Key Words/Phrases: Women Scientists; Science History; Gender; Ethnicity

Overview
In this lesson, students will participate in group efforts to create graphic displays of the lives of women scientists based upon collective reading from short biographies, available on the Internet, provided by the teacher. The graphic displays include such factors as family influences, challenges, experiences as well as successes. Students share their displays with others in the class in the form of presentations.

Introduction
Research results indicate that interest and academic success levels, on the part of female students, typically matches, or exceeds that of their male counterparts through elementary school. However, about the time they reach middle school, girls tend to report loss of interest and their success rates lessen. That trend generally continues through high school and into college. Far fewer female, than male, students choose science-related fields as careers and we continue to witness male domination, in terms of numbers of those working in such professions, on a global scale.

Findings from other research show that when students can identify with scientists, either through gender or ethnic—or both—means, they tend to experience greater success in science classes. Such students are more likely to choose science-related careers later in life.

This activity offers students opportunity to recognize science-related accomplishments by women from various ethnicities and through history. Indeed, one might view this perspective as the, “herstory” of science although it is probably best for students to realize that science is an endeavor that is accomplished by women and men of diverse societies through time.

National Science Education Standards
Content Standard G: As a result of activities in grades 5-8, all students should develop understanding of
• Science as a human endeavor
• Nature of science
• History of science

Content Standard G: As a result of activities in grades 9-12, all students should develop understanding of
• Science as a human endeavor
• Nature of scientific knowledge
• Historical perspectives

Arizona State Standards
Grade 5 - 8
Strand 2: History and Nature of Science
Concept 1: History of Science as a Human Endeavor—Identify individual, cultural, and technological contributions to scientific knowledge

PO 1: Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations.

High School
Strand 2: History and Nature of Science
Concept 1: History of Science as a Human Endeavor—Identify individual, cultural, and technological contributions to scientific knowledge

PO 1: Describe how human curiosity and needs have influenced science, impacting the quality of life worldwide.

PO 2: Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations.

PO 4: Analyze how specific cultural and/or societal issues promote or hinder scientific advancements.

Materials
• Classroom set of packets that contain short biographies of women scientists. Each packet should contain biographies from 4-5 sources for use by a group of students such that all groups have packets for a unique scientist (to avoid potential for duplication of effort between groups). A list of some women scientists, for whom information can be found on the Internet, is provided.
  • Sheet of poster paper or white-board large enough for students to design a poster.
  • Markers and crayons enough so that each group may have enough to develop a poster with a variety of colors.
  • Old magazines from which students can cut out images they might want to include in their posters.
  • Scissors and glue sticks.

Procedure
1] Begin the lesson with a discussion about scientists in general. If you have provided an activity in which students were asked to draw a scientist in an earlier lesson, then they might recall some issues raised. If they do not entertain ideas relative to what it might be like to be a scientist, provide questions so to encourage them to consider this issue. If possible, have students consider any issues that they might consider different for female and male scientists.

2] Allow students, in groups, to choose a packet for one woman scientist.

3] Provide time for them to read the biographies. Each student does not need to read all of the biographies in a given packet but each biography should be read by at least one member of the group. Have students record notes on significant points of that person’s life.

4] Provide a sheet of paper (or white board) for each group and instruct them to create a poster to illustrate the life events of their scientist. In so doing, students might include childhood experiences, influences on the part of others, challenges, successes, failures, etc, that shaped their careers.
Once the posters are finished, have each group present their scientist to the rest of
the class with the poster used as a visual aid.

Upon completion of the presentations, ask students to provide a synopsis of any
patterns they might have noted that were common to many, if not all, of the women scientists.
This synopsis can be accomplished through class discussion, written exercise or both.

Follow the lesson with a reading of, *Letter from Caroline Herschel* (attached to
this lesson). Have students comment on the author’s intent when she (Siv Cederin, 1985) wrote
it. How much, if any, have situations changed for women scientists since Cederin wrote this
poem?

**Possible Follow-up Activities**

- Invite a local woman scientist to speak to your class about her career.
- Students can correspond with/interview a woman scientist of their choice via email. The
  teacher might wish to first identify scientists who would be willing to have students correspond
  with them.
- Arrange for a tour of a scientific facility where both women and men work together.
  Such a tour could include the whole class or a smaller number of students who volunteer to
  participate during a designated time outside of class hours.
- If your school hosts a career fair, invite enterprises that employ female scientists who are
  able to come and talk with students about their professions.