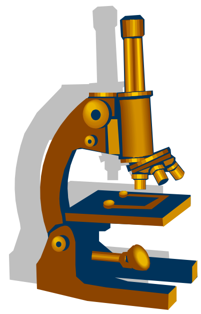
KENNESAW CHARTER SCIENCE & MATH ACADEMY
2018-2019 SCIENCE FAIR



When: Week of 1/14/2019 — 1/18/2019

Where: Media Center

Who: **All interested students, Fifth grade will be mandatory.**

What: Participants are required to conduct a scientific experiment. The experiment does not have to be a "traditional" science experiment! Be creative, have fun! Study what interests you! All projects will be judged by members of our surrounding business and scientific community.

Getting Started:

1. Think of a title for your science project**. Your title must be phrased as a question.** For example, "What kind of juice cleans pennies best?", "Which kind of gum holds its flavor longest?", and "Is the 5-day weather forecast accurate?". **The question should then be able to be answered by the experiment**.

2. The Science Fair application is included in this packet and will be due 12/10/2018. This packet will be sent to teachers via email which should then immediately be sent to parents. **Teachers should also make this document available for download.**

3. Turn in *all* applications to your homeroom teacher, these will then be forwarded to Mr. Donnelly.

KENNESAW CHARTER SCIENCE & MATH ACADEMY
2018-2019 SCIENCE FAIR

INFORMATION & GUIDELINES

Congratulations on deciding to explore the wonderful world of science with a science fair project! Participating in the science fair will give you a chance to better understand the world around you. Your project can be fun and educational at the same time. Everybody who participates will receive a ribbon. Second, and third place science fair projects in each grade will receive a medal, first may be invited to represent our school in the county science fair. Just by participating, Kindergarten through Fourth graders will have gone above and beyond your school class requirements..

Now that you have chosen your science fair topic, there are some guidelines you need to follow in completing and presenting the results of your project. Results from your science fair project should **be presented on a tri-fold board**. The actual materials used in experiments do not need to be presented, nor will the student be present during judging. . **The name, grade, and teacher of the student must appear ON THE BACK of the poster board**.

Your parents are encouraged to assist you, but you must be the main scientist. The role of your parent should be to offer encouragement, to help test ideas, and to offer an extra set of hands and eyes. **A project does not have to be complicated to be a good science fair project**.

Date and Time: Projects may be dropped off at school on the morning of 1/10/2019 for all grades between the hours of 7:00 a.m. - 7:50 a.m. A parent or teacher will check in the project and direct placement.

Location: KCSMA Media Center/R&D Room.

Judging: Judging will take place on 1/12 and 1/13 for all grade levels. The areas of judging are found on the rubric below.

Cobb County School District

Elementary Science Fair RUBRIC Final Score: _____________

Student Name ______________________________ Grade _________________
Project Title ________________________________ School: KCSMA

Instructions to Judge:

For each item circle 0, 1, or 2. (Do not leave any items unanswered.)

0 = No
1 = Some Evidence
2= Yes

1. Is the project based on a research question or questions?
0 1 2

2. Does the project hypothesis offer an answer to the project research question(s)?
0 1 2

3. Are project procedures well-described and able to be repeated?
0 1 2

4. Is there research on the topic? (Research requires 2 or more reputable sources).
0 1 2

5. Do you get a sense of the student's knowledge/understanding of the topic in their own words? 0 1 2

6. Does the project contain measureable data? (For 2 points, student must have done multiple trials). 0 1 2

7. Is there an effective analysis of data? Clearly stated results? (Both are required.)
0 1 2

8. Are the data analyzed sufficiently to answer to the project question? 0 1 2

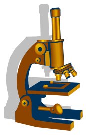
9. Are the project conclusions based on analysis of results? 0 1 2

10. Are the project conclusions and results presented clearly? 0 1 2

Scoring Guide:

0-9	Falls far below inquiry standards
10-13	Approaches inquiry standards
14-18	Meets inquiry standards
19+	Exceeds inquiry standards

Additional Feedback and Commentary on Back



GUIDELINES:

Steps of the Scientific Method

1. Present your **topic as a question,** e.g., "Does taking a shower use less water than taking a bath?" Your topic must be clearly visible on your poster display.

2. After presenting your topic as a question, **take a careful guess at what you will find out from conducting the experiment**. This careful guess, or prediction, is called a ***hypothesis***. Often a hypothesis is formed after researching the subject by asking experts questions or reading. A hypothesis for the question above might be "Showers use less water than baths". A good hypothesis should clearly answer the questions, be able to be answered with an experiment, and be brief and to the point. Your hypothesis should also be clearly written on your display.

3. Now you are ready to plan your experiment. First you must **create a shopping list for all the materials, with size and quantities of each, you will need for your experiment**. For example, instead of simply listing a jar as a needed material, you should list precisely what type and quantity of jars you will need, e.g., three 2 liter, wide-mouthed jars. This list of materials should also be included on your poster.

4. The next stage in planning an experiment is to **write an experimental procedure**, which is simply a list of the directions you will follow when conducting your experiment. Your experimental procedure should also be included on your display. Directions should be detailed and in the correct order. To fairly test your hypothesis, the experiment must be controlled carefully. You should change only one thing at a time and observe and record results. Conditions that are deliberately changed in your experiment are called *variables*. For example, if you are testing which type of detergent cleans clothes the best, you should vary only the detergent and keep all other factors constant, or the same. The water you use, the type of stain you try to clean and the method you use to clean should all remain the same throughout the experiment. You may also choose to use a *control* in your experiment. A control has no variables and is useful for comparison with other results. For example, a control in the experiment described above might be plain water with no detergent. A control is useful for deciding just how much of an effect your variables have.

5. Now you are ready to start your experiment! You must determine some way to **measure the results of your experiment**, by counting, measuring a distance or a weight, recording temperature changes, etc. Scientists use the ***metric system*** of measurement. **All of the measurements in your science project should be made in, or converted to, metrics**. For example, distances should be in meters rather than yards, weights should be expressed in kilograms instead of pounds, volume should be in liters rather than pints, quarts or gallons, and temperature should be written as Celsius and not Fahrenheit. Always when you make a measurement, there is some error involved. Therefore, it is a good idea to repeat each measurement at least three times. **A better experiment has more testing. The more tests or measurements, the more valid the result.** When your experiment is complete, you must find a clear

and simple way to present the results, also called the ***data***. Using a graph, such as a line graph or bar graph, is a good way to show results on your display.

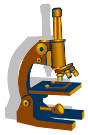
6. Finally, you must present a **concluding statement** that will either support or not support your hypothesis. Don't worry if your hypothesis turns out to be wrong; this is very common in scientific research. Just be prepared to explain your conclusion. If your results were inconclusive and didn't prove anything, explain how you would change the experiment to get better results next time. You may also mention other things that you learned, as well as any problems you ran into, and how you worked the problem out in your concluding statement.

In summary, science fair participants must include the following basic information on their poster display. Additional information may be included as discussed throughout these guidelines:

- The **title** of your project on the front: The title may be the actual problem statement, in which case it should be in the form of a question.
- The **purpose** of your project: The purpose explains what you wanted to learn from the project.
- A 3x5 card taped to the **BACK** of your display with your name, the title of your project, your grade, and your teacher.
- Acknowledgment of who helped you (your mother, father, teacher, etc.).
- A bibliography or listing of books, articles and any other sources you used to research your project. Each reference should include the author's name, title of the book or article, publisher, year published, where published and pages uses should appear on the back.

In addition, participants conducting a scientific experiment must also include the following on their project board.

- A hypothesis.
- The experimental procedure you followed, which should include a detailed list of materials with sizes and quantities included, and a step-by-step explanation of the experiment. Pictures or drawings are helpful.
- The measured results, including any observations you may have made and any charts or tables which may help to show your results. If you use a laboratory notebook to record results, you may place the notebook in front of your display, but please do not put your name on the notebook where it will be visible to the judges.
- An explanation of your results, called a conclusion. This statement should tell what you learned from the experiment. You may refer to charts, tables or observations for this section.



Displaying your Project

- Use sturdy materials, such as heavy cardboard. Display boards are often available in office product stores and educational supply stores (e.g., School Box).

- **Displays must be able to <u>stand on their own</u> and be no more than 3 feet tall, 3 feet wide and 2 feet deep.** Display boards should be 3 sided and able to stand on their own. Sections can be fastened together with strong tape.

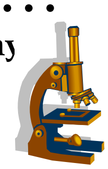
- The title of the project must be clearly visible on the display. Lettering for the title should be large and bold.

- Display should be neat and easy to read but feel free to be creative and colorful!

- All extra materials, including models and collections, must either fit on the display or in front of it. **(Any item that can be spilled should be photographed and the picture shown on the display. EXAMPLES: liquids, soils, food projects, plants, etc.)**

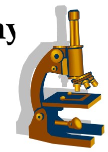
Experiment and Have Fun!!!

Kennesaw Charter Science and Math Academy
2018-2019
SCIENCE FAIR



Experiment and Have Fun!!!

Kennesaw Charter Science and Math Academy
2015-2016
SCIENCE FAIR



APPLICATION

NAME:____

GRADE:____

TEACHER:____

SCIENCE FAIR TITLE (STATE AS A QUESTION IF CONDUCTING AN EXPERIMENT):_______________________________________

____

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____

<u>IF PARTICIPATING IN THE SCIENCE FAIR, SUBMIT THIS COMPLETED FORM ON OR BEFORE</u>:

12/10/2018
FOR ALL GRADES
to your child’s homeroom teacher
(Teachers will then forward to Mr. Donnelly)

Additional tips and ideas:

The First Step: Selecting a Problem

One of the most important steps, and probably one of the toughest, is selecting a problem that you would like to study. Deciding too quickly on a suitable topic may result in a choice that you find uninteresting, is too difficult or time consuming, is dangerous and requires materials you do not have, or is not a testable problem. Read these tips and ask yourself some questions before you make a decision. Researching background information on the Internet may also be helpful, but remember that many science “activities” that are fun and informative are not actual data-gathering tests

1. Is the question or problem interesting to you? Do you like growing plants, working with magnets or rockets, or mixing chemicals? Think about what topics will be enjoyable to study in detail, and explore ways you could use your interest to develop a project that involves experimentation.
2. Is the question unique and different? How did you arrive at your problem question? Did you find it on the Internet, or do you know of other students that have already done the same project? Try to think of a question that is unusual or creative.
3. Is the question something a student can answer? You may be interested in what causes global warming, or how nuclear reactions make electricity, but these are large questions that are either impossible to answer or require equipment that is unavailable.
4. Is the project safe and suitable for your age? It might be interesting to use flammable materials to power a model rocket, but this is very hazardous and is not recommended for young students. Be sure you know and follow all necessary safety procedures, such as wearing goggles when using chemicals or glassware.
5. Do you have enough time to answer the question? Some experiments require months or years to complete. You might want to study how rain affects the erosion of land on a hillside near your home, but to do this you would need to wait for several months to see any changes.
6. Can you complete the project without much assistance? You don’t have to build complicated equipment or models in order to do a science project. Look for simple, inexpensive items that can be used in answering your problem question.
7. What will you measure when you collect data to answer the question? You will often see project questions such as “Which food do dogs like the best?”, but this kind of question can’t be answered because you can’t ask the dog what it likes. Plus, experiments involving vertebrate animals are not acceptable. You should think about what you can count or measure during the experiment. Data collection usually requires some type of measurement: time, weight, mass, temperature, number of objects, volume, pH, area, etc
8. Is your problem question really a question? You may want to build a model of a volcano or a small rocket launcher, but unless you do some kind of testing with the model, then you haven’t tried to answer a question.
9. Does the question have any real application or purpose? For example, you may have

found a bottle of mouthwash at home and decided to see how it effects plant growth. Is this is a reasonable use of mouthwash? Do plants generally encounter mouthwash in their habitat? If the question seems to be without a ‘purpose’ you may want to think of another question.

Examples of Testable Questions

1. How does mass affect the distance a rocket travels?
2. How does temperature change the size of crystals grown in a solution?
3. Does color of a rock change the temperature of the rock if exposed to sunlight?
4. Does the pH of a food affect how fast mold grows on its surface?
5. What color flower do honey bees visit most frequently?

(Notice how the questions involve collection of data such as distance, mass, size, temperature, growth rate, or number of objects.)

Examples of Non-testable Questions

1. Are ants social creatures who like living in groups? (“Like” cannot be measured.)
2. What is the best kind of battery to use in an IPod? (“Best” cannot be measured.)
3. Can you make a volcano with cardboard? (No testing or data collection is involved.)
4. Does television change your mood? (Testing on vertebrates or humans is not allowed, plus this involves an opinion.)
5. How much sugar does cereal contain? (The question is too broad, it has no measurable
variables, and it involves product comparisons which are not permitted.)

Examples of Science “Activities” that are Not Projects (These do not identify variables or include data collection.)

1. What happens when Mentos candy is dropped into a carbonated beverage?
2. Will a plant change color when it is placed in colored water?
3. Can a lemon be used to supply power to run a clock?