# Mapping Science Buddies Content to Core Teaching Standards

Science and engineering projects are excellent vehicles for building not only science skills but also applied math skills and language arts skills. The sections below show how using key Science Buddies resources, as well as completing science and engineering projects, can fulfill core science, math, and language standards.

## Science and Engineering Standards

Individual science and engineering projects, as well as hands-on inquiry-based classroom science activities, can be used to teach specific topics and standards in a variety of scientific disciplines. For example, the project idea Play-Doh Math could be used to teach about the mathematics used to calculate volumes as well as standards on energy and matter. The tables below show how science and engineering projects and other Science Buddies resources fulfill general science standards from the Next Generation Science Standards (NGSS) (preliminary draft May 2012) developed by Achieve, Inc.

**NGSS: Science and Engineering Practices**

| | Planning and Carrying Out Investigation | Analyzing and Interpreting Data | Obtaining, Evaluating, and Communica-ting Information | Asking Questions and Defining Problems | Constructing Explanations and Designing Solutions | Developing and Using Models | Using Mathematics and Computational Thinking | Engaging in Argument from Evidence |
|---|---|---|---|---|---|---|---|---|
| Science Project Idea | X | X | X | X | X | * | X | X |
| Engineering Project Idea | X | X | X | X | X | X | X | X |
| Classroom Activity | X | X | X | X | X | * | * | X |
| Using the Science Fair Project Guide[1] | | X | X | X | * | * | | X |
| Writing a Research Paper for Your Science Fair Project | | | X | X | | * | | X |
| Using Ask an Expert | X | * | X | X | * | * | * | * |
| Reading Science Buddies Blog | | | X | | | | | |
| Exploring Science Careers | | | X | | | | | |

**Key:**

X The vast majority of the resources in this area fulfill the standard.

* The standard is fulfilled in some, but not all resources, depending on the student's specific topic

[1] The most relevant sections of the Science Fair Project Guide are "Getting Started" and "Analyzing Your Data and Drawing a Conclusion."

**NGSS: Crosscutting Concepts**

| | Patterns | Cause and Effect | Energy and Matter | Structure and Function | Stability and Change | Systems and System Models | Scale, Proportion, and Quantity | Influence of Engineering, Technology, and Science on Society and the Natural World | Interdependence of Science, Engineering, and Technology |
|---|---|---|---|---|---|---|---|---|---|
| Science Project Idea | X | X | * | * | X | * | X | * | X |
| Engineering Project Idea | X | X | * | X | X | X | X | X | X |
| Classroom Activity | X | X | * | * | X | * | * | * | * |
| Using the Science Fair Project Guide[2] | X | X | * | * | X | * | * | * | X |
| Writing a Research Paper for Your Science Fair Project | * | * | * | * | * | * | * | * | X |
| Using Ask an Expert | * | * | * | * | * | * | * | * | * |
| Reading Science Buddies Blog | * | * | * | * | * | * | * | X | X |
| Exploring Science Careers | | | | | | | | X | X |

[2] The most relevant sections of the Science Fair Project Guide are "Testing Your Hypothesis by Doing an Experiment" and "Analyzing Your Data and Drawing a Conclusion."

# Mathematics Standards

Undertaking a science or engineering project can teach a student a variety of specific mathematics standards. For example, students often apply mathematics to the real world to design an apparatus or take measurements, and collected numerical data must be analyzed using mathematics principles and equations. This process is especially important to help students understand how scientific principles are defined by mathematical equations. The table below shows how science and engineering projects and other Science Buddies resources fulfill general mathematics standards from the Common Core State Standards (CCSS) developed by the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO).

| | **CCSS for Mathematics** | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1. Make sense of problems and persevere in solving them | 2. Reason abstractly and quantitatively | 3. Construct viable arguments and critique the reasoning of others | 4. Model with mathematics | 5. Use appropriate tools strategically | 6. Attend to precision | 7. Look for and make use of structure | 8. Look for and express regularity in repeated reasoning |
| Science Project Idea | X | * | X | * | X | * | * | * |
| Engineering Project Idea | X | * | X | X | X | * | * | * |
| Classroom Activity | | * | * | | * | | | |
| Using the Science Fair Project Guide[3] | X | * | X | * | X | * | | |
| Writing a Research Paper for Your Science Fair Project | * | | * | * | | | | |
| Using Ask an Expert | * | * | * | | * | | * | |
| Reading Science Buddies Blog | | | | | | | | |
| Exploring Science Careers | | | | | | | | |

[3] The most relevant section of the Science Fair Project Guide is "Analyzing Your Data and Drawing a Conclusion."

# Language Arts Standards

A variety of language arts and literacy standards can be taught by using a science or engineering project. This is because such a project has several vehicles in which it does this, namely performing background research, writing a research paper, maintaining a laboratory notebook, creating a display board, and orally communicating with judges. The table below shows how science and engineering projects and other Science Buddies resources fulfill general language arts and literacy standards from the CCSS developed by the NGA Center and the CCSSO.

**CCSS for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects**

| | Reading | | | | Writing | | | | Speaking and Listening | | Language | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Key Ideas and Details | Craft and Structure | Integration of Knowledge and Ideas | Range of Reading and Level of Text Complexity | Text Types and Purposes | Production and Distribution of Writing | Research to Build and Present Knowledge | Range of Writing | Comprehension and Collaboration | Presentation of Knowledge and Ideas | Conventions of Standard English | Knowledge of Language | Vocabulary Acquisition and Use |
| Science Project Idea | X | X | X | X | * | | X | X | * | X | X | X | X |
| Engineering Project Idea | X | X | X | X | * | | X | X | * | X | X | X | X |
| Classroom Activity | * | | | | | | | | X | | * | X | X |
| Using the Science Fair Project Guide[4] | X | X | X | X | X | * | X | X | * | X | X | X | X |
| Writing a Research Paper for Your Science Fair Project | X | X | X | X | X | X | X | X | * | X | X | X | X |
| Using Ask an Expert | X | X | * | | | * | | * | X | * | * | X | X |
| Reading Science Buddies Blog | * | * | * | X | | | | | | | | X | X |
| Exploring Science Careers | | | X | X | | | | | | | | X | X |

[4] The most relevant sections of the Science Fair Project Guide are “Doing Your Background Research” and “Communicating Your Results.”