Something to Celebrate:
The American Physical Society’s “Woman Physicist of the Month”

Grade Level(s): 6+
Subject(s): Physics, Contemporary

In-Class Time: 60-90 Minutes
Prep Time: 15 Minutes

Materials
- Computer and internet access for student research
- Photocopies of Discussion Questions (found in the Supplemental Materials)
- (Optional) A/V equipment to show brief HERstories video detailing women in physics and their struggles (link found in Required Resources)

Objective
Students will learn about the contributions of contemporary women to physics, astronomy, and related disciplines. They will also explore careers and the significance of professional societies in physics.

Introduction
Since its founding in 1899, the American Physical Society (APS) has sought to “advance and diffuse the knowledge of physics.” Originally APS only held meetings, but its activities have broadened to include the publication of journals and other forms of public outreach and education.¹

The American Physical Society’s mission statement reinforces its original goal. In it, the society asserts its intent to:

- Be the leading voice for physics and an authoritative source of physics information for the advancement of physics and the benefit of humanity;
- Provide effective programs in support of the physics community and the conduct of physics;
- Collaborate with national scientific societies for the advancement of science, science education and the science community;

• Cooperate with international physics societies to promote physics, to support physicists worldwide and to foster international collaboration;
• Promote an active, engaged and diverse membership, and support the activities of its units and members.²

Since January of 2012, APS has been honoring a “Woman Physicist of the Month.” This program, led by the Committee on the Status of Women in Physics (CSWP) recognizes contemporary women who have made a positive impact on others’ lives and careers within physics and related fields. The criteria are open, and the award is available to any woman who does physics-related work. Nominations can come from anyone.³ This lesson exposes students to these accessible women scientists and their accomplishments while developing research and presentation skills.

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**Engage: 5-20 minutes**

Teachers will introduce APS and the “Woman Physicist of the Month” program. (Optional): Teachers may show HERstories video (about 15 minutes long):
http://www.aapt.org/resources/herstories.cfm

**What is the teacher doing?**

Give a basic overview of the significance of the program and the selection process. It may also be helpful to explain and discuss the APS (American Physical Society), including their missions and goals.

Prompt questions from students about the award program and the APS.

(Optional): Show the class the HERstories video (link above and in the Required/Recommended Resources). It delivers an inspirational message from many contemporary women in physics. It can be used as an engagement resource here or as an addition later on in the lesson.

**What are the students doing?**

Participate in the teacher’s introduction of the APS and the Woman Physicist of the Month program. Note the selection process and the APS’ missions and goals. Raise any questions about the Society or the program when prompted by the teacher.

If prompted, observe the HERstories video.

**Explore: 25-30 minutes**

Students will work individually or in small groups to profile one of the women physicists recognized by the APS “Woman Physicist of the Month” program. Teachers will provide students with the Discussion Questions (found in Supplemental Materials) to guide research. Research should begin with the scientist’s biography on the American Physical Society website, which can be found at:

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### What is the teacher doing?
If desired, split students into small groups.

Allow internet access for students to complete their research. Distribute copies of the Discussion Questions (found in the Supplemental Materials) as a guide for the students’ research. Ask students to include the answers to the questions in their presentations. Depending on the scientist, some of the questions may be more difficult to answer than others, as the information for some of the scientists may not be easily accessible.

Instruct students to create a presentation based on their research findings.

**Further options:**
- This activity may be modified to be completed as an out-of-class assignment to save class time.
- For high school classes, students could also research and prepare to share information on the university or workplace where their scientist currently works.
- For collegiate classes, students could prepare a presentation, formal or informal, on their scientist’s field of research.

### What are the students doing?
If instructed, split into small groups.

Receive copies of the Discussion Questions, and use them to guide research. Incorporate the answers into presentations.

Explore the APS biographies website as well as the scientists’ personal webpages and their workplace websites to perform research. For extended research, exploration of journals written by the scientist and university websites may be necessary.

Create a presentation based on research findings.

### Explain: 20-25 minutes
Students will present the findings from their research (time for each presentation will depend on class size).

**What is the teacher doing?**
Ask students questions about the information they present, especially for clarification and justification. Encourage other non-presenting students to ask questions after presentations.

If possible, encourage students to create a short PowerPoint or slide show to accompany their presentation.

**What are the students doing?**
Present profiles of female scientists from the information gathered through research. These presentations can be formal or informal. If available, prepare a short PowerPoint or slide show with photos or other supplemental materials or images.

### Elaborate: 10-15 minutes
Teachers will lead a discussion to review student presentations and the trials and accomplishments of contemporary women physicists.
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<td>Lead a discussion filling in details that may not have been covered in the student presentations. Also use this time to make broader connections regarding the careers of all the women profiled by the students.</td>
<td>Contribute new ideas to a discussion of the scientists the class has profiled.</td>
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Further options:
- If high school students chose to research and present information on the universities or institutions that these physicists work at, then a discussion could be focused on the how universities and departments are working on supporting women in physics.
- For collegiate courses, students could talk about possible career paths for female physicists and the obstacles associated with each.

Evaluate:
Opportunities for evaluation during this lesson occurred during the explanation section, as teachers may evaluate the presentations and whether students participated in the discussion. Other evaluative activities and extensions include:

**Contact the scientists:**
Have students discover the best way to contact their scientist. Many of these women are still very active in their fields and will be easily accessible via email or letter. Students can contact the scientist they profiled and ask them further questions about their work.

**Design an experiment:**
For further scientific investigation, students can design a simple experiment that is related to the field of physics in which the scientist they profiled works. The timing of this activity would be best at the end of a semester/year so that many physics topics can be covered in the project.

**Find a publication:**
If not already done, students can find, read, and/or present on a publication by their profiled scientist. This activity would be particularly effective in collegiate classrooms but may provide initial exposure to high school students regarding scientific publications.

### Required/Recommended Reading and Resources
The following list consists of resources that students can use to start on their investigation:
- APS Woman Physicist of the Month Index:
The Gazette, newsletter of the APS Committee on the Status of Women in Physics (CSWP) and the Committee on Minorities (COM):
http://www.aps.org/programs/women/reports/gazette/index.cfm

The following is a link to HERstories, a video detailing women in physics and their struggles:
• http://www.aapt.org/resources/herstories.cfm

Statistical Data on Women in Physics from the AIP Statistical Center:
• http://www.aip.org/statistics/reports/women
• http://www.aps.org/programs/women/resources/statistics.cfm

Discussion Questions

Discussion Questions can be found as a Handout with a corresponding Answer Key in the Supplemental Materials to this lesson plan.

1. What is the scientist’s family background?
2. Describe her early life and education.
3. How did she develop an interest in her field? Did she have early role models or influences?
4. Where did she attend university and/or graduate school? What did she study?
5. What is her area of research?
6. In which institutions has she worked?
7. How has her work been received by the scientific community?
8. What are her greatest contributions to the field?
9. What honors and awards has she received?
10. Has she experienced prejudice or discrimination in her career?

The following questions can be used to help facilitate a discussion among the class after all groups or students have presented:

1. What surprised or interested you most about your scientist?
2. What question would you like to ask your scientist?
3. Are there any similarities among the stories of the physicists?

Further Reading and Additional Resources

• APS Conferences for Undergraduate Women in Physics (excellent annual opportunity for collegiate female physicists): http://www.aps.org/programs/women/workshops/cuwip.cfm
• Information regarding careers in physics: http://www.aps.org/careers/physicists/index.cfm

Extensions

N/A
### Common Core Standards


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**Next Generation Science Standards**