

# Bluford-Peeler STEAM Academy



## Science Fair Planner

Teacher Name: \_\_\_\_\_

Student Name: \_\_\_\_\_



# Science Fair Due Dates

**ALL DUE DATES ARE NON-NEGOTIABLE & MUST BE FOLLOWED!**

Steps	Activity to Be Completed	Activity Completed by
Steps 1 & 2	Review Handbook and Purpose What is a Topic of Study? Choose Topic of Study	12/9/2020
Step 3A Step 3B	My Topic of Interest My Testable Questions	12/10/2020
Step 3B	Choose Your Testable Question What is an Experiment Plan?	12/11/2020
Step 4	Complete Experiment Plan	12/14/2020
Step 5	Do Your Experiment & Record Data Collected	12/15/2020- 12/20/2020
Step 6	Complete Research Paper Outline	12/21/2020
Step 7	Typed Research Paper Draft <i>edited for spelling, grammar, and organization by Class Teacher or Science Specialist</i>	01/06/2021
Step 8	Final Typed Research Paper	01/07/2021
Step 9	Completed Quadrant Sheet	01/08/2021
Step 10	Bluford-Peeler Virtual Science Fair Be ready to present virtually to judges!	01/12/2021

*Miss. Ferguson, the science specialist, will be checking in on each due date to be sure each step has been completed as they must be followed!*

# Step 1A: Review Planner and Purpose

## What is the purpose of a Science Fair?

The process of choosing a problem and formulating a hypothesis, planning a project and predicting the results, gathering and analyzing data, and drawing conclusions is an incredible learning experience for anyone, but especially for children. Celebrating your child's use of the scientific method will prove to be a memorable experience!

## What is the Scientific Method?

The scientific method is a problem-solving approach that, once learned, can be used as an approach in many areas in life, not just science. Usually applied in a series of steps, the scientific method includes:

- Ask a question or identify a problem.
- Observe what is happening and conduct background research.
- Construct a hypothesis that explains what is happening or predict a result.
- Test the hypothesis by doing an experiment.
- Analyze the data and draw a conclusion
- Communicate the results using descriptions, graphs, and tables.

## What type of projects can be entered?

1. **Experiment**  
Conduct an investigation to solve a problem, answer a question, or test a hypothesis. Example: Which battery lasts the longest?
2. **Observation**  
Report on observations that help explain a scientific process. Example: What birds frequent a feeder in the month of December?
3. **Invention**  
Invent something new or add an innovative touch to something already existing.

*Note: A science fair project can be an experiment, observation or invention but CANNOT be a science demonstration. A science demonstration shows or explains a science concept. An example would be building a model volcano and having it erupt or showing what happens when Mentos are dropped into soda. This is not as complex as a scientific experiment that asks a question and then follows each step of the scientific method to completion by drawing a conclusion and communicating results.*

### **Unacceptable Topics**

The following is a list of items/ideas not to be tested. Remember, models are also not testable. Do NOT use:

Candles	Mold and Bacteria	Volcanoes	Weapons	Vertebrates
Driving Video Games	Solar Systems	Live Animals	Chewing Gum	Surveys

### **Parent don'ts for the Science Fair Project**

Don't wait until the last minute.	Don't turn in late entry forms.	Don't spend more than about \$20.00 on supplies.
Don't place his or her name, or a photo of their face in the presentation photos.	Don't allow your child to use fire, sharp objects or dangerous chemicals as part of the project.	Don't buy a kit for your child to put together.

## Step 1B: Scientific Method Review

- Purpose of science fair project
- Steps of Scientific Method (see chart below)

<b>Purpose</b>	what you want to find out
<b>Hypothesis</b>	what you think will happen <b>and why</b> based on your previous research
<b>Materials</b>	bulleted list of all items used to complete experiment
<b>Procedure</b>	numbered list of all steps used to complete experiment
<b>Constant</b>	factor(s) that <b>do not change</b> throughout trial
<b>Control</b>	a trial that provides a baseline; used to compare other trial results
<b>Variable</b>	one factor that <b>changes</b> throughout trials
<b>Data</b>	a graph or chart where trial results are recorded
<b>Results</b>	short explanation of the data
<b>Conclusion</b>	was your hypothesis correct or incorrect <b>and why</b>
<b>Analysis</b>	what you would change if you did this again

## Step 2A: What is a Topic to Study?

Your topic can be anything that interests you! Think about the things you enjoy doing or hobbies that you have. What kind of science is your favorite? Is there a particular type of scientist you'd like to be when you grow up? Here are a few topics to get you thinking, but you do not have to choose one of the ones listed below:

- Sports: basketball, gymnastics, football, soccer, golf, tennis, dancing, running, skating, baseball/softball, horseback riding, swimming
- Nature activities: plants, trees, gardening, soil, water, rocks, rain, heat, habitats, ponds, mountains
- Animals: spiders, ants, worms, hamsters, cats, lizards, dogs, snakes, beetles, fish, hermit crabs
- Pets: animal toys, pet food, treats, training
- Around the house: cleaners, paper towels, computers, paint, batteries
- People: moods, genetic traits (rolling the tongue), habits, reactions
- Foods: popcorn, cereal, chips, soda, juices, gum, snack cakes
- Structures: bridges, buildings, containers, packaging
- Weather: clouds, air pressure, patterns, disasters
- Science fields: plants, rocks, nutrition, the body, the environment, light, sound, magnetism, simple machines, chemistry, energy, engineering
- Other: electricity, recycling, probability, health, oceans

## Step 2B: Choose a General Topic to Study & Explain

Now it's time for you to identify topics that interest you and explain why.

Your teacher and /or science specialist will work with you and on how to select a topic of interest.

- 1. The following topic \_\_\_\_\_ interests me because**

---

---

---

---

---

- 2. The following topic \_\_\_\_\_ interests me because**

---

---

---

---

---



### Step 3A: My Topic of Interest

Please write the number of the topic from Step 2 that you have chosen for your science project on the line below and explain why you are doing an experiment on this topic.

I have chosen topic number: \_\_\_\_\_ because

---

---

---

### Step 3A: What are Testable Questions?

Students will write questions for science inquiry investigations that are testable. Your teacher and science specialist will review with you the purpose of a testable question and review examples of testable questions. With the help of your teacher and science specialists you will use the topic from above and write 2 **testable questions**.

Remember, you should not already know the answer to the question and it should be an idea you can truly test.

#### Example:

What effect does gender have on the length of adult feet?

**Now Identify:** an independent variable and a dependent variable for this question

**Independent Variable:** *Effect of gender*

**Dependent Variable:** Length of adult feet

More Testable Question Examples
<b>Germination</b> 1. How does <b>temperature</b> affect the rate of seed germination? 2. What effect do <b>microwaves</b> have on the ability of seeds to germinate?
<b>Lubrication</b> 1. How does the <b>temperature of a lubricant</b> affect its viscosity? 2. What effect does <b>greasing bearings</b> have on the speed of a skateboard?
<b>Elasticity</b> 1. What effect does <b>temperature</b> have on the elasticity of a rubber band? 2. How does <b>gas pressure</b> inside a basketball affect how high the ball bounces?

**Insects**

1. Ants mark their path with a scent so they can follow each other in a line. What effect would the **width of gap in the scented trail** have on the ants finding the trail?

**Step 3B: My Testable Questions**

Now write down 2 **testable questions**. Remember, you should not already know the answer to the question and it should be an idea you can truly test. Something that makes you go hmmm...

1. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

2. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Choose Your Testable Question**

Now **circle** the number of the question above that you would like to test the most (this will help your teacher guide you in the right direction).

## Step 4A: What is an experiment plan?

Your teacher and the science specialist will review the definition and purpose of an experiment plan.

Be sure you have reviewed the sample experiment plan to ensure your student understands what they must do next.

### Experiment Plan Sample

**Title: You Gotta be Yoking!**

**1. Purpose/Problem (what you want to find out)**

"I want to know if the number of eggs used in a brownie recipe changes the height of the brownie once baked."

**2. Hypothesis (what you think will happen and why based on your previous research)**

"I think using one egg will make brownies shorter than my control because the brownies will have less liquid."

**3. Materials (bulleted list of all items used to complete experiment)**

- 9 boxes of brownie mix
- 18 eggs
- Oven
- Water
- Pan, 9"x13"
- Timer
- Toothpicks
- Ruler

**4. Procedure (numbered list of all steps used to complete experiment)**

- This is my control. → 1. Mix brownies following package directions, using 2 eggs. Complete 2 more times.
- I do this first. → 2. Measure the height of all three control batches by using a toothpick inserted into center. Compare against ruler.
- Variable 1: → 3. Mix brownies following package directions, using 1 egg (3 times)
- Variable 2: → 4. Measure each with a toothpick; compare against ruler.
- 5. Mix brownies following package directions, using 3 eggs (3 times).
- 6. Measure each with a toothpick; compare against ruler.

**5. Constants (factors that do not change throughout trials)**

"The brownie mix, oven temperature and bake time stay the same throughout my experiment."

**6. Control (a trial that provides a baseline; used to compare other trial results)**

"I baked my brownies according to the package directions, using 2 eggs."

**7. Variable(s) (one or more factors that change throughout trials)**

"I had two variables. The first variable was using 1 egg for 3 trials. The second variable was using 3 eggs for 3 trials."

**8. Data (a table/graph where test results are recorded)**

<b>Variable</b>	<b>Test 1</b>	<b>Test 2</b>	<b>Test 3</b>	<b>Average</b>
<b>1 egg</b>	2.2 cm	2.5 cm	2.6 cm	2.4 cm
<b>2 eggs</b>	3.1 cm	3.3 cm	3.2 cm	3.2 cm
<b>3 eggs</b>	1.9 cm	1.5 cm	1.5 cm	1.6 cm

**9. Results (short explanation of the data)**

"If I did this project again, I would experiment with the type of eggs I use instead of the number of eggs.

## Step 4: My Experiment Plan –required by Guilford County Schools

With the support of your teacher and science specialist, students will complete an experiment plan. The experiment plan must be completed BEFORE a student may start their experiment. **IT MUST BE APPROVED BEFORE YOU START YOUR EXPERIMENT!**

Now look back at step 3 and write the testable question that you selected below.

---

---

---

1. Problem/Purpose to Investigate- Brief Description (I want to know...):

---

---

---

---

---

2. Hypothesis- Statement Sentence (I think...because...):

---

---

---

---

3. Materials I plan to use:

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

My Control:

---

---

**My Variables:**

Variable 1:

---

---

Variable 2:

---

---

**Procedures:** only use the number of steps you need to complete the project and add more steps if you need more than 12.

I plan to use (step by step):

Step 1:

---

---

Step 2:

---

---

Step 3:

---

---

Step 4:

---

---

Step 5:

---

---

Step 6:

---

---

Step 7:

---

---

Step 8:

---

---

Step 9:

---

---

Step 10:

---

---

Step 11:

---

---

Step 12:

---

---

**List of Safety Issues (possible issues):**

---

---

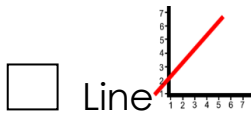
---

---

---

## Data Analysis (How will you show data?)

Which type of graph would best show my data? Use the space below to draw your graph!



## Bibliography (sources you plan to use; you must have at least 2 or 3):

Source 1:

---

---

---

Source 2:

---

---

---

Source 3:

---

---

---



### Step 5: Do Your Experiment and Record Data Collected

As you complete your experiment, record results here. A chart is provided below. You should always record numerical data whenever possible. You should plan for repeated trials (no less than 3). The more trials you complete, the more reliable your data and conclusion will be.

	<b>Trial 1</b>	<b>Trial 2</b>	<b>Trial 3</b>
<b>Control</b>			
<b>Variable 1</b>			
<b>Variable 2</b>			

## Step 6: Research Paper Outline

With guidance from your Teacher and /or Science Specialist you must have complete all of the pages of the research paper.

**Page 1 is the Title Page** – Project title, student name, teacher name

Project Title: \_\_\_\_\_

Student Name: \_\_\_\_\_

Teacher Name: \_\_\_\_\_

**Page 2 is the Acknowledgement Page** –Write 1 or 2 sentences thanking and recognizing all of the people who helped with your project. Identify who they were and what they did to support you during the project.

---

---

---

---

---

**Research Paper** -Minimum requirements for length of paper are as follows by grade level:

Grade Level	
<b>3<sup>rd</sup> Grade</b>	<b>2 typed paragraphs, containing 5-7 sentences each.</b>
<b>4<sup>th</sup> Grade</b>	<b>3 typed paragraphs, containing 5-7 sentences each.</b> Paragraph 1 Testable Question, Control, Variables, Hypothesis Paragraph 2 Information from Research Paragraph 3 Closing/Conclusion
<b>5<sup>th</sup> Grade</b>	<b>4 typed paragraphs, containing 5-7 sentences each.</b> Paragraph 1 Testable Question, Control, Variables, Hypothesis Paragraphs 2-3 Information from Research Paragraph 4 Closing/Conclusion

**Page 3 is the Research Paper–**

Paragraph 1: Write your testable question from Step 3 on these lines:

---

---

---

---

From Step 4, write your control and variables on these lines:

Control: \_\_\_\_\_

Variable 1: \_\_\_\_\_

Variable 2: \_\_\_\_\_

Write your hypothesis on these lines:

---

---

---

---

---

Paragraph 2: You will write information from research on these lines {be sure to include 5-7 sentences}:

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

---

Paragraph 3: Conclusion and Closing – You will restate research information and include a summary sentence on these lines. What did you learn? Did you prove your hypothesis?

---

---

---

---

---

---

---

---

**Page 4 is the Bibliography** – The bibliography is a list of websites, books, interviews, etc. that are used to research and complete the project.

**Book with author**

L'Engle, Madeline. A Wrinkle in Time. Macmillian, 1964.

**Book with editor**

Gallo, Donald, ed. Sixteen. Four Winds, 1964.

**Encyclopedia** (or set of books with more than one volume)

"Africa." Merit Students Encyclopedia (1985). Vol. 1, p. 83

**Magazine article with an author**

Smith, James A. "A New Treatment." Time. Oct. 4, 1964, p. 25

**Newspaper article**

"Candidates Debate in State Capital." Greensboro News & Record. February 28, 1988, Sec. A, p. 1

**Interview**

Melson, Jim. Telephone Interview. July 24, 1999.

**Internet**

<http://www.mayoclinic.com/>. January 26, 2011.

Bibliography:  
Source 1

---

---

Source 2

---

---

### **Step 7: Type Your Research Paper Draft**

*Once typed, be sure to have your classroom teacher and/or science specialist edit for spelling, grammar, and organization.*

### **Step 8: Final Typed Research Paper**

Research papers should be typed using **12-point font in Times New Roman, double-spaced** and **one-inch margins**.

### **Step 9: Complete Quadrant Sheet**