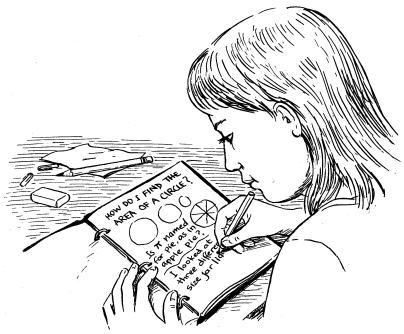
Eureka!

For ages 10 and older.

Since the time that humans first developed a written language, they have recorded their thoughts, questions, and discoveries with pictures and words. In this activity, you will document your own process of discovery as you investigate a mathematics or science problem that interests you.

You will need

- journal, notebook, or three-ring binder with paper
- pen or pencil
- access to research resources, such as books, articles, the Web, or experts



What to do

1. Select a math or science question or problem that interests you. It could be as simple as "How do I find the area of a circle?" or "Why is the sky blue?" or as complex as "Can I build a device that automatically toasts bread in the morning so that it's ready just as I want breakfast?"
2. Record your question or problem in your journal.
3. Record the thoughts you have and the actions you take as you try to answer the question or problem. Include the answers to such questions as:

- Why are you interested in the problem?
- What steps do you need to take to solve it?
- How do you proceed to take those steps?
- What type of research or experimentation do you need to do?
- What outside reference sources do you need? Where can you find those references?
- Which references are helpful? Which ones are not?

Are you able to answer the question or solve the problem? Why or why not?

Be sure to date each entry. In addition to your own thoughts, you might also consider including any of the following:

Materials used in experiments or inventions, and where and how you obtained those materials

Data collected in experiments

Labeled graphs, drawings, and/or diagrams with comments

- Relevant newspaper clippings or magazine articles and your responses to the articles
- Pressed samples or rubbings of gathered objects
- Meaningful quotations or thoughts from other scientists

Learning More

Bragg, Melvin.
On Giants' Shoulders:Great Scientists and Their Discoveries from Archimedes to DNA.
New York, NY: Wiley, 2000.
Describes the lives and work of 12 great scientists, from Archimedes to Watson and Crick. For young adults and adults.

Kassinger, Ruth.
Reinvent the Wheel:Make Classic Inventions,Discover Your Problem-Solving Genius,and Take the Inventor's Challenge.
New York, NY: Wiley, 2001.
Investigates the history and the science behind classic inventions with a collection of hands-on projects. For children and young adults.

The Write Site
www.writesite.org/html/journal.html
Offers advice about how to keep a journal. For young adults.

The Method

One of the reasons that historians and mathematicians are interested in the Archimedes' Palimpsest is that it contains the only known copy of Archimedes' work *The Method*.*The Method* is written as a letter from Archimedes to his colleague Eratosthenes. Archimedes explains how he discovered his theorems on volumes, especially the volume of the sphere. It is interesting to note that the technique Archimedes describes in the manuscript is different from the final proof that he published.In short, *The Method*, like all good journals, gives us a glimpse of the mind of a great mathematician and insight into the process of discovery.