions.

Example:

Snow depth	cm	m
#1 Playground SW corner	6	0.06
#2 Playground NW corner	11	0.11
#3 Playground SE corner	2	0.02
#4 Playground NE corner	15	0.15

- Gather students, discuss findings, and have them reflect on how measuring influenced their observation skills, ask what else they noticed while measuring, and what they can infer from their measurements about the natural phenomena they observed.
- Students use their rubric to self-assess.

Lesson 1