

## How does the Bottle Rocket project align with academic standards?

| BOTTLE ROCKET  |  |
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| NGSS   | Activity Applications  |
| <p><b>Motion and Stability: Forces and Interactions</b><br/><b>3-PS2-1</b><br/>Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.</p>  | <ul style="list-style-type: none"> <li>Mix up a chemical reaction to launch a rocket. The rocket remains on the launcher until an unbalanced force is exerted. When pressure inside the rocket becomes too great, it pushes the rocket off the launcher and into the air.</li> </ul> |
| <p><b>Engineering Design</b><br/><b>3-5-ETS1-3</b><br/>Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.</p> <p><b>MS-ETS1-3</b><br/>Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.</p>   | <ul style="list-style-type: none"> <li>Test the rocket and modify as needed to help it fly higher. Adjust the fins to change how the rocket flies.</li> </ul>  |
| Common Core  | Activity Applications  |
| <p><b>English Language Arts &gt; Reading: Informational Texts</b><br/><b>RI.3.3</b> Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect.<br/><b>RI.4.3</b> Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.<br/><b>RI.5.3</b> Explain the relationships or interactions between two or more individuals, events, ideas, or concepts in a historical, scientific, or technical text based on specific information in the text.</p> <p><b>English Language Arts &gt; Science &amp; Technical Subjects</b><br/><b>RST.6-8.3</b> Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.</p> | <ul style="list-style-type: none"> <li>Make connections between steps in the technical instructions, as well as explain how a chemical reaction causes the rocket to fly.</li> </ul>   |
| <p><b>RI.3.4</b> Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.<br/><b>RI.4.4</b> Determine the meaning of general academic</p>  | <ul style="list-style-type: none"> <li>Acquire and use new vocabulary related to chemical reactions, air pressure, and engineering.</li> </ul>   |

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| <p>and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.</p> <p><b>RI.5.4</b> Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 5 topic or subject area.</p> <p><b>RI.6.4</b> Determine the meaning of words and phrases as they are used in a text, including figurative, connotative, and technical meanings.</p> <p><b>RST.6-8.4</b> Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.</p>   |  |
| <p><b>RI.3.5</b> Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.</p>   | <ul style="list-style-type: none"> <li>• Use bold print, tip text, headings, and icons to locate key information in the Tinker Zine and Blueprint.</li> </ul>  |
| <p><b>RI.3.7</b> Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).</p> <p><b>RI.4.7</b> Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, time lines, animations, or interactive elements on Web pages) and explain how the information contributes to an understanding of the text in which it appears.</p> <p><b>RI.5.7</b> Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.</p> <p><b>RI.6.7</b> Integrate information presented in different media or formats (e.g., visually, quantitatively) as well as in words to develop a coherent understanding of a topic or issue.</p> <p><b>RST.6-8.7</b> Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).</p> | <ul style="list-style-type: none"> <li>• Refer to technical instructions, illustrations, and diagrams, as well as informational articles in the Tinker Zine, to explain scientific concepts.</li> </ul>                        |
| <p><b>RI.4.9</b> Integrate information from two texts on the same topic in order to write or speak about the subject knowledgeably.</p> <p><b>RI.5.9</b> Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.</p>  | <ul style="list-style-type: none"> <li>• Compare and synthesize information presented in articles (such as “Fizz, Fizz” and “Pop Trivia”) and technical instructions to demonstrate fluency in scientific concepts.</li> </ul> |