HAYNES SCIENCE FAIR

PROJECT GUIDELINES

Projects should be **student-initiated and student-generated**. There will be books available for research at the Haynes Library during the week of January 11. All experiments and project write ups/posters should be done at home. The goal is to encourage and promote a joy of science, exploration and discovery. Students must sign up in advance to participate. Registration is open online from January 4th to January 29th.

This packet provides resources for project ideas and guidelines for planning your science fair project.

Student projects should follow an **inquiry-based** approach. With this approach, students will ask questions that they can then explore through experimentation. We suggest that older children will follow the basic steps of the scientific method (described below) while younger children can question and explore.

During the fair, all students will be visited by an adult volunteer to give each child an opportunity to present his/her work. These "reviewers" will present each child with a participation award.

So Kids….

- Decide if you want to work alone, in a pair or with your Grade K–5 siblings or friends. **Please no more than four students working on a project.**
- Start thinking about a question (your topic) and review resources for project ideas (see the **Project Ideas** section later in this packet, the Haynes Library, Goodnow Library, or the internet).
- Choose a project
- Complete registration form on-line by **January 29th.** Only one form is required per project, just be sure to include information for **each team member** on the registration form. This information is critical for planning and acknowledgement of participation (awards!)
- Research your topic, design and perform your experiment at home
- Share your results at the science fair on **February 10 at Haynes 6-8 pm**
- Keep it simple and inexpensive, **no animals, non-household chemicals, no allergens such as peanuts/peanut butter, no tree nuts, or open flame**
- Remember: parents are mentors, teachers and consultants, **KIDS** are the scientists!!! Above all, have fun!!!!!

RESOURCES

Some Useful Web Sites

Haynes Library Web Page! How do I get there?

On the internet, go to:

1. http:www.sudbury.k12.ma.us
2. Click on **Haynes** on the select a school drop down at the top menu
3. Click on the link to the Haynes Library

https://sites.google.com/a/sudbury.k12.ma.us/josiah-haynes-elementary-school-library/

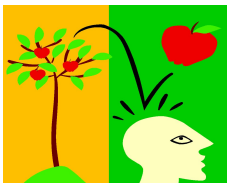
You will be on the Haynes Library Web Page!

To Search Grolier Online Kids:

1. Click on the link that says **Grolier Online Kids**
2. The username and password available in library

http://www.super-science-fair-projects.com
http://www.scienceproject.com
http://www.exploratorium.com
http://www.ipl.org/youth/projectguide/
http://www.pbskids.org/zoom/activities/sci
http://www.all-science-fair-projects.com
http://www.crystal-clear-science-fair-projects.com

Did you ever wonder.....



Here are some sample topic ideas for the Science Fair. Other resources include library books, teachers, parents, and the internet. Ask your own questions and try to answer them!

- Which lasts longer, Duracell or Energizer?
- Why do people choke up on a bat?
- Is Bounty really the "quicker picker upper"?
- How can you tell if dice are "fair"?
- Is there a difference between different plant fertilizers?
- What is the effect of light, soil type, music, temperature, oxygen, or water on plant growth?
- Will cut flowers really last longer when the flower freshness packet is added to the water?
- Will cut flowers turn color if dye is added to the water?
- What is the effect of temperature on gas solubility (soda water)?
- What is the effect of seed treatment before planting (temperature, moisture, etc.)?
- Why do they salt roads in winter?
- How does an airplane take off?
- What happens when I put a shell in vinegar? What happens to a rock? How about a penny?
- What is the effect of temperature, light, moisture on the growth of bread or cheese mold?
- What is the effect of breathing changes, physical activity, eating or music on heart rate?
- What is the effect of friction on the speed of an object?
- Does friction generate heat?
- Do boys really like blue and girls really like pink?
- What happens to a piece of bread forgotten in my locker? Is it different if the bread is in a paper bag, or a plastic one? Does the amount of moisture affect the results?
- Does "Dawn" clean more dishes than "Joy"?
- Which metal conducts heat best?
- How much salt does it take to float an egg?
- Do different types of apples have the same number of seeds?
- Will bananas brown faster on the counter or in the refrigerator?
- Does water with salt evaporate faster than water without salt?
- Can you separate salt from water by freezing?
- What keeps things colder plastic wrap or foil?
- Does the color of a material affect its absorption of heat?
- Which materials absorb the most water?
- Does the color of water effect its evaporation?
- What materials provide the best insulation?
- What materials will sink or float in water? Why?

SCIENTIFIC METHOD

Students will be encouraged to answer the following:

1. What do I want to find out? Ask a **question.** (Topic)
2. What do I predict will happen? (Make a **guess** or in scientific terms a **Hypothesis**)
3. What will I do to answer my question? (Design the **Experiment**)
4. What happens and what does it mean? (**Results**); What is the answer to my question? (**Conclusion**)
5. What if my science project does not agree with my hypothesis? (**What did I learn?)**

For Kindergarten & 1st Grade Students-Please answer the above questions through pictures, photographs, words or any other appropriate manner in which children can express their work.

For 2nd -5th Grade Students- Please use the guidelines below to write up your findings. Pictures and photographs are a great way to show your experiment process as well.

(1) QUESTION. Come up with a question to study — decide what you want to find out:

- You notice something; did you ever wonder why it happens? Do you want to know what causes it and how or why something works? You ask questions about what you have observed. The first step is to write down or talk to an adult about what you have noticed.
- Find out about what you want to investigate. Read books, magazines or ask adults who might know. Older students….keep track of where you got your information.
- Choose a title that describes the thing you are investigating.
- What do you want to find out? Write a statement that describes what you want to do. Use your observations and questions to write the statement.

(2) HYPOTHESIS. Guess what you think might happen

Make a list of what you think will be the answers to the questions you have. What do you think is going to happen? Why?

(3) EXPERIMENT. Design and do your experiment(s) to test your guess (hypothesis):

- Make a step-by-step list of what you will do to answer your question(s).
- Make a list of the things you need to do the experiments, and gather all the material you will need to do the experiment.
- Do the experiment and see the results. If possible, repeat the experiment several times. Write down your results.

(4) RESULTS and CONCLUSIONS. What were the results? What are your conclusions?

- Observations can be written descriptions of what you noticed during an experiment, or problems you may have encountered. Keep careful notes of everything you do, and everything that happens.
- Summarize what happened. This could be in the form of a table or graphs. It could also be a written statement of what occurred during the experiments.

(5) What if my science project does not agree with my hypothesis? What did you learn?

Your project is a **success** whether it agrees with your guess (or hypothesis) or if it does not! The experiment will have taught you something, and that is what matters. This is the case for real scientists who often stumble unexpectedly on results they did not expect. The discovery of penicillin (the class of medicines which help clear up ear infections) is an example of an unexpected result that was a huge breakthrough in medical science.

SCIENCE FAIR SET_UP

Your project will be setup on a table in the school on the night of the Science Fair. Set up is from 5:15-6:00. Each project will have 3 feet of table space. Presentation poster board – tri fold (found at the Paper Store, Office Max, Staples, etc.) is an ideal way to describe your experiment. There will be room on the table in front of the poster board to display the experiment. See the example below for an idea of what your display should look like. The content of the poster board can be completely handwritten as well. Examples will also be set up in the lobby.

Example of a poster board display