*The*

*Oradell PTA Science Fun Committee*

 *Presents the*

 ***Oradell Public School Annual Science Fair***



***INFORMATION & GUIDELINES***

 **Thursday, April 26, 2019**

**6:00PM to 7:30PM (K- 6th)**

**5th and 6th Judging (5:30 – 6:30)**

**OPS Multi-Purpose Room**

**Dear Budding Scientists,**

Are you ready for some Science?

Are you ready to put all that you have learned in the Science Lab to use and try an experiment and present your results to your family and friends?

This is an exciting time of the year as we begin to prepare for the Oradell Public School Science Fair.  This year, you can choose whatever interests you as a science project and conduct a real experiment to present at the fair!

**Who participates in the Fair?**

***All students from Kindergarten through Sixth Grade are eligible to participate in our fair, and we strongly encourage everyone to do so.  It’s fun, and it’s great preparation for the upper grades where hands-on science is the norm.***

All participants will receive special recognition for all of the hard work they have done and will be eligible for great raffle prizes.

This year, ***FIFTH AND SIXTH Grade projects will be judged*** by a panel of independent professionals.  Projects in each grade that receive top honors will receive a trophy and a fabulous prize! Students can choose to work alone or in groups of up to four people.

We are **giving out additional prizes** to the participants in addition to the 1st, 2nd and 3rd places and those are categorized as follows: (Maximum Prizes 2 per Project)

* **Most Innovative Project**
* **Most Ecological Project**
* **Project with maximum practical application**
* **Project with applied STEM**
* **Best explanation project**

**This all sounds very exciting, but how do I get started?**

First, decide if you want to work alone or in a group.  Then, read through this packet and start brainstorming ideas.  Narrow down your field of interest and discuss your ideas with an adult and/or a teacher.

All projects must adhere to the rules of the guidelines in this packet.  Also, all projects must abide by the General and Safety Guidelines included herein.  If you have any questions about appropriateness of an experiment or the guidelines for the fair, ask your teacher or contact the PTA Science Chairs at sciencefun@oradellpta.org.

***Once you have selected a topic, complete the online Registration Form. All forms are due by Friday, April 12, 2019.***

We wish you the best of luck in creating a wonderful science project!

Sincerely,

***The PTA Science Fun Committee***

**General Guidelines**

* You must demonstrate an experiment and present your information.  This is not a fair to simply display collections, models or information
* You may work alone or in groups of 2, 3, or 4 people
* Science Fair participation is optional for Grades K through 6.
* Participants in Grades 5-6 will present their projects to the judges. Presentations must be limited to 5 minutes after which judges may ask questions.
* Participants in Grades K-4 will be asked to present their projects in less than 2 minutes, though they will not be judged.
* Adults can help, but this is YOUR experiment.  Experiments must be age-appropriate.
* A table of approximately 5 feet will be provided.
* All projects must be labeled with student name(s), grade, and teacher.  Visual information must be presented on tri-fold display boards.

**Safety Guidelines**

* Projects will be placed on lunchroom tables for display.  DO NOT damage school property by scraping tables or gluing any substance to the table.  If your project can get messy, please bring newspaper to cover the table and floor area and provide your own cleaning supplies.
* If your project is interactive and/or involves tasting of food, please state that parental permission is required before participation is allowed.  Ingredient listing must be available (cut off ingredient listing from packages).  Please be aware that there are students with allergies to chemicals, food, latex gloves, etc.  **Nut products or products with traces of nuts are not allowed.**
* No pointed or sharp instruments allowed (power tools, knives, screwdrivers, etc.)
* No burners or open flames are permitted.  If any other heat source is needed for your project, it must be pre-approved by your teacher.  Observe fire safety rules at all times.
* Use of hair dryers, fans and/or any electric or electronic devices must be approved in advance.
* Borax is not allowed.  This can be very dangerous if inhaled by those who are allergic( We will disallow all projects containing Borax)
* No animals, microorganisms, chemicals, teeth, human body fluids are allowed. Growing bacteria is not permitted.
* No projectiles or rocket launching
* Plants with poisonous oils (poison ivy), saps (oleander) or other plants known to be generally toxic to humans are not to be used.

**Choosing a Field of Science**

Let’s get started!  The first thing you need to do is choose a field that interests you.

**Life Sciences**:  Life Science topics involve the scientific study of living organisms such as plants, animals and human beings.  This category would include how the body works, ecosystems and even the study of behaviors.  Did you ever wonder how sugar affects your body or why a spider builds a web?  These questions involve the study of life science.

**Physics:**  Physical Science topics involve the study of non-living things.  If you wonder why or how something works, it would fall under this category.  Included in this category would be anything dealing with physics, forces of energy such as electricity and magnetism, or renewable energy such as wind or solar energy. You will be able to discover laws of force and motion, build or construct models and machines, and more!

**Earth and Space Sciences**:  Has the space program always intrigued you?  Did you ever wonder how wind changes direction?  The study of Earth and Space Sciences involves all areas related to our planet and beyond. Subcategories would be geology, oceanography, meteorology, climatology, geography and atmospheric sciences.

**Chemistry:** Chemical reactions happen around us all the time! With these scientific experiments you can test color-changing chemicals, test the nutrients of different food substances, grow crystals, and many more!

**Engineering:** Engineering projects equip children with the knowledge to build something to help solve a problem.

**Conducting your experiment**

The Science Fair is all about the experiment and design process!  You are not just displaying a collection or showing how something works; you need to present a problem, form a research question, do research, experiment, and present your results.

All projects should adhere to a design method.  The following is one basic guide used to help us get from a scientific problem to a solution. It is an “iterative” process, which means that sometimes you will need to back up and repeat one or more steps. The following link provides another example of a design process for an engineering project (<http://www.sciencebuddies.org/science-fair-projects/engineering-design-process-guide.shtml>).

***State the Problem, or Purpose, of the Experiment***

Once you have determined your area of interest, you need to narrow the field down to something specific and determine the purpose of your project.  Use your five senses to question how, why or when something occurs. Develop a research question you would like to investigate. If you are doing an engineering project you will want to define the problem you are trying to solve and express a goal.

For example, what is the effect of sugar on heart rate? How much sunlight is needed to operate a solar light? The whole idea here is to ask questions, even crazy questions, and determine if you can do research and testing to find the answer.  Your parents and teachers can help you select a topic or you can ask a member of the PTA Science Committee for guidance.

***Research – Gather Information***

You will need a minimum of 3 sources of information to research your problem.  Sources can include Internet research, books from the library, science magazines, or personal interviews.  Talk to a variety of people such as parents, teachers, and experts in the field to get their thoughts and professional opinions.  For example, if you are researching plant life, you can speak to a botanist, a landscaper or a florist.   Real scientists thoroughly read and review all sources with a questioning eye.  Make sure you maintain detailed records all sources of information to include with your final project.  This would include bibliographies for written materials and interview subjects’ names, credentials and dates interviewed.

***Construct a hypothesis***

This is a tentative, testable answer to a scientific question. Sometimes people refer to the tentative answer as an “educated guess.” Once the hypothesis is written, you need to refer to several facts from your research that explains why you believe your hypothesis is correct.  Remember, the point of a science project is not to prove your hypothesis right. The point is to understand more about how the natural world works. If your problem is to determine how much sunlight can power a solar light, you might predict that it takes twelve hours because your research showed that twelve hours is the average amount of daylight our region.

***Perform Your Experiment***

This is the fun part!  Now you can design an experiment to test your research question(s). Go ahead, think outside the box and get your hands dirty!  This is Science!  We do have some General Guidelines and Safety Guidelines that you must adhere to, so review them carefully when considering your experiment.

A complete experiment is one that can be duplicated so you will need to conduct the same experiment several times to verify that anyone would receive the same result.  Make sure you maintain a list of all materials used and record all trials and results. You can keep a journal to record observations, draw pictures, take photographs, and list outcomes.  This data will be used in the next step.

Understandably, not all experiments can be completely duplicated at the Science Fair.  Those that require long-term observation or materials that are not permitted according to the safety guidelines need to be altered or condensed for presentation.  Please confer with your teacher or our PTA Science Chairs to determine appropriate ways to present your experiment and/or results.

***Analyze the Data***

Collect your results and organize your data in a form that can be used to draw conclusions.  Assemble charts such as bar graphs or tables to make reading the data easily understandable.

***Conclusion***

Tell us what happened. If there is something about the experiment that you would change, state that here.  Tell what you learned from doing this and how this information might be useful to other people?

**For Grades 5 & 6:** Write a detailed report about the project and what was concluded or discovered.  Tell exactly what your team did, how it was done and what you learned.  Include all the steps you took, the research you gathered, the results of your experiment and what you learned. ***The written report must be available for the judges the day of the Science Fair.***

***Create your Display***

Presenting your information is crucial to each team’s success.   This is where everyone gets to see the great job that you did and helps teach us what you found.

You will need a tri-fold display board to document the steps of the methods you have taken.  Here, you can let your personality shine through.  Use color, graphics, etc.  Just make sure everything is neat. You can refer to the Helpful Links section of this packet for websites that provide good models for display boards.

**Presentation Tips and Judging Criteria** **For Grades 5 & 6**

Science Fair Judges have specific things in mind when they review the projects.   It is not so scary to be judged; just imagine the judges are scientists eager to learn what you did on this project.  But to take the mystery out of judging we have included the judges rubric for your information and offer the following tips:

* Introduce yourself to the judges, point out the title of your display and why you choose your topic.
* Hand the judges a copy of your written report.  Tell them in your own words what you learned from your research.
* Talk about the sources you used in putting this together.  Remember, talking with a real scientist or engineer can count as a resource.
* Be sure you explain in a logical manner the method of your experiment.
* Make sure you sound like an expert by using the correct vocabulary.
* Let the judges know what you learned. Remember, the conclusion is all about what you learned from doing the experiment.
* Judges love this!!!  Did you find a real world application for your topic?
* Remember - be yourself.  There is nothing worse for a judge than to make a student so nervous that they forget what they want to say.  Judges are here because they like to learn too.  So if you make a mistake, stop and reorganize.  It’s okay.
* When you are done, remember to shake hands with the judges and thank them for listening.  Remember, they are volunteers who care!!

Relax, smile and have fun!!  Remember YOU are the expert of your project.  So introduce yourself and have fun talking about SCIENCE!

**Helpful Links**

For help choosing a project or checklists to determine if your project is worth researching, you can check out some of the websites listed here:

[www.sciencebuddies.org](http://www.sciencebuddies.org/)

This site can help you think of ideas for your project.  Ideas are listed by level of difficulty according to grade.  It also includes a detailed review of the step-by-step guide for your research and experiment. Finally, this site gives a great model for a display board!

<http://school.discoveryeducation.com/sciencefaircentral/>

This site is a great overview of projects in general and has some good tips on presenting your results to the judges.

<https://www.homesciencetools.com/a/science-projects>

This site provides some great experiment ideas broken down by scientific category.

<https://www.cool-science-projects.com/Science-Fair-Project-Ideas.html>

More project ideas!!

<https://www.education.com/science-fair/>

Ideas for projects within each scientific field

**JUDGES’ RUBRIC**

**ORADELL PUBLIC SCHOOL ELEMENTARY SCIENCE FAIR**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  **CRITERIA** | **POINT VALUES** |   |   |   |
|  | **4** | **3** | **2** | **1** |
| **Originality of Question/problem to solve** | Original research | Unique perspective on a traditional project | Embellishes on an existing idea | No originality, just a canned project |
| **Hypothesis** | Thoroughly developed with  "I think…because..." question | Sufficiently developed | Partially developed | Major flaws |
| **Investigation/Trials……...."Experiments"** | Experiments performed more than 2 times. | Experiments performed 2 times | Experiment was performed 1 | Experiment performed incompletely |
| **Analysis** | Data clearly presented and directly relates to the research question/problem to address | Data reasonably presented and shows relationship to the research question/problem to address | Data is minimally presented and shows some relationship to the research question/problem to address | Data is not presented and no relationship to research question/problem to address is presented |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **CRITERIA** | **POINT VALUES** |  |  |  |
|  | **4** | **3** | **2** | **1** |
| **Conclusion** | A logical conclusion is drawn based on data collected and answers the question or raises a new question.  Has a real world application | A logical conclusion is drawn based on the data collected | A reasonable conclusion is drawn from the data collected | The conclusion drawn does not relate to the data collected |
| **Display Presentation** | Board is organized and easy to follow sequence of the method followed.  Visually appealing. | Board is organized and depicts the sequence of the method followed | Somewhat difficult to follow due to sequence lapses of the method followed | Difficult to follow; no specific method presented |
| **Presentation** | Students excited, enthusiastic about project.  Able to eagerly discuss details of experiment | Students pleasant and shares information about project.  Shows understanding of experiment | Student tells about project when asked.   Knows basic of experiment but gives minimal explanation | Student answers questions about project.  Can answer questions when prompted |
| **Overall Impression:** |   |   |   |   |