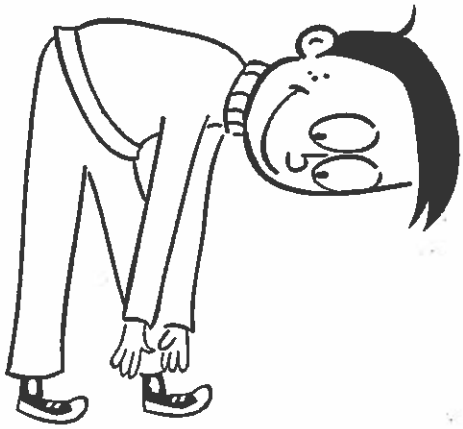
Sample Project One: Stretch Test

Name: _____ **Date:** _____

Below is an example of a science project from start to finish.
You can use this as your guide as you work on your own project.

Project Topic: How a Person's Flexibility Changes Throughout a Workout

Project Title: Stretch Test



1. My Question

The question I plan to answer with my experiment is: Are people able to stretch farther before or after hanging in a forward bend?

2. My Purpose

Rewrite your question to complete the following sentence. The purpose of my experiment is to: find out when people are most flexible–at the start or end of a workout.

3. My Variables

My *independent variable*, or the one thing I plan to change, is: the total length of time spent hanging in a forward bend before giving a stretch test.

My *dependent variable*, or the change I will measure, is: the distance that people stretch.

My *controlled variables*, or the things I will keep the same, are: people will perform the same stretch test. I will make sure that the room temperature stays constant throughout the workout because people's muscles loosen up in warmer temperatures. I will have people perform the stretch test three days in a row, always at the same time of the day.

4. My Research

Go to the library, perform Internet research, or interview an expert to gather information about your topic. Keep notes on your findings:

It is best to do light stretching before a workout and a more thorough stretching routine after a workout. Stretching your muscles when they're cold increases your risk of pulled muscles. Source: Mayo Clinic staff, Stretching: Focus on flexibility, The Mayo Clinic, http://www.mayoclinic.com/health/stretching/HQ01447

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5. My Hypothesis

A *hypothesis* is a possible answer to a research question. Reread your question in Step 1. Based on my research, my hypothesis is:
The longer a person works out before stretching, the farther the person will be able to stretch.

6. My Procedure

Materials:

ruler
masking tape
clock
pencil
paper

Procedure Steps:

1. Place a ruler on the floor.
2. Use masking tape to tape the ruler to the floor.
3. Ask a person to sit on the floor with his or her legs straight out in front and heels lined up with the ruler's 5-inch mark. Have the person separate his or her heels by 12 inches.
4. Have the person lean forward, arms stretched straight out in front as far as he or she can reach.
5. When he or she can't stretch forward comfortably any more, have the person put his or her fingertips down on the ruler. Record this distance (measure from the 0-inch mark).
6. Have the person stand up and hang in a forward bend for one minute.
7. Repeat Steps 3 through 5.
8. Have the person stand up and hang in a forward bend for another minute.
9. Repeat Steps 3 through 5 once more.
10. Repeat the experiment with the same person for three days in a row. Perform the experiment at the same time each day.

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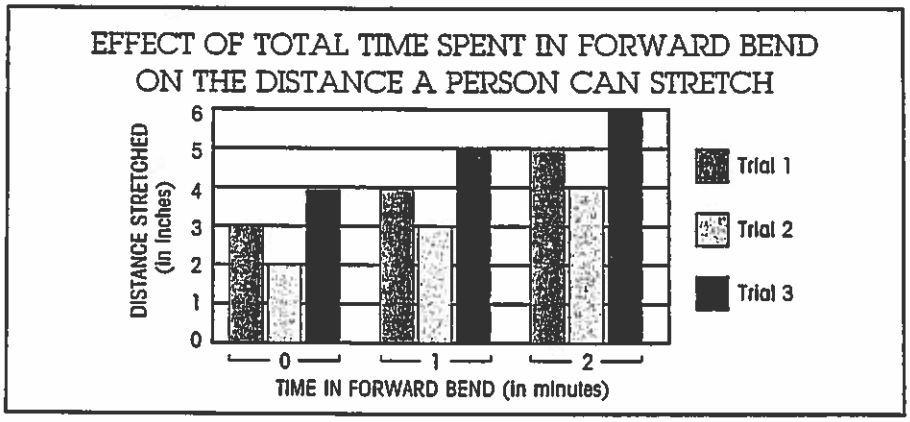
7. My Data

Independent Variable: Total length of time in forward bend	Dependent Variable: Distance stretched (in inches)			
	Trial 1	Trial 2	Trial 3	Average
0 minute	3 inches	2 inches	4 inches	3 inches
1 minute	4 inches	3 inches	5 inches	4 inches
2 minutes	5 inches	4 inches	6 inches	5 inches

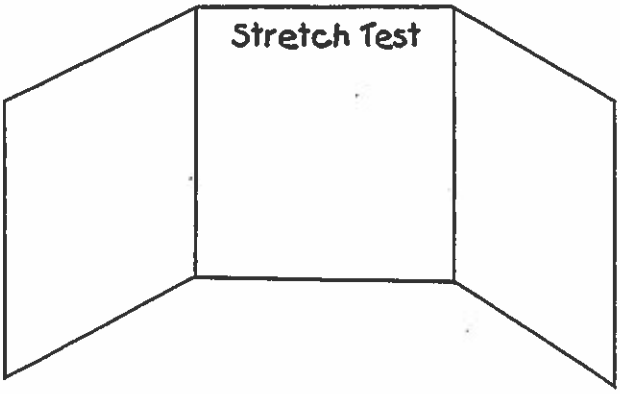
8. Graph of My Data



9. My Conclusions

Based on my results, I conclude that my hypothesis was correct. The longer a person works out before stretching, the farther the person will be able to stretch. I would like to see how other forms of workout affect the distance a person can stretch. For instance, would doing jumping jacks help a person stretch farther?

10. A Sketch of My Display



Choosing a Project Type

How are inventions different than investigations?

Investigators find out things for themselves. Inventors are engineers who design and make things that will solve problems. Engineering uses a scientific approach and both inventions and investigations depend on good questions, planning, using appropriate materials, collecting data, making sense of the data to verify the results, and presenting the results to others for review.

Inventions are everywhere. Each time we see a new product, it is somebody's invention. Fire alarms were developed to quickly to warn everyone of a possible fire first across cities to summon the fire department, then in buildings to save lives. Strobe lights were added to alert hearing impaired people. They will even wake someone out of a sound sleep. Each of these inventions required someone to recognize the problem, define the need, and come up with an invention that solved the problem. The inventions were carefully designed and tested and results were used to determine how well they worked.

While most people think of engineers as those who design buildings, cars, or spaceships, many engineering careers are in the areas of social engineering, urban planning, medicine and many other ways of meeting people's needs. The design and development of an inexpensive water pump that works in remote parts of Africa has the potential to save millions of lives by providing them clean drinking water.