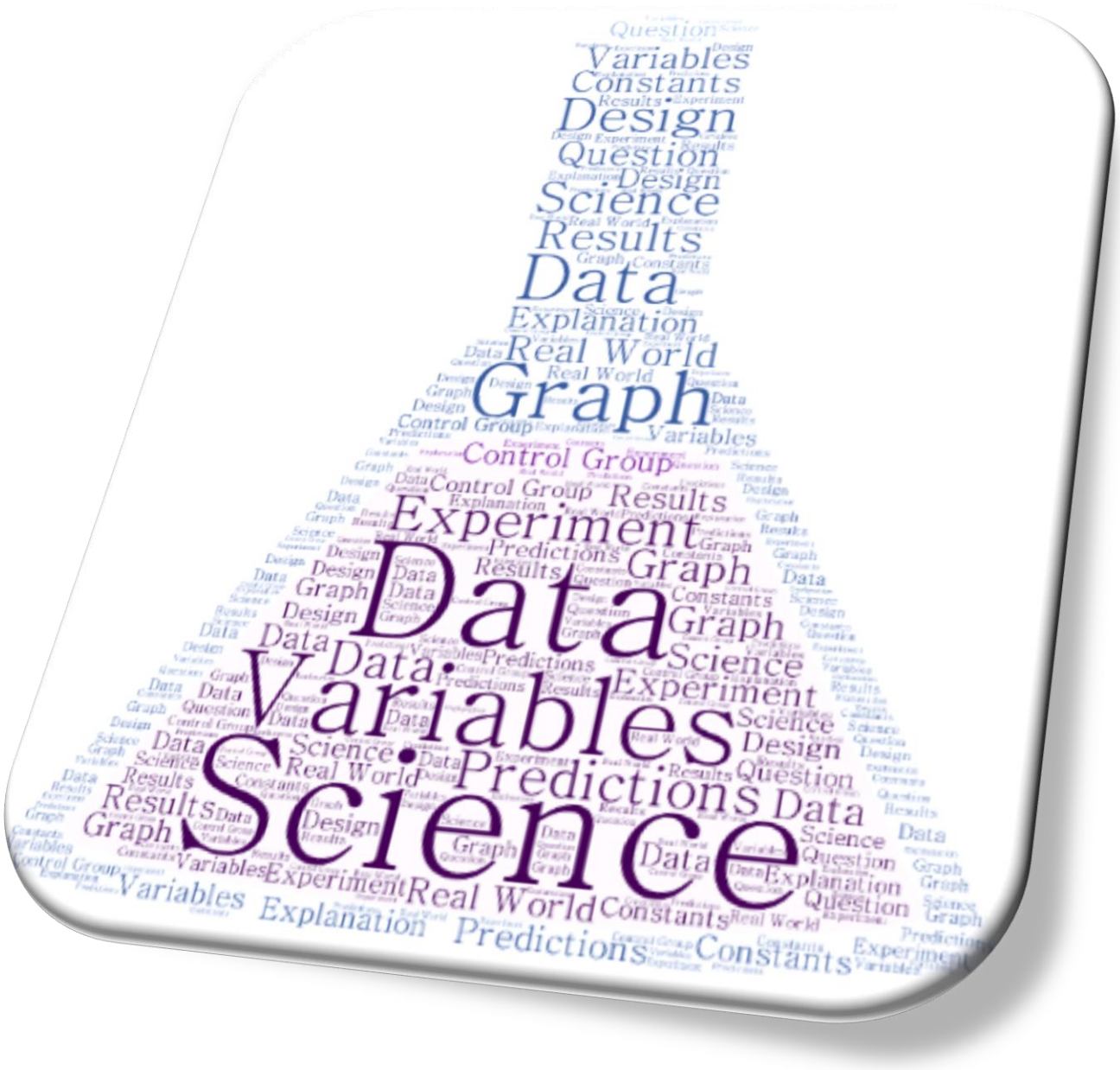


Pinellas County Science Fair and Showcase Guide

Rationale

Twenty-five percent (25%) of the FCAT Science test administered to 5th graders requires understanding of "***the nature of science***." Practicing the scientific method, through completing a science research project, is a powerful and authentic way for students to internalize this knowledge and to practice the process skills of science.

This manual was developed to provide parents and teachers with the necessary information to assist students in using the scientific method to complete a science research project. The goal of elementary science is to introduce students to science content knowledge and provide practice for them to use inquiry skills to analyze and solve problems. Use of inquiry skills encourages students to think creatively and actively engages them in science on a variety of levels. These skills include ***observing, predicting, measuring, classifying, collecting and interpreting data,, experimenting, inferring and communicating.*** Throughout the process, science investigations reinforce skills in reading, writing, speaking, mathematics and the social sciences.

Ways to Support Your Child: A Guide for Parents:

I. Begin your science project experience with a planning meeting. You and your child will want to review this manual and the scoring rubric prior to starting the project. Some ideas to keep in mind are:
   A. This entire process should be ***fun***. It is a great opportunity to spend time together doing something of educational value.
   B. Budget more time for the project than you think you will need...***then double it***.
   C. Topic selection should be at the child's level. Please keep in mind that the ultimate project choice should remain with the child. The science book and the grade level benchmarks listed on **flstandards.org** are excellent resources for grade level appropriate ideas.

II. Remind your child that the science journal begins on Day 1 when ideas are being generated.

III. Help your child focus attention on what is being learned and the accuracy of the information being presented.

IV. Help your child understand the necessary parts of the project.

V. Make sure that your child follows the guidelines as well as all safety regulations.

VI. Encourage your child to refer to the rubric often to assess his/her own progress.

If you have a question as the project progresses, ask the child's teacher.

Some things to think about:

Most of the "how to do a science project" books and websites **are useless**. They typically do not show the scientific process or experimentation. They usually show demonstrations or models that are neither creative nor classical scientific investigation.

The following website may be helpful to an adult who is assisting a child with a project:
http://www.cpet.ufl.edu/sciproj/

District Science Showcase vs. School Fairs

All children are encouraged to participate in a classroom-level or school-level research fair. Students **do not** compete against each other. Projects compete against a standard scoring rubric. Schools will be given information on how many projects can be sent to the district science showcase. Projects will **not** be judged again at the district showcase, but will be on public display. Participation in the District Science Showcase is optional but highly encouraged.

District Science Showcase Categories:

There will be three categories of entry into the District Science Showcase:

Class Research Projects – for Primary Grades K-2
Individual Research Projects - for Intermediate Grades 3-5
Group Research Projects – for Intermediate Grades 3-5

- Only class research projects may be submitted to the District Showcase at the primary level (grades K-2).

- At the intermediate level (grades 3-5), research projects may be submitted as either a group (2 to 4 students working together) or as an individual.

Characteristics of Projects to Avoid:

Avoid consumer economics or product testing projects (i.e., which brand of popcorn pops the most kernels; which paper towel absorbs the most water; which brand of cereal has the most raisins; which battery lasts longest). Although these may qualify as experiments, they are seldom original and are not fair to the companies that make the products. Consumer economics or product testing projects shall not be displayed at the District Science Showcase, and may not be allowed at the classroom or school level.

Avoid models, demonstrations or inventions **unless they are used to measure cause-and-effect relationships.** Models created to gather data (i.e., which type of bridge structure will support the most weight; which shape of boat hull has the least water resistance; which type of propeller blade is most efficient in the wind; etc) **are acceptable** and are usually quite creative.

Avoid any project that is dangerous, expensive, involves humans or vertebrate animals, involves controlled substances (cigarettes, alcohol, drugs), or is beyond the understanding or grade-level ability of the child. An adult supervisor must be present whenever students engage in manipulating supplies, materials, or equipment. A detailed description of things to avoid is listed under Safety Regulations.

Safety Regulations

The following safety regulations must be followed. These rules are for the safety of all children and their adult sponsors. Violation of any rule will result in a project that fails to qualify for scoring. If in doubt, contact your child's teacher or the district science office at 588-6075.

During experimentation:

- All projects must be supervised by an adult…..the **Adult Sponsor**.
- Appropriate protective clothing and equipment (goggles, aprons, gloves, tongs, etc.) must be worn or used by anyone exposed to potentially harmful materials.
- No vertebrate animal may be used in any way.
- No humans (students or adults) may be used as subjects of experimentation.
- No living organism is to be harmed in any way (plants excluded).
- No drugs (including over the counter medications such as aspirin, cigarettes, alcohol) or substances that may be a safety/health hazard may be used. Safety/health hazards are to be assessed by the Adult Sponsor.
- No microbes (mildew, mold, fungus, bacteria) may be cultured or used.
- No explosives of any type, including firecrackers and/or firearms, may be used.
- Projects involving electrical circuits must use standard batteries not to exceed 12 volts DC. No car or motorcycle batteries, open top batteries, or use of 110 volt AC is allowed. All wiring must be properly insulated.
- Standard household appliances (lights, fans, hair dryers) may be used in their original form, without modification, and with Adult Supervision.
- Heating sources (stoves, hot plates) may be used with Adult Supervision.

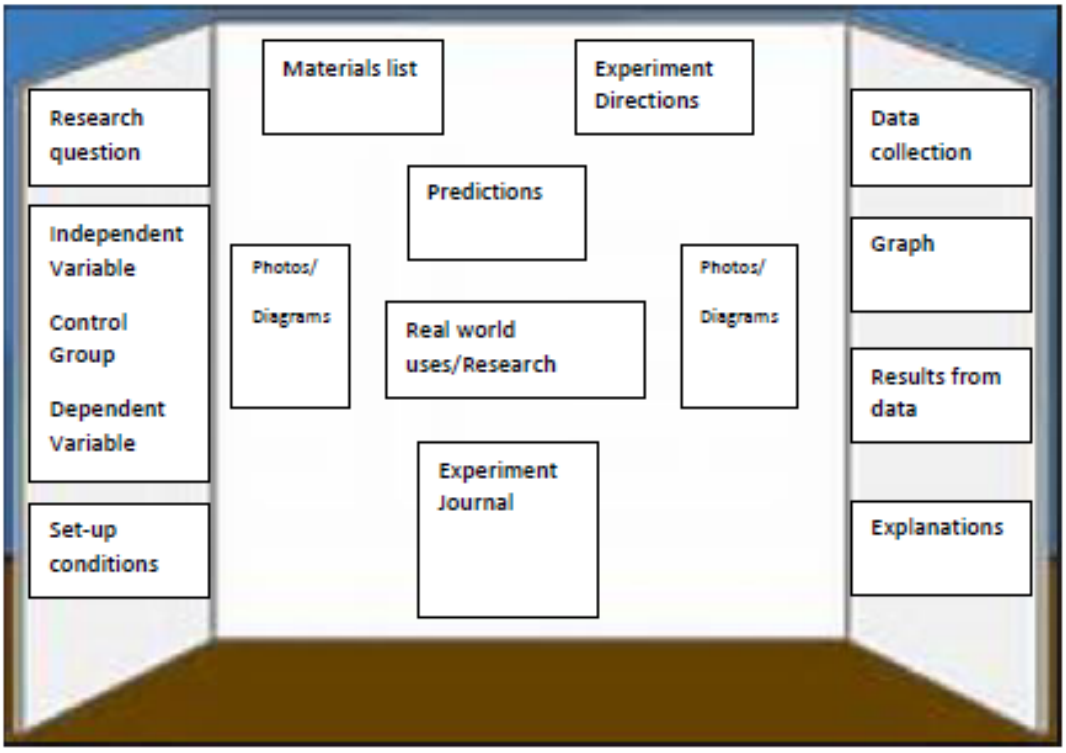
*****Projects that do not follow the guidelines contained in this document will not be considered for the District Showcase.**

In the Display:

- No sharp object; glass; food; liquid (including water); chemical; microbe; laser operation; unshielded wiring; temperature exceeding 70° C; brand names of products; pictures of students (without signed parent permission); loud or distracting sound; bright or distractive light; pressurized gas; unshielded belt, pulley, chain or moving part may be displayed. Pictures of these (except as prohibited in the regulations above) may be taken to document and explain what was done in the experiment.

Presentation Board for Experiment

Below is an example of what a Science Research board would look like



Below is a great site for generating ideas for an experiment!

https://www.education.com/science-fair/elementary-school/physical-science/

Sample Science Investigation Questions

*The list below are beginning questions/wonderings.

*Think: How can I take the question/wondering that I am interested in and make it better? (Think outside the box and make it interesting!)

*For example take this beginning idea: Does the height of a ramp affect the distance a toy car will roll? ***My NEW Experiment Question: How does increasing the angle of a ramp from 15°, 30° and 45° affect the distance a 100g toy car will roll on a tile surface measured in centimeters?***

Force and Motion:

- Does the weight of a permanent magnet affect its strength?
- Does the height of a ramp affect the distance a toy car will roll?
- Does the mass of a car affect the distance it will roll from the bottom of a ramp?
- Does the material that the ramp is made of affect the distance a toy car will roll?
- Does the distance a rubber band is stretched affect how far it will fly when released?
- Does the amount of weight suspended from a rubber band affect how far it stretches?
- Does the weight of a wooden block affect the force that it takes to drag it across a table top?
- Does the height from which a rubber ball is released affect the height that it bounces?
- Does the surface of the ground affect how far a ball will roll?
- Does the amount of air (pressure) in a basketball affect how high it bounces?
- Does the number of blades of a propeller affect how fast it will turn in the wind?
- Does the angle of a wing affect the amount of lift it develops in the wind?
- Does the number of pulleys affect the force necessary to lift a weight?
- Does the length of a lever (from the fulcrum) affect the force necessary to lift a weight?
- Does the length of a pendulum affect its period (time it takes to swing)?
- Does the weight of a pendulum affect its period (time that it takes to swing)?

Heat and Temperature:

- Does the color of water affect the time it takes to freeze?
- Does the kind of water affect how long it takes to boil?
- Does the kind of water affect how quickly it will evaporate?
- Does the surface area of a container of water affect its evaporation rate?
- Does the depth of the water affect its evaporation rate?
- Does the temperature of water affect its evaporation rate?
- Does the kind of material used to insulate a refrigerated can of soda affect its temperature change?
- Does the color of a can affect its rate of temperature change when placed in the sun?
- Does the kind of soil (sand, gravel, clay) affect its temperature change in the sun?
- Does the color of a crayon affect its melting rate?
- Does the temperature of a tennis ball affect how high it bounces when dropped?
- Does the shape of an ice cube affect how slowly it melts?
- Does the mass of an ice cube affect how slowly it melts?
- Does temperature affect the density of a liquid?
- Does the temperature of water affect the height at which an object floats?

Plants:

- Does the type of fertilizer affect the height that a bean plant grows?
- Does the amount of fertilizer affect the height that grass will grow?
- Does the kind of water affect the number of leaves on a Marigold plant?
- Does the size of a bean seed affect its germination rate?
- Does temperature affect the germination rate of bean seeds?

- Does the amount of sunlight affect the germination rate of radish seeds?
- Does the amount of moisture affect the germination rate of pepper seeds?
- Does temperature affect the height of petunias?
- Does classical music affect the height of tomato plants?
- Does the diameter of an apple affect the number of seeds inside?
- Does the circumference of a pumpkin affect the number of seeds inside?
- Does water drainage affect the height of sunflower plants?

Non-Vertebrate Animals:

- Does the type of surface affect the distance a meal worm travels?
- Does the moisture of the surface affect the distance a meal worm travels?
- Does the temperature affect the distance that a meal worm travels?
- Does the amount of light affect the distance that a meal worm travels?
- Does playing rock music affect the distance that a meal worm travels?
- Does the number of earthworms in soil affect the germination rate of radish seeds?
- Does temperature affect the number of “chirps” per minute that crickets make?
- Does the color of light affect how far earthworms with travel?
- Does the moisture of the surface affect the distance that an earthworm travels?
- Does the color of light affect how many insects are attracted to it at night?

Earth/Space and Environmental:

- Does the kind of soil affect the rate of water erosion?
- Does moisture affect the rate of decomposition in a compost pile?
- Does the slope of the surface affect the rate of water erosion?
- Does the kind of soil affect how much water it will hold (retain)?
- Does salt affect the freezing rate of water?
- Does wind speed affect the evaporation rate of water?
- Does the rotation of the earth (time of the day) affect the length of a shadow?
- Does the kind of water (fresh or salt) affect how long it takes an ice cube to melt?
- Does the velocity of the wind affect the height of waves?
- Does the direction of the wind affect the outdoor temperature?
- Does the velocity of the wind affect the timing (high and low) of the tides?
- Does barometric pressure affect the chance of rainfall?
- Does the phase of the moon affect the height of the tides?
- Does gravel affect the rate that sand erodes on a beach?