

**APPLY SCIENTIFIC INQUIRY
and
SCIENTIFIC HABITS OF MIND**

Performance Standard 11A/13A/13 B.B

Students will apply the concepts, principles and processes of scientific inquiry within classroom investigations accordingly:

- *Knowledge*: Understand the concepts, principles and processes of scientific inquiry.
- *Application*: Apply the appropriate scientific habits of mind when investigating science concepts.
- *Communication*: Incorporate scientific technologies and the processes of scientific inquiry into classroom investigations and reports.

Note to teacher: These concepts could be embedded into scientific inquiry investigations in varying combinations. Suggested activities and assessments for standards 12A, B, E, and F at stage B, incorporate many of the performance descriptions for Standard 11A.

Procedures

1. *In order to know and apply the concepts, principles and processes of scientific inquiry (11A) and the accepted practices of science (13A) and apply scientific technologies (13B)*, students should experience sufficient learning experiences to develop the following:
 - Describe science event with appropriate attributes, units and tools.
 - Sequence the appropriate processes or steps.
 - Choose or propose causes or effects based on their observations of the scientific event.
 - Ask pertinent questions about the event.
 - Predict conditions that can or could have influenced the event or changes in the event.
 - Propose ways to test student-generated predictions about science events.
 - Distinguish hypotheses from guesses.
 - Determine simple steps to follow to investigate selected question(s).
 - Identify safety hazards associated with classroom inquiry investigation.
 - Assemble proper materials and equipment to conduct their guided inquiry investigation.
 - Follow appropriate procedural steps and safety precautions.
 - Choose and use appropriate instruments (technologies) and units for data collection.
 - Compare accuracy of estimations and precise measurements.
 - Sequencing appropriate steps for instructed use of equipment.
 - Record data on classroom charts, tables, journals or on computers.
 - Sort or modify pictures or drawings that illustrate their data.
 - Organize their data on graphs or charts.
 - Construct reasonable and accurate explanations from their data.
 - Apply qualitative and quantitative terminology that describes their observed data patterns.
 - Communicate results of individual and group investigations.
 - Relate knowledge that was gained through careful, repeated observations by classmates.
 - Match similar data from other data sources.
 - Identify reasons for differences or discrepancies in data.
 - Select data that can be used to predict future events or data trends.
 - Generate questions for future inquiry investigations.

Separated assessment of 11A may not be practical. Significant research has demonstrated the value of inquiry-based, life-long learning for students. The emphasis of scientific inquiry is incorporated into the wording of all performance descriptions for Goal 12, in stages A-J. A spiraling, inquiry-based curriculum is encouraged for all classrooms. Specific performance descriptions may be emphasized in different inquiry investigations in order to build mastery of each concept or process of scientific inquiry.

Examples of Student Work not available

Time Requirements

- Initial introduction of processes may require additional time as needed by students.

Resources

- Science Rubric