

TIME-LAPSED OBSERVATIONS

Performance Standard 13A.C

Students will apply scientific habits of mind by comparing data sets from classroom observations and timed intervals accordingly:

- *Knowledge*: Understand that scientists rely on repeated observations when they analyze their data.
- *Application*: Make repeated observations in various scientific inquiries or technological design investigations.
- *Communication*: Explain the results of the experiment and why repeated observations helped interpret the results.

Procedures

1. ***In order to know and apply accepted practices of science (13A)***, students should experience sufficient learning opportunities to develop the following:

- Make careful observations and record data accurately.
- Compare data using repeated observations across timed intervals.
- Explain knowledge that was gained through repeated observations.

Note to teacher: This activity relates to the practice of science which relies on making repeated observations in science investigations, notably when using timed observations. This activity can be integrated easily into the science classroom assessments suggested for 12E, “Water, Water Everywhere” as a scientific inquiry, as well as the assessment suggested for 12F, “Solar System Cycles” as a technological design investigation.

2. For the purpose of illustrating the procedures, the directions for timed observations for standard 12E are copied below:

- Begin inquiry investigation by displaying a classroom closed terrarium which probably has water droplets forming on its walls. Ask “How did the water travel to get on the walls?” After recording their ideas on a classroom chart, pose a technological dilemma: “How can we replicate the ‘travels’ of water? Offer large, wide-mouthed glass jars (with caps) and small cups of water as the only resource materials for solving this dilemma. Students should plan an investigation which could make water appear on the walls of their jars. They must generate ‘success criteria’ (their rules for solving the dilemma) and safety precautions, as well as data tables to record variables such as time, temperature, classroom location and amounts of water (probably suggested by teacher). This activity may be accomplished over several days with students recording their data accurately. Students can taste the water that is collected. (Colored water may be used in the small cup; the condensed water will not be colored. Additional questions about evaporation could be generated from this phenomenon.) Ask students to describe the patterns from their data tables and offer suggestions for making their design better.

3. Another example for the purpose of illustrating the procedures, the pertinent directions for timed observations for standard 12F are also copied below:

Broaden the investigation to include the concepts associated with changing shadows during the day. Ask students to observe their own shadows in the classroom. Ask if there is a difference in the shadow of the same person at different locations. Encourage the students to diagram the light source-person-shadow angle and length setting AND propose explanations for why their shadows change with their ‘constant’ light source. Continue the shadow observation process outside at specific times during one day (morning, noon, and afternoon) at the same location (probably on the playground in an area with an unobstructed view of the sun). By working in pairs, students will be able to collect data about themselves at the three specific times. Be sure to include their actual heights, shadow lengths, times and sun location and record the date. Periodically, repeat this activity throughout the week, month, season and year.

4. Provide each student a copy of the “Time-Lapsed Observations” task sheet or have the students create their own charts (depending on their previous experience with creating data tables). Have students review and discuss the assessment task and how the rubric will be used to evaluate their work.

5. Evaluate each student’s work using the Science Rubric as follows and add the scores to determine the performance level:

- *Knowledge*: Description of how to make repeated observations was complete and correct.
- *Application*: Observations were conducted and recorded thoroughly and accurately.
- *Communication*: Explanation was well-focused and well-detailed.

Examples of Student Work not available

Time Requirements

- One class period

Resources

- Copies of “Time-Lapsed Observations” Task Sheet
- Markers
- Crayons
- Science Rubric

NAME _____ DATE _____

TIME-LAPSED OBSERVATIONS

- What are your variables? _____
- What variable remains constant? _____
- Which variable or variables change? _____

Please record your observation data in each box below:

Variable #1	Variable #2	Variable #3	Variable #4

- How does your data gather and compare with others in your group.
- Explain what you learned from comparing these observations.

- Summarize what you have learned through these careful observations.

