



CRS

COMMUNITY RESOURCES FOR SCIENCE

practical support for great science teaching

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Rubric Categories: Key Ideas for Measuring Science Skill Development

Scientific concepts or scientific knowledge: Measure ability of student to demonstrate **accurate and thorough understanding of the concept**, with performance ranging down through understanding **most of concept**, **limited understanding**, and **inaccurate understanding**. **Every** rubric should include this category. The specific content in this category is based on the content goal(s) you were trying to teach.

Observation Skills/Comparing/Sorting: Measure student's ability to **use scientific observation skills described in science content standards or Investigation and Experimentation strand**. In Kindergarten this is as simple as using all five senses to observe objects or organisms or experiments, and compare and sort using various physical characteristics or spatial relationships. As students get older, this category can be used to assess targeted skills that extend our natural ability to observe and sort, like **ability to use** scales in kindergarten, thermometers & wind vanes in first grade, microscopes in 2nd grade, diagnostic property table for rock-forming minerals in 4th, and various lab equipment in 5th grade that support quantitative observation.

Information Gathering: Observe student's ability to gather **accurate information**, from **several sources** (building from one source) in a **systematic manner**.

Question or Hypothesis: Measure the student's ability to pose a **clear, testable question**. **Looking at the I&E standard:** by first grade students should be able to ask questions that can be investigated, by 2nd they can ask question based on their observations (will the plant die if I don't water it?), by 4th they are identifying testable hypothesis, in 5th criteria should measure their ability to form a hypothesis that tests relationships between specific controlled variables and an independent variable.

Plan or Drawings/Diagrams: Look for **clear measurements and labeling, This applies to any plans, drawings, diagrams, that demonstrate knowledge**. The science skill is to develop plans and records that would allow any other person to look at your plan or journal or diagram and understand your experience. Mastery includes neatness & clarity so they don't have to struggle to see what you saw or planned to do.

Data Collection: Observe student's process and data recording to see **clear data, collected in a organized, reliable manner**. Starting in 2nd grade mastery can also include constructing and using graphs to record data. By 3rd grade, mastery should also mean **data is taken several times** in a careful, reliable manner.

Procedures: Measure ability to **communicate clear, complete, sequential steps that would allow anyone to repeat your experiment** or project with the same conditions and get similar results. The ability to replicate finding is the basis for all scientific fact and the I&E standard starts building this skill in 2nd grade by asking for written or drawn descriptions of a "sequence of steps, events, and observations", and continues to build the skill until students can design and conduct a replicable, independent investigation in 5th grade.

Conclusions: Measure the student's ability to **draw conclusions from observations and compare to predictions**. Starting in 3rd grade criteria can include whether the findings supported the predicted outcome, building to the ability to identify whether additional information is needed to support conclusion by 5th grade.