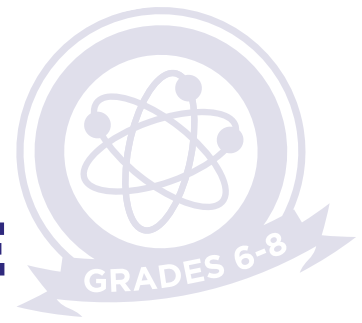
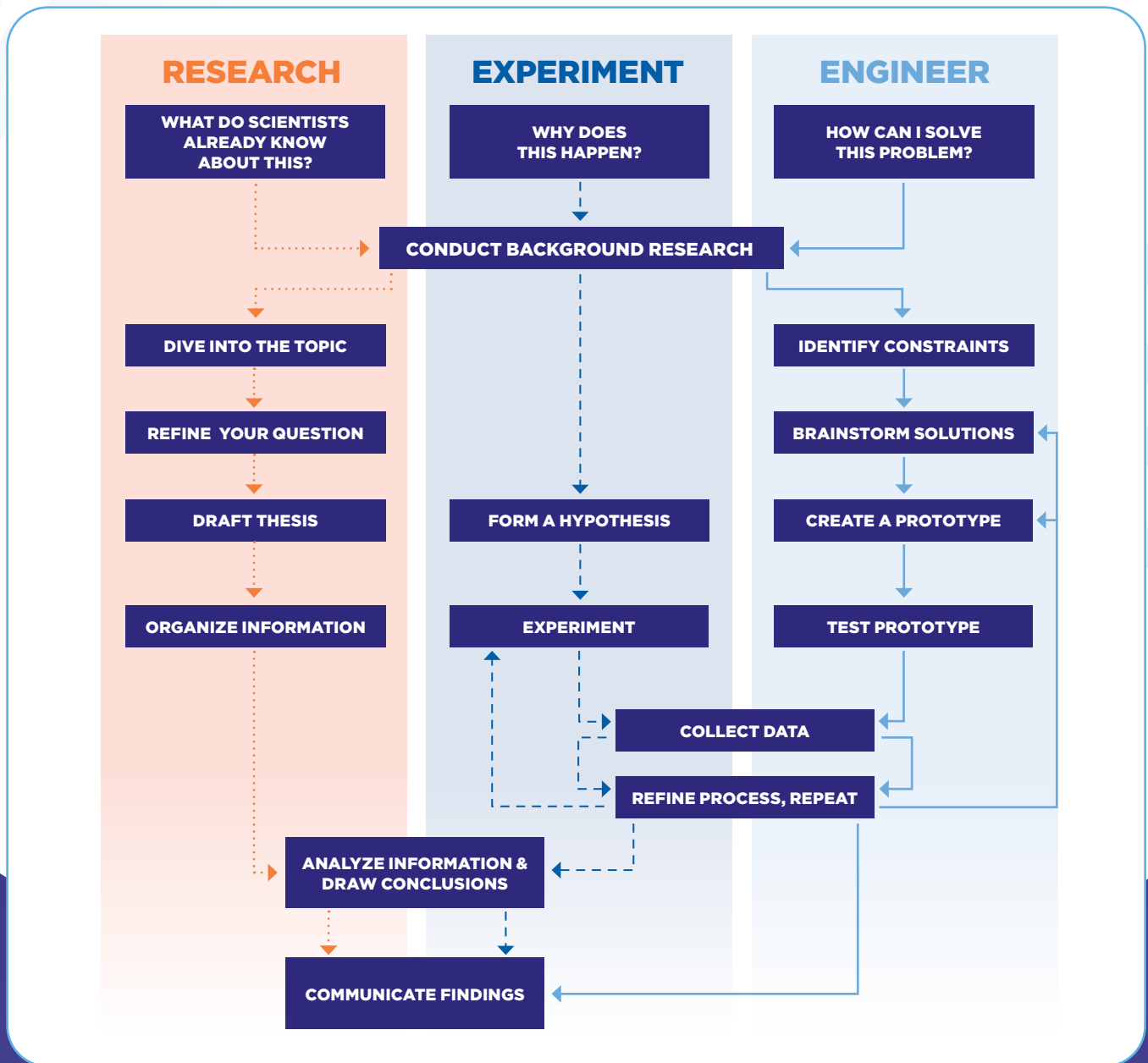


Name: \_\_\_\_\_



# SUCCESSFUL SCIENCE FAIR PROJECT GUIDE

This student planning guide has everything you need to turn your idea into an amazing science fair project. Start by thinking about what type of project you want to create. Do you want to **research** a question or idea that scientists have already answered? Do you want to figure out why or how something happens through **experimentation**? Perhaps you want to **engineer** a solution to a problem. Use the guide that accompanies the path you select to help create a great science fair project.



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



# My Science Fair Project Plan: **RESEARCH PATH**

## What do scientists already know?

If you want to research a topic that is already well understood choose this path. When selecting a topic avoid broad topics such as “genetics” or “cancer” instead select topics like “How Can Genes Predict Athletic Performance” or “How the Sun Contributes to Skin Cancer.”



### 1. CONDUCT BACKGROUND RESEARCH

- This will give you the information you need to familiarize yourself with the topic that excites you and will guide your research.
- *Helpful hint:* Websites such as Wikipedia can be great places to begin your research just do not cite them in your final product



### 2. DIVE INTO THE TOPIC

- Start to gather all your research and sources into a central location. Consider how this information might allow you to ask better questions.



### 3. REFINE YOUR QUESTION

- Use your newly acquired information to ask a better question.

Question: \_\_\_\_\_



### 4. DRAFT A THESIS

- Create a working thesis to serve as the foundation for your research. Do not worry about making it sound good you will likely rewrite your thesis before your project is complete.

Thesis: \_\_\_\_\_



### 5. ORGANIZE INFORMATION

- Categorize your sources and information in a logical order. Bullet points can be helpful for this step.



### 6. ANALYZE INFORMATION & DRAW CONCLUSIONS

- Consider what the implications of your research are for society. Determine why you agree or disagree with a particular stance on the topic. Determine what your call of action should be.



### 7. COMMUNICATE FINDINGS

- Assemble your findings in a logical order for a presentation.

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



# My Science Fair Project Plan: **EXPERIMENTATION PATH**

Conduct an experiment in order to help explain a phenomenon.  
Typically it answers questions like “why does this happen?” or “how does this work?”



## 1. CONDUCT BACKGROUND RESEARCH

- To figure out what is already known about this topic, use resources like encyclopedias, computers, and scientific journals.
- Make a list of your sources.



## 2. FORM A HYPOTHESIS

- A hypothesis is a statement of what you expect to happen.
- It should not include person pronouns. For example, “I think the egg will get bigger when placed in water” is not a good hypothesis. Change it to; “The egg will grow by 2cm when placed in water.”
- If you can prove that it is false, it is a good hypothesis.

Hypothesis: \_\_\_\_\_



## 3. DESIGN AN EXPERIMENT

- An experiment has the following parts
  - **Independent variable** — One part that changes in order to observe the result.
  - **Dependent variable** — The part you are observing. It is evaluated using two types of data:
    - **Control** — Is treated to the same conditions through the experiment but is not exposed to the independent variable. Used for comparison.
    - **Constants** — Conditions that need to stay consistent through the experiment.



## 4. COLLECT DATA

- Create data tables to assemble the data.
- Turn your data into a graph. *Hint:* The independent variable typically goes on the X-axis whereas the dependent variable goes on the Y-axis.



## 5. REFINE AND REPEAT

- If any of the data does not seem right, go back to your experiment and make sure everything was set up correctly. Check your constants.
- Repeat the experiment if necessary



## 6. ANALYZE INFORMATION AND DRAW CONCLUSIONS

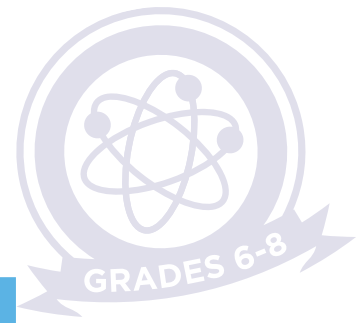
- Look at your data and decide if it proves or disproves your hypothesis.
- Make a conclusion that states what actually happened. Be careful not to manipulate your data to say what you think it should say.



## 7. COMMUNICATE FINDINGS

- Assemble your hypothesis, experimental design, data, graphs, and conclusion in a presentation.

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



# My Science Fair Project Plan: **ENGINEERING PATH**

## How can I solve this problem?

If you want to innovatively solve a problem this path may be for you. In this path be prepared to think outside the box to determine a solution to your problem.



### 1. CONDUCT BACKGROUND RESEARCH

Investigate the problem from multiple angles and consult outside sources.

### 2. IDENTIFY CONSTRAINTS

Recognize constraints on solutions and potential success (ex. time, materials).



### 3. BRAINSTORM SOLUTIONS

List all solutions you can imagine within the constraints previously identified.

### 4. CREATE A PROTOTYPE

Select your best solution and build a model to serve as your prototype.



### 5. TEST PROTOTYPE

Test your model to see how effectively it solves your problem.

### 6. COLLECT DATA

Create data tables to assemble the data. Turn your data into a graph.



### 7. REFINE PROCESS & REPEAT

Improve your prototype and if necessary return to steps 3 or 4.

### 8. COMMUNICATE FINDINGS

Share your prototype and data through a presentation.

