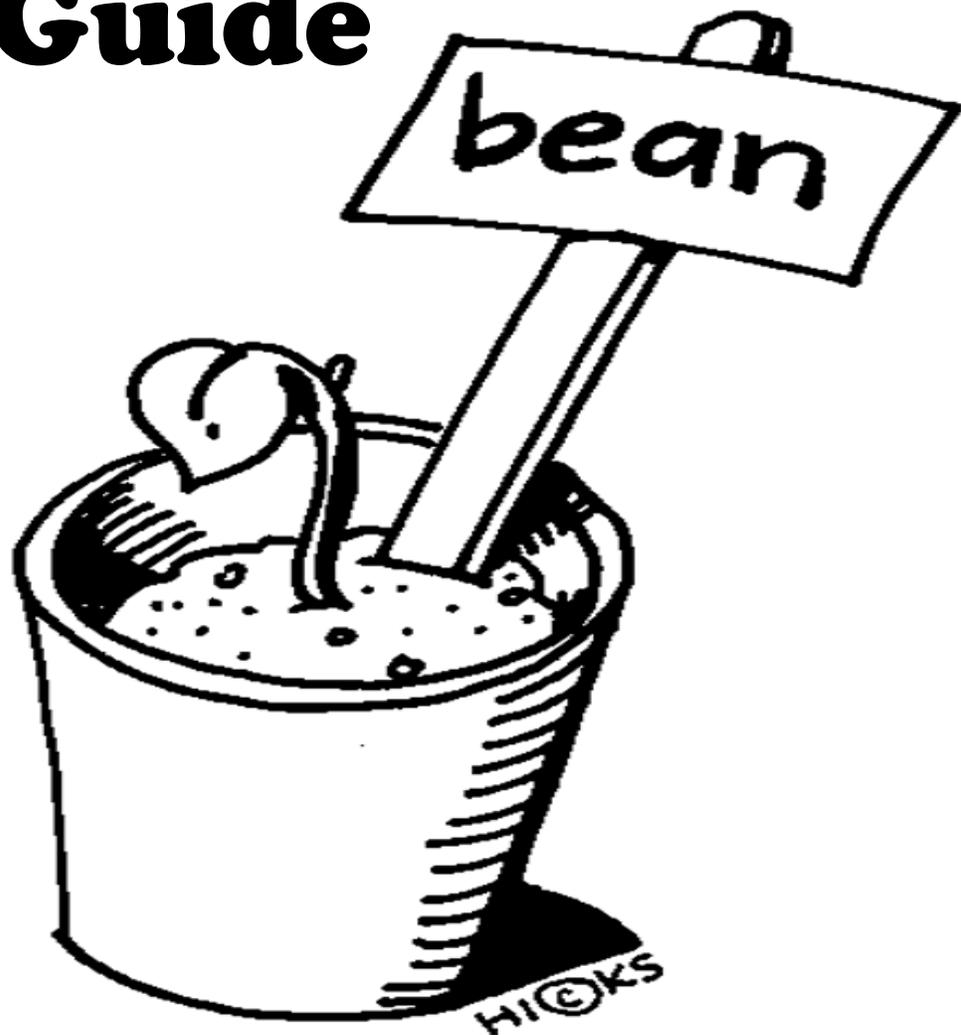


# Science Fair Investigations and Invention Convention Guide



## Investigations and Inventions

### 1. Investigations

#### A. Experiment

This project is most often presented at Science Fairs. It is a display and explanation of an experiment that follows the scientific method.

#### B. A Demonstration or Working Model

In this type of project, students demonstrate a particular STEM idea or concept. Students can build a model for a specific purpose and show how they used the steps of the Engineering Design Process to complete it.

#### C. A Collection of Natural Objects

Collections are an assembly of items, sorted and categorized.

### 2. Inventions

#### A. Problem to Solve

This type of project directly relates to solving a real life problem using the Engineering Design Process. Students can show how they went through each step and the resulting data for each invention.

#### B. Process or Design

Using the Engineering Design Process, students can take an existing design and make improvements to it. This will allow the student to design the solution and explain how it should work.

**Remember, a good project is one that is planned and developed over weeks or months rather than rushed through to completion in a weekend.**

**Start planning now!**

## Traditional Science Projects or Investigations Entry

**WHAT TO INCLUDE ON YOUR DISPLAY BOARD:** See below for guidelines on what to display with your project. Please remember these are suggestions and can be modified for your child.

### **Experiment**

#### Display Board Guideline

|  |  |  |
|--|--|--|
| <b>Procedure</b> – What you did  | <b>Title or Question</b><br>By: Your full name & Grade | <b>Results</b> – what happened?  |
| <b>Pictures &amp; Drawings</b><br> | <b>Purpose</b> – What you wanted to find out           | <b>Charts &amp; tables</b><br> |
|  | <b>Hypothesis</b> – what you thought would happen      |  |
|  |  | <b>Who helped you</b>  |

**Experiments:** The type of project most often presented at Science Fairs is the experiment/investigation. These presentations incorporate the Scientific Method and seek to answer a question -- the hypothesis -- at the beginning of the experiment.

### THE SCIENTIFIC METHOD

- **STEP 1:** Research: collecting information about your topic.
- **STEP 2:** Problem: the scientific question to be addressed.
- **STEP 3:** Hypothesis: your idea about the solution to a problem.
- **STEP 4:** Experimentation: the process of testing your hypothesis.
- **STEP 5:** Results: what happened when you tested your hypothesis, may include graphs, charts, tables, or photos.
- **STEP 6:** Conclusion: a summary of the findings and what you learned from the experiment. Did you get the results that you expected?

## Demonstration

### Display Board Guideline

|                    |   |                     |
|--------------------|---|---------------------|
| <b>Explanation</b> | <b>Title or Question</b><br>By: Your full name &<br>Grade   | <b>Examples</b>     |
|                    | <b>Labeled Diagram</b><br> | <b>Bibliography</b> |

**Demonstration:** In this type of project, students demonstrate a particular STEM principle or fact. Students may wish to demonstrate how something works, a scientific phenomenon, how something is created naturally or in the lab. Models may be of interesting STEM objects such as bridges, towers, pulleys, the solar system, volcanoes, the inside of the earth, sea floor, etc. Dioramas of animal habitats are also a suggestion.

## Collection

### Display Board Guideline

|                                   |   |   |
|-----------------------------------|---|---|
| <b>Tell about your Collection</b> | <b>Title or Question</b><br>By: Your full name &<br>Grade   | <b>Tell what you learned from your collection</b> |
|                                   | <b>Labeled Diagram</b><br> |   |

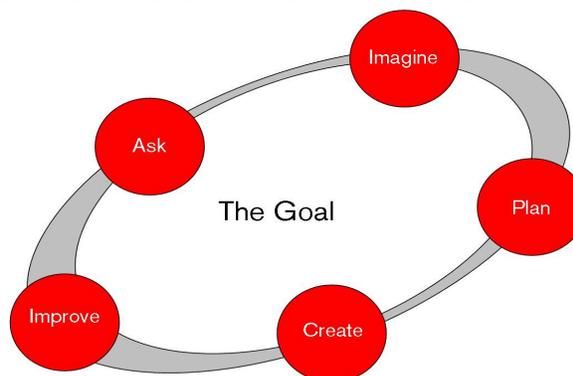
**Collections:** Collections are an assembly of items such as sea shells, birds, nests, rocks, minerals, types of soil, insects, etc. that are labeled and grouped to show how they relate to each other and how they differ. Collections should include as many samples as possible, to fully represent the topic.

## Invention Convention Entry

### **Invention Engineering Design Process**

Through the use of the EDP, students can create a solution to their real world question.

- Ask questions and do research to determine the best way to solve it.
- Using your imagination think about what you are going to do to solve the problem.
- Begin to plan out your design. Pencil and paper are a great start!
- Now you are ready to create your model and test it out.
- Many times engineers have to improve their model to meet their needs. Don't get frustrated if it doesn't work the first time...try, try again!



Be sure to collect data to support and show how your solution works! For more information and a full list of questions to use in each step of the EDP visit [Engineering is Elementary](#).

You can also visit [Science Fair Central](#) for more information on how to complete an invention project.

### **SAFETY**

Safety is essential at the Science Fair and Invention Convention.

The following rules are necessary for the safety of participants and visitors:

- No dangerous or caustic chemicals
- No open flames or flammable liquids
- No live animals may be brought to school

## RESOURCES:

[Discovery Education](#) has information related to science fair projects.

[Super Science Fair Project Ideas](#) has many ideas of various projects for any child.

[Education.com](#) You can also go to the activities tab at the top of the page and then search for science activities based on your child's grade.

[Science Buddy](#) has a tab for project ideas as well as a project guide section which could be helpful for the beginner.

[Science Fair Projects World](#) has a collection of science fair projects.

[NASA Best Engineering Design](#) has the definition of engineering as well as a few activities for students to complete.

[Engineering for Kids](#) has various examples of STEM projects for elementary age students.

[PBSKids Zoom Into Engineering](#) has several downloadable activities kids can do with the assistance of an adult.

[Science Kids](#) has a variety of activities both for science experiments and STEM projects.