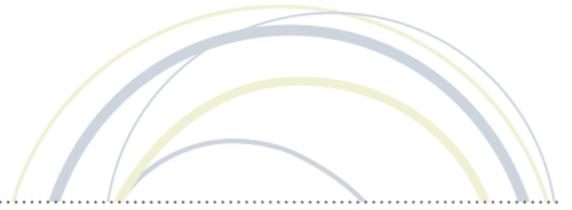




# ISTE SEAL OF ALIGNMENT REVIEW FINDINGS REPORT

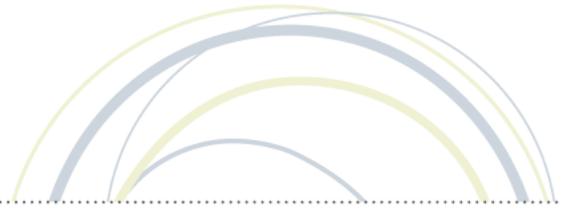
Google Science Fair

JUNE 2018



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## ABOUT

### **ABOUT ISTE**

The International Society for Technology in Education (ISTE) is the premier nonprofit membership organization serving educators and education leaders. ISTE is committed to empowering connected learners in a connected world and serves more than 100,000 education stakeholders throughout the world.

As the creator and steward of the definitive education technology standards, our mission is to empower learners to flourish in a connected world by cultivating a passionate professional learning community, linking educators and partners, leveraging knowledge and expertise, advocating for strategic policies, and continually improving learning and teaching.

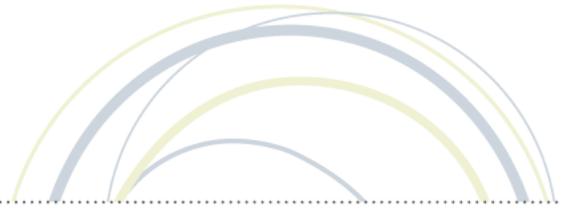
### **ISTE SEAL OF ALIGNMENT**

Resources and products designed with the ISTE Standards in mind are choosing to demonstrate their commitment to support critical digital age learning skills and knowledge. Regardless of a solution's intended grade level, purpose or content area, by addressing the ISTE Standards and earning a Seal of Alignment, a solution is shown to consciously, purposefully and meaningfully support best practices for digital age teaching and learning.

ISTE considers a solution aligned to the ISTE Standards only after an extensive review conducted by trained ISTE Seal of Alignment reviewers, and it has been determined to meet all critical elements of a particular standard indicator in accordance with specific review criteria.

By earning a Seal of Alignment, ISTE verifies that this product:

- Promotes critical technology skills
- Supports the use of technology in appropriate ways
- Contributes to the pedagogically robust use of technology for teaching and learning
- Aligns to the ISTE Standards in specific ways as described in the review finding report



## RESOURCE DESCRIPTION

### **WHAT IS THE GOOGLE SCIENCE FAIR PROGRAM?**

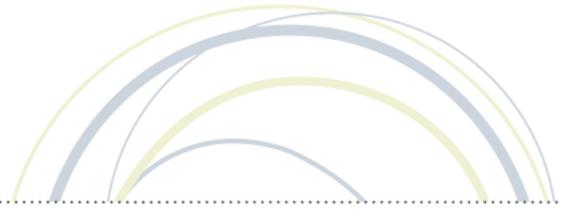
Google Science Fair is an online, international competition sponsored by Google and its partners, and is designed to encourage students from 13 to 18 years of age to develop and submit solutions to significant science, technology and engineering problems. Participants can win prizes including scholarship funding, trips and other educational experiences.

### **HOW IS THE GOOGLE SCIENCE FAIR PROGRAM IMPLEMENTED?**

Through seven sets of Google Slides, teachers and other facilitators can access and use these materials to help students develop problem-solving skills and participate in the competition.

Each slide set is accompanied by presenter notes with prompts for teachers/facilitators to use while presenting and by supplementary materials such as brain-storming worksheets and research guides to aid students in their learning, as well as research and development activities. Some of the slides also include video content.

These resources are designed to be adaptable to a variety of settings and across a range of subjects. They are also highly constructivist in nature. The resources provided function mainly as scaffolding to assist teachers in guiding students through the process of selecting a science fair topic, exploring a problem and developing a solution while enabling students to exercise the maximum of individual initiative and creativity.



## ISTE SEAL OF ALIGNMENT REVIEW

**Product:** Science Fair

**Company:** Google

**Date of Award:** June 2018

### REVIEW METHODOLOGY

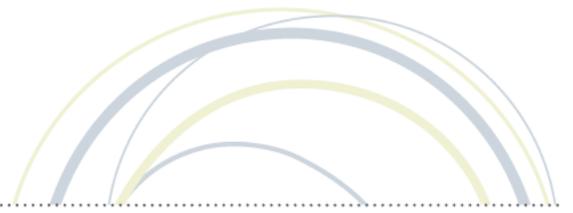
ISTE Seal of Alignment reviews are conducted by a panel of education and instructional experts. Reviewers use data collected both separately and collectively to determine how a solution addresses specific elements described in each of the indicators of the ISTE Standards. Special instruments are used by reviewers to collect data on potential alignment across all resource materials. Alignment is determined based on the extent to which all or some of specific elements are addressed within the materials. Reviewers conduct regular calibrations to assure the validity and reliability of the results and final review findings are combined for an overall score for alignment on each individual indicator.

The Google Science Fair resource was reviewed for alignment against the ISTE Standards for Students, at the Readiness level. Readiness level reviews examine how a resource instructs and/or assesses specific skills and knowledge that have been identified as foundational to the elements of the ISTE Standards.

### SCOPE OF REVIEW

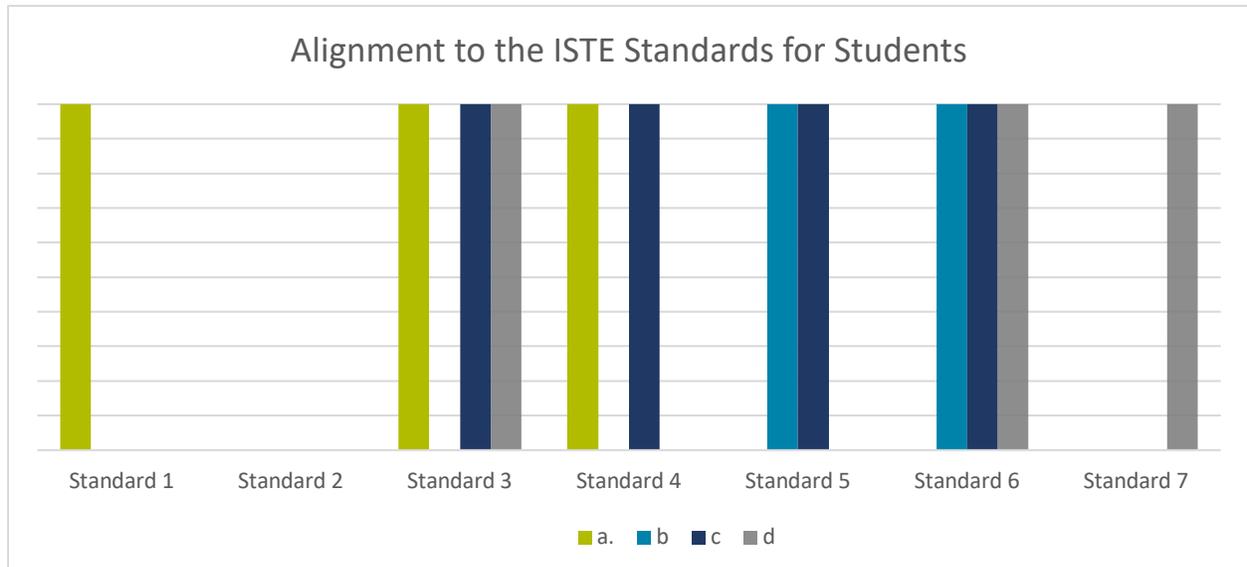
During the review process for the Google Science Fair program, reviewers:

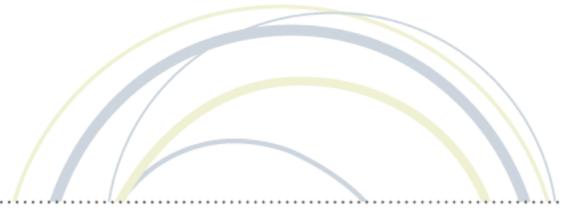
- collected data on when and how each activity addressed specific skills and knowledge described in the ISTE Standards for Students.
- compiled findings to determine overall alignment across all ISTE Standards for Students standards and indicators.
- used aggregate findings to form the basis of the overall alignment results.



## REVIEW FINDINGS

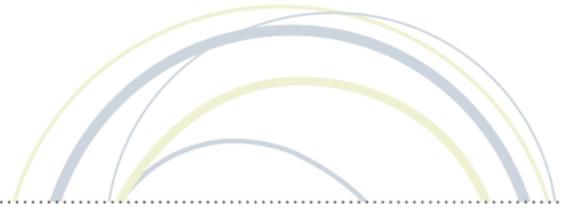
The Google Science Fair resource supports the following indicators of the ISTE Standards for Students:



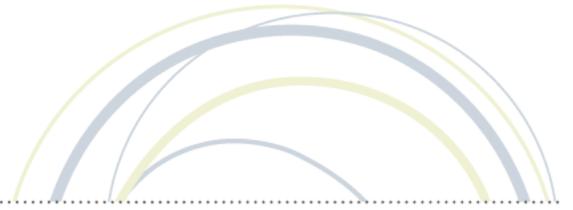


The Google Science Fair resource supports the ISTE Standards for Students at the readiness level in the following ways:

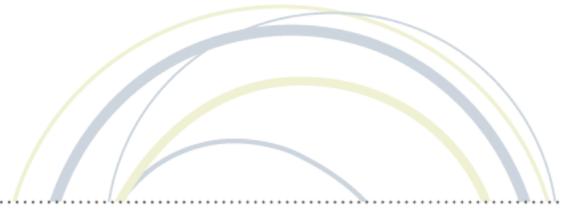
ISTE Standard	Finding Statement
<b>1. Empowered Learner</b>	
1.a. Articulate and set personal learning goals, develop strategies leveraging technology to achieve them and reflect on the learning process itself to improve learning outcomes.	Students are guided through problem identification by seeing examples, providing criteria for problem selection such as personal interest and feasibility, and steps for turning a problem in to a question that can be tested. Worksheets are provided for students to use to capture their thinking.
1.b. Build networks and customize their learning environments in ways that support the learning process.	
1.c. Use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.	
1.d. Understand the fundamental concepts of technology operations, demonstrate the ability to choose, use and troubleshoot current technologies and are able to transfer their knowledge to explore emerging technologies.	
<b>2. Digital Citizen</b>	
2.a. Cultivate and manage their digital identity and reputation and are aware of the permanence of their actions in the digital world.	
2.b. Engage in positive, safe, legal and ethical behavior when using technology, including social interactions online or when using networked devices.	
2.c. Demonstrate an understanding of and respect for the rights and obligations of using and sharing intellectual property.	
2.d. Manage their personal data to maintain digital privacy and security and are aware of data-collection technology used to track their navigation online.	
<b>3. Knowledge Constructor</b>	



3.a. Plan and employ effective research strategies to locate information and other resources for their intellectual or creative pursuits.	A Research Guide provides an outline for planning research, and the iterative process of developing a solution reinforces implementation strategies using a variety of tools.
3.b. Evaluate the accuracy, perspective, credibility and relevance of information, media, data or other resources.	
3.c. Curate information from digital resources using a variety of tools and methods to create collections of artifacts that demonstrate meaningful connections or conclusions.	Students are introduced to numerous examples of the process of collecting and curating digital artifacts to synthesize into a science fair project.
3.d. Build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.	The complete set of presentation slides and student worksheets promote student knowledge-building through the process of exploring real world issues and through the step-by-step creation of a viable science fair project.
<b>4. Innovative Designer</b>	
4.a. Know and use a deliberate design process for generating ideas, testing theories, creating innovative artifacts or solving authentic problems.	Students are introduced to multiple examples of deliberate design processes including those used in engineering, scientific exploration and computational thinking. Supporting worksheets give students the opportunity to explore and use one or more of them in the design of their own projects. Design also extends to the consideration of communication strategies for presenting their project.
4.b. Select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.	
4.c. Develop, test and refine prototypes as part of a cyclical design process.	The step-by-step process of developing a viable science fair project involves the creation, testing and refinement of prototypes.
4.d. Exhibit a tolerance for ambiguity, perseverance and the capacity to work with open-ended problems.	
<b>5. Computational Thinker</b>	
5.a. Formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.	



<p>5.b. Collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.</p>	<p>Throughout the project development process, students are shown examples of how a variety of tools can be used to analyze their findings and to determine, represent and communicate their solutions.</p>
<p>5.c. Break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.</p>	<p>In several steps of the development process, students are shown examples of and provided scaffolding for problem decomposition including interrogating, revising and prioritizing questions and multiple descriptive data models.</p>
<p>5.d. Understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.</p>	
<p><b>6. Creative Communicator</b></p>	
<p>6.a. Choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.</p>	
<p>6.b. Create original works or responsibly repurpose or remix digital resources into new creations.</p>	<p>The outcome of the learning process is to submit a science fair project. All the sessions build toward the creation of an original solution to a science or technology problem.</p>
<p>6.c. Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.</p>	<p>Students are shown examples of strategies for communicating descriptions of their projects in various formats and media. Worksheets provide scaffolding for developing a story that communicates their message effectively.</p>
<p>6.d. Publish or present content that customizes the message and medium for their intended audiences.</p>	<p>Emphasis is made on the need to develop strategies for customizing communication to the intended audience. Support materials include video examples, story boarding, a starburst brainstorming tool and a SWOT analysis worksheet.</p>
<p><b>7. Global Collaborator</b></p>	
<p>7.a. Use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.</p>	
<p>7.b. Use collaborative technologies to work with others, including peers, experts or community members, to examine issues and problems from multiple viewpoints.</p>	



7.c. Contribute constructively to project teams, assuming various roles and responsibilities to work effectively toward a common goal.	
7.d. Explore local and global issues and use collaborative technologies to work with others to investigate solutions.	Examples of previous winning projects show engagement with local and global issues of importance. The use of collaborative technologies is implicit rather than direct throughout.

## CONCLUSION

The presentation and support materials for the Google Science Fair competition are thoughtful, polished and professional; and, these instructional materials provide effective scaffolding and support for both teachers and students. The examples and stories of previous participants and projects not only serve as practical guides for learning, but, are also inspirational.

The learning materials aid both teachers and students in developing and applying a foundational set of problem-solving skills. Participation in the Google Science Fair program clearly broadens and deepens these skills.

As such, the Google Science Fair program is a valuable contribution to the educational community, as it encourages and supports student learning activities across a range of subject areas, and addresses many of the ISTE Standards for Students. By preparing to participate in the Google Science Fair program, students learn real-world problem-solving skills that will benefit them not only during their education but also in their careers.