

Why Do a Science Project?

For many parents and their children, the goals of a science project may be unclear. You may wonder why it was assigned in the first place. The answer is threefold. Science projects are assigned so that the student can

- Explore a science topic in depth
- Assume responsibility for planning and carrying out a long-term endeavor
- Use scientific methods in seeking an answer to a real-world question

Beyond that, however, lie some important intellectual goals that may not be obvious to either parents or their children, the most important of which is this:

Science projects help students develop habits of thought that will serve them well in whatever activities or vocation they pursue, whether science-related or not.

A science project is something like a workout at the gym, but it's the mental muscles that grow. The workout begins with the warm-up: "What questions interest me?" "What question can I answer using experimental methods?" Then comes the hard work, when the pulse quickens and sweat pours. Materials must be gathered and organized into an experimental setup. Variables must be identified and controlled. Data must be collected and analyzed—not once, but several times to assess the consistency of outcomes and discern average tendencies. From those data, logical conclusions must be drawn, and a poster or exhibit that explains the whole process must be constructed. Then comes the time when cooling down is required, but may be difficult to achieve: The project must be presented to others.

Throughout this process, mental muscles are at work that can grow flabby when school learning comes mostly from textbooks. A science project requires students (and the parents who assist them) to extract answers from nature—that is, to infer from their own observations how a natural process works. Achieving that end requires careful observation, description, classification, and measurement. The experimental process yields outcomes that are nearly always mathematical. To gain insight from them, students make data tables to organize results and draw graphs in hopes of revealing the trends that hide in raw numbers. But graphs cannot speak for themselves. They speak through the student experimenter who must interpret them logically. That's no small challenge, because the precise statement of what experimental results show—or don't show!—is a mental workout all on its own. Scientists say their craft requires healthy skepticism, which means being suspicious of pat answers and rejecting any conclusion not clearly and totally supported by all available evidence.

A science project is like a workout in one other way. Each project yields some benefit. Mind, like body, grows a little tougher, and the thinking muscles feel a tingle after exertion. But one workout is never enough. Growing stronger and staying strong require regular, vigorous exercise. That's why there's a science project next year and the year after that. Students should view future projects not as chores, but as opportunities. That's why science projects are never finished. Each one is preparation for the next, and the process of thinking, working, and acting scientifically is ongoing. That's why science projects are so important.

