RESEARCH PROJECT WORKSHEETS for Elementary & Middle School Students
This resource packet is presented to you by:

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Our thanks to those teachers, parents, & students who helped produce this document.

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TEACHERS...

Please be sure to adapt this packet to meet the needs of your particular students.

We want to make sure inquiry & research get kids EXCITED ABOUT LEARNING, not discouraged, frustrated, or thinking it’s all just TOO HARD!!

All we ask is that you give us credit (cite this document as a source) when you adapt this packet for use in your classroom. Thanks!
GUESS = No prior experience with this area at all.

PREDICTION = Based on prior experience, repeated observations, etc.

HYPOTHESIS = Specific prediction indicating the variable to be tested.

Write a QUESTION that is something you can investigate:

____________________________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

From this question, write a HYPOTHESIS:

IF ____________________________________________________________
____________________________________________________________________________
____________________________________________________________________________
THEN ____________________________________________________________
____________________________________________________________________________
____________________________________________________________________________

When I Change:

What I will change... INDEPENDENT VARIABLE(s)

What Will Happen To:

What I will measure... DEPENDENT VARIABLE(s)
**Experimental Design Process**

Things to Change or Vary... **INDEPENDENT VARIABLES:**

<p>| | | | |</p>
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Things to Measure or Observe... **DEPENDENT VARIABLES:**

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Narrowing Down & Choosing Your Variables

I Will Change...INDEPENDENT VARIABLE(s):

I Will Measure...DEPENDENT VARIABLE(s):

I Will NOT Change (so that it is fair!):

I Will NOT Measure:
My Plan or Design

NOTE: Other people should be able to follow your plan without asking you any questions!

Items to be Included in Research Plan/Engineering Design

A. My Question

B. Hypothesis/Problem/Engineering Goals

C. Description of Methods or Procedures (be specific)

PROCEDURES (What Are You Going to Do To Gather Data?): Describe the steps you will take (procedures) and the experimental design to be used for data collection.

____________________

____________________

____________________

____________________

____________________

____________________

____________________

____________________

____________________
DATA ANALYSIS: Describe what you will do to analyze the your data to help you answer your research question or hypothesis (graphs, charts, statistics, etc.).

BIBLIOGRAPHY: List at least 3 (elementary/middle school) to 5 (high school) major references (ex: science journal articles, books, internet sites, etc.) from your library research. If you plan to use vertebrate animals, give an additional animal care reference. Choose one style and use it consistently to reference the literature used in the research plan.

1. 

2. 

3. 

4. 

5. 

TEACHERS: Please refer to the ISEF Research Plan Guide for specific additional information needed for projects involving human subjects; vertebrate animals; potentially hazardous biological agents; &/or hazardous chemicals, activities, and devices.

Materials Needed for This Project:
Data Collection

What I will change or vary (INDEPENDENT VARIABLE):

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

What I will measure or observe (DEPENDENT VARIABLE):

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

How I will collect and record data:

________________________________________________________________________________________

________________________________________________________________________________________

________________________________________________________________________________________

Number of trials I will complete: ____________________________________________________________

Sample chart for recording findings:

<table>
<thead>
<tr>
<th>WHAT I MEASURED</th>
<th>TRIAL 1</th>
<th>TRIAL 2</th>
<th>TRIAL 3</th>
</tr>
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<tbody>
<tr>
<td>WHAT I CHANGED</td>
<td></td>
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</tbody>
</table>
Data Analysis

Title of Graph:

What I MEASURED
(specify units)
Dependent Variable
Y Axis

What I CHANGED
(specify units)
Independent Variable
X Axis

NOTE: Both axes need to be labeled and appropriate units of measurement marked!
Finding Patterns in Results

When I Changed...

(What I changed...INDEPENDENT VARIABLE)

What Happened To...

(What I measured...DEPENDENT VARIABLE)

DATA SUMMARY STATEMENTS

How did what I changed (INDEPENDENT VARIABLE) affect what I measured (DEPENDENT VARIABLE)?

Describe the data by explaining the relationship(s) between the variables on the graph.
This statement should also contain as much quantitative (numbers from your data) information as possible.

Describe what the data showed you. What did you notice about the information you collected?

How does your data support (or not support) your hypothesis?
Conclusion

The CONCLUSION is a statement based on evidence (information that helps you form a conclusion) and a logical argument (reasonable statement for or against something).

**Use your Data Summary Statements to help you write your CONCLUSION.**

1. Explain the **cause & effect relationship** from your hypothesis: __________________________

2. What **unanswered questions** do you still have? __________________________

3. How might mistakes during data collection &/or analysis have influenced your results?

4. Answer your original question OR explain why it can’t be answered at this time: ___

**PRACTICAL APPLICATIONS:** Could your results be used in the real world? How? For what?

**FURTHER INVESTIGATION:** The next thing I want to know is...

**NEW INDEPENDENT VARIABLE:** Another thing I’ll CHANGE...

**NEW DEPENDENT VARIABLE:** Another thing I’ll MEASURE...