

Important Information Packet

This packet will tell you some important guidelines.
Read and follow them carefully!



Some important things to think about: (Pages 1 - 2)

- A simple experiment is often better than a complicated one.
- Your experiment must use safe materials in a safe way.
- We cannot guarantee the safety of the equipment. Avoid a topic that needs expensive equipment.

A Science Fair project has several parts. (Pages 3-5)

- A report giving background information about the topic
- A question about the topic
- A prediction of what you think the answer might be (hypothesis)
- A plan for testing (experimenting) to find the answer to your question
- A record of the data you collect when you do the experiment
- A graph or chart with a written explanation of your results
- A conclusion
- An exhibit to show all of this to people who come to the science fair

The Science Fair is competitive.

Ribbons will be awarded.

Ten exhibits will be selected to represent Kennedy Academy at the Regional Science Fair at Notre Dame in March of 2020.



Students must do the projects themselves.
Parents or adults may help and advise,
but the student is responsible for the work.



SEFI - KA and SEFI Science Fair Rules

Please read before you begin your science project

Restrictions

The following are prohibited in K-8 Science Fair Projects with NO Exceptions

- **NO MOLD OR BACTERIAL STUDIES FOR STUDENTS IN ELEMENTARY SCHOOL (GRADES K-5) WILL BE ACCEPTED FOR ENTRY TO AN INDIANA REGIONAL FAIR.**
- Biological Agents Experiments at Home projects that use or study microorganisms including bacteria, viruses, prions, fungi, and parasites.
- Vertebrate Animal Research involving pain, withholding of food or water. All Vertebrate animal research should be reviewed by a Doctor of Veterinary Medicine.
- Class IV Lasers (All use of lower-class lasers must be under the direct supervision of a qualified adult)
- Radioactive substances or equipment that emits any form of ionizing radiation
- Hazardous Chemicals or reagents, DEA Controlled substances, tobacco, alcohol, prescription drugs, firearms or explosives.



NO PETS ALLOWED

The following may be permitted but only with permission from the NIRSEF Safety Review Committee in advance.


Human Subjects may be used only if all experimentation is conducted under adult supervision and student researchers have notified parents of the conditions of the experiment and provided the opportunities for subjects to opt-out of participation. All research guidelines for human participants must be followed and forms submitted to an IRB committee BEFORE experimentation begins.




- Animal Behavior Studies Research projects should be reviewed by a Veterinarian to ensure the safety of the student and animal. All Vertebrate animal studies MUST be of an observational nature and not be done with any animals other than family pets.
- If you wish to do an animal research project, please use invertebrates!



A Message from the Notre Dame Science Fair Director - Dr. Michael Kilburn






PLEASE DO NOT CHOOSE TOPICS THAT PRIMARILY TEST CONSUMER PRODUCTS...

One type of experiment that you want to steer away from are consumer product testing.

Examples:







- Which battery will last the longest?
- Which paper towels absorb most liquid?




I've updated our website sciencefair.nd.edu to better streamline information by division. Look through the elementary division, display guidelines, and fair tips.

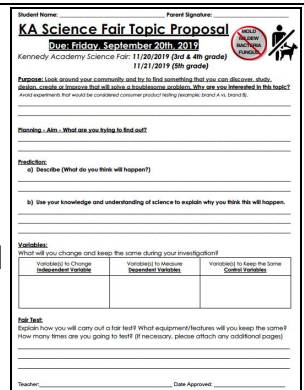
One thing I would add is that students can answer questions with the scientific method in different ways. Sometimes observing replaces the traditional experiment, especially in regards to astronomy. A 3rd-grade student could observe the moon at the same time each night, or if they had a solar filter they could observe sunspots at the same time each day and record weather, temperature, etc to look for patterns.

How To Pick Your Science Fair Topic:

	<p>Find a topic that interests you. We encourage you to visit the INTEL Science Resources page for science fair and research ideas.</p> <p>1. Explore the areas of your interest. <i>Look for questions within that area that might be worth exploring ...</i></p>
	<p>2. Is Your Topic Community Based?: Along with interest, you should also choose a topic that can benefit your community or society in general. Look around your community and try to find something that you can discover, study, design, create or improve that will solve a troublesome problem. Why not choose a topic that will allow you to contribute to society and to make a difference?</p>
	<p>3. Try It! Don't be afraid to try something even though it might not work. Let your imagination run wild and be creative. Sometimes the simplest solutions and the smallest contributions are the most important.</p>
	<p>4. Time?: Always choose a topic that interests you and <u>make sure whatever you choose is possible to do in time and with the equipment available.</u></p>
	<p>5. Readers Make Leaders!: Once you have an idea, research what is already known about the topic. Narrow the idea to a specific scientific question.</p>
	<p>6. MAKE IT YOURS!!!: If you choose to research a website similar to Science Buddies to get inspired, <i>please do not conduct the same exact experiment word for word.</i> Adjust and create your own fixed and controlled variables as well as procedures.</p>

2018-2019 Science and Engineering Fair Timeline

	By this date	Have this completed
	<p>Friday, September 20th, 2019</p>	<p>Topic chosen</p> <p>KA Science Fair Topic Proposal Form Due</p> <p>→ KA 3rd/4th/5th grade teacher approved prior to experimentation.</p>



← 3rd, 4th, & 5th Grade Kennedy Students

You may begin to work on your science fair project as soon you have:

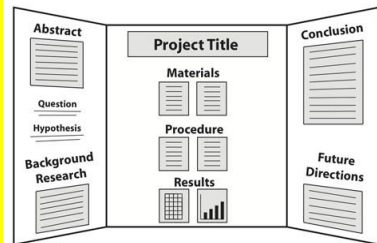
1. Selected an appropriate **experimental** topic.
2. Been approved from your classroom teacher to begin experimentation.
3. Completed and submitted the appropriate KA Science Fair Topic and Proposal o your classroom teacher.

SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT	SUN	MON	TUE	WED	THU	FRI	SAT
SEPTEMBER 2019							OCTOBER 2019							NOVEMBER 2019						
1	2	3	4	5	6	7			1	2	3	4	5						1	2
8	9	10	11	12	13	14	6	7	8	9	10	11	12	3	4	5	6	7	8	9
15	16	17	18	19	20	21	13	14	15	16	Fall break	19	10	11	12	13	14	15	16	
22	23	24	25	26	27	28	20	21	22	23	24	25	26	17	18	19	20	21	22	23
29	30						27	28	29	30	31			24	25	26	27	28	29	30

September - November 12th Conduct your experiment and collect data.

September - October 14th

Poster (tri-fold) request turned in for distribution within Kennedy Academy



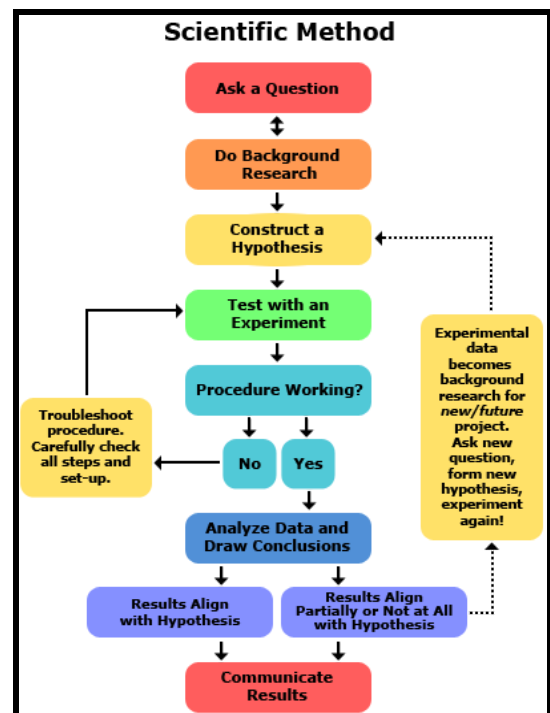
November 2019							November 18th & 19th	ALL PROJECTS DUE
SUN	MON	TUE	WED	THU	FRI	SAT	Nov. 20th	<ul style="list-style-type: none"> 3rd & 4th Graders bring in their exhibits to the gym to be judged.
					1	2	Nov. 21st	<ul style="list-style-type: none"> 5th Graders bring in their exhibits to the gym to be judged. Bring your parents and friends to see the exhibits from 5:00 to 6:30 pm. All ribbons will be displayed on the project for this event, as well as Notre Dame notification.
3	4	5	6	7	8	9	Nov. 22nd	<ul style="list-style-type: none"> Classes will be viewing the projects during the day. You will take your project home at the end of the day unless you are advancing to Notre Dame
10	11	12	13	14	15	16		
17	18	19	20	21	22	23		
24	25	26	27	28	29	30		



Sample Youtube videos to watch to help you and your family further understand the scientific method. Feel free to explore on your own as well...

YouTube Video Title	Link - case sensitive
"Prepare for the Science Fair" by Kevin Temmer	https://goo.gl/Cdx2bz
The Steps of the Scientific Method for Kids - Science for Children: FreeSchool	https://goo.gl/YIRqX3
The Scientific Method: Steps, Terms, and Examples	https://goo.gl/z1Z4Mg

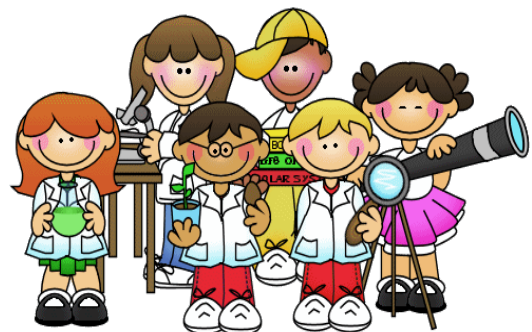
Kennedy Academy Science Fair Projects rubric for ALL 4th & 5th-grade students	Possible Points
1. Title	5 pts
2. Purpose	5 pts
3. Question	5 pts
4. Hypothesis	5 pts
5. Materials	5 pts
6. Procedure	5 pts
7. Data/Pictures/Charts/Graphs	10 pts
8. Results	10 pts
9. Conclusion/Application	5 pts
10. Neatness/Presentation/On Time	15 pts
Total	70 pts



Science and Engineering Fair IMPORTANT PARTS

1. **Question:** You are investigating a question. You are not building things or demonstrating things. Each science fair project must test something, show data to prove something, and be clearly presented. Most experiments involve measuring differences when one variable is changed.
2. **Hypothesis:** Write a complete sentence telling what you think will happen and why you think it will happen. The hypothesis should be completed before you begin the experiment. It is OK if your experiment proves that the hypothesis was incorrect.
3. **Materials:** List everything you use during your experiment.
4. **Procedure (plan):** List step-by-step instructions. Number the steps. Do not write a paragraph. Make a list.
5. **Data:** As you do your experiment, record your results as a tally chart or other way of recording. This is not a paragraph.
6. **Results:** Explain your data in words and with a graph, if possible. Do not tell the conclusion in this section.
7. **Conclusion:** Write one or more paragraphs to clearly explain the results. This is the answer to the question you asked at the beginning. You may add what you would do differently another time, why this is important, or other ideas about the experiment.

Students must do the projects themselves. Parents or adults may help and advise, but the student is responsible for the work.



Variables

Every Experiment should have three different variables listed /described below:

Scientists use an experiment to search for cause and effect. There are many items that could be altered to test the reaction of another. These changing quantities are called **variables**. A variable is any factor, trait, or condition that can exist in differing amounts or types. An experiment usually has three kinds of variables: independent, dependent, and controlled.



The **independent variable** is the one that is changed by the scientist. To insure a fair test, a good experiment has only **ONE** independent variable. As the scientist changes the independent variable, he or she records the data that they collect.

The **dependent variable** is the item that responds to the change of the independent variable. The dependent variable depends on/changes when the independent variable is changed.

For example, if you open a faucet (the independent variable), the quantity of water flowing (dependent variable) changes in response--you observe that the water flow increases. The number of dependent variables in an experiment varies, but there is often more than one.

The **controlled variables** are quantities/items that you want to remain constant and must observe them as carefully as the dependent variables.

For example, if we want to measure how much water flow increases when we open a faucet, it is important to make sure that the water pressure (the controlled variable) is held constant. That's because both the water pressure and the opening of a faucet have an impact on how much water flows. If we change both of them at the same time, we can't be sure how much of the change in water flow is because of the faucet opening and how much because of the water pressure. In other words, it would not be a fair test. Most experiments have more than one controlled variable. Some people refer to controlled variables as "constant variables." In a good experiment, the scientist must be able to **measure** the values for each variable. Weight or mass is an example of a variable that is very easy to measure. However, imagine trying to do an experiment where one of the variables is love. There is no such thing as a "love-meter." You might have a **belief** that someone is in love, but you cannot really be sure, and you would probably have friends that don't agree with you. So, love is not measurable in a scientific sense; therefore, it would be a poor variable to use in an experiment.

(http://www.sciencebuddies.org/science-fair-projects/project_variables.shtml)

KA Science Fair Topic Proposal

Due: Friday, September 20th, 2019

Kennedy Academy Science Fair: 11/20/2019 (3rd & 4th grade)
11/21/2019 (5th grade)



Purpose: Look around your community and try to find something that you can discover, study, design, create or improve that will solve a troublesome problem. Why are you interested in this topic? *Avoid experiments that would be considered consumer product testing (example: brand A vs. brand B).*

Planning - Aim - What are you trying to find out?

Prediction:

a) Describe (What do you think will happen?)

b) Use your knowledge and understanding of science to explain why you think this will happen.

Variables:

What will you change and keep the same during your investigation?

Variable(s) to Change <u>Independent Variable</u>	Variable(s) to Measure <u>Dependent Variables</u>	Variable(s) to Keep the Same <u>Control Variables</u>

Fair Test:

Explain how you will carry out a fair test? What equipment/features will you keep the same? How many times are you going to test? (If necessary, please attach any additional pages)

Science and Engineering Fair: The Exhibit

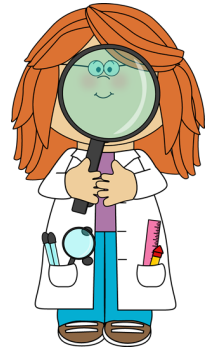
The exhibit must be on sturdy tri-fold cardboard and must stand-alone. **It should be about three feet tall and about the same width.**

After your Kennedy classroom teacher has approved your science fair experiment, you may then order a science and engineering fair poster board by completing the form. The form should be turned in by **Monday, October 14th**. Or you may choose to purchase your own science fair poster board at United Art and Education (Indian Ridge Plaza) or elsewhere.

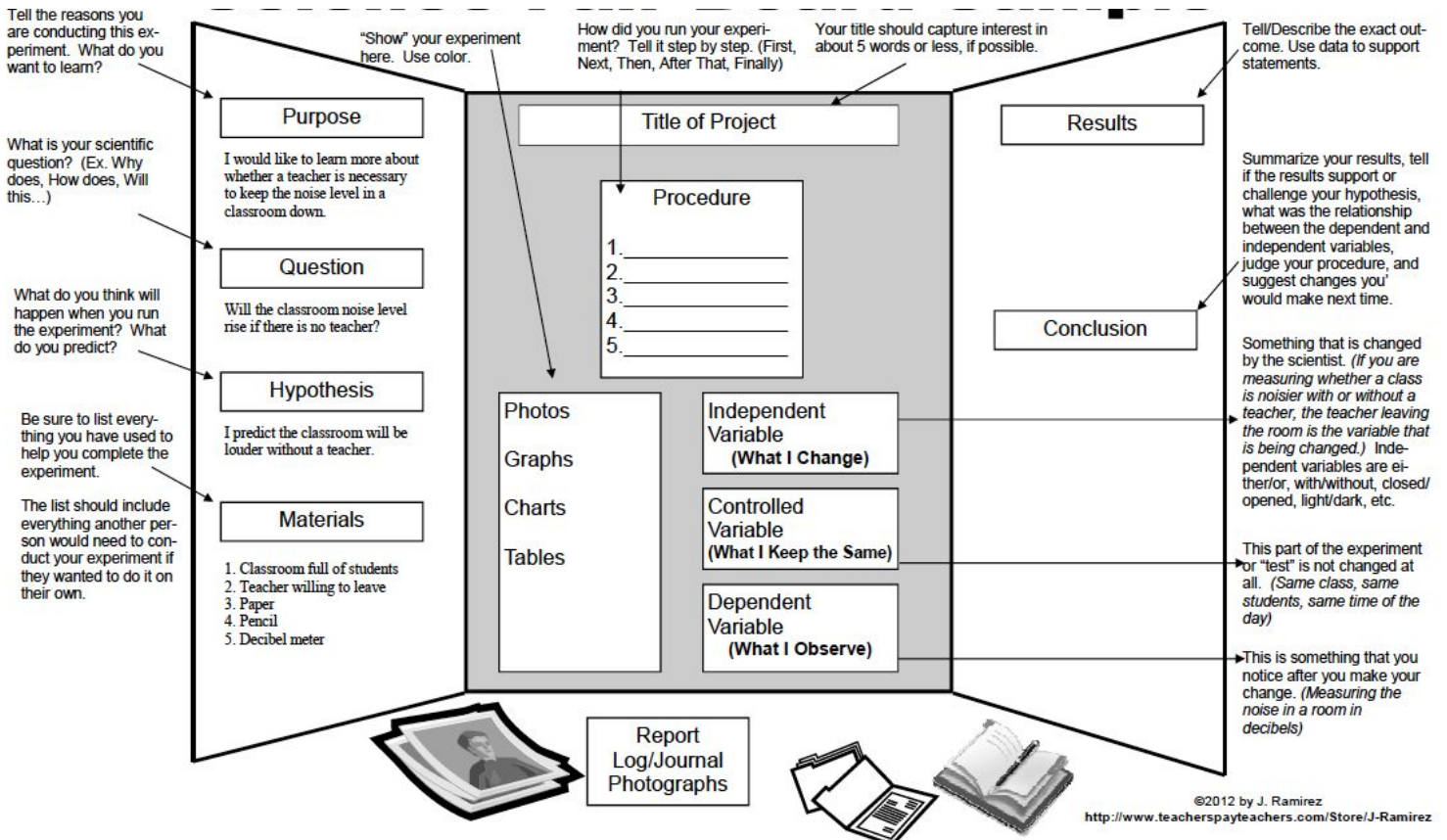
The completed poster should be neat and attractive. If at all possible, the information should be typed (neatly printed in ink is OK). Graphs should be on graph paper or computer-generated (**student work – not adults!!**)

Colored paper backing makes a nice-looking frame for each section, but is not necessary.

The most important part of the exhibit is the student's understanding and interest in the topic. Please practice at home so you will be able to answer any questions that the judges may have!



Science Fair Board Requirements:



Kennedy Academy - Science Fair Judging Rubric (Experimental)



Student Name		Grade:	
Project Title:		Project #	
Judge's Name		Score	/ 45

Question	Hypothesis	Purpose	Materials	Procedure	Data	Results	Conclusion	Abstract	Score
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Area of Assessment	<u>Advanced Level</u> 4	<u>Proficient Level</u> 3	<u>Competent</u> 2	<u>Developing</u> 1	Score
Purpose	There is a definite purpose benefit for society timely and relevant offer solutions to real problems	The project has a purpose benefit for society	The purpose that benefit is vague.	There is no real world problem solving connection made.	
Testable Question	Sophisticated question can be answered through comprehensive scientific method.	Question can be answered with student's application of scientific method	Partially developed does not address variables	The question is too broad to lend itself to investigation with scientific method. It is better suited for a research report or it is a demonstration.	
Hypothesis	Thoroughly developed with "I think.... because..."	Sufficiently developed	Partially developed.	Major flaws.	
Materials	Complete list that details how others could replicate the results with exact measurements in metric units	Complete list.	Partial list or does not use metric units	Incomplete list unable to replicate project as written.	
Procedure	easy-to-follow sequence of the scientific method language is clear and correct	Easy to follow the sequence of the scientific method. Some language errors.	Somewhat difficult to follow because of lapses of a sequence of scientific method	Difficult to follow the sequence of the scientific method	
Results	Data is clearly presented and directly relates to the hypothesis/ question.	Data is reasonably presented and shows good relationship to hypothesis/question.	Data is minimally presented and shows some relationship to the hypothesis/ question	Data is not presented in/no relationship to hypothesis question is evident.	
Conclusion	A logical conclusion that has been drawn from the data collected, and answers the hypothesis question and or raises a new hypothesis question. Has real world application.	A logical conclusion that's been drawn from the data collected.	A fairly reasonable conclusion has been drawn from the data collected	The conclusion drawn is not shown to relate to the data collected	
Scientific Method 1. Question & Purpose 2. Hypothesis 3. Materials 4. Procedure 5. Results 6. Conclusion	Use a scientific method uses variables in can make use of the comparison data apply information to previous knowledge and can make predictions.	Use the scientific method in a skillful manner control variables.	Adequately addresses scientific method examples a weakness with controlling variable	Minimally addresses the scientific method, may leave out of stuff. Does not control any variables.	
Display Board	Meets all proficiency level criteria. In addition so special use of appropriate technology or special artistic talents	Project is visually appealing labeled organized neat colorful concise easy to see from a distance that contains major information and supporting detail	The project is visually appealing, but lacks consistency in at least one area mentioned at the professional level	Project is complete by lacks inconsistency in several areas mentioned that the proficiency level.	

Should this student represent Kennedy at Notre Dame's Regional Fair? **Definitely** **Yes** **Yes with reservation** **No**
 Judge's Additional Comments:

Kennedy Academy - Science Fair Judging Rubric (Interview)



Student Name		Grade:	
Project Title:		Project #	
Judge's Name		Score	/ 35

Content	<u>Proficient</u> 5	<u>Competent</u> 3	<u>Developing</u> 1	Score
States the purpose	The purpose is clear and captures the listener's attention.	The purpose is apparent.	The purpose is not evident.	
Organizes the content.	The content is organized logically with fluid transitions to capture and hold the listener's attention throughout the entire presentation.	The organization of the content is congruent; transitions are evident.	The content lacks organization; transitions are abrupt and distracting.	
Supports Ideas	Important details add to the interest and depth of the presentation; details work to connect the listener to the speech.	The speaker provides the basic details necessary for the listener to understand the premise of the presentation.	The majority of ideas are unsupported by additional information or explanation.	
Summarizes the main idea(s)	The conclusion unites the important points of the presentation and encourages future discussion.	The conclusion summarizes the main ideas.	The speech ends without a summary.	
Demonstrates awareness of listener's needs.	The choices of language, examples, and aids work together to heighten the listener's interest and connection to the topic.	The speaker's word choices, explanations, and enthusiasm are appropriate for the topic and for each point; appropriate aids are incorporated.	The presentation is uninteresting.	
Speaks clearly with appropriate vocabulary and information.	The vocabulary is descriptive and accurate, engaging the listener through imagery.	The vocabulary provides clarity and avoids confusion.	The vocabulary is awkward or inappropriate for the topic, making the speaker difficult to understand.	
Appears comfortable with audience	Eye contact, interaction with aids, and physical gestures demonstrate the speaker's energy and interest, guiding the listener through the presentation.	Eye contact, interaction with aids, and physical gestures are natural and fluid.	Eye contact with the audience is lacking. Gestures are missing or awkward. The speaker depends heavily on the written speech or notes.	

Should this student represent Kennedy at Notre Dame's Regional Fair? **Definitely** **Yes** **Yes with reservation** **No**
 Judge's Additional Comments: