

Science Process Skills

Classifying	Students need to know how to classify, because students often need to group objects or organisms based on one or more common properties. This skill allows them to understand the differences and similarities between items of study. For instance, students might classify plant samples in various ways (color, bloom date, location, quantity, genus, and so forth) to find patterns for early blooming.
Communicating	<p>Communicating is an essential skill because students will almost always—in any subject or real-life situation—need to explain their reasoning, description, or explanation in a clear and understandable way. Communicating can involve presenting information to others in a variety of ways, including written text, oral discussions, symbols, metaphors, and demonstrations. Communication also includes being able to communicate information through charts, graphs, and other models.</p> <p>Scientists present and communicate their findings in scientific journals, conference presentations, online publications, and other means of collaboration or peer review. The Internet provides similar opportunities for students through online project collaboration sites, e-mail with experts, and videoconferencing with other classrooms.</p>
Estimating	Students need to know how to estimate to determine approximate amounts and values. Estimation is useful for quick observations, but more importantly, estimation can help students judge when a calculated or measured value is incorrect. If students can estimate the weight of different items based on past experiences, they will know to recheck measurements when they find significant deviations from their estimates.
Inferring	<p>An <i>inference</i> is a reasonable, but tentative, conclusion or explanation about objects, organisms, events, or causes based on one's prior knowledge. Inferring allows students to make educated assumptions or conclusions based on reasonable explanations when a complete set of data is not present.</p> <p>For instance, when conducting and recording observations about the weather, students could notice wet roads and sidewalks on their way to school. They would infer that it has rained during the night even though they did not actually see it rain. They would, however, still note the rain in their weather chart.</p>
Interpreting	Interpreting data consists of collecting observations and data in an organized way, finding patterns, and drawing conclusions. This skill is essential for students to understand and make conclusions based on their empirical data. For example, students may read information in a table about the growth of plants and use of compost, and then interpret the data to conclude that, to a certain point, more fertilizer causes greater plant growth.
Measuring	During investigations, students need to accurately take measurements, collect data, and record data. Accuracy ensures an experiment or observation is valid and helps identify problems in data collection. Students need practice with a variety of common materials of different

	shapes and content, including liquid. Students need to know how to use rulers, scales, graduated cylinders, and other typical tools to measure and record data in multiple ways.
Observing	Students need to know how to gather data through observation by using their five senses—sight, sound, smell, touch, and taste—along with instruments that extend the senses. Instruments, such as thermometers, scales, rulers, microscopes, and probes, can help improve the precision of observations. Observations can be qualitative (such as describing color, texture, and smell) or quantitative (such as identifying diameter and length).
Predicting	Students need to know how to use current knowledge and data patterns to make educated guesses on probable outcomes of investigations. Predicting allows students to form a hypothesis, ask relevant questions, and begin studying in a particular direction. Predicting allows students to extend limited experiments to further studies, such as extrapolating what will occur in further studies of evaporation based on a limited experiment.