

2022 BRYANT WOODS ELEMENTARY SCIENCE FAIR PACKET

The Science and Invention Fair is an optional activity for all Bryant Woods Elementary School Pre-Kindergarten through Fifth Grade students. *Scientific investigation* is the process by which we advance our understanding of the world around us. *Invention* is the process of turning that understanding into new technologies that improve our lives. Students who participate will choose **either a scientific investigation or invention** to present at the science fair. They can work alone or with a partner but the students should do most of the work. Adult help should be given if safety is an issue and to support students with 504/IEP accommodations. Obviously, younger children will need more support than older children. Students who might need help getting project supplies should contact Ms. Sylvestre, the school counselor.

Safety first! Do not touch, taste, or inhale chemicals or chemical solutions. Wear protective goggles, close-toed shoes, long pants, and long sleeves. No projects involving animals, drugs or explosives. Use safety on the Internet – never contact anyone without adult guidance.

1. **Choose a topic** that interests you.
2. **Return your registration form** to your homeroom teacher or sign up online.
3. **Research your problem.** Read books/websites on the topic. Make observations by simply looking at things, talk to people, and find out as much as possible about your topic. Keep notes on where you get information so you can cite your resources.
4. **State your purpose as a question.** What is it that you want to find out by doing this project? Is this a question that can be answered? Is this a question you can answer?
5. **Form a hypothesis.** From your reading and discussion, what do you think is going to happen? Based on what you know or found out from step #3, what do you think the results of your experiments will be? What are other possible results (alternative hypotheses)?
6. **Plan your project.** How will you test your hypothesis? What experiments will you do? How will you measure the results? Be sure to keep notes and write down everything you do and what happens. Is this a question you can answer safely? If not, how can you change the question to be a question you can answer safely?
7. **Conduct your experiments.** Remember, the more times you do an experiment the more reliable and accurate the results will be. Use something to measure your experiments: a ruler or yardstick if you are measuring distance, a clock to measure time, etc. Check the measurements to be sure you are correct. Consider doing each experiment at least three times and get an average of the results for your graph.
8. **Record your data.** As you do your experiments, you will want to write down what you saw or found out. Organize this information in an orderly manner. Put the date, time, and any other useful information. Write your measurements clearly.
9. **Draw conclusions.** What did you learn from your experiments? Have you proved or disproved your hypothesis? You made a guess about what you thought would happen. Now tell what really happened. You don't lose points if your guess turns out to be wrong.
10. **Prepare your 36" x 48" tri-fold display board** with titles, charts, graphs,

drawings, and diagrams. Make them large enough to see, neat, and colorful.

Display boards

The display board should be a **36" x 48" tri-fold display board**. An example is provided on the next page. In addition to your display board, you may bring any other supporting materials relevant to the presentation of your project, including your investigation/invention notebook, models, and invention. Should you need assistance getting a display board, please contact Ms. Sylvestre, our school counselor.

For an investigation it should include:

- **Project Title** that includes the topic investigated
- **Names and grade level** of investigators.
- **Purpose:** State the purpose of your investigation in the form of a question.
- **Hypothesis:** State the hypothesis of your investigation. In other words, state your best educated guess that you think answers your project question. The results of your investigation will either support or contradict your hypothesis.
- **Procedure:** Describe how the experiment was carried out. Provide a step-by-step explanation of how you conducted the experiment. Include drawings or photographs to help clarify your procedures.
- **Data/Results:** Present data tables and graphs that show the outcome of your experiment.
- **Conclusion:** Offer an interpretation of your results. Did your findings support or contradict your hypothesis? Your investigation can be a success even if your hypothesis is wrong – as long as you learn something new!

For an invention it should include:

- **Project Title** that includes the name of the invention
- **Names and grade level** of inventors.
- **Impact statement:** How will your invention improve lives? What problem(s) are you trying to solve?
- **Novelty:** What is original about your invention? How does it improve on an existing design?
- **Model:** Physical representation of the invention (working or non-working) and/or diagram of the invention
- **Approach:** Description of how your invention works, including the scientific principles, and the steps you took to create it. May include photos of the invention and of you or your team working to create it.
- **Results:** If you constructed a working model, what happened during testing? Did you refine the model? If so, how?
- **Biggest Challenge:** What was the biggest challenge you encountered during the design process, and how did you address it?

Example display boards

Investigation

<p>Materials</p> <ol style="list-style-type: none"> 1. 2. 3. <p>Procedure</p> <ol style="list-style-type: none"> 1. 2. 3. 	<p style="text-align: center;"><u>Investigation Title</u> Student names and grades</p> <p style="text-align: center;">Purpose (What scientific question did you set out to answer?)</p> <p style="text-align: center;">Hypothesis (What was your best guess as to the answer of that question?)</p> <p style="text-align: center;">Results (Models, Diagrams, Charts, Pictures, Graphs and/or Tables)</p>	<p style="text-align: center;">Conclusion (What did you learn? Did your results support or contradict your hypothesis?)</p> <p style="text-align: center;">Acknowledgements (Who helped you? How did they help you?)</p>
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Invention

<p>Materials</p> <ol style="list-style-type: none"> 1. 2. 3. <p>Approach</p> <ol style="list-style-type: none"> 1. 2. 3. 	<p style="text-align: center;"><u>Invention Title</u> Student names and grades</p> <p style="text-align: center;">Impact Statement (What problem you were trying to solve?)</p> <p style="text-align: center;">Model, Diagram and/or Picture of your Invention can be placed in this section</p> <p style="text-align: center;">Results (What happened in testing? Charts, graphs and/or tables showing your data)</p>	<p style="text-align: center;">Biggest Challenge (and how does your design address it?)</p> <p style="text-align: center;">Acknowledgements (Who helped you? How did they help you?)</p>
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Parent Guidelines

The choice of project should be left to the student to create a sense of ownership and pride around the investigation. However, they may need help identifying the right scope of the project—one that is not too big or too small for them and your family. Here are some guidelines you can follow to help your student(s) during the process of investigation:

- Be a supportive coach. Be a resource for your child. Use books or the internet to support their investigation.
- Guide your child during the brainstorming session, ask questions, do not judge them, and always be impressed.
- Encourage them to get started earlier, to ensure it is enjoyable and not stressful for them and for you. Allow time that if your child gets discouraged, they can rest and start again.
- Help your child manage time wisely. Help them break up the project into smaller steps and work on them.
- Help your child understand that it's OK for result to contradict their hypothesis. As long as the investigation produces new knowledge, the investigation was a success!
- Inventions will be on display for public viewing, and students will present on the evening of the Fair.
- It is a night to celebrate students' hard work and creativity. Get excited! Encourage them! Keep them relaxed.

The following websites might be helpful as you begin to think about your project:

<https://www.iamascientist.info/collection>

<https://sciencefaircentral.com/>

<https://spaceplace.nasa.gov/science-fair/sp/> (Disponible en Español)

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

<https://www.verywellfamily.com/choosing-a-type-of-science-fair-project-620831>

<http://www.sciencebuddies.org/>

<http://www.sciencebob.com/index.php>

<https://www.need.org/need-students/science-fair-projects/>

<https://www.usgs.gov/programs/earthquake-hazards/science-fair-project-ideas>

<http://www.sciencefairadventure.com/>