

**Science & Engineering Practices**  
**Obtaining, Evaluating,**  
**and Communicating**  
**Information**

Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: using tables, diagrams, graphs, models, and equations as well as orally, in writing, and through extended discussions. Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs.



K–2 Condensed Practices	3–5 Condensed Practices	6–8 Condensed Practices	9–12 Condensed Practices
Obtaining, evaluating, and communicating information in K–2 builds on prior experiences and uses observations and texts to communicate new information.	Obtaining, evaluating, and communicating information in 3–5 builds on K–2 experiences and progresses to evaluating the merit and accuracy of ideas and methods.	Obtaining, evaluating, and communicating information in 6–8 builds on K–5 experiences and progresses to evaluating the merit and validity of ideas and methods.	Obtaining, evaluating, and communicating information in 9–12 builds on K–8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs.
<ul style="list-style-type: none"> <li>Read grade-appropriate texts and/or use media to obtain scientific and/or technical information to determine patterns in and/or evidence about the natural and designed world(s).</li> </ul>	<ul style="list-style-type: none"> <li>Read and comprehend grade-appropriate complex texts and/or other reliable media to summarize and obtain scientific and technical ideas and describe how they are supported by evidence.</li> <li>Compare and/or combine across complex texts and/or other reliable media to support the engagement in other scientific and/or engineering practices.</li> </ul>	<ul style="list-style-type: none"> <li>Critically read scientific texts adapted for classroom use to determine the central ideas and/or obtain scientific and/or technical information to describe patterns in and/or evidence about the natural and designed world(s).</li> </ul>	<ul style="list-style-type: none"> <li>Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</li> </ul>
<ul style="list-style-type: none"> <li>Describe how specific images (e.g., a diagram showing how a machine works) support a scientific or engineering idea.</li> </ul>	<ul style="list-style-type: none"> <li>Combine information in written text with that contained in corresponding tables, diagrams, and/or charts to support the engagement in other scientific and/or engineering practices.</li> </ul>	<ul style="list-style-type: none"> <li>Integrate qualitative and/or quantitative scientific and/or technical information in written text with that contained in media and visual displays to clarify claims and findings.</li> </ul>	<ul style="list-style-type: none"> <li>Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.</li> </ul>
<ul style="list-style-type: none"> <li>Obtain information using various texts, text features (e.g., headings, tables of contents, glossaries, electronic menus, icons), and other media that will be useful in answering a scientific question and/or supporting a scientific claim.</li> </ul>	<ul style="list-style-type: none"> <li>Obtain and combine information from books and/or other reliable media to explain phenomena or solutions to a design problem.</li> </ul>	<ul style="list-style-type: none"> <li>Gather, read, synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.</li> <li>Evaluate data, hypotheses, and/or conclusions in scientific and technical texts in light of competing information or accounts.</li> </ul>	<ul style="list-style-type: none"> <li>Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.</li> <li>Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible.</li> </ul>
<ul style="list-style-type: none"> <li>Communicate information or design ideas and/or solutions with others in oral and/or written forms using models, drawings, writing, or numbers that provide detail about scientific ideas, practices, and/or design ideas.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate scientific and/or technical information orally and/or in written formats, including various forms of media and may include tables, diagrams, and charts.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate scientific and/or technical information (e.g. about a proposed object, tool, process, system) in writing and/or through oral presentations.</li> </ul>	<ul style="list-style-type: none"> <li>Communicate scientific and/or technical information or ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically).</li> </ul>