



2021-22 Science and Engineering Fair Student Handbook

Event Date: January 11, 2022

Project Submission and Setup Deadline: January 10, 2022

**Participates: All 3-5 Grade Students (Individual / Small Groups)
K-2 (Class Projects)**

Felica Topper (School Science Fair Coordinator)

Felica.topper@apks12.org

Ms. Pookrum (Pre-K-2 Coordinator)

dpookrum@apks12.org

Mr. Armstrong (3-5 Coordinator)

mgarmstrong@apks12.org



**Atlanta Public Schools & Bolton Academy
Science and Engineering Fair
2021-2022 Calendar of Events**

Topic	Description
Project Submission Date and Set up Date	January 10, 2021
Science Fair & Judging	January 11, 2021
APS District Science Fair	<p>January 26, 2021</p> <p>The Atlanta City District & Regional Fair will be held at the following:</p> <p style="text-align: center;">The Coan Building 1550 Hosea L Williams Drive NE, Atlanta, GA 30317</p> <p style="text-align: center;"><i>(Location is subject to change due to Covid-19 restrictions. If the location is changed, the fair will take place virtually.)</i></p>
School wide Gallery Walk	January 12,2021-January 13 th (Please see Ms. Johnson to schedule a time)
Community Connection	All projects will be shared with our school community via Google Sites.
Event Location	Bolton Academy Media Center
Participation	<p>K-2 Homerooms will submit a class project</p> <p>3-5 All students will submit an individual project or a small group (2 to 3 people) project</p>

The Wonder of Science

Science & Engineering Fair Timeline
School Level Due Dates

	Date
Distribute and Review Student Handbook with staff and students	November 19, 2021
Determine Science Fair Project Concept/Idea and Identify a Problem	By December 6, 2021
Submit Forms 1, 1A, & 1B Required Documents and Submit Project Approval Form to grade level coordinator Ms. Pookrum (K-2) dpookrum@apsk12.org Mr. Armstrong (3-5) mgarmstrong@apsk12.org <u>Please include the research plan.</u> <u>(Form 1B must be signed and dated prior to experimentation or the project will not be accepted-Form is included.</u>	By December 6, 2021
Complete Form 1A once approved , write your MATERIALS, PROCEDURE and VARIABLES in your log book.	By December 6, 2021
Experimentation (May begin after Form 1A has been submitted and approved or the project will not be accepted).	December 6, 2021
Document all activity related to your project in your student logbook	Ongoing-Log all action items
Experimentation (May begin after Form 1A has been submitted and approved or the project will not be accepted). Hypothesis Writing Sheet and Procedure Research/Bibliography Research Paper/Report	December 15th-December 30th
Abstract & Project Submission (display board, prototypes, dioramas,etc)	January 10, 2022
School-Based Science Fair	January 11, 2022
Register Projects for the Atlanta City Regional Fair Projects will be registered through the provided links:	January 14, 2022

Student Display and Safety Regulations

Display:

Maximum Size of Project

- **Depth** (front to back): 30 inches or 76 centimeters
- **Width** (side to side): 48 inches or 122 centimeters
- **Height** (floor to top): 108 inches or 274 centimeters.

*Projects must be exhibited on the table top. No part of an exhibit may be placed on the floor or under the table.

A completed, unaltered Official GSEF Abstract must be displayed vertically on the front edge of the table.

You must have your required forms in numeric order in a three-ring binder on the table:

1. Checklist for Adult Sponsor (1)
2. Student Checklist (1A)
3. Research Plan/Project Summary
4. Approval Form (1B)
5. Forms 1C – 7 (per specific project)
6. Research Paper (suggested)

* It is suggested that your logbook be displayed on the table but this is not required per ISEF.

Safety:

The following items **cannot** be displayed during the fair: awards, medals, business cards, flags, logos, CDs, DVDs, flash drives, brochures, booklets, pens, key chains, living organisms, soil, sand, rock, and/or waste samples, specimens and preserved animals.

Note: Further rules regarding project display can be found on the GSEF and ISEF websites. More information can be found in the exhibitor's handbook.

Images, Tables, and Graphs:

All images (photos, graphics), tables, and graphs must be credited to the appropriate parties.



THE FOLLOWING ITEMS ARE NOT ALLOWED AT PROJECTS

NOT ALLOWED PER SAFETY REGULATIONS

- **Living or dead organisms**, including fungi, animals, plants and microorganisms
- **Taxidermy specimens, parts, pelts**
- **Preserved vertebrate or invertebrate animals** or animal parts, including cells
- Human or animal **food** of any kind
- Human or animal **parts or body fluids** (including bones, urine, bloodstains)
- **Plant materials** including potpourri, grain, birdseed, spices, leaves, flowers, logs, branches, etc. Plastic or other inorganic replicas or photographs should be used instead. (Exception: manufactured construction materials used in building the project or display)
- **Soil, sand, rock, minerals, or waste** samples, even if fully encased in acrylic
- **All chemicals**, including water.
- **All liquids, gels, powders, and creams**, such as shampoo, sunscreen, salt, soap, agar, etc.
- **Dry ice** or other sublimating solids
- **Hazardous substances or devices**, including poisons, drugs, firearms, weapons, martial arts weapons, ammunition, etc.
- **Sharp items**, including syringes, needles, pipettes, nails, knives
- **Flames or highly flammable materials**
- **Glass** or glass objects unless deemed by the Display & Safety Committee to be an integral and necessary part of the project (e.g., glass that is an integral part of a computer screen)
- **Hammering, pinching, or pounding devices** that are not fully immobilized, pulleys or hinges with pinch points, etc.
- **Batteries** with open-top cells, **Drones, or 3-D Printers**
- Any apparatus or item deemed unsafe by any member of the SRC, the Display & Safety committee, judges, or the GSEF staff (e.g., vacuum tubes or dangerous ray-generating devices, pressurized or empty tanks that previously contained combustibles, etc.)

NOT ALLOWED PER DISPLAY REGULATIONS

- **Acknowledgments**, endorsements, thanks.
- **Awards**, medals, flags, logos (including school and university logos).
- **Give-away items** such as flyers, pens, postcards, CDs, business cards, etc. You may give out unaltered copies of your Official Abstract Form.
- **Contact information** of any finalist or their school: email or postal address, social media address, QR code, telephone, business card, fax number, or contact URL (URLs used solely to cite the sources of photos are permitted).
- **Active Internet** or email connections.
- For Continuation projects, no prior years' written material or visual depictions on the display board. However, previous years' logbooks and binders may be on the table if desired and if clearly marked, e.g. "Year I." The project title should mention which year the project is, e.g., "Year Two".

2021 Georgia Science and Engineering Fair Rubric

Teachers and students in Georgia should consider the following judging criteria when planning to complete science fair projects. These guidelines are based on the Intel ISEF criteria. ISEF and GSEF offer a second set of criteria that may be applied to projects in engineering, mathematics and computer science. The judging process places special emphasis on the student's ability to discuss the project effectively during the oral interview. Other criteria include the originality, creativity, imagination, discovery, and inventiveness of the projects.

Displays serve two primary functions: 1) Communicate the research clearly when the student is not present, and 2) Promote in-depth discussions of the projects. Judges may examine the student notebook (three-ring binder), which are required to include ISEF Forms 1, 1A and 1B, the Research Proposal, any additional forms/permissions required by the specific research being conducted, and optional items such as a research paper.

<i>Most Science Projects</i>	<i>Engineering Projects (may be applied to some projects in mathematics and computer science)</i>
I. Research Question (10 pts.) <ul style="list-style-type: none"> ● Clear and focused purpose ● Identifies contribution to field of study ● Testable using scientific methods 	I. Research Problem (10 pts.) <ul style="list-style-type: none"> ● Description of a practical need or problem to be solved ● Definition of criteria for proposed solution ● Explanation of constraints
II. Design and Methodology (15 pts.) <ul style="list-style-type: none"> ● Well-designed plan and data collection methods ● Variables and controls defined, appropriate and complete 	II. Design & Methodology (15 pts.) <ul style="list-style-type: none"> ● Exploration of alternatives to answer need or problem ● Identification of a solution ● Development of a prototype/model
III. Execution: Data Collection, Analysis & Interpretation (20 pts.) <ul style="list-style-type: none"> ● Systematic data collection and analysis ● Reproducibility of results ● Appropriate application of mathematical and statistical methods ● Sufficient data collected to support interpretation and conclusions 	III. Execution: Construction & Testing (20 pts.) <ul style="list-style-type: none"> ● Prototype demonstrates intended design ● Prototype has been tested in multiple conditions/trials ● Prototype demonstrates engineering skill and completeness
IV. Creativity (20 pts.) <ul style="list-style-type: none"> ● Project demonstrates significant creativity/originality/inventiveness in one or more of the above criteria 	
V. Presentation (35 pts.) <p><u>Poster</u> (10 pts.)</p> <ul style="list-style-type: none"> ● Logical organization of material ● Clarity of graphics and legends ● Supporting documentation well selected and displayed <p><u>Interview</u> (25 pts.)</p> <ul style="list-style-type: none"> ● Clear, concise, thoughtful responses to questions ● Understanding of basic science relevant to project ● Understanding of interpretation and limitations of results and conclusions ● Degree of independence in conducting project ● Recognition of potential impact in science, society and/or economics 	

- Quality of ideas for further research
- For team projects, contributions to and understanding of project by all members

www.georgiacenter.uga.edu/gsef

Project Categories and Subcategories

ANIMAL SCIENCES

- Animal Behavior
- Cellular Studies
- Development
- Ecology
- Genetics
- Nutrition & Growth
- Physiology
- Systematics & Evolution

BEHAVIORAL & SOCIAL SCIENCES

- Clinical and Developmental Psychology
- Cognitive Psychology
- Physiological Psychology
- Sociology & Social Psychology

BIOCHEMISTRY

- Analytical Biochemistry
- General Biochemistry
- Medicinal Biochemistry
- Structural Biochemistry

BIOMEDICAL & HEALTH SCIENCES

- Disease Diagnosis
- Disease Treatment
- Drug Development & Testing
- Epidemiology
- Nutrition
- Physiology & Pathology

BIOMEDICAL ENGINEERING

- Biomaterials & Regenerative Medicine
- Biomechanics
- Biomedical Devices
- Biomedical Imaging
- Cell and Tissue Engineering
- Synthetic Biology

CELLULAR & MOLECULAR

BIOLOGY

- Cell Physiology
- Genetics
- Immunology
- Molecular Biology
- Neurobiology

CHEMISTRY (CH)

- Analytical Chemistry
- Computational Chemistry
- Environmental Chemistry
- Inorganic Chemistry
- Materials Chemistry
- Organic Chemistry
- Physical Chemistry

COMPUTATIONAL BIOLOGY & BIOINFORMATICS

- Biomedical Engineering
- Computational Pharmacology
- Computational Biomodeling
- Computational Evolutionary Biology
- Computational Neuroscience
- Genomics

EARTH & ENVIRONMENTAL SCIENCES

- Atmospheric Science
- Climate Science
- Environmental Effects on Ecosystems
- Geosciences
- Water Science

EMBEDDED SYSTEMS

- Circuits
- Internet of Things
- Microcontrollers
- Network & Data Communications
- Optics
- Sensors
- Signal Processing

ENERGY: CHEMICAL

- Alternative Fuels
- Computational Energy Science
- Fossil Fuel Energy
- Fuel Cells and Battery Development
- Microbial Fuel Cells
- Solar Materials

ENERGY: PHYSICAL

- Hydro Power
- Nuclear Power
- Solar
- Sustainable Design
- Thermal Power
- Wind

ENGINEERING MECHANICS

- Aerospace & Aeronautical Engineering
- Civil Engineering
- Computational Mechanics
- Control Theory
- Ground Vehicle Systems
- Industrial Engineering-Processing
- Mechanical Engineering
- Naval Systems

ENVIRONMENTAL ENGINEERING

- Bioremediation
- Land Reclamation
- Pollution Control
- Recycling, Waste Management
- Water Resources Management

MATERIALS SCIENCE

- Biomaterials
- Ceramics & Glasses
- Composite Materials
- Computation & Theory
- Electronic, Optical & Magnetic Materials

MATHEMATICS

- Algebra
- Analysis
- Combinatorics, Graph Theory, and Game Theory
- Geometry and Topology
- Number Theory
- Probability and Statistics

MICROBIOLOGY

- Antimicrobials & Antibiotics
- Applied Microbiology
- Bacteriology
- Environmental Microbiology
- Microbial Genetics
- Virology

PHYSICS AND ASTRONOMY (PH)

- Astronomy and Cosmology
- Atomic, Molecular, and Optical Physics
- Biological Physics
- Computational Physics & Astrophysics
- Condensed Matter & Materials
- Instrumentation
- Magnetics, Electromagnetics, & Plasmas
- Mechanics
- Nuclear & Particle Physics
- Optics, Lasers, Masers

- Quantum Computation
- Theoretical Physics

PLANT SCIENCES

- Agronomy
- Development & Growth
- Ecology
- Genetics/Breeding
- Pathology
- Physiology
- Systematics & Evolution

ROBOTICS & INTELLIGENT MACHINES

- Biomechanics
- Cognitive Systems
- Control Theory
- Machine Learning
- Robot Kinematics

SYSTEMS SOFTWARE

- Algorithms
- Cyber Security
- Databases
- Operating Systems
- Programming Languages

TRANSLATIONAL MEDICAL SCIENCE

- Disease Detection and Diagnosis
- Disease Prevention
- Disease Treatment and Therapies
- Drug Identification and Testing
- Pre-Clinical Studies

*** *All Categories can include other as a subcategory**
