

BENCHMARK SC.5.N.1.1

Reporting Category	Nature of Science
Standard	Big Idea 1 The Practice of Science
Benchmark	SC.5.N.1.1 Define a problem, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types such as: systematic observations; experiments requiring the identification of variables; collecting and organizing data; interpreting data in charts, tables, and graphics; analyze information; make predictions; and defend conclusions. (Also assesses SC.3.N.1.1, SC.4.N.1.1, SC.4.N.1.6, SC.5.N.1.2, and SC.5.N.1.4.)
Also Assesses	<p>SC.3.N.1.1 Raise questions about the natural world, investigate them individually and in teams through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.</p> <p>SC.4.N.1.1 Raise questions about the natural world, use appropriate reference materials that support understanding to obtain information (identifying the source), conduct both individual and team investigations through free exploration and systematic investigations, and generate appropriate explanations based on those explorations.</p> <p>SC.4.N.1.6 Keep records that describe observations made, carefully distinguishing actual observations from ideas and inferences about the observations.</p> <p>SC.5.N.1.2 Explain the difference between an experiment and other types of scientific investigation.</p> <p>SC.5.N.1.4 Identify a control group and explain its importance in an experiment.</p>
Benchmark Clarifications	<p>Students will evaluate a written procedure or experimental setup.</p> <p>Students will identify appropriate forms of record keeping.</p> <p>Students will interpret and analyze data to generate appropriate explanations based on that data.</p> <p>Students will identify examples of or distinguish among observations, predictions, and/or inferences.</p> <p>Students will explain the difference between an experiment and other types of scientific investigations.</p> <p>Students will identify a control group and/or explain its importance in an experiment.</p>

Content Limits	<p>Items will not require the identification or evaluation of a hypothesis. Items should not use the term <i>hypothesis</i>.</p> <p>Items will not require the design of a procedure.</p> <p>Items will not require mathematical computations.</p> <p>Items will not require the differentiation between outcome variables (dependent variables) and test variables (independent variables).</p> <p>Items will not assess the reason for differences in data across groups that are investigating the same problem.</p> <p>Items referring to conclusions will not require the formation of a conclusion.</p>
Stimulus Attributes	<p>Scenarios describing a scientific experiment are limited to one control group.</p> <p>Scenarios referring to observations will not use the term <i>systematic observation</i>.</p>
Response Attributes	None specified
Prior Knowledge	<p>Items may require the student to apply science knowledge described in the NGSSS from lower grades. This benchmark requires prerequisite knowledge from SC.K.N.1.1, SC.K.N.1.2, SC.K.N.1.3, SC.K.N.1.4, SC.K.N.1.5, SC.1.N.1.1, SC.1.N.1.2, SC.1.N.1.3, SC.1.N.1.4, SC.1.E.5.3, SC.2.N.1.1, SC.2.N.1.3, SC.3.N.1.3, SC.3.N.1.6, SC.4.N.1.4, and SC.4.E.6.5.</p>

Sample Item 1 **SC.5.N.1.1**

Delilah followed these steps of an investigation:

- Collect five objects made of different types of metal.
- Place them on a large laboratory table.
- Touch each metal object with a magnet and lift slowly.
- Record observations.

Which of the following statements is Delilah **most likely** testing?

- ★ **A.** All types of metal are attracted to magnets.
- B.** Each magnet can lift the metal object to the same height.
- C.** Larger magnets can pick up heavier metal objects than smaller magnets can.
- D.** Heavier metal objects are more attracted to magnets than lighter metal objects are.