Rhodes School for the Performing Arts

# Rhodes School for the PerformingArts

## 2nd-8th Grades

# Science Fair Information Packet

# 2018-2019

Rhodes School for the Performing Arts

September 24, 2018

Dear TRS Parents and Students,

Welcome to the Science Fair! In addition to learning how to think critically and developing positive attitudes about themselves and their work; students gain the following benefits from participating in the science fair:

- Reinforcement of grade level science, literacy and math skills
- Fostering curiosity, awareness, and creativity
- Increased scientific knowledge
- Learning research techniques
- Growth in ability to work independently
- Having fun with science!

Science Fair projects are produced at home, and while parental support is essential, the following guideline should be used when considering how much help to provide students.

- 2nd and 3rd graders should be able to do at least 50% of the project alone.
- 4th - 8th graders should be doing almost the entire science project by themselves.

There are two separate links on the school website (www.rhodesschool.org) for Science Fair packets this year. One will be for 2nd grade, and the other for 3rd through 8th grades. Carefully select the packet that is appropriate for your student's grade level. The packet will be a guide to help your student prepare a project and exhibit for the school Science Fair.

The packet includes:

- Types of Science Projects
- Schedule of Assignments (can be used as a Checklist)
- Project Ideas
- Definitions & Science Fair Ideas
- Oral Presentation Rules
- Assignment forms, Resource pages, & Rubrics

The first step is to help your child decide what science project he/she wants to do. Please review this packet carefully with your child, then choose a project your child is interested in and that you deem appropriate for his/her grade and ability level. Need ideas or help? The packet lists several ideas and suggestions and you may also contact your child's Science teacher with questions or help with project ideas.

Once you choose your project, fill out the project plan form and turn it in to your teacher by the

**September 26th** due date. Use the due date schedule/checklist(pg.6) to help you follow the process and meet deadlines. Each deadline signifies that an assignment needs to be returned to the teacher and will be taken for a grade. Please send a written request or email to your student's homeroom teacher if you need a hard copy of the Science Fair packet. The Science Fair packet can be found on the school website. **www.rhodesschool.org**

Good luck & have fun!

**PLEASE SIGN AND RETURN:**

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STUDENT NAME: TEACHER: GRADE:

**I have reviewed the Rhodes School Science Fair information and all due dates with my child and understand that a final project MUST be submitted on October 31, 2018 (REQUIRED). I further acknowledge that my child understands his/her responsibility to complete much of the work for his/her project at home, according to the enclosed timeline. I also understand that a rubric will be used to evaluate my child's completed project.**

**Parent/Guardian Signature** **Date**

**Student Signature** **Date**

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**TYPES OF ACCEPTABLE PROJECTS:**

1. Experiment or Investigation: This is the most common type of project, where you use the scientific method to propose and test a hypothesis/ask a testable question. After you accept or reject the hypothesis, you draw conclusions about what you observed.

Example: Which type of lotion is softer, Vaseline or Suave? Hypothesis: Suave is softer. Conduct an experiment to test the hypothesis and report on the findings.

2. Research: In this project, you collect information about a topic and present your findings.

Example: A research project can be an excellent project if you use the data to answer a question. An example would be polling people to ask about their beliefs on religious freedom in America, then drawing conclusions about what the results mean or how they may relate to some of our current laws or laws that should be in place. - Must include charts or graphs.

3. Model ($2^{nd}$ -$3^{rd}$ GRADE ONLY)

This type of project involves building a model to illustrate a concept or principle.

Example: The vinegar & baking soda volcano, used to demonstrate the reaction between the various chemicals used in the project. Report on observations and findings.

4. Invention ($4^{th}$ -$8^{th}$ Grade Only) - information below is quoted from http://school.discoveryeducation.com/sciencefaircentral/Getting-Started/Inventions.html

**Invention is really about engineering a solution. For students, this can be:**

- A problem they want to solve
- A process or physical design they want to improve

**In designing and engineering a solution, students:**

- Find a local problem or something that needs to be improved
- Research it to find out what others know
- Suggest a solution and explain why it should work
- Design the solution and the method for testing to see if it works
- Build and test the solution
- Collect data to be sure your solution made a change
- Make sense of the data – how do you know it worked, or didn't work?
- Develop a report and share it with your fellow scientists

Note that sometimes the invention is a model or a sample set. Once the model or design shows that the solution can work, it can be applied to the real world. Examples are: improving the aerodynamic design of a model car; controlling the spread of a pest; improving building design to better conserve energy.

As with investigations, the key to defining the project is by posing the right question. Students can ask themselves, “What bothers me?” “What have I heard other people complaining about?” Is it something that could be fixed or improved?

**Examples of Invention Projects**

| GENERAL SCIENCE TOPICS | PROBLEM EXAMPLES | DESIGN QUESTION |
|---|---|---|
| Gravity and mass | My backpack is too heavy to carry. | How can I make it easier to get it to school? |
| Behavior | Our dog barks too much. | How can I get him to quiet down without hurting him? |
| Visibility | When I'm in a crowd, I can't see around me. | What can I do or use to help me see more? |
| Stabilizing temperature | My juice gets warm in my lunchbox. | How can I keep it cold? |
| Human accessibility | My younger brother and sister are too small to reach the light switches. I always have to go turn on the light for them. | How can I make it so they can turn their bedroom room lights on or off? |

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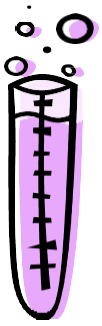
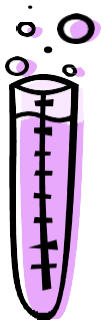


# Schedule of Assignments



| Due Date | Assignment |
|---|---|
| Monday, September 24 | *Science Fair packets go home with students where parents will review with students and choose a topic. |
| Friday, September 28 | *Topic choice is due |
| Tuesday, October 2 | Assignment #1 is due: **Problem/Question & Hypothesis** *(science grade)* |
| Tuesday, October 9 | Assignment #2 is due: **Materials & Procedures** *(science grade)* |
| Tuesday, October 16 | Assignment #3 is due: **Data, Results & Conclusion** *(science & math grade)* |
| Tuesday, October 23 | Assignment #4 is due: **Written Report** *(science & ELA grade)* |
| Tuesday, October 24 | Assignment #5 is due: **Background Research/Resources & Bibliography** *(science & ELA grade)* |
| Tuesday**October 30 by 8:00am | Assignment #6 is due: **Final Project-Oral Presentation** |
| Tuesday**October 30 by 8:00am | Assignment #7 is due: **Final Project-Display Board** |
| Thursday, November 1 | Project Judging Complete |
| Thursday, November 1 | Science Fair Night - Winners Announced |

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# Science Project Ideas

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|---|---|
| What keeps things colder plastic wrap or aluminum foil? | Does the color of a material affect its absorption of heat? |
| Do sugar crystals grow faster in tap water or distilled water? | Does the length of a vibrating object affect water? |
| How accurately do people judge temperatures? | Do watches keep time the same? |
| How can you measure the strength of a magnet? | Do ants like cheese or sugar better? |
| Do roots of a plant always grow downward? | Can you tell what something is just by touching it? |
| What kind of things do magnets attract? | 1How long will it take a drop of food dye to color a glass of still water? |
| Can you tell where sound comes from when you are blindfolded? | Do bigger seeds produce bigger plants? |
| What materials dissolve in water? | Does a ball roll farther on grass or dirt? |
| Which dissolves better in water, salt or baking soda? | Can things be identified by just their smell? |
| Where on school grounds does the grass grow greener? | What brand of eraser is most effective in removing pencil marks? |
| What is the effect of color cellophane on the growth of lima beans? | Which metal conducts heat best? |
| Is using two eyes to judge distance more accurate than using one eye? | Which way does the wind blow most frequently? |
| Does the size of a light bulb affect its energy use? | What type of soil filters water best? |
| Does sound travel best through solids, liquids, or gases? | Can you see better if you limit the light that gets to your eye? |
| What common liquids are acid, base, or neutral? | What type of oil has the greatest density? |
| Can plants grow without soil? | Does warm water freeze faster than cool water? |
| What holds two boards together better-a nail or a screw? | Does temperature affect the growth of plants? |
| Do all objects fall to the ground at the same speed? | Does anyone in my class have the same fingerprints? |
| Which rocks best resist cracking from the impact of a weigh? | What brand of tape hold the most weight? |
| What brand of tape hold the most weight? | How does temperature affect the height that a dropped ball bounces? |

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# Science Project Ideas

| | |
|---|---|
| Which plants and vegetables make the best dye? | Which color of light causes green beans to grow best? |
| What type of line carries sound waves best? | Can same-type balloons withstand the same amount of pressure? |
| What materials provide the best insulation? | What are the effects of chlorine on plant growth? |
| Do wheels reduce friction? | What is the soil in my schoolyard made of? |
| Can plants grow from leaves? | What conditions cause iron nails to rust faster? |
| What common substances prevent the rusting of iron nails? | What are the effects of caffeine on the germination and growth of bacterial? |
| What is the effect of various antiseptics on the growth of bacteria? | What conditions affect the strength of adhesives? |
| How does the number of coils affect the strength of a magnetic field? | Which lubricant best reduces friction? |
| Does the shape of the container affect the freezing rate of water? | How does the PH of soil affect the rate of seed germination? |
| Heat transfer-Which is the best conductor? | What effect does temperature and water composition have on crystal growth? |
| Which type of wild flower grows best under artificial light? | Is there a relationship between phases of the moon and our weather? |
| Does the carbonation in soda cause the soda cans to corrode? | |

# Science Fair Ideas

1. **Society for Science:** See sample fair projects, look through other student's examples, and see the steps involved in judging projects. https://student.societyforscience.org/

2. **Science Buddies:** Use the topic selection wizard to help you figure out what science projects interest you most. Once you have a topic, get help doing research, setting up the experiments, and completing them. http://www.sciencebuddies.org/

3. **Science Fair Central:** Includes cool project ideas, a science fair handbook, reviews of students' experiments, and more from Discovery Channel School. http://school.discovery.com/sciencefaircentral/

4. **Science Fair Project Resource Guide:** Samples, ideas, magazines, resources, and more. Includes a list of sites that explain the Scientific Method. http://www.ipl.org/div/kidspace/projectguide/

5. **Scientific Method:** Describes the five steps of the Scientific Method that are helpful when creating a science fair project. Includes examples of wording and sample projects to explain certain steps. http://school.discoveryeducation.com/sciencefaircentral/Getting-Started/Investigation.html

6. **Super Science Fair Projects:** Guide to projects, topics, experiments, and tips for successfully completing a science project, including the six steps of the Scientific Method. http://www.super-science-fair-projects.com/

7. **Cool Science Fair Project**: Suggestions and ideas on science projects. http://www.cool-science-projects.com/Science-Fair-Project-Ideas.html

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# Definitions

1. Background Information/Research: Any essential information (e.g. definitions) that may be necessary to begin your investigation or is necessary to develop your hypothesis.

2. Bibliography: A list of references consulted during your project.

3. Conclusion: A statement telling what was learned as a result of the investigation.

4. Further Research: Ideas for further investigation.

5. Hypothesis: A scientific guess about the relationship between the manipulated variable and the responding variable. The hypothesis provides guidance for the student (the investigator) about what data to collect.

6. Manipulated Variable: A variable that is intentionally changed in a situation (e.g. different amounts of water or brand of paper towel used).

7. Materials: Any items needed to conduct the investigation.

8. Procedures: A complete list of steps followed during an investigation.

9. Recording Data: A complete record of all observations and measurements gathered during an investigation. Keep notes, charts, ideas, etc. in a journal of your project.

10. Responding Variable: A variable that is possibly changed as a result of the manipulated variable (e.g. height of plant growth or winning the game every time).

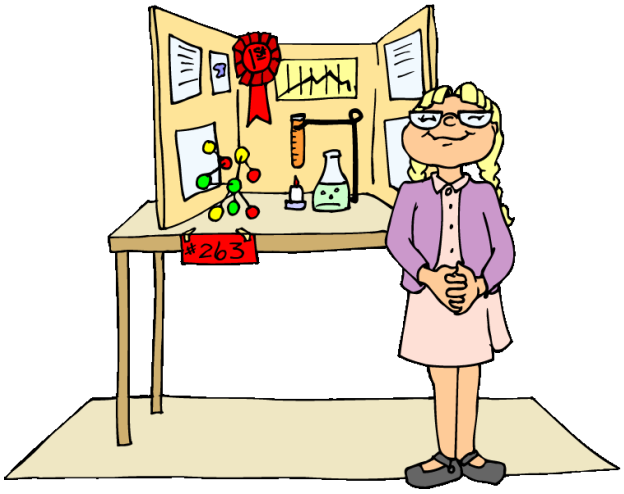
11. Results: A statement telling the outcome of the investigation.

12. Statement of the Problem (Question): A simple question that can be answered through an investigation.

13. Variable: A condition that varies or changes in a situation.

# Oral Presentation

A lot of kids are scared of speaking in public or to a teacher/judge. Just imagine they are a fellow scientist who just wants you to share what you learned.
Relax, smile, and have fun. Remember, you are the expert and you had fun doing the project. But if you are a little nervous, we listed some things that you need to do during the presentation.




Helpful Hints:
o Look sharp, feel sharp, and you will be sharp. Dress nice that day, be polite, and speak clearly. You will show that you have confidence. Don't forget to look at your audience.

o Introduce yourself. Point to the title of your display. Tell your audience why you chose to study this.

o State your problem that you studied (your question.) Tell them about your hypothesis (what you thought might happen.)

o Talk about what you learned while researching your topic.

o Talk about the sources (books, websites, and interviews) that helped you understand your topic.

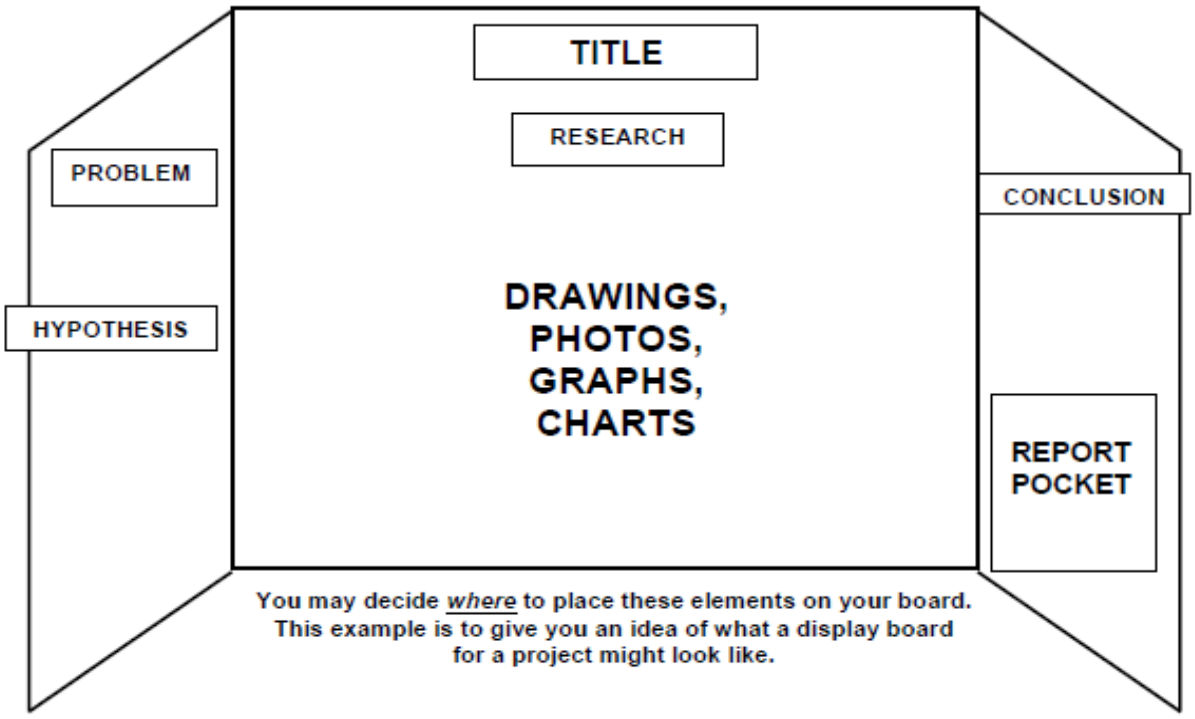
o Tell about your project and explain the steps you took to conduct your experiment. Be sure to mention all the materials involved and point out the pictures that you may have taken.

o If it applies, be sure to show them that you tested your experiment at least 3 times.

o Show them all of the cool graphic organizers that you made, like your tables and charts.
Remember to point out the labeled parts of your graph or table to show that you know what it represents.

o Be sure to explain what your data means. Make sure you can read your graphs and tables. Let them know if you were surprised by the results, or if you know what would happen because you studied about it.

o Make sure you sound like an expert on your topic. Always use the appropriate vocabulary especially by using words from the Scientific Method, like: Problem, Hypothesis, Procedure, Results, and Conclusion.




You may decide *where* to place these elements on your board.
This example is to give you an idea of what a display board
for a project might look like.