



# Telling Time on a Ship

## Overview & Major Themes

This hands-on activity gives instructions to make a half hour glass with your students that measures time just like on a naval vessel in 1812. It integrates math, using 24-hour time, telling time in other ways besides a clock, and the nautical and naval term of “watches”.

## Objectives

- Students will understand how time is told differently on ship than it is on land.
- Students will understand the watch system used on a ship.

## Outcomes

- Students will use math to calculate the watches in a 24 hour day.
- Students will create a half-hour glass that tells time in the same way it was told on Ship.

## Materials & Resources

- “Sleeping at Sea” illustration
- Word problem worksheet
- Ordinary Seaman’s Daily Routine chart
- Two clear plastic bottles, clean and dry
- Sand
- Plastic drinking straws (thinner, the better)
- Modeling clay or play-doh

## Instructional Activity

5 min.

Explore the “Sleeping at Sea” illustration with students. Ask students if they need to do certain tasks at certain times, how do they know the time, and would they be able to know the time if they did not have a clock? Explain to students that sailors on board *Constitution* relied on a different way to tell time: by a half hour glass and the chiming of bells.

15 min.

Have students complete the math problem below and fill in the worksheet. Then ask them to fill in the tasks and duties they normally complete in that time period below. Have them compare their tasks to those of an ordinary seaman on *Constitution*.

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5 min.

Ask students how sailors knew what time it was. Common answers include – watch, clock (which were not reliable at sea due to the rocking and rolling of a ship), stars and sundials (which aren't consistent due to ship's movement and changing weather). Prompt them to think about how they know when a turn is up in board games – sand glasses. Time on a ship was rung out every half hour thanks to the use of a half hour glass.

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60 min.

**To make a half hour glass with your students, follow the directions:**

1. Measure the plastic drinking straw so that it is long enough to enter both bottle openings when together. Cut off the extra length, your straw should not be more than 2”-4” long, as this is what your “sand” is going to pass through.
2. Wrap your cut plastic drinking straw in clay. Leave the ends of the straw clean and open, and make sure the clay wrapped around the straw is thick enough to fill the ends of your bottles.
3. Fill one of the clear bottles with sand.
4. Stick the clay-wrapped drinking straw into the open neck of the sand-filled bottle.
5. Fit the other bottle on top. Try to get the same amount of clay in each bottle, with no holes besides the straw.
6. Turn over the two connected bottles. At the same time, start a stopwatch or watch the clock.
7. When 30 minutes has passed, turn the timer onto its side to stop the “sand” running any more. If the sand ran out before 30 minutes was up, add more “sand” and re-time your half hour. (You may wish to test this ahead of time and give students the right amount of sand for a half hour).
8. Very carefully, remove the top bottle and empty out the extra sand. Replace the top bottle, and test your sand timer. It may take a couple times to accurately fix your half-hour glass.