

December 14, 2011

Dear Parents and Family of Key School students,

It is time to gear up for the eighth Annual Key School Science Fair! **Save the date of March 2, 2012.** As in past years, the science fair will culminate in a special family science night. This year promises to be even more exciting with hands-on activities and a true celebration of science! **The 2012 science fair theme is “Science Matters – Every Day!” will focus on the science that is in our everyday lives.**

We want students to explore topics and conduct experiments of areas of interest to them. It is certainly not a requirement to follow the school’s theme but I hope many students will explore the science that is in their everyday lives. This overall theme covers the science strands of physical, earth and life sciences. Students can work in teams (no more than two persons in a team) or as individuals. Siblings can also work together but will be judged based on the student in the highest grade.

Primary students (grades Pre-K through 1st) use a process called Guess, Test and Tell. 2nd graders should use the Predict, Observe, Explain method and students grades 3-5 elaborate further using the more formal scientific method. While there are a few variations of this method, the general outline for the Scientific Method involves asking a question, followed by forming a hypothesis, testing the hypothesis, using materials and a procedure, collecting data, finding the results and making a conclusion. Of course, all students need to research and learn about their topic to help answer the all important question “Why did this happen?”

In addition to investigative projects, students may also choose to do a demonstration project (testing how something works by building a model), observation project (making observations over time such as moon watching, bird watching, etc.) or creating a collection (a mini-museum). While all of these types of project represent the breadth of science, please note for those students who wish to be considered for the city-wide fair, it must be an investigative project.

As in the past, students conduct and complete their science fair projects at home and bring them to school **on February 28 for sharing in class before formal judging on March 2.** There are two scheduled office hours for families in need of guidance to get started – **January 5 and January 9 at 3:30-4:30 on first come first serve basis.** **Additionally there will be a Student and Parent “Are You Stuck?” workshop on Thursday February 9, 6:30pm-8:00pm.** This will be an interactive workshop style evening to clarify any unclear steps in the process. As always, I will be checking in with students and am available to assist students throughout the process.

Attached is a suggested timeline and a list of possible questions to explore. This is by no means an exhaustive list but rather a starting place to generate ideas. There are great resources in the library, the science room and the Internet. A helpful website is sciencebuddies.org. Students can do an interest survey to help narrow down areas of

interest. Students should use books and resources to generate ideas and then try to think of some way to make the project their own. One suggestion is to do the experiment in books for exploration and then generate a new question from that experiment for the science fair. These are great dinner table conversations and family nights. The project interest form is due **no later than January 10**. Once that form is returned and project is approved, your child will be sent a complete science folder including scientific worksheet, additional helpful tips and tools that he or she will follow as a guide to the process.

We encourage all students to participate in the science fair but **it is a class requirement for grades 3-5**. There are so many educational benefits with participation in this fair but most of all it's a rewarding, challenging and fun experience! It's a wonderful opportunity to educate the entire Key community on many topics of science! I will be available throughout the months leading up to the science fair to guide and assist families as needed through this process. Please do not hesitate to contact me with your questions or concerns at amy.johnson@dc.gov.

Final word of advice: Simple is better! Learning to observe and collect meaningful data is a skill that grows over time. Students should try to narrow question down to something that can be tested and on their level. If the project requires calculating math beyond student's grade level, perhaps the project should wait until the student has the mathematical skills to handle it. When the student can do the majority of the work on the project, the more meaningful it is to them. This IS NOT A PARENT PROJECT! Science fair projects are not two day projects – the most successful projects are done over time where students can learn as much about their topic as possible, conduct their investigation multiple times, and reflect on what they have learned.

On behalf of the science fair committee, we look forward to another great science fair.

Warmly,

Amy Johnson
Science Teacher

Important Reminders

1. Return project interest form no later than January 10 – it's time to get started!!!!
2. When project form is returned/approved – complete science folder based on grade will be sent home with forms, checklists, timelines, and specifications for the date.
3. Science projects due on February 28, 2012.
4. Project boards will be once again for sale at Key – more information coming.

My Science Fair Project

Please fill out and return to Ms. Johnson no later than Wednesday, January 10, 2012

Name: _____

Grade: _____ Teacher: _____

Topic: _____

I want to do the following type of project:

_____ Individual investigation

_____ Demonstration

_____ Mini-museum collection

_____ Observation

My question I want to answer: _____

_____ I am working on my own

_____ I am working with the following student

Parent/Guardian Signature: _____

Date: _____



To be filled out by Ms. Johnson

_____ Project approved

_____ Packet sent home

_____ Date

Project Ideas

Coming up with an idea for the science fair can be most fun and yet the most challenging aspect of the science project! What should I do for the science fair? What are you interested in? What do you have questions about? Brainstorm with family and friends and explore some possible topics. The Internet is a great resource to generate ideas for science projects. If using a project that you find in a book or Internet, do the experiment and then build a new question off of that project for your science project! Key School Library and The Palisades Library have some great resources too!! The following is just to get your imagination stirring.....

Investigations

What things affect surface tension?
Do different soils retain water differently?
How do different plants affect erosion?
How does gravity affect plant growth?
Do plants need light for germination?
How does density affect the movement of magma?
How do gravity, weight and friction affect the speed of a toy car?
How does the length of a string affect a pendulum's speed?
How does distance affect sound?
What makes the best sound barrier?
How does gender affect reaction times?
Does salt water evaporate faster than fresh water?
Does the thickness of the container affect the amount of condensation?
Does temperature make a difference on how high a tennis ball bounces?
What materials melt ice best?
What is the effect of water temperature on how long a bubble lasts?
Does snowmelt salt affect plants and trees?
Are some snowmelts safer for plants and trees than others?
What is the effect of different liquids on the speed at which a marble can travel through?
How does pollution affect building materials that are freezing and thawing?
Which materials conduct heat better?
How does the depth of soil affect seed growth?
Does warmth or light make a flower open?
How does smell affect taste?
If seeds are frozen, will they still germinate?
Where does a plant store starch - -in the stem, leaf or root?
Does the temperature of the water affect transpiration?

How can I tell if Vitamin C is present in foods?
Can you tell the PH of soil by the color of the soil?
Do earthworms prefer one type of soil to another?
In what conditions does mold grow best?
What is the best temperature for bread to rise?
Does hot water freeze faster than cold water?
What is more soluble – kosher salt, Epson salt or sugar?
What are the freezing temperatures of salt, Epson salt and sugar solutions?
What improves the rate of pickling?
Which toothpaste protects teeth better – natural or those with fluoride?
What foods do mealworms prefer?
Can things be identified just by their smell?
Do mint leaves repel ants?
Do all objects fall to the ground at the same speed?
Can plants grow from leaves?
Does the shape of a kite affect its flight?
Does sugar make cut flowers live longer?
Does the color of water affect the rate of evaporation?
Which student in class has the largest lung capacity?
Do all colors fade at the same rate?
Does a baseball go further with a metal, wood or plastic bat?
Which metal conducts heat best?
Do boys or girls have a higher resting heart rate?
Do different soils hold heat differently?
Why does ice cream freeze?
Which vegetables release the most sulfur?
Does temperature affect a cricket's chirp?
Why doesn't it snow often near an ocean?
How can we preserve foods from spoiling?
Can surface color affect the earth's temperature and ice cover?
Is there more air pollution inside a building or outside?
Why is rainwater free of pollutants from the surface water?
Can oil be cleaned from bird's feathers?
Are plants sensitive to air pollutants?
Can acid rain affect building materials?
When organic material decomposes, does it release energy?
Building an earthquake resistant structure
Can you train a goldfish?
How effective is pasteurization?
Are new pennies less dense than old pennies?
Which antacid works the best to neutralize an acid?
What type of compost makes the best soil?
Do worms speed up the making of soil?
How does wind vary with height above ground in your neighborhood or school?
Does temperature affect the life a battery?
Do window shades reduce inside temperatures?

Is a solar collector a good way to heat water?
Does reflector color determine reflector quality of efficiency?
What things affects a room's temperatures
Compare beam to arch bridges strength
Does the position of the beam affect strength?
Build a machine that will separate large and small marbles
Can you move something with the weight of water?
Can you build a suspension bridge?
Do flaps increase the airplanes lifting power?
Build a windmill that will generate electricity
How does wing shape affect flight?
What propeller design is most efficient in producing electricity?
How does the number of blades on a windmill affect the revolutions per minute?
At what angle should windmill blades be set for maximum efficiency?
How does the size of the blades of a water wheel affect the energy produced?
How would the number of blades of a water wheel affect the energy produced?
Which design of skyscrapers best withstands wind?
What kind of pulley can hold the most weight?
What kind of building can withstand an earthquake?
What features can be added to a house to make it "green"?
Does the depth of the soil affect plant growth?
What's the best method for growing vegetables in the winter?
How does weight affect acceleration of falling objects?
How does shape affect the rate of acceleration of falling objects?
How does light travel through different substances?
What objects in our everyday lives have the most germs attached.
What kind of things attract fruit flies most?
Do organic fruits and vegetables rot faster than non-organic?

Demonstrations

Inertia at work
The center of gravity
Centrifugal force
Simple machines
Does soil have layers
How does the curved shape of the earth affect climate?
How can you make a model of a thermometer?
How can the speed of wind be measured?
What causes dew?
What causes thunder and lightning?
What cause ice cycles to form?
How do simple machines make work easier?
How does your saliva turn starches into sugar?
How does bacteria change a milk product?

How does sedimentary rock form?
How does a seismograph work?
How do bones and muscles work?
Why is Mars red?
What is a comet?
How does a hot air balloon work?
How can you make a compass?
How do our taste buds work?
Greenhouse effect and global warming
How can water be purified?
How can I test for acid rain?
How do satellites launch into orbit?
What do wetlands do?
What is a green roof?
What are calories?
Passive solar solutions for households
How does a camera work?
How does a telescope work?
How do people navigate by the stars
Which animal covering keeps animals warmest –fat, fur or feathers?
Which cereals have the most iron?
What affects the temperature in a room?

Observations

Shadows over the day, shadows over a week.
What is the relationship of the Moon's location and the time of day?
What is the weather like over the month of January compared to last year?
What are signs in nature that predict the weather - - how?
Which way does the wind blow most frequently?
How accurately do people judge temperatures?
Where is the best location at Key School to put a windmill based on wind speed and direction?
How many shapes of snowflakes can I find?
Does a breeze make you cooler?
When does it rain, snow, sleet, or hail?
What birds winter in DC – what things do they eat?
Do trees grow during the winter months?
Do soils differ in different parts of Washington DC?
What kind of constellations can I see in the winter sky in and around DC?