

The OHIO ACADEMY of SCIENCE

1500 West Third Avenue Suite 228 • Columbus OH 43212-2817
Phone 614/488-2228 • Fax 614/488-7629
Email oas@iwaynet.net • Website <http://www.ohiosci.org>
Fostering curiosity, discovery and innovation to benefit society.

Here is a new opportunity for elementary school science students.

Dear Science Teacher:

In addition to grades 7-12, The Ohio Academy of Science will accept a limited number of students in **grades 5-6** into State Science Day for 2010 and 2011. Students must follow all aspects of the Academy's **Science Day Standards** including the completion of research plans and other forms posted at <http://www.ohiosci.org/sds.htm> .

Please email The Ohio Academy of Science at oas@iwaynet.net if you need help to engage your students in scientific inquiry and technological design projects. Be sure to include your name and complete mailing address.

We expect that inquiry and technological design will be the *central focus* of Ohio's new science education standards for ALL grade levels.

The new science standards will have less emphasis on memorizing scientific facts and vocabulary and focus more on students developing their **own ability** to inquire and analyze. It's more effective long term for students to go in depth on some subject they are interested in by going through a process of identifying an issue or problem, and then trying to solve it by collecting data and defending it to teachers, peers and the community.

Students will study science the way science is done and do science.

What is State Science Day?

Since 1949—and now with more than 50,000 alumni—State Science Day is the pinnacle of student-originated, inquiry and project-based STEM education for Ohio's students. During the past 60 years more Ohio students may have chosen careers in science, engineering and technology because of State Science Day than any other factor in their lives. The academic equivalent of a State athletic championship, this year's event is one of the largest of its kind in the nation.

Drawing upon a base of over 30,000 students at more than 1,000 local school science fairs, over 1,000 students in grades 5-12 from nearly 300 schools will be evaluated this year on their scientific research and communication skills. They will compete for nearly 100 different scholarships and awards valued at several million dollars. One out of three students will receive a scholarship or award. Individuals will be recognized and several sponsors will also make awards to members of team research projects. Recent State Science Day Title Sponsor's were The Ohio Academy of Science, American Electric Power, The Ohio Environmental Education Fund and Boehringer-Ingelheim Roxane Inc. The Ohio State University will host the event on May 8, 2010 and May 7, 2011.

We hope to see your 5th-6th graders at District Science Days (see enclosed map) and possibly at State Science Day.

Sincerely,

L E

Lynn E. Elfner
CEO
Enclosures

The Ohio Academy of Science

Scientific inquiry vs. technological or engineering design projects.

Inquiry projects shall have *hypotheses*; technological and engineering design projects shall have *design statements* with measurable criteria for success.

Just as scientific inquiry projects require (1) the identification of a problem or question and (2) a proposed hypothesis that might offer a solution to the problem or answer the question, so too, engineering and technological design projects require (1) a problem or needs statement and (2) a design statement that identifies such limiting factors and criteria for success or meeting the design as cost or affordability, reliability (mean time between failure MTBF), material limits (strength, weight, resistance to corrosion, color, surface texture, ease of manufacture or reproducibility), operating environment or conditions (temperature, humidity, barometric pressure, caustic conditions), ergonomics (human factors), health and safety and general ease of use or operation.

In a manner similar to the development of methods used to test a hypothesis, engineering and technological design projects must test the “design statement” to see how close a prototype, for example, comes to meeting the design criteria. A prototype developed for an engineering and technological design project must achieve stated design objectives and satisfy specified constraints. Generally the results of an engineering and technological design project will describe the extent to which the prototype met the design criteria. An inquiry project shall state the extent to which the results derived from experimentation validate or invalidate a hypothesis. Thus a *hypothesis* is to *inquiry* as *design* is to *engineering* and *technology*. In all cases students must present the results of repeated trials.

The Scientific Method	The Technological or Engineering Design Process
State a question or problem.	Define a problem or need.
Gather background information.	Gather background information.
Formulate hypothesis; identify variables.	Establish design statement or criteria for success.
Design experiment; establish procedure(s).	Prepare preliminary designs.
Test hypothesis multiple times by an experiment.	Build a prototype and test multiple times.
Analyze results & draw conclusions.	Analyze results; verify, test & redesign as necessary.
Present results.	Present results.

Administrative notes:

1. Technology is not limited to computers. Technology encompasses aerospace & aviation, agriculture & food technology, construction, energy, environment and natural resources, information & communications, manufacturing, materials, medicine & health and transportation.
2. As appropriate, “hypothesis or design statement” will replace the term “hypothesis” in the *Science Day Standards*.

The Ohio Academy of Science

2010 District Science Days

Website: <http://www.ohiosci.org/dsd1.htm>



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Hosted by
The Ohio State
University
May 8, 2010
French Field House
and St. John Arena
www.ohiosci.org/ssd.htm

Future Dates
May 7, 2011

09/14/2009

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