Cub Run Elementary School PTA

Cub Run Science Fair
March 9, 2017

The information in this guide is provided to emphasize the process of doing a science project not the result of the project. The Cub Run Science Fair is intended to introduce a love for the discovery process that comes with doing science. While awards are given, the emphasis of the Science Fair is to provide students with a fun, fair, and enriching science experience. We hope this guide will serve as a resource to answer any of your questions about the science fair and provide a guide for choosing the right project for your student.

Science Fair Highlights

- All participating students will receive a recognition award
- Students in grades 2 – 6 will compete for ribbons based on meeting rubric guidelines
- Students can work with one friend within a grade level
- Siblings across grade levels can work together on a project

Projects Should Be

- Fun and interesting to the student
- Age-appropriate
- Displayed neatly
- Understanding of the subject matter is most important

As a parent, your role is to encourage your child's participation. There are many ways to do this without actually doing the project. Some suggestions are:

- HELP your child develop a list of possible projects, based on their interests and abilities
- Arrange for your child to get together with their partner, if they choose to work in pairs
- Help your child gather materials and construct a time frame; transport the project to school
- Make sure that the project is safe; provide supervision when necessary
- Write any text provided by younger students who are unable to do so themselves, without compromising the integrity of their work

This Science Fair guide has valuable information including:

- Science Fair Rules
- Details regarding submission of a project approval request (approval required before starting project)
- Project Categories and Project ideas
- How to prepare a project for the science fair
- How to display your results

- How will your project be evaluated
- Reference websites with incredible project ideas

Science Fair Committee: Our role is to make your experience as easy and enjoyable as possible. Please feel free to contact us with any questions.

Rebecca McGonigle – cubrunptapresident@gmail.com
Linnea Ober - cubrunptacommunity@gmail.com

Science Fair Rules:

- All students must fill out the project approval request form
- Displays should be not more that 3'w x 4'h x 2 – ½' d (a standard tri-fold board) and should be clear, simple, and neat. Be sure to include your name
- NO live animal experiments or displays using real blood, tissue, or bodily fluids from any animal. Displays of live insects, worms, spiders, etc. are not permitted. Displays of mounted, dead insects in enclosed display boxes are permitted.
- NO caustic chemicals or hazardous materials may be brought to the school. Use of matches, burners or other sources of open flames, or small quantities of Dry Ice must be approved in advance by the principal and the science fair committee. The parent of the student must handle the sources of open flame or dry ice and use must be supervised at all times before, during and after the science fair.
- No explosives or projectiles allowed
- All displays must be freestanding and self contained. Exhibitors must provide protective coverings for the display table and/or contain fluids, loose materials, powders, etc. in adequate containers if their project may cause damage. Exhibits, which soil the display tables or floor, or present any other potential hazard, may be disqualified and removed from the display area.

The Science Fair Committee reserves the right to remove any project that violates the Science Fair rules, may endanger public safety, or is inappropriate. The decision is final. If you have any questions about the safety or suitability of your project, please contact one of the science fair committee members. Also please let us know if you need to be located near an electrical outlet.

Note to Parents of Grade Pre-K – 2 Students
You will find that this packet of information is geared more toward students in Grades 3 – 5. Expectations are that Grade Pre-K – 2 projects will follow a similar but less elaborate process, with the emphasis on simplicity, fun, and introducing your child to the science project concept. There are many project suggestions in this guide that are geared towards the younger students.

You can help your child by scanning the information presented here and leading them in the right direction. As they develop their ideas, help them turn those ideas into questions that they can then attempt to answer through their project.

There is no set standard for Pre-K-2 displays. You can take your cues from the packet, but your child need only include those bits of information that are relevant to his/her project. Pictures, drawings, and photos can often replace volumes of text. There is no need to fit a simple project into a tedious display.

Remember that this is not a competition but an opportunity for students to begin to explore their world in a more formal way.

As you scan the information in this packet, please make note of:

- Deadlines
- Resources available for support all along the way
- Project ideas
- Display dimensions

Hopefully, this information will also help you get a feel for the expectations of the upper level projects so that together we can begin to lay the foundation for students to think and communicate like a scientist, skills that can be applied to many other disciplines.

Science Fair Project Areas and Ideas

The best way to come up with a science fair project idea is to listen to yourself the next time you say, "I wonder why…?" or "I wonder if…?" You probably think these thoughts all the time! This is how scientists come up with their ideas. Scientists also talk to other scientists to brainstorm. If you're having trouble coming up with a science fair idea talk to a friend, a parent, or a teacher. You can also read this list to get your creative juices flowing.

Collections (Pre-K – 1 Grade Levels Only)
Specimens: eg. Shells, leaves, rocks, etc.
Try to ask a question that can be answered by describing properties, comparing, contrasting, or grouping your specimens. E.g. "How do you label and organize a rock collection?"
Displays should be well organized by systematically compiling, classifying, and ordering specimens.
Descriptive terminology and comparisons (origin, characteristics of objects, etc.) will probably be important information to collect and display with your specimens.

Biology
What type of bird food attracts the most birds?
What factors will affect a person's heart rate? Exercise? Food? Excitement? What's the best way to take a pulse?
Can you make a self-contained garden in a bottle? What are the components needed? Describe which cycles are occurring inside.
Experiment with a cookies recipe to find out what happens if you exclude each ingredient.
How does smell affect taste?
What is the effect of different substances on plants? Caffeine, aspirin, acid?
Measure a group of peoples' reaction time using the drop test. Can you affect their reaction time by playing music? Giving them sugary food? Asking them to solve a math problem?
Will ants eat artificial sweeteners? Why or why not?
Will microwaving seeds change their germination rate?
What is the most germy place in your home? Use homemade agar plates to find out.

Chemistry

What is the best cleaning agent for removing stains from clothing?
What factors affect the rate of ice melting (temperature? Size of ice pieces? Addition of other substances?)
Food batteries (lemons, potatoes, what else can be used and why?)
Use purple cabbage juice to determine what in your kitchen is acidic, and what is basic. Why does this work?
What colors make up food dye? Use paper chromatography to find out.
What are endothermic and exothermic reactions?
What is the best substance to use for invisible ink?
What is surface tension and how can it be changed?
Can we see how much space there is between molecules?
Why do apples turn brown? What can be done to stop the process?

Geology

Make a working model of a fault line and show why earthquakes happen.
Model an impact crater.
Make a compass and describe how it works.
Model the flow of a river. How are deep rivers formed? Wide rivers? Winding rivers?
VOLCANOES! You knew this one would be here! What do volcanoes tell us about plate tectonics? What other things can we learn from volcanoes?
What causes landslides and what can be done to minimize the damage?
What can the movement of ocean animals tell us about sea currents and ocean temperatures?
What can algal blooms in the Chesapeake Bay tell us about water quality?
Can tornadoes be predicted?
Build a device to measure humidity with your own hair! How does this work?

Physics

Solar power – Use a small solar panel to discover how the angle or type of light effects the power collected
Static electricity – Can electric charge be transferred by a balloon? By a wool sweater? By Rice Krispies?
Buoyancy – What floats, what doesn't float, and why? And what does it have to do with this helium balloon?
Magnetism – How to see a magnetic field. Can you make your own magnet? Why does this work?
Gravity – Investigate gravity by making parachutes for different objects. What factors affect how quickly something falls?

Astronomy

Using a prism, find out which colors the light from the sun contains? What does this tell us about the sun? What about other stars?
Make a model that shows why we see the moon's phases.
Make a "sun print." What type of light works best? Why?
Is the earth's magnetic field affected by solar storms? How can you measure it? Why?
What is a sundial? Is it an accurate way to measure time?

There are many, many more ideas contained in the websites listed at the end of this guide.

CHECKLIST: COUNTDOWN TO THE SCIENCE FAIR

Use this form to keep your science fair project on schedule

☐ Choose a topic that you are interested in doing.

☐ Submit the Science Fair Project Approval Form by **February 10, 2017**

☐ Receive an email approval from the Science Fair Committee

☐ Research your topic as necessary. Record your references

☐ Write out your procedure

☐ Gather your materials

☐ Work on your project

☐ Carefully collect and record data and observations as you progress

☐ Take and develop photographs, if needed, as you work

☐ Make or purchase your display board

☐ Begin work on your display board

☐ Deliver your project to the school by 8:30AM on Thursday March 9th. The Science Fair committee will be available to help you set up.

☐ Science Fair judging will be done during the day

☐ Attend the PTA Science Fair night from 6:30pm to 7:30pm to discuss your projects with family and friends and receive the awards

☐ Pickup your project no later that 7:30pm on March 9th to avoid damage or loss.

How to Prepare a Science Project

These are guidelines only, and can be adapted to the project category selected. Projects from younger students will obviously follow an abbreviated version of that given here.

1. Select a Topic

Choose something that you are interested in. Consult the listings of project suggestions and websites for additional ideas. List questions that you think might be interesting to answer. Try to make your questions as specific as possible. Examples might be:

- "How important is sugar as an ingredient in cookies?" (Experiment)
- "How yeast works" (Demonstration)
- "The Solar System" (Model)
- "What can I learn from the seashells I collected at Virginia Beach?" (Collection K-1 grades only)

Choose a topic that you think you can answer. Before making a final choice, consider these questions:

- Will it be interesting and safe?
- Can I get the necessary equipment or materials to do it?
- Will I have enough time to complete it?

Determine which category your project best fits into: model, collection, observation, invention, demonstration, or experiment.

2. Gather Background Information

Find out more about what you want to investigate. Keep track of where you got your information since you will need that information for your display.

3. State the Purpose

This is often written as a question. What do you want to find out? If you are performing an experiment, you will also state a hypothesis.

4. Develop a Procedure

Write out a step-by-step plan for your project. Envision how you are going to answer your questions or test your hypothesis. What materials will you need? How will you measure your results? Consult the Safety Rules

5. List and Gather Materials

Be as specific as possible, in case someone else wants to try to repeat your experiment

6. Carry Out Your Proposal

Once you have received an email confirmation, begin to follow your plan carefully. Use parental supervision where necessary for safety reasons.

7. Record Observations and Results

Keep careful records. This is the heart of your project. Record any data as you go. Make drawings, take measurements, record observations, and take photographs along the way.

8. Draw Conclusions

Explain why your project turned out the way it did. If you made predictions, were they correct? What did you learn from your project? What problems did you encounter? If you are able, relate it to your everyday life. What would you do next?

9. List Sources of Information

10. Prepare your Display

The information displayed will be determined by the type of project you have chosen. Keep it simple!

Remember there are no mistakes or failures, just opportunities for learning. It is okay if the experiment or the model doesn't work …. That's science!

Project Display

All Science Fair Projects must utilize a display board. Student Name(s), Grade, and Teacher's name must be written on the back of the display board.

The display board: It should be a standard freestanding 3-sided, folding cardboard or foam board no larger than 32" tall by 48" wide. A single sheet of poster board alone tends to bend and sag.

Layout and Appearance:
Make your display look interesting and present all information clearly. Plan ahead to be sure that all the text and segments will fit. Text should be clear and the title large enough to read from a distance.

Sample Information to be Included on your display board (see graphic on next page for example)

- Title
- Purpose or question
- Hypothesis
- Materials
- Procedure
- Results
- Pictures, drawings, photos, graphs
- Observations
- Conclusions
- Research information
- References

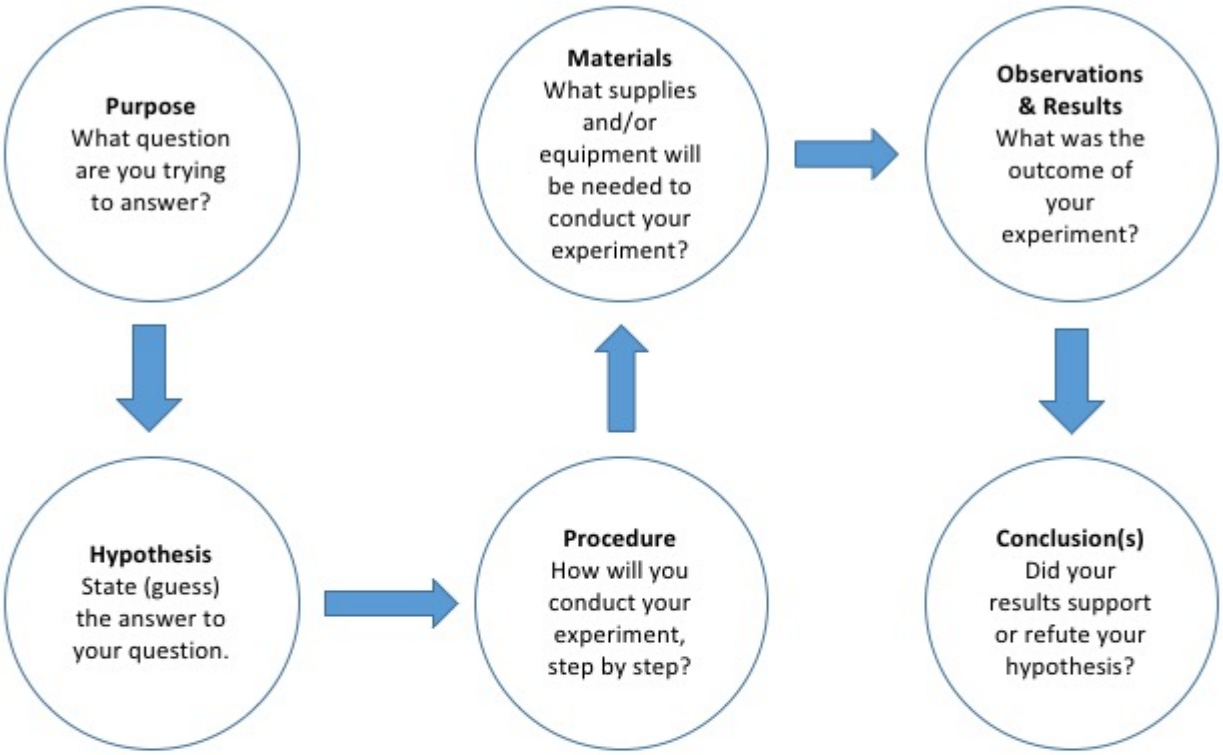
Attachments to the board:
Appropriate materials can be attached to the display board (e.g. bags of popped corn)

Additional items for exhibit:
An additional item must fit in front of and within the boundaries of the standing display board.

Protect your science project:

- Expensive or fragile items should not be displayed but should be simulated or photographed.
- Collections (minerals, shells, feathers, etc.) can be protected with a covering of plastic wrap
- Design your display so that it is easy to transport to and from the fair.
- Carefully pack all materials when transporting.
- Have a photo taken of you and your project for your scrapbook!

THE SCIENTIFIC METHOD



Example Display Board

Guidelines for Awards and Ribbons

Two independent judges will judge each project. Students will be given times to present their projects to the judges. Students in grades Pre-K – 1 will not be judged, but will receive a participation ribbon. Students in grades 2 – 6 will receive a ribbon based on the following point scale.

112 – 128 Blue Ribbon
64 – 111 Red Ribbon
0 – 63 White Ribbon

Scoring Rubric

Criteria		Expectations	No		Meets		Exceeds
EXHIBIT	Display	Neat and well organized	0	1	2	3	4
		Clear and concise information	0	1	2	3	4
		Student participation evident (not all done by parent)	0	1	2	3	4
	Documentation	Easy to follow	0	1	2	3	4
		All steps of the scientific method are present (if applicable)	0	1	2	3	4
		Charts, pictures and/or graphs support research	0	1	2	3	4
PRESENTATION	Presentation	Student is able to clearly explain project	0	1	2	3	4
		Information is not read directly from the board	0	1	2	3	4
		Student is able to answer judges questions	0	1	2	3	4
		Student makes eye contact with judges	0	1	2	3	4
SCIENTIFIC METHOD	Experiment/ Project	Purpose: clearly stated	0	1	2	3	4
		Hypothesis: what did you think would happen?	0	1	2	3	4
		Materials: listed and complete	0	1	2	3	4
		Procedure: written in clear steps	0	1	2	3	4
		Results: Observations listed - includes graphs/charts if applicable	0	1	2	3	4
		Conclusion: Includes discoveries and relates back to hypothesis	0	1	2	3	4
Judge's Comments & Feedback							

Science Fair Web Sites

- www.ipl.org/youth/projectguide/
- http://www.makeitsolar.com/science-fair-ideas/index.htm
- http://school.discoveryeducation.com/sciencefaircentral/Science-Fair-Projects/Samples-Investigation.html
- http://www.madsci.org/experiments/
- http://reekoscience.com
- http://scienceclub.org/kidproj1.html
- http://www.teacherstryscience.org/kids-experiments?field_experiment_category_tid=14
- http://www.education.com/science-fair/life-science/
- http://www.madaboutscience.com.au/store/index.php?main_page=free_experiments
- http://www.sciencebuddies.org/science-fair-projects/student_resources.shtml#sciencefairprojecthelp
- http://www.all-science-fair-projects.com

This guide is a compilation of previously produced guides. The sources are as follows:

- http://reespta.org/forms/15-16Forms/Eagles%20in%20the%20Lab%20info%20packet-%202016.pdf
- http://meiklejohnpta.com/files/2011/08/MJE_ScienceFair_Handbook2015.pdf

Cub Run Science Fair Project Approval Form

The Science Fair will be held on Thursday, March 9th 2017 from 6:30pm to 7:30pm.

All projects must be approved by the Science Fair Committee before you begin. You will receive an email confirmation or request for more information within a week of submitting this form. If you are working with a partner, please only submit one form. If you change your project, you must submit a new approval form. By submitting this form, you are agreeing to the rules provided in the Science Fair guide found at http://cubrunpta.org/science-fair/

Deadline for form submission is **Friday February 10th.**

Student Name: _____ Student's Teacher: _____ Grade: ___

Are you working with a partner? Yes____ No____

Partner Name: _____ Partner's Teacher: _____ Grade: ___

Project Title: _____

Do you need access to an electrical outlet at the fair? Yes____ No _____

Provide a brief description of your project:

Parent Name: _____

Parent Email: _____ (Please Print Clearly)

The Cub Run Science Fair is sponsored by the PTA. For questions please contact Rebecca McGonigle at cubrunptapresident@gmail.com or Linnea Ober at cubrunptacommunity@gmail.com