



# Science Project Activity



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**A science project is an activity that allows learners to discover knowledge independently through hands-on practice, in the form of study, exploration, research, experimentation, and invention. Learners are responsible for selecting the topic, gathering data, conducting experiments, drawing conclusions, writing reports, and presenting their work using the scientific method, with teachers serving as motivators, guides, and close advisors.**

**Science projects are classified into 4 types based on how answers are obtained through the scientific method:**

- 1. Survey and Data Collection Projects**
- 2. Experimental Projects**
- 3. Invention or Product Development Projects**
- 4. Theoretical Projects**



# Survey and Data Collection Projects

The project maker will survey and collect data, then classify the data into categories and present it in various formats to clearly identify the characteristics or relationships of the subject being studied.

In a survey and data collection project, variables are not necessarily required. The project maker simply surveys and collects the data, then organizes it into categories and presents the findings.



Survey of local wisdom in various aspects



Survey of local medicinal plants

# Experimental Projects

In conducting an experimental project, variables that affect the experiment must be managed. There are 3 types:

1. Independent Variable – refers to the cause of the experiment
2. Dependent Variable – refers to the result arising from changes in the independent variable
3. Controlled Variable



Experimenting with growing plants in solution or soil-free cultivation (Hydroponics)



Experimenting with poultry feed formula studies



# Invention or Product Development Projects

This type of project involves applying existing knowledge to invent or create something new that is highly beneficial. It may also include writing books, composing songs, creating plays, and other creative works under the category of invention projects.



Solar-powered water distiller



Fruit wrapping machine

# Theoretical Projects

This type of project involves using one's own imagination to explain new principles or concepts, which may be expressed in the form of formulas or equations, or to explain phenomena that cannot be described by existing principles.

For this type of project, the project maker must have a strong foundation in scientific knowledge and must conduct extensive research on related topics until they have broad and in-depth understanding of the subject matter.

For example: ...

- The origin of continents and oceans – creating a theoretical model to explain.
- Study and research of traditional medicine texts.
- The origin of earthquakes in Thailand.



# Steps for Developing a Science Project

1. Define the problem or topic to be studied.
2. Formulate a hypothesis, identify independent variables, dependent variables, and controlled variables to increase data reliability. (if applicable)
3. Design the experiment or determine the methods or data sources to be studied.
4. Conduct the experiment or study as planned – for experimental projects, experiments must be repeated at least 3 times to ensure certainty before drawing conclusions.
5. Discuss the results by evaluating the data obtained from the experiment and discussing it with reference to other supporting documents and evidence.
6. Present the findings in the form of a report, display board, or oral presentation.



# Writing a Project Outline

- Project Title
- Project Author(s)
- Project Advisor
- Background and Significance of the Project
- Objectives of the Study
- Hypothesis (if applicable)
- Methodology
- Work Schedule / Timeline
- Location of Implementation
- Budget
- Expected Benefits
- References



# Benefits of Conducting Science Projects

1. Develops knowledge, expertise, and confidence in applying the scientific method to problem-solving.
2. Builds awareness and responsibility for self-directed learning and independent research.
3. Allows in-depth study and learning in areas of personal interest beyond the regular curriculum.
4. Develops and demonstrates individual abilities according to one's own potential.
5. Provides opportunities to showcase personal capabilities.
6. Encourages productive use of free time.
7. Helps build positive relationships between teachers and students, as well as among students themselves.
8. Helps strengthen the relationship between the community and the school.
9. Builds a good reputation for both the individual and the educational institution.



# Activity !!

## Science Invention Project Activity to solve everyday life problems

1. Each group researches problems faced by people in each age group as follows:

- Ages 1–12 years
- Ages 12–20 years
- Ages 21–59 years
- Ages 60 years and above

2. Design 1 invention to solve the identified problem, specifying:

- Structure and components of the invention
- Instructions for use
- Benefits of the invention

3. Present the invention design

