

Dear Parent(s),

Now that the school year is in full swing, we are excited to announce that Herod will be holding its annual Science Fair Exhibit and Competition on **February 17-21, 2014**. Students in grades 3rd-5th may compete in Science Fair. Team projects may be submitted for grades **3, 4 and 5**. Each team can have **2 members**.

To help your child with this project, we have assembled a packet of guidelines, ideas, and judging criteria for the project. This packet will be available on-line on November 5th, 2013. Your child is going to need your help. You can assist your child throughout the preparation of this project by providing encouragement, praise, necessary materials, and appropriate guidance.

The scientific and technical community throughout the world uses the Metric System. Because of this, students will be required to use the metric system (wherever necessary) for projects entered in the Science Fair.

In selecting an experiment, your child should choose one appropriate to his/her level, and one that matches your child's interests and abilities. The science exhibit should be a fun experience for your child.

We will be holding an informational meeting on Monday, November 18th to review the packet and discuss science fair ideas with your children. If you have participated in science fair before, it is not mandatory to attend. If this is your first science fair, we highly recommend you attend. This meeting will be held after school from 3:15-4:00 in Ms. Whitby's room, #183.

Here is the Science Fair timeline:

- Monday, November 18th: First Science Fair meeting from 3:15-4:00; packets available at the meeting and on the Herod website.
- Friday, December 13th: Science Fair Research Plan due. (See pp. 12-13 in this packet)
Disapproved research plans will be returned. **NO LATE PROPOSALS WILL BE ACCEPTED!**
- Monday, February 17th : Herod Science Fair- Projects due
- February 17th -21st : Herod Science Fair projects judged

Sincerely,

Ms. Pavlich and Ms. Whitby

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The Science Fair Project

The science project is an investigation of a question with the hope of discovering the answer. A science fair project includes a research paper, a data logbook, and a freestanding project board.

Herod Science Fair participants are required to undertake an experimental project. In an experimental project, the student(s) will perform a test and collect and analyze data to answer a question.

Examples of inadmissible projects include the following:

- 1. Displays, including text, charts, graphs or illustrations, which include only research about a topic.**
- 2. Models that demonstrate a scientific principle, such as solar system and volcano models.**
- 3. Collections, such as insects or rocks.**

If you are not certain whether your proposed project meets this requirement, it is your responsibility to talk to your teacher, Ms. Pavlich or Ms. Whitby before starting your work. The judging criteria are set up so that only an experimental or investigative project will score well.

The Scientific Method

When conducting a science experiment, you should use the scientific method. The scientific method is an orderly system used to solve problems. Many scientists, through years of research and study, formed the general rules of scientific method:

STEPS IN THE SCIENTIFIC METHOD

- 1) Question
- 2) Observations and Research
- 3) Hypothesis
- 4) Experiment
- 5) Data Collection
- 6) Conclusions

Scientific Method: Step by Step

1) Question

Pick a question that you have a genuine interest in learning the answer! A good science fair question should be *testable* and *measurable*. For example: Which brand of bubble gum keeps its flavor the longest? You can *test* this by chewing different brands of bubble gum and you *measure* how long the flavor lasts for each brand.

Some other sample problems:

What are the effects of magnetism on seed germination?

How does the shape of an airplane wing affect lift?

Which battery lasts the longest?

Hint: You can use your question as the title of your project.

2) Observations and Research

Research comes in many forms. You can research a topic by going to the library, reading magazines or the newspaper, performing internet research, interviewing a scientist, or even speaking with experts at the zoo, hospitals, museums, etc.

Information on your topic should be collected from **various** resources. ***You should have a minimum of 3 different resources!*** This means all of your information cannot come solely from the internet. (In reference to the bubblegum example, you could contact different employees from different companies that make bubblegum.)

Read these resources and take notes! Write a one to two-page research paper on the concept behind your future experiment.

- Write the most important facts (summary)
- Write in complete sentences
- Write your own words. ***Do not*** copy sentences from a book.

Attach a Title Page to your research paper. Include the following information on the Title Page for either computer-generated or handwritten reports:

Title of Project

Project #

Grade Level

Herod Elementary

Writing a Bibliography for Your Research Paper

It is important to properly cite the sources used during your project. A bibliography is a list of the books of a specific author or publisher, or on a specific subject. So why do you need to use a bibliography? A bibliography helps you know where you got your information from and it lets your teacher know you are giving proper credit for your sources of information.

How to write your Bibliography

- *Alphabetize by author's last name.
- *If no author, go by the first main word of the title.
- *You may use the bibliography style below.

1. Book with one author:

Blodgett, E.D. Alice Munro. Boston: Twayne, 1988.

2. Book with more than one author:

Elwood, Ann, and Linda C. Wood. Windows in Space. New York: Walker, 1982.

3. Article in a magazine:

Daglish, Brenda, "A Matter of Interest." Maclean's, February 15, 1993, pp.36-37.

4. Article in a newspaper:

Smith, Beverly, "Canadians Skate to Gold Medal," The Globe and Mail, March 11, 1993. p. A1.

5. Article in an encyclopedia:

Humber, William. "Bicycling." The Canadian Encyclopedia, 1988.

6. Video or Film:

Shooting Stars. Videotape. National Film Board of Canada (Toronto), 1987. 49 min., 30 sec.

7. Radio or television program:

"Haida Gwaii – Islands of the People." Nature. PBS, December 19, 1992.

8. Interview:

Delaney, Daphne (musician). Personal interview, Toronto, April 10, 2006.

9. Information from the Internet:

Include the web site address and the date the information was researched.
<http://www.cableeducation.ca> (January 1, 2001)

3) Hypothesis

Your hypothesis should be based on your research. It is important to remember that it is okay if your hypothesis turns out to be wrong, you can still learn a lot from it!

When creating your hypothesis, think of it as a simple cause and effect statement. It should be phrased in an "IF/THEN/BECAUSE" format. For example: "**If** I water my plants too much, **then** they will not grow as well **because** too much water is not healthy for plants.

4) Experiment (And Keeping Your Logbook)

Now that you have asked your question, done your background research, and formulated your hypothesis, you are ready to experiment. You will need a logbook for this part. Your logbook can be a spiral notebook, loose-leaf paper stapled together, etc.

You must have in your logbook: **(a)** all of the materials you intend to use in your experiment, **(b)** a step-by-step procedure explaining exactly how you plan to conduct your experiment **(c)** what variables will be included in your experiment **(d)** results for your experiments, **(e)** data that explains your results and, **(f)** a conclusion that either

accepts or rejects your hypothesis.

(a) MATERIALS: List all the materials you intend to use in your experiment including quantity and dimension. It is best to list them in column form. *Use the metric system whenever possible.*

List of Materials:

1. 20 ml. water
2. Two baby food jars

(b) PROCEDURE: This section is *extremely* important. Numerically list each and every step in the exact order you intend to perform your experiment. Explain how you will measure your results and compare them to your hypothesis. Be specific but try not to make it complicated. Someone should be able to repeat your experiment by following your procedure.

(c) VARIABLES: A science fair project involves variables, or things that change or could be changed. There are 2 types of variables: independent and dependent. An independent variable is the one you change on purpose (In the bubblegum example, this would be choosing the different brands of bubblegum). The dependent variable is what you are measuring, or what is responding to the change in the independent variable (In the bubblegum example, this would be the amount of time the flavor lasts).

Everything else must remain constant: for example, only testing sugar-free gums or only sticks of gum and not gumballs.

Another example:

Question: Will plants grow as tall if they are watered with liquids other than water?

Variables: The independent variables are the liquids you will water the plant with, such as soda or orange juice. The dependent variable is the height each plant grows. Constants include using the same amount of sunlight, the same type of soil, the same type of plant and watering with the same amount of liquid.

This original logbook must be exhibited as part of your project display. You may add charts and graphs to display your data more clearly, but they do not replace the original, handwritten project logbook. Noting such information will prevent you from forgetting important details.

5) Data

You must write your raw data by hand in your logbook as you work on your experiment. Be sure to put the time and date for each entry in your logbook, and jot down information as you work on your experiment.

A chart or graph can show all your data in a way that is much easier to understand. This is good to have if you have many results, especially if they are numbers. The chart or graph should have a title and be well labeled.

You may also add an illustration. This can be a drawing, diagram, map, or graph that shows important information about your topic. You may trace or copy, but don't have someone else do it for you. You learn more when you do your own work. Use

unlined, white paper. Write a title, label all the parts, and write a caption (a sentence explaining your picture).

6) Conclusions

This section of your report summarizes what you discovered and learned based on your experimental results. It should restate your hypothesis and tell whether or not your data supports it. This is also the place to write any questions that arose from your experimentation and any project extensions you might like to try in the future.

The following items may be used in projects, but cannot be brought to school with the displays:

1. Glass
2. Liquids of any kind
3. Household chemicals
4. Food
5. Molds, bacteria, fungi

The following items are prohibited in Science Fair projects:

1. Poisonous or dangerous plants
2. Poisons, drugs and controlled substances
3. Any items prohibited by the HISD Code of Conduct
4. Killing of organisms is also prohibited

Project Display

All exhibits must have a freestanding project board. Your exhibit must be neat, uncluttered and to the point. Do NOT put your name anywhere on your board, on your report, or on your logbook. Photographs should not contain any identifiable people. Faces may be covered with stickers if you want to use the photographs. You will be given a Project Number, and this will appear on the above items. Use your project number as identification.

The following sections should be on your board.

TITLE *Make your title eye-catching and interesting!*

QUESTION OR PROBLEM

HYPOTHESIS

MATERIALS

PROCEDURES

VARIABLES

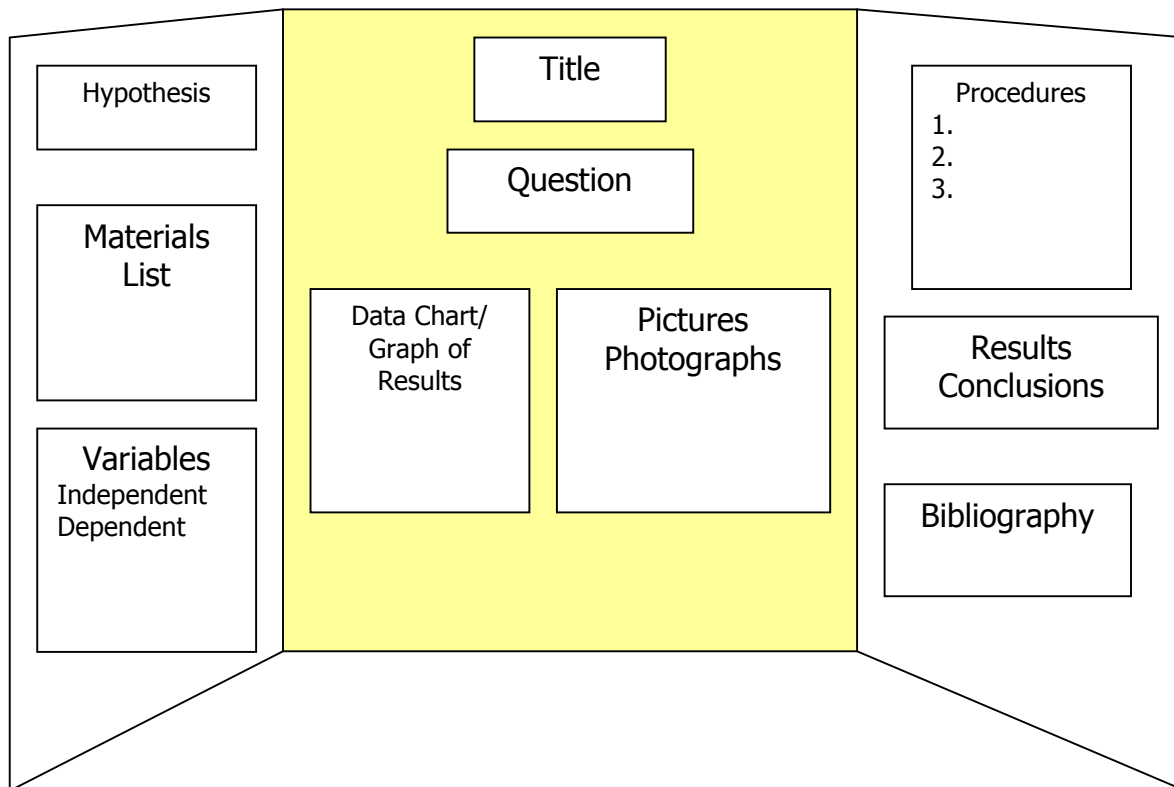
RESULTS

CONCLUSION

BIBLIOGRAPHY (This can be attached to the back if you need the space. Just be sure to make a notation so the judges will know where to look)

Do not forget to include your logbook and research paper with your project display

Suggested Display Format for Science Fair Projects



Helpful Hints

- **Lettering**
 - Use easy to read, simple lettering in one-color printing to avoid confusion
 - Spell correctly
- **Main points should be clear and legible.**
- **Show measurements in metric units.**
- **Do NOT put your name anywhere on the project.**

Displays cannot require electricity for operation. Outlets are not accessible in the areas where the projects are displayed.

Contact your teacher, Ms. Pavlich or Ms. Whitby if you have any questions. You will be required to remove any prohibited items from your display.

Checklist for My Science Fair Project

Place a check by each task when you complete it

	Turn in the entry form and Research plan by December 13 th to either Ms. Pavlich or Ms. Whitby.
	Read <i>at least</i> 3 sources about my project topic
	Create a rough draft bibliography from these sources
	Write a rough draft research paper
	Edit rough draft research paper and bibliography
	Write final copy of my research paper (must be <i>at least</i> 1 page typed, double spaced, or 2 pages handwritten, front side of paper only)
	Write final copy of bibliography to place at the end of the background paper and on the project board
	Create the title page for the background paper to place at the front of the background paper
	Be sure logbook has project number clearly written on front
	Write entries about my procedures and observations in my logbook
	Do at least trials of the experiment, make the model, or collect items for my project
	Record and analyze data from my experiment
	Review the Judging Criteria to be sure I have covered all the items that will be considered when my project is judged
	Purchase or make my project board
	Put my project title and labels on my backboard. (<i>Title, Problem, Hypothesis, Materials, Variables, Procedure, Data, Results, Conclusion</i>)
	Type or neatly write the information for my Problem, Hypothesis, Materials, Variables, Procedure, Data, Results and Conclusion for my experiment and place them under the labels on my project board.
	Make neat charts, graphs, or diagrams from my data I collected in my logbook and place them under the <i>Data</i> label on my project board.
	Make a copy of my bibliography page and place it on the front corner or back of my project board.
	Turn in my project board along with my background paper and logbook on February 17 th , 2014
	All Science Fair guidelines for project research and competition have been reviewed and met.

Herod Science Fair Project Scoring Rubric

	Points Awarded
Content (30) 5 points per bullet <ul style="list-style-type: none"> ○ Question is clearly identified ○ Hypothesis uses if/then/because format and directly relates to the question ○ Procedure clearly tests the hypothesis ○ Experiment was replicated for reliability (at least 3 trials) ○ All variables were clearly identified.(independent and dependent) ○ Materials are listed 	
Research Paper (20) 10 points per bullet <ul style="list-style-type: none"> ○ Bibliography has at least 3 different references written in correct format. ○ Paper shows depth of study. 	
Results (30) 10 points per bullet <ul style="list-style-type: none"> ○ Science log book contains dated entries, raw data and description of procedure. ○ Results are clearly presented and demonstrated with a table, chart or graph. ○ Results are directly related to the question and hypothesis. 	
Conclusions (5) 5 points per bullet <ul style="list-style-type: none"> ○ Conclusion is logical and based on data collected. 	
Communicating the Results (15) 5 points per bullet <ul style="list-style-type: none"> ○ Project appears well organized and neat ○ All parts of the experimental design process are present. ○ Project was clearly done by the student, with appropriate parental guidance. 	
Total Points (100 possible)	

RESEARCH PLAN WITH APPLICATION FOR RESEARCH
(Must be completed for all projects prior to starting the project research)

Participant's name: _____

Grade Level: _____

Homeroom Teacher's Name: _____

If doing a group project, please provide the other student's name with homeroom teacher.
Teams only need to turn in one proposal.

Student's Name: _____

Homeroom teacher _____

PROJECT TITLE: _____

MY QUESTION:

The question I plan to answer with my experiment is:

VARIABLES:

My independent variable, or the one thing I plan to change, is:

My dependent variable, or the change I will measure, is:

My constants, or the things that will remain the same are:

******HYPOTHESIS (If...Then...Because):**

A hypothesis is a possible answer to my question. If you have already done some research on your topic, please provide your hypothesis using If...Then...Because in your statement.

PROCEDURE: Write a brief description of the steps you will follow when doing your experiment. Write on back if necessary. *(Add additional sheets if more space is needed.)*

This is to be filled out by Ms. Whitby or Ms. Pavlich. When you have received this signature, you may begin with your project.

Signature: _____ Date: _____
(School Science Fair Coordinator)

Your science fair number is _____ - _____
Have fun experimenting!