CRS
COMMUNITY RESOURCES FOR SCIENCE
practical support for great science teaching

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Opportunities to Observe Science Learning

Different assessment types can be used to assess different kinds of learning outcomes. This list includes suggestions about which assessment activities are most suitable for assessing specific types of learning goals: **C/S**=Cognitive/Skill learning; **A/I**=Affective/Intrapersonal learning; **B**=Behavioral learning.

Assessment Activity	Description	Most suitable for..
Story writing	Students can make sense of and communicate their observations of the natural world by writing stories.	C/S, A/I, B
Letter writing	Students demonstrate their abilities to apply and communicate concepts they have learned by writing letters to peers, scientists, newspapers…	C/S, A/I
Advertisements	Students communicate a point of view through facts, ideas, and images. Commercials often use statistics or experimental results to persuade consumers. Different formats—brochure, poster, song, TV commercial, powerpoint, etc.—accommodate multiple communication styles and/or technology integration.	C/S, A/I, B
Reflections	An open-ended approach to verbal communication. Oral reflections can take place through individual and group questioning, discussions, and student presentations. Written reflections can be recorded as journal entries, persuasive writing, articles for school publications, or reports.	C/S, A/I
Game Playing	Students vividly reveal skills and knowledge through science games. Games can be more engaging than formal tests or oral/written presentations.	C/S, A/I, B
Pre-Post Testing	Assessing students in a similar manner before *and* after a unit allows teachers to measure not just what students know at a fixed point in time, but what they learned.	C/S, A/I
Model Making	Model-making is a fundamental part of scientific practice and allows students to visualize the world in a deeper way than just looking at it.	C/S
Explorations	Open-ended explorations are a crucial part of science. Teachers can observe students: using all their senses to observe, recording observations, making comparisons, formulating questions and hypotheses, and making inferences.	C/S

Experiments	When students design, conduct, and analyze experiments, teachers can observe their abilities to perform inquiry skills: identify and control variables, design and describe procedures, collect data, communicate evidence-based conclusions, and critique an experiment.	C/S
Investigations	Teachers can observe students using content and process skills to construct their own pathways, make observations, collect/analyze data, and draw conclusions.	C/S
Conventions, Conferences, and Debates	At a scientific convention, participants meet to share ideas with the larger science community. They learn about each others' research and argue, debate, and evaluate each others' work. Staging such an event allows teachers to observe students exercising their skills and knowledge.	C/S, A/I, B
Applications	When an activity requires application of knowledge, teachers learn whether students are able to apply concepts in new and/or real-life situations.	C/S, A/I, B
"Essential Questions"	Conceptual questions/writing prompts (e.g. "What should we eat?' "What is the difference between a scientific fact, a scientific theory, and a strong opinion?") require students to consider knowledge and skill as the means of answering questions central to understanding key issues in your subject. Essential questions spark connections and promote transfer of ideas from one setting to others.	C/S, A/I
Interviews	Interviews require students to develop good questions as well as good answers. Interviews provide opportunities to get multiple inputs (and opinions), compile and compare data, use technology (video or tape recording), and report results.	C/S, A/I
Surveys	Gather data on opinions, awareness and behavior as well as knowledge. Students can design and apply surveys, collect and analyze data.	A/I, B

Sources:

Insights and Outcomes: Assessments for Great Explorations in Math and Science (GEMS), Barber et. al., Lawrence Hall of Science, UC Berkeley, 1995.

Big Ideas: Exploring the Essential Questions of Education, ejournal: www.bigideas.org