JOHN GREEN'S SCIENCE FUN FAIR

GETTING STARTED…

Keep it simple and just have fun. Students from the upper grades may use books to find an idea, but are encouraged to modify the experiment to make it an original one. Science books, including books about science fair projects, are generally on shelves found in the 500's and 600's. Adults can help with your project if you need it, but they should help as little as possible. Your work should be your own so that you really understand your project.

Use the scientific method if at all possible. Using the scientific method will help prepare you for future scientific studies. Remember too, that ALL types of projects require a display board. The project board should be bright and colorful and clearly show what you have learned. It should contain your name, grade, and room number.

The first step in getting started on your project is choosing a topic. Here are some suggestions. The world is full of thousands of ideas from A to Z.

Science Topics A to Z

A	amphibians, animals, archaeology, astronomy
B	bats, biology, birds, boats, bones, brain
C	chemistry, color, computers, conservation, constellations, caves
D	dew, digestive system, dinosaurs, disease, drugs, decomposition
E	ear, ecology, electricity, enamel, energy, eye
F	fingerprints, fish, flowers, fossils, friction, fruits
G	gardening, geology, giraffes, glass, glaciers, gravity
H	habitats, heart, herbs, hot-air balloons, human body
I	insects, instinct, insulation, invertebrates
J	jellyfish, jet propulsion, jet stream, joints
K	kaleidoscope, kangaroos, kelp, kidney, knee
L	lava, life cycle, lightning, lizards, lung
M	machines, magnets, matter, minerals, molecules
N	natural resources, nervous system, nutrition
O	oceanography, optical illusion, osmosis
P	paleontology, petroleum, plants pollution
Q	quail, quartz, quasar, queen bee, quicksand
R	rain forest, reptiles, respiratory system, robots, rocks
S	soap, solar power, sound, spiders, springs, sundial
T	teeth, telescope, terrarium, turtles
U	ulcers, unicycles, Uranus
V	vertebrates, vitamins, vocal cords
W	water, weathers, work, worms
X	x-rays, xylophone
Y	yams, yeast, yogurt
Z	zebras, zinnias, zucchini

Science Fair Project Research

Research is essential for your project. Use the library and the Internet to get information.

Websites There are many good sites out there. Here are a few suggestions…

- www.ipl.org (Librarians' Index to the Internet, a librarian-evaluated selection of thousands of websites)
- www.scifair.org (A one-stop "everything about science fairs")
- www.kidsclick.org (A search site especially for kids by librarians)
- www.sciencebuddies.org (A site with Science project ideas)
- http://www.all-science-fair-projects.com (Another site with Science project ideas)

Types of Science Fair Projects

Your science project may be in one of five categories: Collection, Observation, Model, Experiment, or Invention

1. **COLLECTION**

A collection study is a fun way to learn the proper names of a lot of objects. It involves collecting the objects, describing them, grouping them, and identifying them by their proper name. The five senses may be used to describe the objects:

Eyes	color, shape, sheen
Hands	texture, weight, temperature
Ears	pitch, rhythm, loudness
Nose	odor, strength
Tongue	sweet, sour, salty, bitter

Examples of a collection might be leaves, insects, seashells, fossils, rocks, or coins.

2. **OBSERVATION**

An observation begins with the selection of a topic and a question that can be investigated by observing. Specific movements, behaviors, or actions in nature might be observed over a period of time, and once the observations are gathered, they are studied for patterns that will answer the question. Examples of observation might be ants' eating habits, pollination process, moon phases, family pet behavior, or insect life cycles.

3. **MODEL**

A model study may begin with a curiosity about how something works. It is a way to display the parts of something and show what each part does to carry out a particular function. Examples of functional models include building an electromagnet, showing how lungs work, making a solar cooker or connecting wires to show the difference between parallel and series circuits. Another type of model is an enlargement or reduction as a scaled version of an object. Examples of enlarged-scaled models include building a flower model or a cross-section of an apple. Examples of reduced scale models include making volcanoes, craters on the moon, the solar system, a dinosaur, or a space shuttle.

4. **EXPERIMENT**

An experiment occurs when one variable (the independent variable) is changed. Another variable (the dependent variable) responds to the first and is watched. Other variables (constant variables) remain the same, or are unchanged, throughout the experiment. An experiment answers a question using the scientific method. Examples of experiments might include 'How does Mold Grow on Bread and Fruit?' 'What Makes Things Move?' 'How Can Apples Be Kept from Turning Brown?'

5. **INVENTION**

An invention can be one of two things. First, it can be something or some process that has never been made or done before (for example, the first spaceship, the first car, or the first airplane). The other type of invention is one in which a thing or process is modified in some way (for example, a better television, a better brake system in a car, or a better mousetrap). Such a changed thing or process is still considered an invention. Examples of an invention for the Science Fun Fair might be to design a new toy, make a lunchbox that will keep food fresh for 12 hours, design a new pot for growing plants, make an electromagnet that will pick up 10 nails, or build a bird feeder that will attract only cardinals.

Scientific Method

1. SELECT A QUESTION you can answer by conducting an experiment. The best science project comes from a question that YOU want to answer. It is also a good idea to include an explanation as to why you selected the project.

Your question should be asked in such a way that it couldn't be answered with a simple yes or no. For example, "How does salt affect the freezing point of water?" is a better question than "Does salt effect the freezing point of water?"

2. FORM A HYPOTHESIS. This is a guess or prediction about what will happen as a result of your experiment. Forming a hypothesis will help you design your procedure, and the experiment will prove or disprove your hypothesis. "I think…" or "I predict…"

3. PERFORM THE PROCEDURE. Plan the details of your experiment. Select the manipulated and responding variables. Decide what things you must keep the same – these are your controls.

a. Determine what you will be measuring and what instrument you will use.
b. Select the materials to form the test equipment. Plan how the tests will be done:
    Which test will you do first?
    How many tests will you do?
    What will be recorded?
    How many times will each test be repeated?
c. Assemble the equipment to be used in the experiment.
d. Prepare datasheets for recording measurements and for your comments.
e. As you perform the test, enter all measurements on your data sheets. It is important that you repeat each test several times.

4. PREPARE AND EXPLAIN THE RESULTS. Group and organize the measurements you have made. Make charts, graphs, and tables to show what happened. It is a good idea to spend some time thinking about your results and talking to other people about them. Try to explain "how" and "why" the results are what they are. What was the cause? Do the results agree with your hypothesis?

5. DRAW CONCLUSIONS. What can you say about your experiment in general? What can you count on happening again if someone else does a similar experiment? If possible, try to describe how your results might apply to everyday experiences.

Using these five steps of the SCIENTIFIC METHOD will make for an orderly experiment with reliable measurements and results. Follow this, and like any good detective, you can trust your finding.

You may wish to cut apart these headings to label your project board when using the scientific method.

Question

Hypothesis

Procedure

Results

Conclusion

Planning your Science Project

The title is _____

My question is _____

My hypothesis is _____

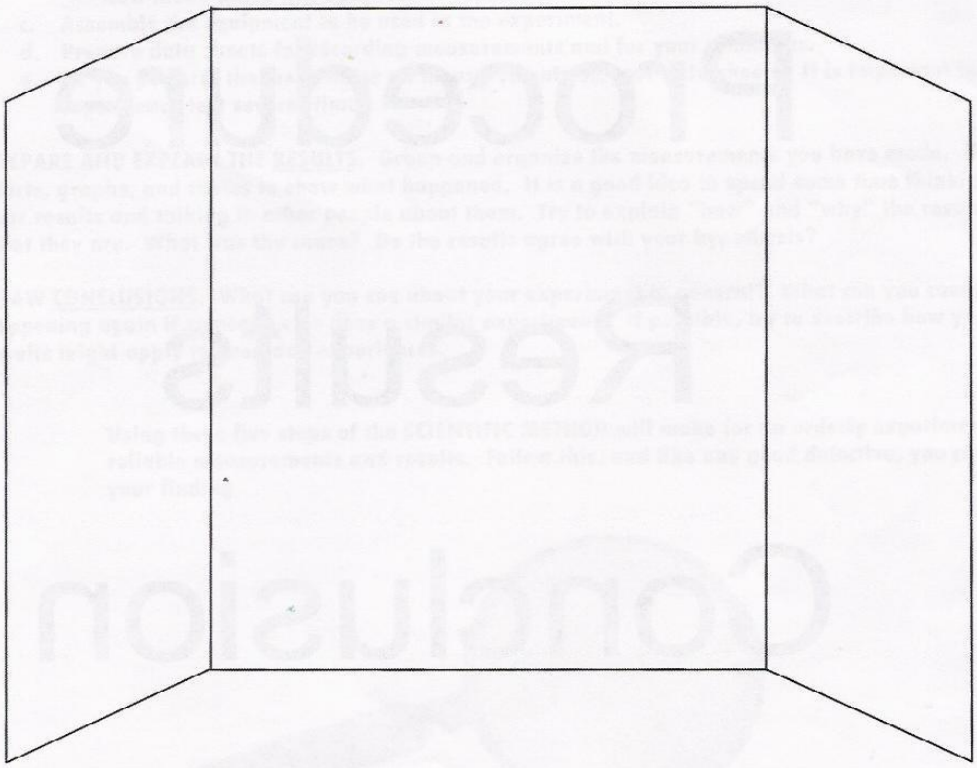
Reference I might use _____

Materials I might need _____

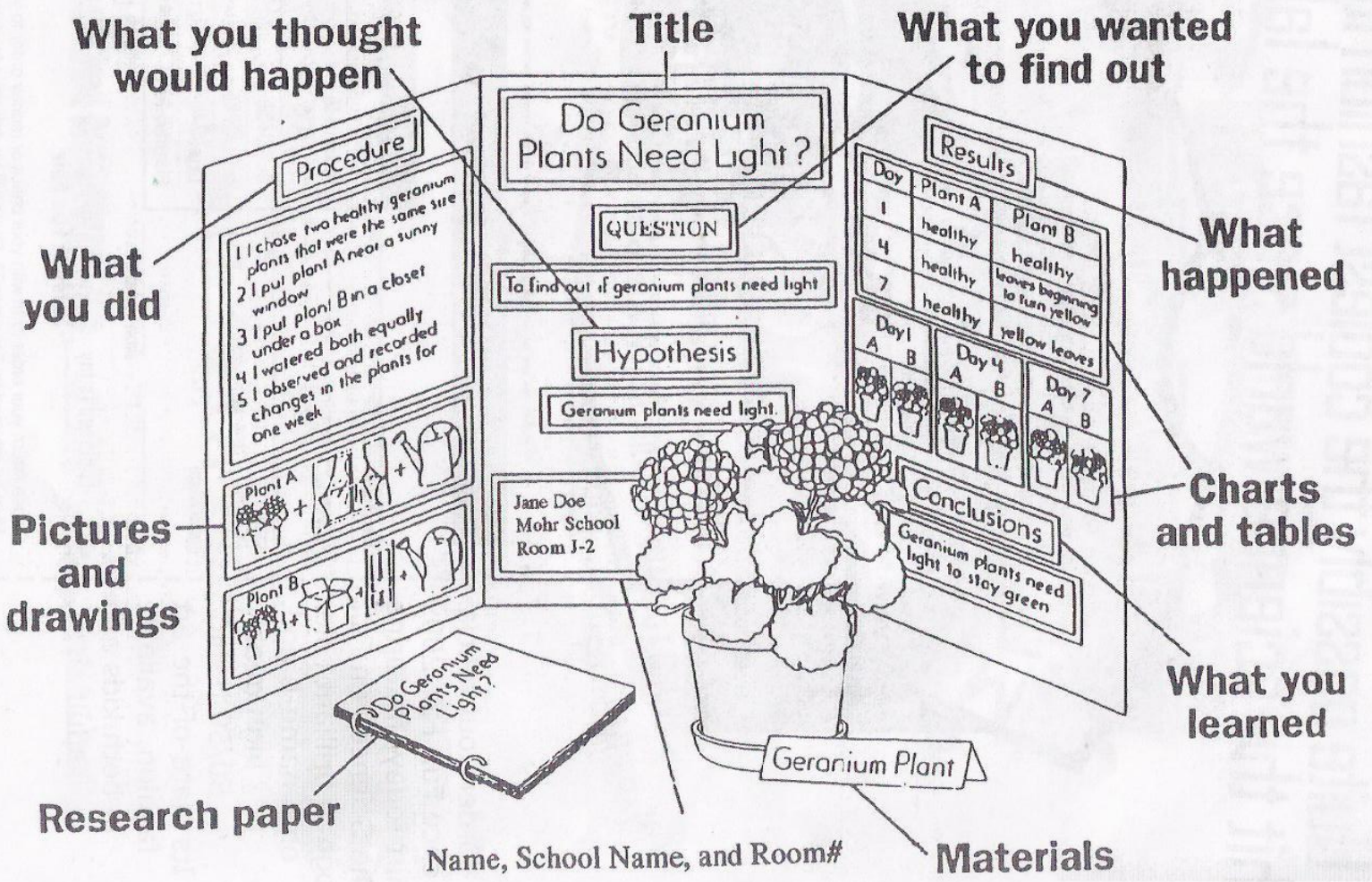
Experiment or activity I plan _____

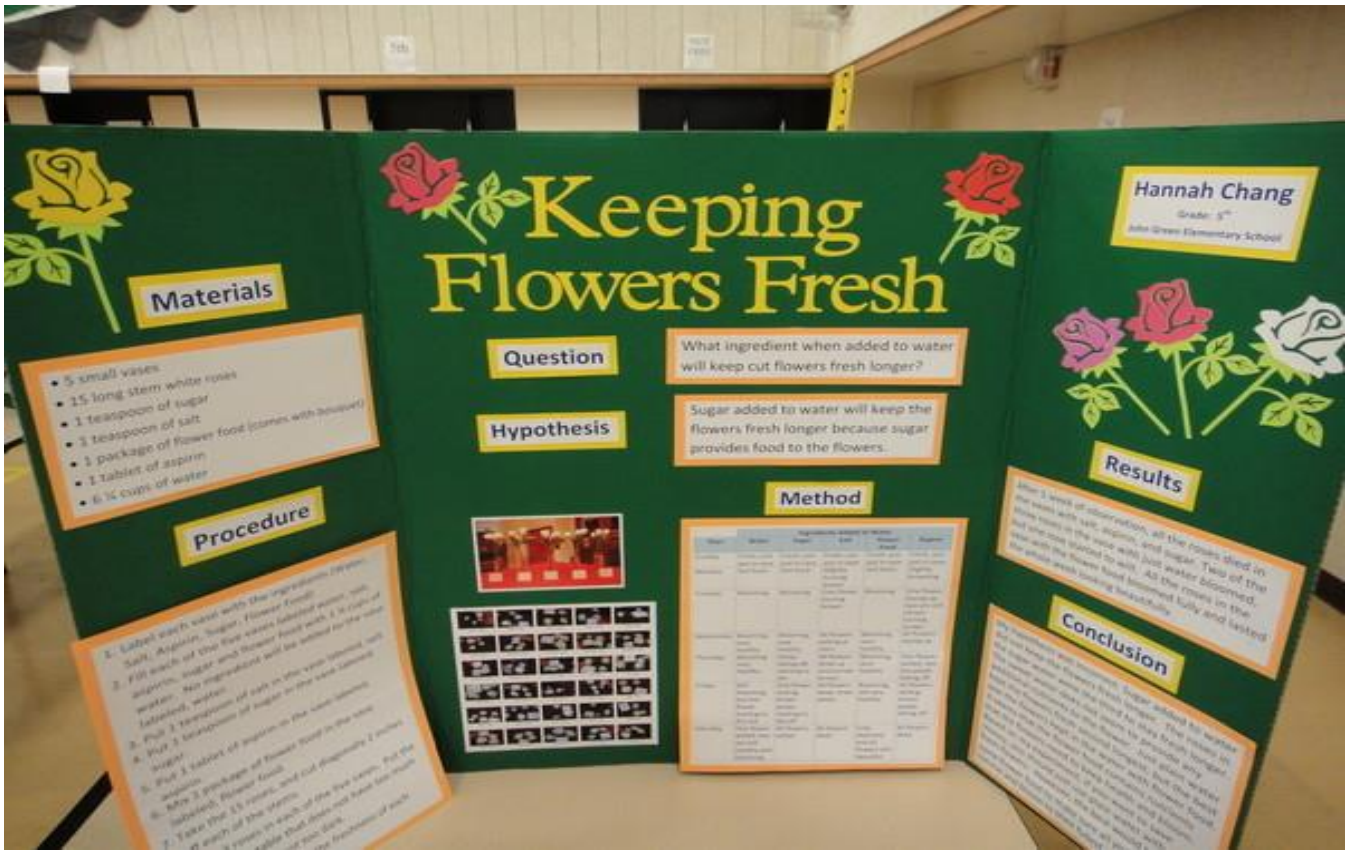
How I will record results _____

Imagine what your project will look like. Draw a picture of it and label the parts.



Displaying a Science Fair Project




Keeping Flowers Fresh
Hannah Chang
Materials
• 5 small vases
• 15 long stem white roses
• 1 teaspoon of sugar
• 1 teaspoon of salt
• 1 package of flower food (comes with bouquet)
• 1 tablet of aspirin
• 6 ¼ cups of water
Question
What ingredient when added to water will keep cut flowers fresh longer?
Hypothesis
Sugar added to water will keep the flowers fresh longer because sugar provides food to the flowers.
Method
Procedure
Results
Conclusion


What drinks stain your teeth?