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!!

Ask a Question...Form a Hypothesis

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**:
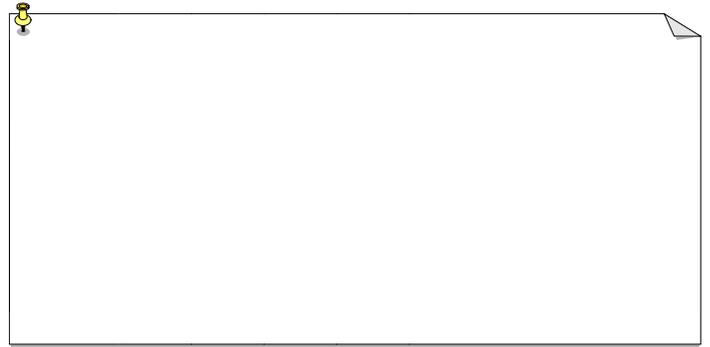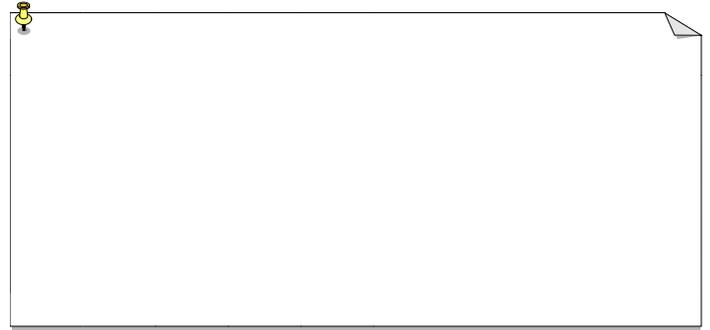
IF _____

_____

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:
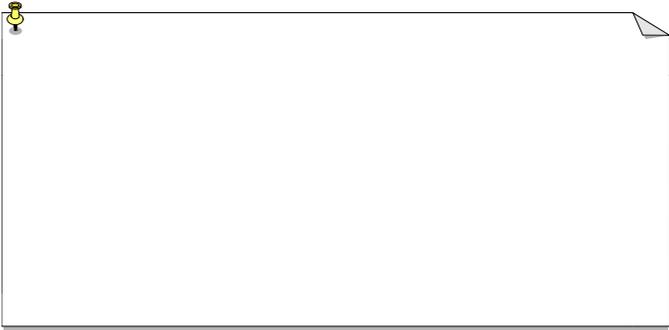
Things to Measure or Observe...DEPENDENT VARIABLES:
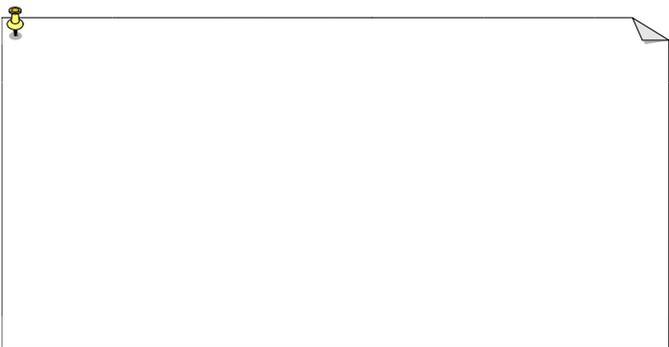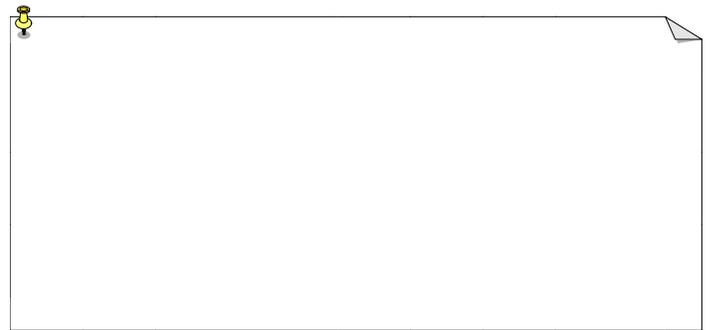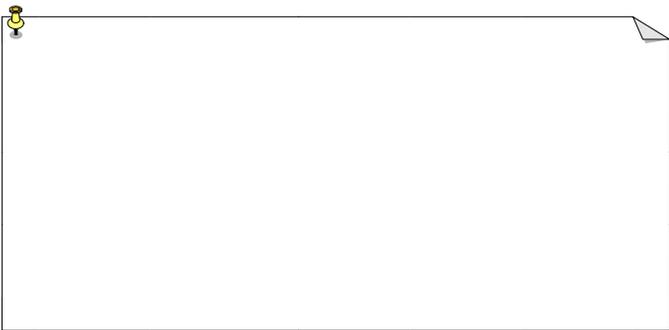
Narrowing Down & Choosing Your Variables

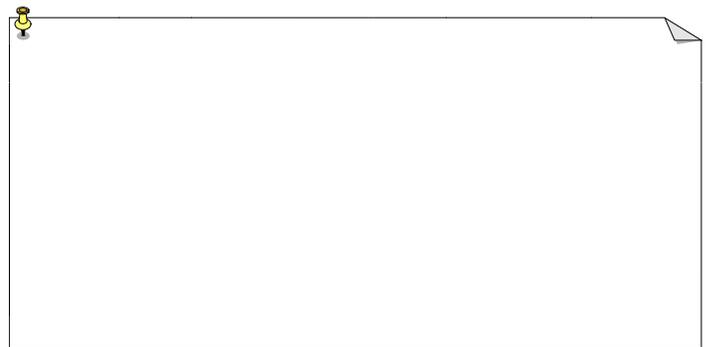## I Will Change...INDEPENDENT VARIABLE(s):

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

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

I Will NOT Measure:

My Plan or Design

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:

WHAT I MEASURED
(Dependent Variable; for Y axis)

	TRIAL 1	TRIAL 2	TRIAL 3
WHAT I CHANGED *(Independent Variable; for X axis)*			

Data Analysis

Title of Graph: _____

What I MEASURED
(specify units)
Dependent Variable
Y Axis
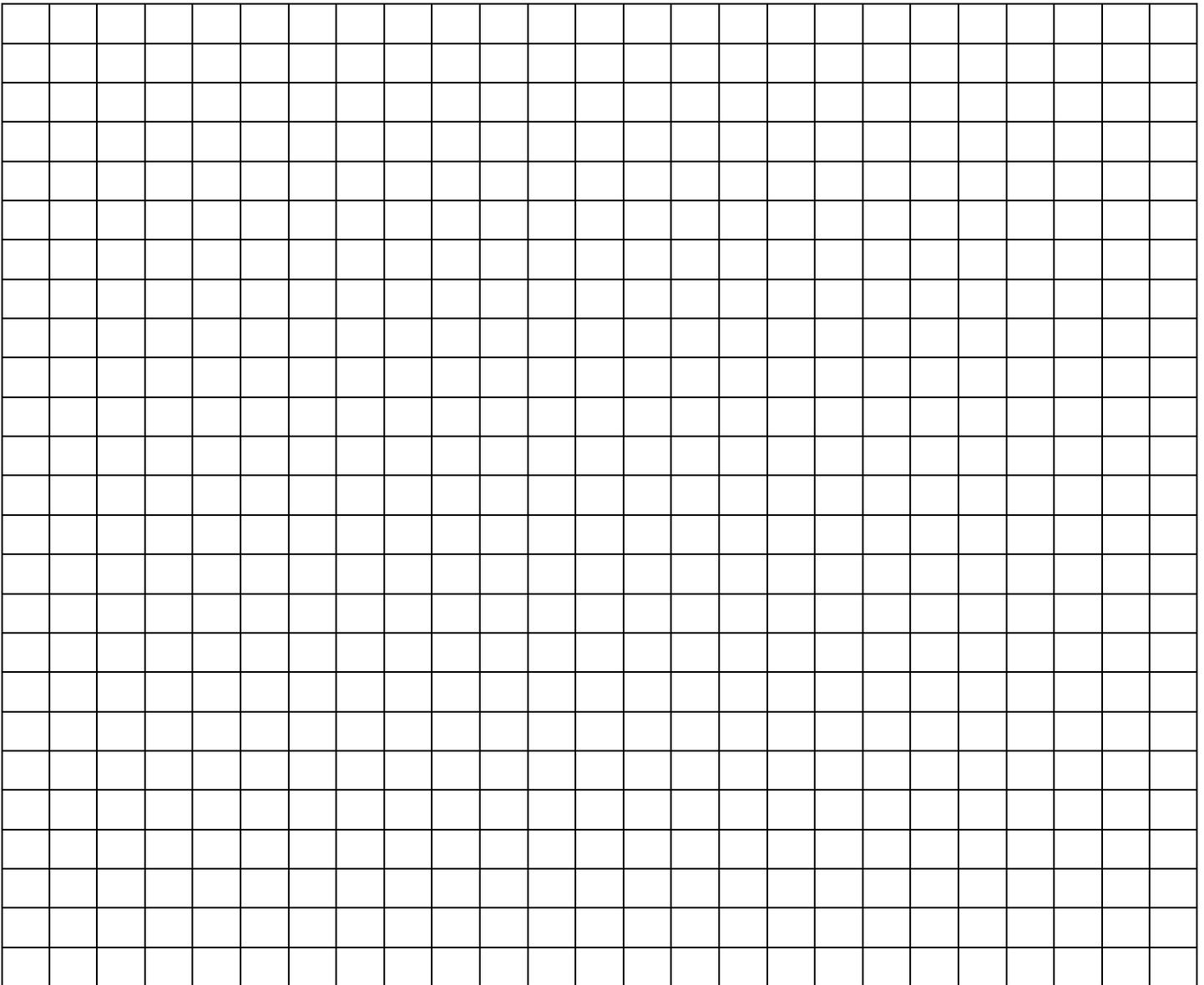
What I CHANGED
(specify unites)
Independent Variable
X Axis

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…

_____

_____