

DISCOVERY PROJECT

"Curiosity in Action"

PROJECT TITLE

Complete this after you have chosen your topic.

STUDENT RESEARCH TEAM

List the full names of all group members:

1. _____
2. _____
3. _____
4. _____
5. _____

TEAM CONTRACT

We agree to share the work equally, listen to each other's ideas respectfully, and complete our assigned tasks on time. We understand that research requires patience, reading, and careful note-taking.

Signatures:

INSPIRATION & RESOURCES

This project is your chance to explore the world as a researcher. Scan the QR codes below to find project ideas and tools to help you succeed.

Science Project Ideas

Science Buddies

Browse the "Project Library" to review science projects.



Social Studies Ideas

WV Social Studies Fair Archive

View photos of winning display boards.



Bibliography Tools

Use these tools to help generate your citations correctly.

MyBib



Citation Machine



THE VOCABULARY OF RESEARCH

To be a researcher, you must speak the language. Review these terms with your group.

GENERAL TERMS (FOR ALL STUDENTS)

- **Abstract:** A one-page summary (approximately 250 words) placed at the beginning of your report. It explains what you did, how you did it, and what you learned.
- **Bibliography:** A comprehensive list of all sources (books, websites, interviews) used in your research, organized alphabetically.
- **Discipline:** A specific branch of knowledge or learning (e.g., Biology is a discipline of Science; History is a discipline of Social Studies).
- **Primary Source:** First-hand information.
 - *In Science:* The data you collect yourself during an experiment.
 - *In Social Studies:* A document, diary, letter, photograph, or interview from the specific time period or event you are studying.
- **Secondary Source:** Information written by someone who did not witness the event or perform the experiment (e.g., Encyclopedias, textbooks, news articles written years later).

SCIENCE SPECIFIC TERMS

- **Hypothesis:** An educated prediction about the relationship between variables. It is usually written as an "If... then..." statement.
- **Variable:** Any factor that can change in an experiment.
 - *Independent Variable:* The one thing you change on purpose.
 - *Dependent Variable:* The result you measure.
 - *Controlled Variable:* What you keep exactly the same to ensure a fair test.
- **Engineering Design Process:** A method used to solve a problem by building a prototype, testing it, and improving it.

SOCIAL STUDIES SPECIFIC TERMS

- **Exposition:** A type of project that informs, explains, or describes a specific topic in detail. It tells the "story" of the subject.
 - **Anthropology:** The study of human societies, cultures, and how they develop over time.
 - **Sociology:** The study of the development, structure, and functioning of human society (groups).
 - **Economics:** The study of how society manages its resources, including money, trade, and the production of goods.
-

≡ CHOOSE YOUR DISCIPLINE

Review the disciplines below. Your group must choose **ONE** area to focus your project on.

PATH A: SOCIAL STUDIES

1. Anthropology (Culture):

Customs, traditions, religions, and how people live together.

(Examples: Ancient Civilizations, Native American Games, Festivals, Mythology, Clothing.)

2. Economics (Money & Trade):

How people make, sell, and buy goods to satisfy wants and needs.

(Examples: The Stock Market, Manufacturing, Inflation, Cryptocurrency, International Trade.)

3. Geography (Man & Nature):

The environment, land, maps, and how humans interact with the earth.

(Examples: Pollution, Recycling, Floods, City Planning, Conservation, Maps.)

4. History (The Past):

The written story of human events and civilizations.

(Examples: Wars, Biographies of Leaders, Historical Trends, Treaties, Famous Battles.)

5. Political Science (Government):

Laws, politics, and how we organize society.

(Examples: The U.S. Constitution, the FBI, Court Systems, Elections, Military.)

6. Sociology (Groups):

How people live in groups (families, communities) and social changes.

(Examples: Family Traditions, Crime, Communication, Social Media Effects, Lifestyles.)

PATH B: SCIENCE

1. Biology (Life):

The study of living organisms and their interactions.

(Examples: Plant Growth, Animal Behavior, Bacteria, Human Health, Genetics.)

2. Chemistry (Matter):

The study of substances, what they are made of, and how they change.

(Examples: Chemical Reactions, Acids and Bases, Crystals, Food Chemistry.)

3. Physics (Energy & Motion):

The study of matter, motion, and energy.

(Examples: Aerodynamics, Electricity, Magnetism, Gravity, Simple Machines.)

4. Earth & Environmental (The Planet):

The study of the earth's structure and atmosphere.

(Examples: Weather, Rocks/Minerals, Water Quality, Solar Energy, Volcanoes.)

5. Engineering (Building):

Using science to build solutions to practical problems.

(Examples: Robotics, Bridge Building, Water Filtration Systems, Circuit Design.)

✓ **DEFINE YOUR PROJECT TYPE**

Once you have selected a discipline, you must decide **HOW** you will investigate it. Check the box that matches your plan.

IF YOU CHOSE SOCIAL STUDIES:

Select ONE of the following methods. You will use the corresponding worksheet later in this packet.

- ☐ **Problem Solving Project**
You identify a specific problem (e.g., "Homelessness in our city"), describe it using data, and offer a realistic solution.
- ☐ **Exposition Project**
A deep-dive research report that "tells the story" of a topic. You must use interviews or visits to sites, not just books. (e.g. "The Rise and Fall of the Maya")
- ☐ **Demonstration Project**
Show *how* something is done. This involves teaching the audience a skill or process (e.g., "How a bill becomes a law").

IF YOU CHOSE SCIENCE:

Select ONE of the following methods. You will use the corresponding worksheet later in this packet.

- ☐ **Experiment Project**
Ask a question, form a hypothesis, and run a test changing *one* variable to see what happens.
- ☐ **Engineering Challenge Project**
Identify a need, define constraints (rules/limitations), build a prototype, and test it to see if it works.

Our Chosen Topic Title:

? THE RESEARCH QUESTIONS

Break your big topic down into smaller "W" questions. Assign each question to a group member to research. This ensures collaboration.

Topic:

Keywords (5 words to use in search engines):

Question Type	Specific Question to Research (Write the full question here)	Who is Responsible?
WHO? (Who discovered this? Who does it affect?)		
WHAT? (What causes this? What are the parts of it?)		
WHEN? (When did this happen? When does it occur?)		
WHERE? (Where can we find this? Where is it used?)		

Question Type	Specific Question to Research (Write the full question here)	Who is Responsible?
WHY? <i>(Why is this important? Why does it change?)</i>		
HOW? <i>(How does it work? How do we measure it?)</i>		
??? <i>(Additional questions)</i>		
??? <i>(Additional questions)</i>		
??? <i>(Additional questions)</i>		
??? <i>(Additional questions)</i>		
??? <i>(Additional questions)</i>		
??? <i>(Additional questions)</i>		

≡ **BIBLIOGRAPHY WORKSHEET**

You need a minimum of **3 different types** of sources. Use this page to log them exactly as you find them.

Source 1: Book or Encyclopedia

Author(s) Last Name, First Name:

Title of Book/Article:

City of Publication: _____

Publisher: _____

Year Published: _____

Source 2: Website (Trusted Sources Only)

Author (if available):

Title of Article:

Name of Website:

Full URL:

Date You Visited: _____

Source 3: Primary Source (Interview, Survey, Site Visit, Letter, Diary)

Description of Source:

Person Interviewed (if applicable):

Date of Event/Interview: _____

Source 4: Book or Encyclopedia

Author(s) Last Name, First Name:

Title of Book/Article:

City of Publication: _____

Publisher: _____

Year Published: _____

Source 5: Website (Trusted Sources Only)

Author (if available):

Title of Article:

Name of Website:

Full URL:

Date You Visited: _____

Source 6: Primary Source (Interview, Survey, Site Visit, Letter, Diary)

Description of Source:

Person Interviewed (if applicable):

Date of Event/Interview: _____

Source 7: Book or Encyclopedia

Author(s) Last Name, First Name:

Title of Book/Article:

City of Publication: _____

Publisher: _____

Year Published: _____

Source 8: Website (Trusted Sources Only)

Author (if available):

Title of Article:

Name of Website:

Full URL:

Date You Visited: _____

Student Name: _____

Topic: _____

Read your source. Close the book or tab. Write what you learned in your own words. Be sure to write down which source number the fact came from (see Page 7).

[illegible]

Student Name: _____

Topic: _____

Read your source. Close the book or tab. Write what you learned in your own words. Be sure to write down which source number the fact came from (see Page 7).

[illegible]

Student Name: _____

Topic: _____

Read your source. Close the book or tab. Write what you learned in your own words. Be sure to write down which source number the fact came from (see Page 7).

[illegible]

Student Name: _____

Topic: _____

Read your source. Close the book or tab. Write what you learned in your own words. Be sure to write down which source number the fact came from (see Page 7).

[illegible]

Student Name: _____

Topic: _____

Read your source. Close the book or tab. Write what you learned in your own words. Be sure to write down which source number the fact came from (see Page 7).

[illegible]

SCIENCE: THE EXPERIMENT PLAN

Use this worksheet *ONLY* if you are doing a Science Experiment where you test a hypothesis.

1. THE VARIABLES

Independent Variable (The one thing I will change):

Dependent Variable (What I will measure):

Controlled Variables (The specific things I must keep exactly the same to ensure a fair test):

1.	2.
3.	4.

2. THE HYPOTHESIS

Complete this sentence:

IF I change the **Independent Variable** (_____) to be
(_____), THEN the **Dependent Variable**
(_____) will [increase / decrease / change] BECAUSE:

3. DETAILED MATERIALS LIST

List every single item, tool, and amount you need. Example: "500ml of warm water," not just "water".

• _____	• _____
• _____	• _____
• _____	• _____

4. PROCEDURE (STEP-BY-STEP)

1.

2.

3.

4.

5.

6.

7.

8.

9.



SCIENCE: ENGINEERING DESIGN PLAN

Use this worksheet *ONLY* if you are doing an Engineering Project where you build a solution.

1. DEFINE THE PROBLEM

Who needs help? What is the specific challenge?

2. CONSTRAINTS (RULES)

What are the limitations? (e.g., must cost less than \$10, must fit in a shoe box, cannot use glue)

1.

2.

3.

3. PROTOTYPE DESIGN

Materials Needed:

Sketch/Description of Idea:

4. TESTING & IMPROVEMENT

Test 1 Result: (Did it work? Why or why not?)

Changes made for Prototype 2:

Test 2 Result:

Changes made for Prototype 3:

Test 3 Result:

Changes made for Prototype 4:

Test 4 Result:

Changes made for Prototype 5:

Test 5 Result:

! **SOCIAL STUDIES: PROBLEM SOLVING PLAN**

Use this worksheet *ONLY* if you are offering a solution to a problem.

1. IDENTIFY THE PROBLEM

What is the problem? Be specific. (Don't just say "Recycling", say "People throwing cans in the trash at lunch").

2. PROVE THE PROBLEM EXISTS (RESEARCH)

What evidence did you find that this is real? (Quote a statistic, an article, or your own observation).

3. OFFER A SOLUTION

What is your plan to fix it?

4. FEASIBILITY

Why will your solution work? How much will it cost? Is it easy to do?

SOCIAL STUDIES: EXPOSITION PLAN

Use this worksheet *ONLY* if you are "telling the story" of a culture, event, or topic.

1. THE TOPIC FOCUS

What is the main subject?

Why is this topic important to learn about?

Is there a mystery, debate, or argument historians have about this topic?

2. RESEARCH "CHAPTERS"

Divide your report into 3 main sections (e.g., Food, Clothing, Religion OR Before the War, During the War, After the War).

Chapter 1 Title: _____

Details to cover:

Chapter 2 Title: _____

Details to cover:

Chapter 3 Title: _____

Details to cover:

3. PRIMARY SOURCE PLAN

Who will you interview OR what historical site/museum will you visit?

What specific thing are you looking for?

SOCIAL STUDIES: DEMONSTRATION PLAN

Use this worksheet *ONLY* if you are showing *HOW* to do something or make something.

1. THE SKILL / OBJECT

What are you demonstrating?

What culture or time period is this from?

2. MATERIALS NEEDED

List everything you need to do the demonstration:

3. STEP-BY-STEP INSTRUCTIONS

Write the steps clearly so anyone could follow them.

1.

2.

3.

4.

5.

6.

4. THE EXPLANATION

Why do people do this? How is it useful?

DATA VISUALIZATION

You must translate your words and numbers into pictures. Use the guide below to draft your visual.

A. CHOOSE YOUR VISUAL

- **Line Graph:** Best for showing change over time (e.g., Plant growth over 10 days).
- **Bar Graph:** Best for comparing amounts (e.g., Survey results: Pizza vs. Tacos).
- **Pie Chart:** Best for percentages (e.g., Economic budget).
- **Annotated Map:** Best for Geography/History (e.g., Drawing battle lines or trade routes on a map).
- **Timeline:** Best for History (e.g., Sequence of events).

B. DRAFT YOUR VISUAL

Use the space below to SKETCH what your graph or map will look like.

Title of Graph/Visual:

WRITING GUIDE: SCIENCE EXPERIMENT

Use this guide if you are doing an ****Experiment Project****. Draft your paragraphs here.

1. INTRODUCTION

What is your question and why did you choose it?

2. BACKGROUND RESEARCH

What did you learn from your books/websites **before you started? (See your notes on Page 8).**

3. METHODOLOGY

State your Hypothesis (If/Then). Describe your procedure clearly.

4. RESULTS (THE DATA)

What happened? Look at your graphs. Did the numbers go up or down?

5. CONCLUSION

Was your hypothesis correct? What would you do differently next time?

WRITING GUIDE: ENGINEERING DESIGN

Use this guide if you are doing an **Engineering Project** (building a solution).

1. PROBLEM DESCRIPTION

Who has the problem and what do they need?

2. BACKGROUND RESEARCH

What similar inventions already exist? What science concepts (gravity, electricity) did you need to understand?

3. DESIGN REQUIREMENTS

What were the rules (constraints)? What materials did you choose and why?

4. TESTING RESULTS

Did your first prototype work? What failed? How did you improve it for the second test?

5. FINAL CONCLUSION

Does your final design solve the problem?

WRITING GUIDE: SOCIAL STUDIES PROBLEM SOLVING

Use this guide if you are doing a **Social Studies Problem Solving Project**.

1. THE PROBLEM

Describe the problem clearly. Why is it bad for the community?

2. EVIDENCE & BACKGROUND RESEARCH

Prove the problem exists. Use your statistics, news articles, and research notes.

3. PROPOSED SOLUTION

What is your plan? Describe it in detail.

4. WHY IT WILL WORK (CONCLUSION)

Explain why your solution is the best choice. Is it affordable? Is it fair?

WRITING GUIDE: SOCIAL STUDIES EXPOSITION

Use this guide if you are doing a **Social Studies Exposition** (telling the story of a topic).

1. INTRODUCTION

Introduce your main topic. Why is this history/culture interesting?

2. BACKGROUND RESEARCH (THE STORY)

Tell the main story using your research notes. (Use the 3 Chapters you planned on Page 12).

3. PRIMARY SOURCE ANALYSIS

What did you learn from your interview or site visit that wasn't in books?

4. CONCLUSION & CONNECTION

Why does this topic matter today? How does this history help us understand a problem happening right now?

WRITING GUIDE: SOCIAL STUDIES DEMONSTRATION

Use this guide if you are doing a **Social Studies Demonstration** (How-To).

1. INTRODUCTION

What object or skill are you demonstrating?

2. HISTORICAL CONTEXT (BACKGROUND RESEARCH)

Where does this come from? Who used it originally and why? (Use your research notes).

3. THE PROCESS

Describe the materials and the steps you took to make/do it.

4. CONCLUSION

Why is it important to keep this tradition or skill alive?

DRAFTING THE ABSTRACT

STOP! Write this section **LAST**. The Abstract is a summary of the report you just wrote on the previous pages.

An abstract is approximately **250 words maximum**. In professional papers, it is usually just one big block paragraph. You can draft it in sections here, but when you type your final paper, combine these thoughts into one or two smooth paragraphs.

Part 1: The "Why" (Purpose)

Summarize why you chose this topic and what your goal was.

Part 2: The "How" (Method)

Briefly summarize the steps you took (Experiment, Survey, or Research).

Part 3: The "What" (Conclusion)

Summarize your final result. What is the one thing you want the judges to know?

FINAL REPORT & DISPLAY

THE WRITTEN REPORT

You must type your final paper. Hand-written reports are not accepted.

- **Font:** Calibri or Arial, Size 12.
- **Spacing:** Double-spaced.
- **Margins:** 1-inch on all sides.

Order of Pages:

1. **Title Page** (Title, Student Names, Date)
2. **Table of Contents**
3. **Abstract** (The summary you drafted on Page 20)
4. **Body of Report** (The specific Writing Guide you used on Pages 15-19)
5. **Bibliography** (Your list of sources in alphabetical order)

THE DISPLAY BOARD

Use a standard 36-inch wide tri-fold board. Make sure text is large enough to read from 3 feet away.

LEFT SIDE	CENTER	RIGHT SIDE
The Plan: • Abstract • Problem/Question • Hypothesis • Methodology	The Evidence: • TITLE • Photos • Charts & Graphs • Maps • Diagrams/Models	The Result: • Results (Data) • Conclusion • Future Questions

✓ **FINAL PROJECT CHECKLIST**

Verify every item below before you hand in your project.

- ☐ **Topic:** Is our topic specific (not too broad)?
- ☐ **Contract:** Did everyone sign the team contract on Page 1?
- ☐ **Bibliography:** Do we have at least 3 sources? Are they alphabetized?
- ☐ **Notes:** Did every group member contribute research notes?
- ☐ **Investigation:** Did we complete the correct planning sheet (Science OR Social Studies)?
- ☐ **Body of Report:** Did we write full paragraphs (not just bullet points)?
- ☐ **Abstract:** Is it under 250 words? Is it placed at the very front of the report?
- ☐ **Visuals:** Do we have at least one graph, map, or timeline on the board?
- ☐ **Display:** Is the board neat? Is the font large enough to read from 3 feet away?
- ☐ **Spelling:** Did we check for spelling and grammar mistakes?
- ☐ **Practice:** Did we practice our 5-minute oral presentation 3 times?

PERSONAL REFLECTION

(Self-Evaluation)

What was the hardest part of working with your team (or the rest of the research project), and how did you handle it?
