

NTPS Next Generation Science Standards Grading Definitions

5th Grade Report Card Insert

SCIENCE AND ENGINEERING PRACTICES

Physical Science, Life Science, and Earth & Space Science

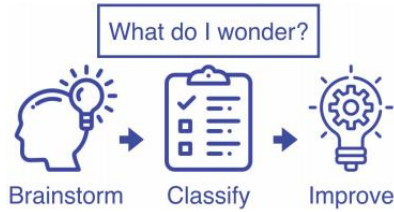
Descriptions of what proficient students KNOW and DO

Students can generate scientific questions about observations, investigations, and conclusions.

Asking Questions (Science)

and

Defining Problems (Engineering)



Example:

Students generate individual questions about the nitrogen cycle.

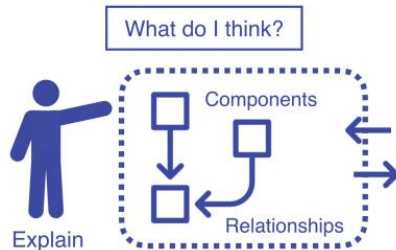


Example:

Students can name impacts that humans have on the environment, and define a problem caused that could be investigated further.

Developing and Using Models

Students create models focused on describing, predicting or explaining the natural world and the relationships of its components (*parts*).

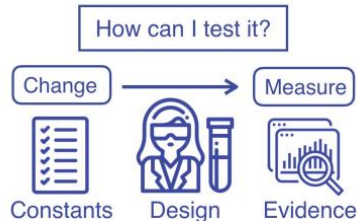


Example:

Students use marker to trace the stream created in a stream table and label landforms as a model of investigation results.

Planning and Carrying Out Investigations

Students design or conduct investigations and gather data. Students make decisions about variables and procedures and refine their plans if necessary.



Example: *You are stranded on a desert island and need clean drinking water for your community. Consider what materials you have to create a filtration system. Plan a model solution and test it. Evaluate how well it worked. What improvements are necessary?*

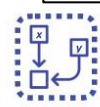







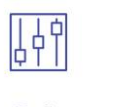






Analyzing and Interpreting Data

Students organize and interpret data to recognize patterns and relationships in the natural and designed world.



Example: *Students use data collected in an investigation analyze which material had the most viscosity.*

Finish Order	Trial 1	Trial 2	Trial 3	Trial 4
First				
Second				
Third				

<p>Using Mathematics & Computational Thinking</p>	<p>Students use mathematical skills, reasoning, and technology to answer a scientific question and support conclusions.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>How can I prove it?</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="display: flex; justify-content: space-around; font-size: small;"> Represent Model Analyze </p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Example:</p> <p>Measure the volume of the water. Is it the same as the volume you added to the mixture in Part B of this lesson? Explain. _____</p> </div>
<p>Constructing Explanations (Science)</p> <p>and</p> <p>Designing Solutions (Engineering)</p>	<p>Students can construct their own explanations of how a phenomenon occurs and design their own solutions to a problem.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>How does it work?</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="display: flex; justify-content: space-around; font-size: small;"> Question Cause Mechanism </p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Example:</p> <p><i>When viewing a demonstration of erosion on the bank of a creek, the student can construct an explanation of how or why erosion is occurring.</i></p> </div> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>How can I fix the problem?</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="display: flex; justify-content: space-around; font-size: small;"> Solution Criteria Constraints Refine </p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Example:</p> <p><i>When asked to make a plan to slow erosion on the bank of a creek, students develop a plan to plant shrubs in the riparian (Creekside) zone as one way to slow erosion.</i></p> </div>
<p>Engaging in Argument from Evidence</p>	<p>Students use evidence and reasoning to defend and support their claims and explanations.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>How do I know?</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="display: flex; justify-content: space-around; font-size: small;"> Claim Reasoning Evidence </p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Example: <i>In the Conclusion to an investigation, the student can answer the following question:</i></p> <p>Out of the three models your group built and tested, which model do you think would be most effective in the long run and why?</p> </div>
<p>Obtaining, Evaluating, and Communicating Information</p>	<p>Students communicate information, evidence, and ideas in multiple ways.</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>What did I learn?</p> </div> <div style="display: flex; justify-content: space-around; align-items: center;">    </div> <p style="display: flex; justify-content: space-around; font-size: small;"> Obtain Evaluate Communicate </p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Example:</p> <div style="border: 2px solid green; border-radius: 10px; padding: 10px; margin: 5px;"> <p>Notebook Prompt: Explain the difference between a food chain and a food web.</p> <p>The difference between a food chain and a food web is _____.</p> </div> </div>

Each year, students should be able to demonstrate greater capacity for connecting knowledge across, and between, the physical sciences, life sciences, earth and space sciences, and engineering design.

During grades 3–5, your child will begin to form deeper connections between concepts and skills previously learned in grades K–2, such as evaluating methods for collecting data, revising models based on evidence, and analyzing data to make sense of phenomena. Upon completion of grades 3–5, your child should have a deeper understanding of: • the effects of chemical reactions, forces, and energy on the world around us; • the ways different organisms and the environment interact; • the ways the geosphere, biosphere, and hydrosphere interact; and • how engineering design can be a regular part of problem solving.