Safa & Marwa Islamic School

Science Fair - March 2021

Dear Parents/Guardians,

As-Salamu'alaykum

Safa & Marwa Islamic School is pleased to announce its annual SAM Science Fair 2021. This Fair, which will begin on March 22 and end on March 26 will provide students with an opportunity to apply their learning from the classroom and apply it in a hands-on scientific manner. However, this year our Science Fair will be a little different than the previous years.

Please be advised that this document outlines pertinent information regarding the changes in the Science Fair. In order for us to operate safely, the participation rules are updated and certain modifications have been made based on the changed COVID-19 environment we now live in.

In accordance with the current guidelines and recommendations, we would like even our younger grade students to work individually on their science projects, so that we are able to maintain health and safety within our school community.

The science teachers from Grade 1 to Grade 8 will help students choose their topics. The teachers will approve topics and also make suggestions to buy materials needed for the successful completion of a science project. Each student will record a short video (3 to 4 minutes long only) of his/her project and upload it on Google folder. The students will also be required to submit a report with important details about the project.

The judges will watch the video, read the report and ask students questions related to their chosen topic and project. All science project videos and reports must be uploaded to the Google folder by March 20, 2021. A schedule will be sent out in March with details about the date and timings each grade will be assessed.

Students have been provided with a Science Fair Handbook via Google Classroom/email, showing the steps in developing a Science Fair Project. These items will help, guide and encourage students to stay focused and successfully complete their project.

Thank you for your continuing support and partnership!

SAM Administration

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Introduction

It seems that nothing strikes fear in the hearts of students and parents like these three words: science fair project.

But it doesn't have to be that way. A science fair project is an opportunity to research and learn about things that interest you. And through your studies you will learn how science is basic to everything around us.

You will benefit beyond your improved science knowledge. Science fair projects teach you problem-solving skills, improve your written and oral communication ability and give you the satisfaction of completing a well-done project.

The ideas for projects are endless; you are limited only by your imagination. For example, does dirty dish water affect the growth of plants? Or how does acid rain affect plant growth? Which diapers are the most absorbent? What is the pH of various shampoos? Do different brands of gasoline make a difference in gas mileage?

The first key to a successful science fair project is picking a topic that interests you. The reason is simple: you will be motivated to do a better job on the project and will have fun doing it. And remember, a good science fair project doesn't have to be complicated. It is important that you understand your project and that you have explored the scientific technical issues related to your project.

The second key is careful planning. After discussing your project with your teacher and getting approval for your idea, allow yourself plenty of time for research, experiments, observation and analysis. In other words, don't wait until the last minute. Projects take time.

Ask questions about your project, but do the work yourself. If you do the work yourself, you will get a much better understanding of why things do and do not work as expected.

Finally, don't get upset if your experiments prove your hypothesis incorrect. Throughout history, some of the most important experiments were those that didn't prove the original hypothesis.

Good luck.

What is a Science Fair Project?

A science fair project is an investigation of a question that involves research, planning, and application of the scientific method to find the answer.

The Scientific Method
The scientific method is a tool that scientists use to find answers to questions. The tool involves the following steps: doing research, identifying a problem, stating a hypothesis, conducting project experimentation, and reaching a conclusion.

Research
Your research begins when you select your project topic. Once you have chosen your topic, you'll begin your project research. HERE'S A TIP: Choose a catchy title. Make it specific. Usually, it's best for the title to be a question or something like this:

- The Effects of…
- The Study of…
- An Investigation of…
- A Comparative Study of…
- The Observation of…

Problem
The problem is the question to be answered.

Hypothesis
The hypothesis is simply your best guess as to what will happen.

Project Experimentation
Project experimentation means testing your hypothesis. This includes more research – designing and planning for experimentation and testing. Test your hypothesis carefully by experimenting. Record everything you do. Make observations and record the results. Make charts and graphs or take pictures so others can understand what you have done.

Things that can affect your experiment are called variables. The independent variable is the variable you purposely change. The dependent variable is the variable you are observing that changes in response to the independent variable. The variables that are not changed are called controlled variables.

Conclusion
The conclusion is a summary of what you have learned. Analyze your data and decide if your hypothesis was correct. Is more work needed? What else would you do to work on this problem?

Tips on How to Choose a Science Fair Project

- List your favorite activities and subjects. Now, select a project from one of those areas.
- What are some of the materials you could use with your experiment? Are the materials available at your home? You may want to select materials that are inexpensive and easy to find.
- Your school library and local public library are good places to go for more information to complete your science fair project.

Steps to Prepare a Science Fair Project

1. Select a Topic
See the Ideas List and What Makes a Good Project?. Remember a Science Fair Project is a test you do to find an answer to a question, not just showing what you know about something.

2. Gather Background Information
Gather information about your topic from books, magazines, the Internet, people and companies. Keep notes about where you got your info

3. Scientific Method
State the Purpose of your experiment - What are you trying to find out?
Select a variable (something you will change/vary) that will help you find your answer.
State your Hypothesis - your guess about what the answer will be.
Decide on and describe how you will change the thing you selected.
Decide on and describe how you will measure your results.

4. Run Controlled Experiment and Record Data
Do the experiment as described above.
Keep notes in one place. Write down everything you can think of, you might need it later.

5. Graphs and Charts
What happened? Answer that question, then put the results in graphs and charts.

6. Construct an Exhibit or Display
It has to be neat, but it does NOT have to be typed.
Make it fun, but be sure people can understand what you did.
Show that you used the Scientific Method.

7. Write a short Report
Tell the story of your project - tell what you did and exactly how you did it.
Include a page that shows where you gathered background information. It can be 2 pages or even more. Paper Guidelines to help you out.

8. Practice Presentation to Judges
Practice explaining your project to someone (parent, friend, grandparent, etc.) This will help you be calm on Science Fair Day. The judges are very nice and will be interested in what you did and what you learned.

9. Come to the Fair and have fun! See you there!

Tips for Parents:
Assisting Your Child Scientist with an Enjoyable Project

Selecting a project: Keep it simple! The best project is interesting for your child, but not too complicated or difficult. As one of our teachers put it nicely, "the projects should be done by *child scientists,* with *adult assistants."* If you are using plants, allow five (5) weeks for them to grow.

Making a display: Most kids enjoy doing a science project at home with mom or dad. For the very little ones (K and 1st grade), choose a project where the child can show what happened by drawing a picture. Use the Scientific Method to organize the project. Even for older kids, a picture is worth 1000 words. Simple bar graphs are a great way to show information. In addition, a brief sentence or two is often sufficient to state how the child did the experiment, what happened, what they were trying to find out, etc.

It's O.K. for a parent to help with the writing, but please, use the child's own words. Even a kindergartner can copy a sentence in his own printing, or at least print headings for the display. Likewise, a parent can give their child suggestions on how to make the display look nice, and encourage the child to do neat work. There's no need, for the display to look polished or professional. A hand-lettered display made by a child, with all its quirks and imperfections, is authentic and charming. The children are so proud of things they have done themselves, and learn so much by doing!

Safety Reminders:

1. All **liquids** must be securely contained.
2. **DO NOT** display anything **hazardous**. (Use diagrams, drawings and photographs instead.)
No flammable, combustible, caustic or dangerous materials are allowed. (No solid model rocket engines or strong acids, for example.) No flame, open or concealed, is allowed. (No candles or Bunsen burners.) Devices producing **temperatures over 120 ˚F** must be adequately insulated.
3. **Electrical Devices** must be safe. **Bare wire and exposed knife switches** may be used only on circuits of 12 volts or less, otherwise, standard enclosed switches are required. Voltage over 12 volts must be out of reach and protected by an overload safety device. **Batteries** with open top cells (wet) are not permitted.
4. **Bacterial or fungal cultures** (including bread mold and stinky cheese) must be secured in an airtight container. Photos or drawings are preferred to live displays.
5. **Live animals** permitted only with permission of the student's teacher, and only within an appropriate enclosure. Animals' basic needs (food, water, bedding) must be met.

Displays considered unsafe will not be allowed in the Fair!

Last, but not least: The Science Fair is not a competition; there is no judging. Every participant is a winner, and everyone gets a ribbon and a participation certificate. Making a Science Fair project can be a really fun way for parents to help their children explore science. So good luck to all, and enjoy the Fair.

Science Fair Project Guidelines

1. Experiment
An experiment can be a test made to demonstrate a known scientific fact. It can also be a test to determine if a hypothesis (your educated guess of what will happen) is accurate.

ProjectlProblem: What scientific question will you be attempting to answer?
Research: Learn about your question.
Hypothesis: What do you think will happen (answers the above question)?
Procedure: How will you test your problem?
Materials: What materials will you need?
Data: Show your results in a graph or display.
Conclusion: What did you learn?

2. Model or Demonstration
A model is a small object usually built to scale that represents some already existing object. A demonstration is an illustration or explanation of a scientific principle that shows how and why something works.

Project: What scientific question are you trying to demonstrate or model?
Research: Learn about your question.
Materials: What materials will you need?
Procedure: Write a description of what you plan to do. How will it be displayed?
Conclusion: What do you hope to teach others with your demonstration or model?

3. Collection
A collection is a grouping or gatl1ering of various objects which must be scientifically related and demonstrate that you have learned something through the process of collecting and categorizing. Items should be categorized and labeled correctly using scientific names when available.

Project: *What will you collect?* What scientific question will your collection illustrate?
Research: Learn about your question.
Materials: How will you obtain the items for your collection?
Procedure: How will you organize and label your collection? How will your display illustrate your research and collection?
Conclusion: What do you hope to learn and teach others with your collection?

The Scientific Method

For projects which involve experiments

Use the following five steps of the scientific method when conducting an experiment

1. Identify the problem.
Think about what area of science interests you. Narrow your focus down to a specific question.

2. Collecting Information.
Research your topic. Take notes on information that you think will be important for your experiment.

3. Develop a hypothesis.
A hypothesis is an *educated* guess. It takes into account the research you have done and also your opinion of what you think will happen. What do you think will happen when you perform your experiment? The hypothesis answers your question.

Example: Plant food "B" will cause the lawn to grow faster.

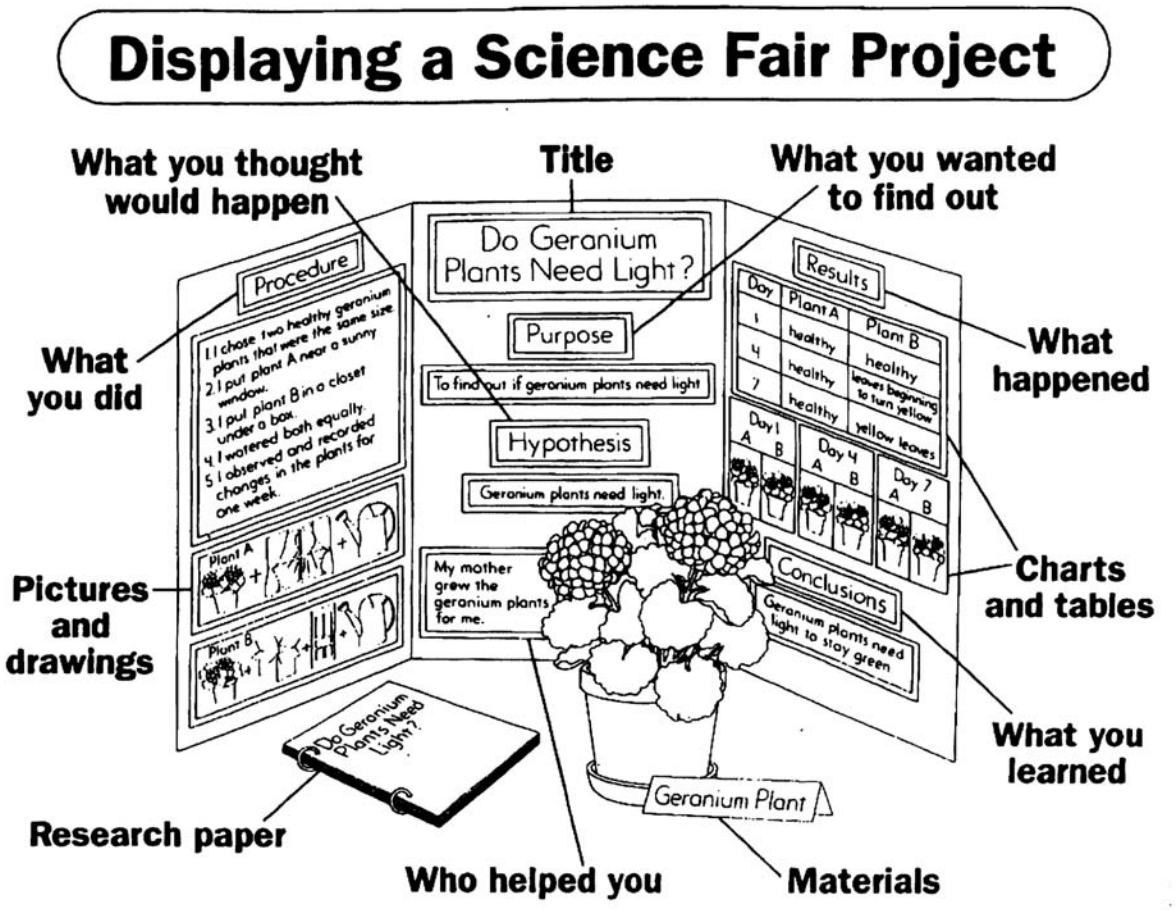
4. Plan and conduct an experiment.
First, make a plan for how you will do your experiment and a list of all the materials you will need. Conduct your experiment and observe what happens. In your experiment, make sure that you are only changing one variable at a time. This means that everything should be the same among the tested items (conditions remain constant). The only difference (variable) would be the procedure or item being tested in that part of the experiment. Keep a journal to record what you did and your observations changes, growth or other results of your experiment. Photos or illustrations of the progress of your experiment are good ways to display what you did and what your results were.

Example: All lawns being tested should be treated the same (conditions remain constant): the same type of grass soil, temperature, sunlight, water feeding times, etc. The only difference (variable) would be the plant food fed to the lawns. Make a chart of the weekly lawn growth.

5. Display results.
This could be a picture or a graph or a table showing your results.

6. Draw a conclusion.
Analyze the results of your experiment. Draw a conclusion based on your results. Was your hypothesis correct? Why or why not? Your conclusion should tell what you learned by conducting the experiment. Remember, an experiment is *not* a failure if the hypothesis is proven wrong!

Example: The lawn fed with plant food "A" grew faster than any of the other plant foods tested. My hypothesis was not correct, even though plant food "B" cost more and promised better growth. Plant food "A" contained more nitrogen than "B." I learned that not all plant foods are the same and that advertising is not always true.



Science Fair Display

Table Display: 4 feet wide x 2 feet and 6 inches deep x 6 feet and 5 inches tall

Tips for a Great Display

1. Check with your teacher to see if your school has any specific guidelines on the size, style or shape of the display.

2. Keep the display simple – include only the essentials.

3. Let the headlines tell the story – no lengthy descriptions.

4. Check your spelling.

5. When possible, use color to clarify information (charts, diagrams, and graphs).

6. Use photographs or drawings to help show what was done.

7. Make the display as neat as possible. If you have access to a computer to make charts, graphs, and labels – that's fine. If you don't, you can still make an attractive, neat and effective display. Use a stencil and ruler if possible. If you have to use a pencil, carefully, go over the pencil lines with a dark marker.

8. Let the teacher or science fair chairperson know early if the display needs electricity or other special arrangements.

9. Use safe, durable materials. Make sure anything used in the display meets school safety standards.

Have magazine articles, brochures and other materials to place in front of your display.

Ways to find a science fair project idea

1. Look at lists of **science categories** and pick one that you are interested in, and then narrow that down to a project. (Example, say you pick psychology, then narrow it to the differences between boys and girls, then to a topic like "Do boys remember boy-type pictures (footballs) better than girl-type pictures (flowers)?" (Two lists of categories attached)
2. Use **your experiences** Remember a time you noticed something and thought "I wonder how that works?" or "I wonder what would happen if..." then turn that into a project. Check the science section of the school **library**. Browse and look at book titles, then look inside the ones that look interesting to you. Also thumb through encyclopedias and magazines. Good magazines for ideas are: National Geographic, Discover, Omni, Popular Science, Popular Mechanics, Mother Earth News, High Technology, Prevention, and Garbage. Perhaps go to the downtown Library.
3. Think about **current events**. Look at the newspaper. People are hungry in Africa because of droughts - a project on growing plants without much rain, which types grow ok with little water? Or the ozone hole over Antarctica - how can we reduce ozone? -a project on nonaerosol ways to spray things. Or oil spills. how can we clean them up? -a project on how to clean oil out of water
4. Watch **commercials** on TV. Test their claims. Does that anti-perspirant really stop wetness better than other ones? What are the real differences between Barbie and imitation Barbie dolls? Can kids tell the difference between Coke and Pepsi if they don't know which they are drinking?

Add to Others Ideas:

Look at sample projects, look at this list, look at projects in books or projects from last years science fair - then add your own question, your own idea to them.

Don't just use these ideas.
Take these ideas and add something of your own.
For example, change Are dogs colorblind? to Are cats colorblind? Or look at another of the 5 senses of dogs and test their sense of taste...

- What material is the best insulator
- Are dogs colorblind
- Do soap bubbles last longer on warm or cold days
- Are hot air balloons different from blimps
- What is the best method, other than heat, to melt ice
- What effect does oil have on water plants
- What would happen to the weather if the Earth was a cube
- Do goldfish chemicals they sell you really help the fish adapt to the new aquarium

- How can a tomato plant be grafted to a potato plant How is sound obtained from a compact disk
- How does a nuclear reactor work, how does it look
- How is 2-yr old talk different from ours
- How does burning gasoline make a car move
- How do we tell how far away a star is from Earth
- What soils are best to build a house on
- How do plants react to different kinds of music, different light, colors, and different neighbor plants
- What is the best way to dispose of paper
- Do plants move

Try putting different words in these blanks...

What is the effect of_____on_____?

detergent	germination of seeds
temperature	the volume of air

How/to what extent does the_____affect_____?

humidity	growth of fungi
color of a material	its absorption of heat

Which/what_____(verb)_____?

foods	do	gerbils prefer
detergent	makes	the most bubbles

What Makes a Good Project?

As kids and parents think about Science Fair projects, they sometimes wonder how to pick a topic - not how to find an idea, but how to decide if the idea is a good one.

Review the Sample Judging Forms above for some ideas...here are some more thoughts:

1. You are interested in the topic - it's something you like to think about.

2. You can do a test to find an answer to a question.

A good Science Fair project is an experiment - that means it's a test to find an answer to a question you have. For example, if you are interested in bugs and you saw some ants moving real slowly once on a cold day, you might test to see what effect temperature has on the rate at which bugs move. You'd get some bugs, find a way to make their container a little colder than normal and measure how fast they moved somehow. Then you'd make their container a little warmer than normal and measure what happened then.

Don't do demonstrations or simple reports - those don't use the scientific method. They are just showing what you know about something. For example, a diagram or model of something with no test/experiment. 3. You can do it with only a little help from parents, teachers and friends. The reason to do a project is because it's fun and you will learn something you didn't know before. Having someone else help too much takes away some of your fun and you don't learn as much. Your project doesn't have to be perfect, just neat and following the scientific method. Don't be afraid to ask for help if you really need it.

4. It doesn't hurt or scare people or animals, including you. It's not only a bad idea, it is also against the rules of our science fair and of the regional science fair to hurt or badly scare people or animals as part of an experiment. You also may not use dangerous materials in your project except in very special situations when you get permission from the coordinators. Ask advice about this from your parents and teacher.

5. It's a project that, even when you are done with it, makes you think of new things you want to know. One way to tell if you have a good project is to see if the results make you wonder about other things. Did doing the project, or reading or seeing what happened make you think of other questions you are curious about? That's a great project!

PROJECT IDEAS

Please note there are many other possibilities - These are just a few ideas to help you get started!

Kindergarten and First Grade:

1. How many of each color is there in a bag of M&M's? Make a simple bar graph by pasting a colored paper square for each M&M counted.
2. What kind of juice cleans pennies best? Why?
3. What foods are acids? Test with homemade red cabbage juice.
4. What materials dissolve in water? With some, (like sugar) will more dissolve in hot water than in cold water? Try others-salt, baking soda, etc.
5. Why do people sprinkle salt on ice when making homemade ice-cream? (Try comparing the temperature of the ice water before and after)
6. Do sugar crystals grow faster in tap water or distilled water? Why?
7. Do plants grow better with tap water or distilled water?
8. Which banana has the most sugar - green, yellow or brown? (a more difficult project)
9. Does adding sugar, aspirin or lemon-lime soda to tIle water make cut flowers last longer?
10. How does the color of light affect plant growth? How about temperature?
11. Does it matter in which direction seeds are planted?
12. How does exercise affect your heart rate? Why do you think your heart reacts tllat way?
13. Does a blindfolded person walk in a circle?
14. Why will more air inside a basketball make it bounce higher?
15. Does a baseball go farther when hit by a wood or metal bat? Why?
16. Does sound travel best through solids, liquids or gases? Why?
17. Which boat shape is fastest? Which shape holds the most weight? Make boats of paper, clay or wood. Test in a bathtub.

Grades 2 & 3:

1. How do people make anti-freeze for cars? Hint: Does salt water boil sooner than plain water?
2. How much of a piece of fruit is water?
3. Does colored (or muddy) water heat up faster in the sun than clear water?
4. What other crystals can you grow? Suggestion: Borax crystals (from grocery store's borax laundry booster) grow overnight. Bonus: Can you make an even bigger crystal by using one of your homemade crystals as a "seed" crystal?
5. Are all potting soils alike? Does the difference affect how well a plant grows?
6. Does leaf surface area affect plant growth? (this is a more difficult project)
7. Do living plants give off moisture? How do you know? If they do, why?
8. How do you know a green plant adds oxygen to its environment?
9. What are the effects of chlorine/bleach/fertilizer on plant growth?
10. Do roots of a plant always grow downward? Can you make a plant grow sideways?
11. Does the human tongue have definite areas for certain tastes? ("Map" your tongue.)
12. Is there a relationship between age and response time?
13. Do we read or remember with different colored paper? If so, which works the best?
14. Does a baseball go farther when hit by a wood or metal bat? Why?
15. How can one student use a lever to lift another student who is bigger?
16. What materials conduct electricity? (Try plastic, metal, glass, paper, rubber, etc.)

17. Can you make electricity out of magnets? How about out of a lemon?
18. Which bridge design is strongest? Compare an arch to a flat bridge.

Grade 4:
1. Do cockroaches have a preference for direction? Catch and release cockroaches. Which way do they go? Is there a common trend or not? You can try this project with ants or other crawling insects.
2. Does magnetism travel through all materials? Put different materials between a magnet and metal. Do they affect how strongly the magnet is attracted to the metal? If so, do they all affect the magnetic field the same amount?
3. Will seeds germinate if you soak them in a liquid other than water? You can try milk, juice, vinegar, and other common household liquids. Alternatively, you could see if plants will grow if they are 'watered' with liquids other than water.
4. How much salt (or sugar) can a plant tolerate? Water plants with different solution of salt or sugar. How high of a concentration can a plant tolerate? A related question would be to see if plants can survive if they are watered with soapy water, like leftover dishwater.
5. Do birds have a preference for birdhouse material? In other words, do they seem to care if the birdhouse is made from wood or plastic or metal? 6. Do worms react when exposed to light? Do worms react differently to different colors of light?
7. Do ants prefer different types of sugar? Different types of sugar are found in table sugar, honey, maple syrup, and molasses.
8. Can you taste the difference between foods that contain fat and fat-free versions of the same product?
9. Do white candles and colored candles burn at the same rate?

Grade 5:
1. Do people have the same sensitivity to smell? Place people at one end of a room. Have another person open a scent, such as lemon oil or vinegar. Have your test subjects write down what they smell and what time they smelled it. Is the time the same for different scents? Does it matter whether the test subject was male or female?
2. Does storage temperature affect popcorn popping? Store popcorn in the freezer, refrigerator, at room temperature, and in a heated location. Pop the same amount of each 'sample'. Count how many unpopped kernels remain. Can you explain the results?
3. Does food cooked in the microwave cool at the same rate as food cooked in the oven or on the stovetop? Heat foods to the same temperature. Use a thermometer to measure the temperature at set times. Explain your results.
4. Can you sip the same amount of liquid through two straws at once as one straw? What about 3 straws?
5. Does the color of a light affect how bright it appears in fog? In water?
6. Where is the best place to store apples? Where is the best place to store bananas? Are they the same?
7. Does the temperature of a magnet affect its magnetic field lines? You can trace the magnetic field lines of a magnet by putting iron filings on a sheet of paper over the magnet.
8. What brand of battery lasts the longest?
9. Make ice cubes starting with different temperatures of water. Does the starting temperature of water affect how long it takes to freeze?

Grade 6:

1. What type of insulation holds in heat the best?
2. Do different types of knots affect the breaking strength of a rope?
3. Does wiping a doorknob with an antibacterial wipe really reduce the numbers of bacteria? Does using hand sanitizer really reduce the amount of bacteria on your hands?
4. How do different flame retardants affect the flammability and burning rate of cotton?
5. Which cooking method results in the least loss of vitamin C?
6. Does temperature affect the maximum size you can inflate a balloon?
7. Does the color of a crayon affect how long of a line it will write?
8. Does changing the temperature affect how long a pen will last?
9. Do all types of bread mold at the same rate?
10. Does coloring carbonated water change how its taste is perceived?
11. Do different types of carbonated sodas have different pH?
12. Can you tell different brands of soda pop apart based on taste?
13. Do some plants grow better inside than outside?
14. Which type of water contains the lowest amount of chlorine?

Science Fair Project Resources

Web Sites:
school.discovery.com/sciencefaircentral
www.ipl.org/youth/projectguide/
www.scdhec.net/recycle
www.scifair.org
www.lhs.berkeley.edu/kids/kidshome.html (Lawrence Hall of Science, UC Berkeley)
www.nwf.org/kids/ (National Wildlife Foundation)
www.enchantedlearning.com/Home.html
www.seaworld.org (Sea World/Busch Gardens Animal Resource)
www.nationalgeographic.com (National Geographic)
www.mobot.org/MBGnet/sets (Biomes, site for Missouri Botanical Gardens)
www.ran.org/ran/kids_action (Rain Forest information)
www.hhmi.org/coolscience/ (Howard Hughes Medical Center site of science for kids)
www.brainpop.com
www.madsci.org
www.geocities.com/Athens/1850/listscience.html (experiments included)
www.billnye.com (Bill Nye, the Science Guy)
www.cotf.edu/ete/modules/msese/earthsysflr/rock.html (Resource about rocks)
www.exploratorium.edu
www.terimore.com
www.all-science-fair-projects.com
www.scienceproject.com
www.juliantrubin.com/fairprojects/physics/optics.html (Ideas and sample projects)
www.energyquest.ca.gov/projects (Ideas and sample projects)
www.sciencebuddies.com (How to do science fair projects)

Books:

101 Great Science Experiments: A Step-by-Step Guide, by Ardley, N.

Science Fun: Simple Experiments and Projects, by Nevins, D.

365 Simple Science Experiments With Everyday Materials, by Churchill, E.R., Loeschnig, L.V., and Mandell, M.

Science Fairs Made Easy!, published by Chicago Academy of Sciences

Student Science Fair Project Methodology

SCIENTIFIC METHOD

- State the Problem
- Research--Observe--Collect Data
- Form Hypothesis
- Experiment
- Form Conclusions

SCIENTIFIC METHOD OUTLINE

State the Problem - *What do I want to find out?*

Write the Hypothesis - *What do I think will happen?*

Design the Experiment - *How can I test what I think will happen?*

Materials

Procedure

Record and Analyze the Data - *What happened?*

Draw Conclusions - *What did I find out and how does it compare with what I thought would happen?*

SCIENCE FAIR PROJECT TIMELINE

Choose a topic and write question

- 2 days

Research Question - 1 week

Write hypothesis - 1 day

Submit Science Fair Project Proposal - 1 day

Write Experiment / Do Experiment - 2 weeks

Identify variables
Do you have a control?
What materials do you need?
Conduct your experiment and write observations.
Record your results.

Create graphs from data tables - 2 days

Draw conclusions - 2 days

Write report - 4 days

Prepare exhibit - 1 week

SCIENCE FAIR PROJECT DUE DATE

GETTING THE IDEA FOR A SCIENCE FAIR PROJECT

1. What are you interested in? Hobbies, magazines you read, TV programs you watch, sports you play, etc.?

2. Which science experiments in books look interesting?

3. Do you know someone with a job that you would like to know more about?

4. Have you seen things on TV you have wondered about? Describe these:

5. Within the "topic areas" listed above, find the relationships which you might be able to test. *For example,* if you listed gardening and plants, there are relationships between plants and water, plants and fertilizers, plants and sunlight, plants and temperature, etc.

6. Choose one testable relationship that *you* could investigate and write a question for that topic:

IDENTIFY THE VARIABLES

Before you begin your research, you must thoroughly examine the relationships that are testable in your question. The part of your question causing the reaction is called the *independent variable*. The part of your question being affected is called the *dependent variable.*

Below are three examples:

Which fertilizer will cause pansies to produce more flowers?
independent variable (cause) fertilizer
dependent variable (cause) flower production of pansies

Can insulation cause an ice cube to melt at a slower rate?
independent variable (cause) insulation
dependent variable (cause) rate of ice cube melt-down

Can surface texture cause a change in skateboard speed?
independent variable (cause) surface texture
dependent variable (cause) skateboard speed

What are the variables in the question you have chosen to investigate for your science fair project?

Independent variable (cause):

_____

_____

Dependent variable (cause):

_____

RESEARCH

Using printed material, people and places, now you want to find out as much as you can about your topic.

Use 3 X 5 cards to record your research. Put useful information on one side, and write the source for your bibliography on the other. Some information will be written and other information might be drawings or a useful chart or graph. Find out as much as you can to give you a good background *before you write your hypothesis and do your experiment.*

CHECKING YOURSELF

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1. Is my topic question something that I can investigate?

2. Did I find background information on my topic?

3. Did I restate my question in this form: "The purpose of my investigation is to find out... ?"

4. Did I make a hypothesis about what would happen in my investigation?

5. Did I list all my materials in metric units?

6. Have I investigated all the variables in my investigation?

7. Are my step-by-step directions clear enough for someone else to follow?

8. Have I recorded my measurements and other observations in a log or journal?

9. Have I collected enough data (by using many subjects or repeating trials at least three times)?

10. Have I graphed my data accurately?

11. Do my conclusions include a summary of my data, a comparison of my hypothesis and the data, and a statement of support or rejection?

12. Did I follow all the school rules in displaying my project? Is it the right size?

13. Am I well prepared to answer questions about my investigation and research paper?