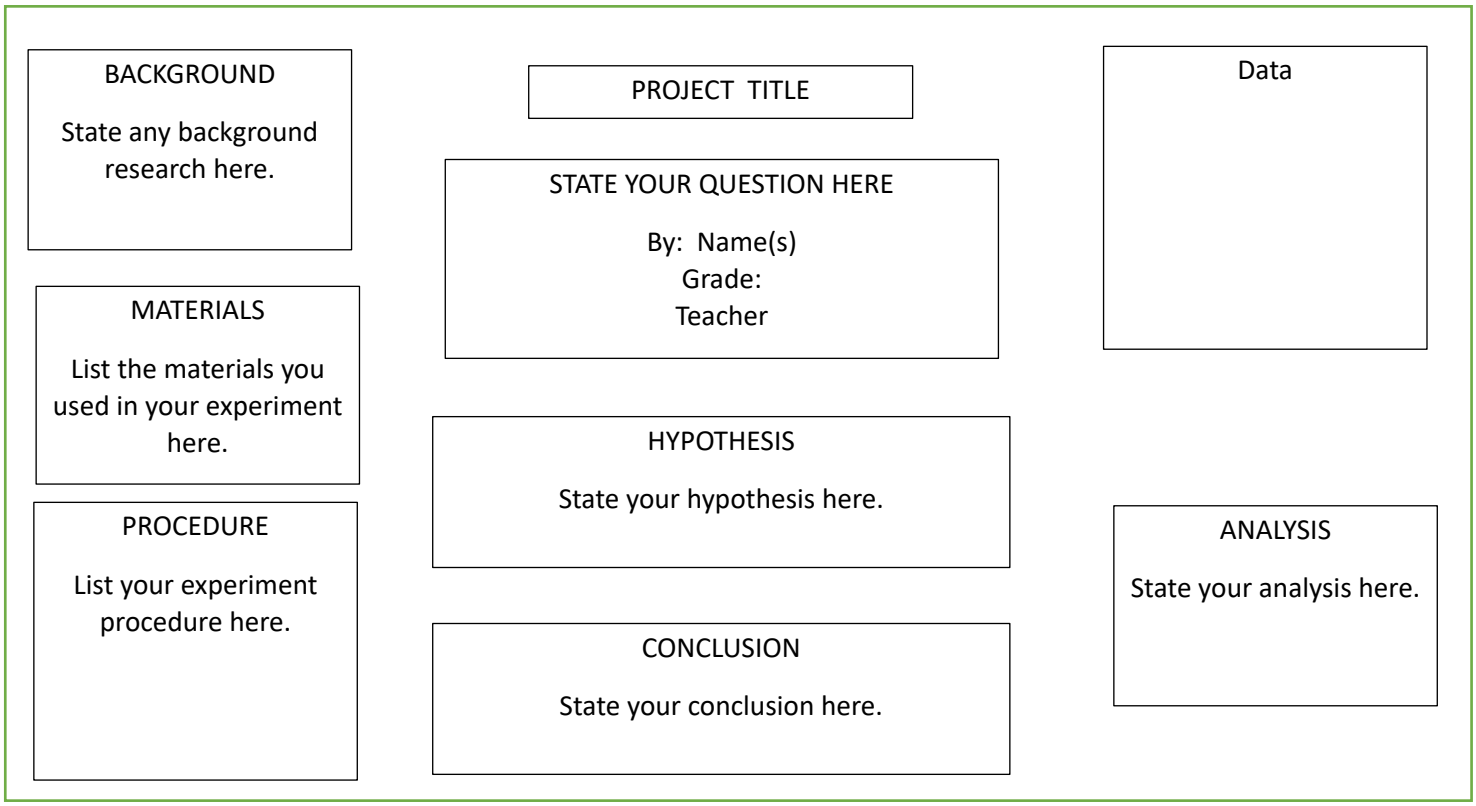
Inquiry or Experiment: Use the Scientific Method.

The Scientific Method:

1. **Ask a Question -** Ask yourself, "What do I want to learn more about?" or "I wonder what would happen if…?" Find a question that interests you. Online resources can help with ideas.
2. **Do Background Research -** Describe why you chose this question. Do some research to help you make an educated guess, or hypothesis.
3. **Create a Hypothesis -** Answer your question! Make a prediction about what you think will happen based on what you know and what you learned in your research.
4. **Test your hypothesis by doing an experiment -** Make a repeatable experiment that tests your hypothesis. Collect data and observations from your tests.
5. **Analyze your data and draw a conclusion -** Use the data and observations to draw conclusions from your experiment. Describe what happened, graph or chart your data, and discuss any interesting results.
6. **Communicate your results. -** Was your hypothesis correct? Discuss how your hypothesis compared to your data, observations, and results.

You can include photos, drawings, or materials from your experiments in your display if they meet the safety guidelines.

Inquiry or Experiment Display Board Example



Invention, Engineering, Coding:

1. **PROBLEM**: State a problem that you want to solve.
2. **BACKGROUND**: Explain why you chose this problem to solve and do research on the problem.
3. **REQUIREMENTS:** Brainstorm a list of requirements your design must meet to be successful. Include any constraints you may have as well.
4. **BUILD STEPS and MATERIALS**: Design and build a solution to the problem, either by creating an invention or machine, or by writing a computer program.
5. **TEST PROCEDURE**: Create a procedure to test your design. The test procedure should include a test for each requirement of your design.
6. **RESULTS**: Write down your observations and data from your requirements tests.
7. **IMPROVEMENT PLAN**: Create a plan for any improvements that you would make in your design or your testing process.

For your presentation, tell why you chose the problem you did, list the steps and parts involved in building your solution, and explain the results of testing your invention.

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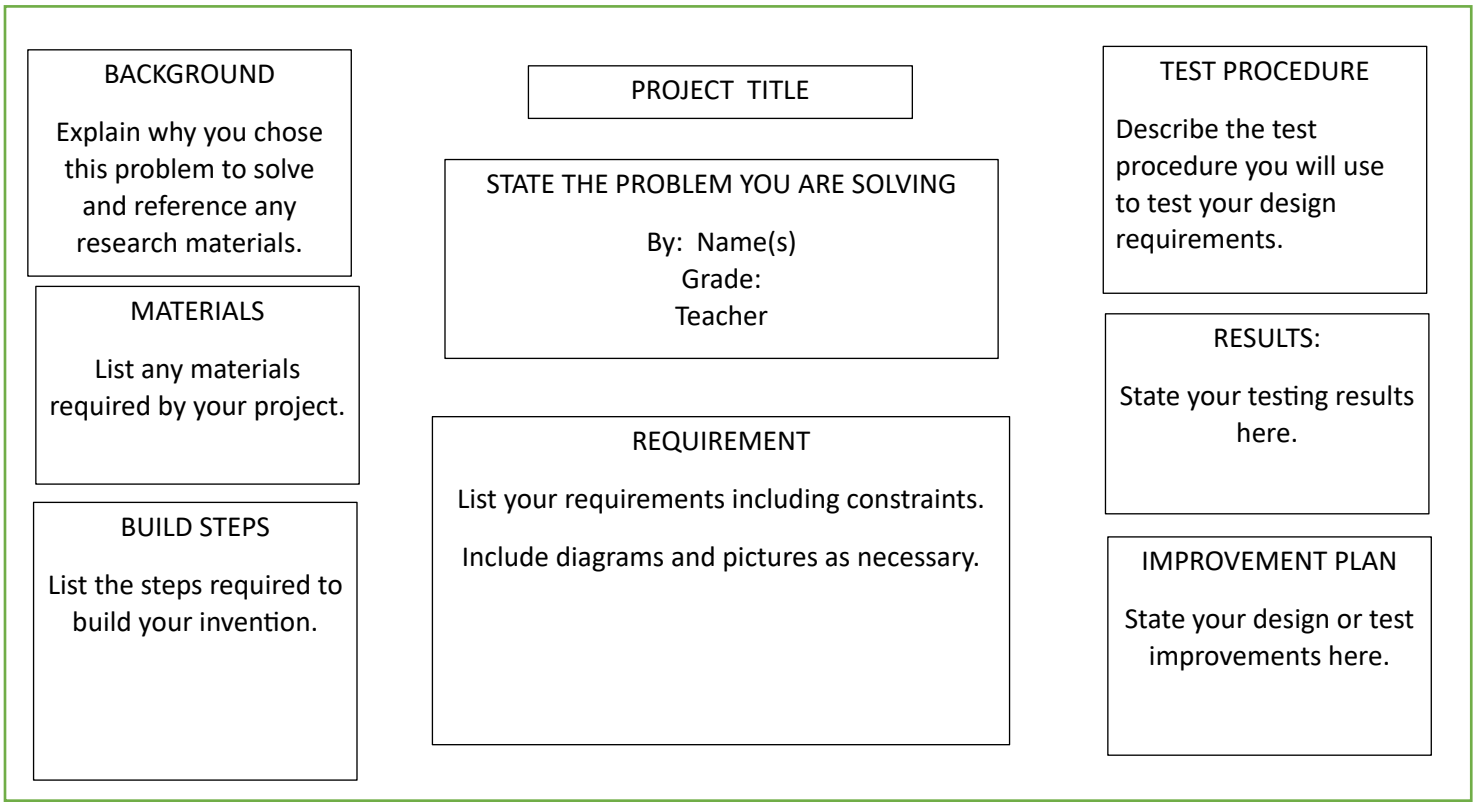
Invention, Engineering, or Coding Display Board Example



Reverse Engineering:

1. **MECHANICAL ITEM**: Choose a mechanical item that you will take apart to discover how it works.
2. **BACKGROUND**: Explain why you chose this mechanical item to reverse engineer. Do research into the mechanical item.
3. **PRODUCT DESCRIPTION**: Describe how the mechanical item works and what is used for.
4. **PROCEDURE**: Document and show the steps required to take the item apart and document each of the parts you removed.
5. **INDIVIDUAL COMPONENTS**: Mount and label the individual components of the item to the display board with a short description of the function of each component.
6. **DIAGRAM**: Present how each part goes into the item and how they all work together in a diagram or schematic of the item.

IMPORTANT: Products containing hazardous materials (such as screens or televisions) and weapons of any kind (including toy guns) are not allowed. Products chosen for reverse engineering should be appropriate for elementary aged students and allowable on school grounds.

You can include photos, drawings, or materials from your experiments in your display if they meet the safety guidelines.

Reverse Engineering Display Board Example

BACKGROUND

Explain why you chose this item to reverse engineer and reference any research materials.

PROCEDURE

List the steps required to take the item apart here.

PROJECT TITLE

LIST THE ITEM YOU ARE REVERSE ENGINEERING

By: Name(s)
Grade:
Teacher:

PRODUCT DESCRIPTION

Describe how the item works and what it is used for.

DIAGRAM

Include a diagram or schematic of where each component is in the mechanical item.

INDIVIDUAL COMPONENTS

Mount the individual components of the item here with labels and descriptions.

SCIENTIST RESEARCH REPORT

1. **SCIENTIST**: Research a scientist that you are interested in.
2. **BACKGROUND**: Explain why you chose to research this Scientist.
3. **RESEARCH**: Present what your scientist studied, and what contributions they made to their field.
4. **MATERIALS**: Explain how you learned about your scientist (what books or materials did you used).
5. **MOST IMPORTANT CONTRIBUTION**: Show some of the scientist's most important work.

You can include photos, drawings, or materials from the experiment in your display (as long as they meet the safety guidelines)

Scientist Research Display Board Example