

## Lesson Plan Accessibility



**Grade Level(s): 9+**

**Subject(s): Contemporary**

**In-Class Time: 65-90 Minutes**

**Prep Time: 30 Minutes**

### Materials

- A/V capabilities in the classroom
- Copies for the whole class of (all found in the Supplemental Materials):
  - How to Get the Most Out of Your First Conference
  - APS Accessibility Policy
  - Accessibility at the 288<sup>th</sup> AAS Meeting
- Copies for one-fourth of the class of (All found in the Supplemental Materials):
  - Autism Reading
  - Deaf and Hard of Hearing Reading
  - Learning Disabilities Reading
  - Physical & Mobility Impairments Reading

### Objective

In this lesson, students will watch a TED talk given by a blind astronomer. They will learn about academic conferences and their value in the scientific community. Then, they will read about different disabilities and think about the obstacles that disabled scientists need to overcome at conferences. Students will come up with policies to lessen these obstacles and compare their ideas to the existing accessibility policies of the American Physical Society and the American Astronomical Society.

## Introduction

Recently, there has been a push for diversity in the sciences. These efforts are usually focused on expanding racial and gender diversity, but there are other types of diversity that would also benefit the community, namely the inclusion of people with disabilities. Successful scientists throughout history have had both physical and learning disabilities. Annie Jump Cannon, the astronomer that developed the classification scheme for stars, was deaf. Albert Einstein had an Autism Spectrum Disorder and is thought to have been dyslexic. Stephen Hawking is physically handicapped by his illness, ALS (also known as Lou Gehrig's Disease).

One example of an astronomer that redesigned her research techniques to fit her abilities is Wanda Diaz Merced. Merced is a Puerto Rican astronomer who went blind early on in her career due to prolonged illness. She worked with her collaborators to sonify astronomical data so that she could listen to it instead of studying it visually as plots. She has been able to detect features of the sonified data that were previously unnoticed when analyzed visually. Now, in addition to her astronomy research, she works to advocate for the value of accessible methods of research and to design computer software that will make science more accessible to people with disabilities.

Not all cases of disabled scientists are as extreme as Merced. Other physical and learning disabilities also affect the way individuals with those disabilities conduct their science, and some effects are more indirect than others. For example, although a scientist may not be affected by their disability in performing research, they may have trouble navigating an academic conference. Conferences are gatherings at which researchers and academics present and discuss their work through poster sessions and talks. Conferences often have invited speakers that present their research or conduct professional development workshops. There are also smaller sessions where participants can focus in on a topic that is of particular interest to them. Conferences are significant networking events; participants make connections with other people in their field for future collaboration, mentorship and job opportunities. Conferences are very important, but they often pose obstacles for people with disabilities. Someone who is deaf or hard of hearing may have difficulty without a sign language interpreter, captions or a transcription. Someone in a wheelchair may have trouble navigating from their hotel to the conference space or around the conference space itself. Someone with an Autism Spectrum Disorder may be overwhelmed by the conference atmosphere and require a quiet space to occasionally get away from the activities. It is the responsibility of the scientific community at large to root out ableism (prejudice in favor of the non-disabled) and of conference organizers to create policies which will lessen the obstacles for people with disabilities at such important professional events.

Throughout this lesson, students will learn about academic conferences and different disabilities. They will consider what obstacles these disabilities would pose at a conference. They will design policies that conference organizers could implement in order to increase accessibility, then they will compare their ideas to the policies implemented by the American Physical Society and the American Astronomical Society.

**Instructions**

**Engage: 10-15 Minutes**

In this section of the lesson, students will watch part of a TED Talk given by Wanda Diaz Merced, a blind astronomer.

**What is the teacher doing?**

Play 3:28-9:07 of Wanda Diaz Merced’s 11 minute TED Talk. You can include the beginning of the talk (prior to 3:28) in which she talks about the gamma ray bursts and magnetars that she studies and/or the end of the talk (after 9:07) in which she talks about her work with disabled students. You can find the video [here](#) and listed in the Required/Recommended Readings below.

Lead the students in a brief discussion of the video they just watched. Prompt them to think about how different disabilities can affect a person’s ability to do science.

**What are the students doing?**

Watch a portion of Wanda Diaz Merced’s TED talk.

Discuss, with the class, the video that they just watched. Think and talk about how different disabilities can affect a person’s ability to do science.

**Explore: 25-30 Minutes**

After learning about how a loss of vision affected Wanda Diaz Merced’s ability to analyze her data, students will think about how different disabilities would affect a scientist’s ability to perform at an academic conference (a vital component of a scientist’s communication with their community). Students will read an article intended to prepare undergraduates to go to their first academic conference. Then they will split into groups. Each group will read about a different disability and some of the everyday obstacles associated with that disability. Then they will think about and discuss the issues that might come up for someone with that disability specifically at an academic conference, as well as the different ways that these struggles could be eased.

**What is the teacher doing?**

Introduce the students to the concept of an academic conference. Talk to them about the importance of conferences in the communication between scientists within a field, that they use conferences to share the work that they’ve been doing and to make connections for future jobs and collaborations.

Distribute and have the students read the “How to Get the Most Out of Your First Conference” handout (found in the Supplemental Materials). Answer any questions they may have.

Divide the students into 4 groups and assign each of them a disability from the list below to read about and consider:

**What are the students doing?**

Listen to the teacher describe academic conferences in general. Learn about the purpose of conferences and the activities that usually take place at them.

Read “How to Get the Most Out of Your First Conference” to learn more about what happens at academic conferences and what is expected of a conference attendee. Ask any questions they might have about conferences and how they work.

Break into four groups, one for each disability.

<ul style="list-style-type: none"> <li>• Deaf/Hard of hearing</li> <li>• Autism</li> <li>• Physical and mobility impairment</li> <li>• Learning disability, for example: dyslexia</li> </ul> <p>Students will read about their assigned disability (readings for each disability can be found in the Supplemental Materials). In their groups, the students will discuss the specific obstacles that having these disabilities would present at an academic conference, i.e. in presenting one’s own work, attending someone else’s talk, networking, etc. They will also come up with a list of policies at a conference that could lessen these obstacles. See “Explore Section: Possible Responses” in the Supplemental Materials for sample responses to obstacles and possible policies to ease them.</p>	<p>Read about their assigned disability. In groups, discuss the specific obstacles that having these disabilities would present at an academic conference, i.e. in presenting one’s own work, attending someone else’s talk, or networking. Come up with a list of policies that could be implemented at a conference to lessen the obstacles that they discussed.</p>
--	--

**Explain: 15 Minutes**

<p>Students will come together as a class and discuss the type of disability that they read about, what obstacles someone with this disability might face at an academic conference and ways that those obstacles could be minimized. Either the teacher or another student should record the class’s ideas for minimizing the struggles of disabled conference attendees.</p>	
<p><b>What is the teacher doing?</b> Reconvene the class for a discussion of what the students have read and talked about. Have each group describe the disability that they read about and share out both the obstacles that someone with that disability might face at an academic conference and the policies that the group came up with to combat those obstacles. Either have a student keep a running list of the proposed policies or do it yourself.</p>	<p><b>What are the students doing?</b> Engaging in a class discussion about their group work. Sharing out what they learned about their assigned disability, the obstacles that they think someone with that disability might face at an academic conference, and the policies that the conference might enact to lessen those obstacles.</p>

**Elaborate: 15-30 Minutes**

<p>Students will read the accessibility policies of the American Physical Society (APS) and the American Astronomical Society (AAS) and compare them to the student crafted policies. Optional: Students can be instructed to write a letter to either conference organization committee suggesting edits to their accessibility policies.</p>	
<p><b>What is the teacher doing?</b> Distribute the APS Accessibility Policy and the Accessibility at the 228<sup>th</sup> AAS Meeting handouts (both found in the Supplemental Materials). Give the students time to read these documents. Have a discussion about the similarities between their</p>	<p><b>What are the students doing?</b> Reading the APS Accessibility Policy and the Accessibility at the 228<sup>th</sup> AAS Meeting handouts. Discussing with the class the similarities and differences between their suggested policies and the actual policies of the APS and the AAS.</p>

<p>policies and the suggestions that the class came up with. Ask the students if any of the policies surprised them and have them ask any questions they may have about the purpose of the different policies.</p> <p>Optional: Have the students write a letter to either the APS or the AAS suggesting edits to their accessibility policies.</p>	<p>Talking about any policies that surprised them and asking about any policies which they may be unclear about.</p> <p>Optional: Write a letter to either the APS or the AAS suggesting edits to their accessibility policies.</p>
---	---

**Evaluate:**

Students can be evaluated on their participation in the class discussion and on the optional writing assignment from the Elaborate section, if it was assigned.

**Required/Recommended Reading and Resources**

- Accessibility at the 228th AAS Meeting. (n.d.). Retrieved July 26, 2016, from <https://aas.org/meetings/aas228/accessibility> (Found in the Supplemental Materials)
- Brown, L. X. (n.d.). Autistic Hoya: Autism FAQ. Retrieved August 01, 2016, from <http://www.autistichoya.com/p/introduction-to-autism-faq-of-autism.html> (Excerpt found in the Supplemental Materials)
- Community and Culture - Frequently Asked Questions. (n.d.). Retrieved August 01, 2016, from <https://nad.org/issues/american-sign-language/community-and-culture-faq> (Found in the Supplemental Materials)
- Diaz Merced, W. (2016, February 16). *How a Blind Astronomer Found a Way to Hear the Stars*. Speech presented at TED2016 in Canada, Vancouver. Retrieved July 26, 2016 from [http://www.ted.com/talks/wanda\\_diaz\\_merced\\_how\\_a\\_blind\\_astronomer\\_found\\_a\\_way\\_to\\_hear\\_the\\_stars?language=en#t-249456](http://www.ted.com/talks/wanda_diaz_merced_how_a_blind_astronomer_found_a_way_to_hear_the_stars?language=en#t-249456)
- Dyslexia. (n.d.). Retrieved August 01, 2016, from <https://ldaamerica.org/types-of-learning-disabilities/dyslexia/> (Found in the Supplemental Materials)
- Physical & Mobility Impairments: Information & News. (n.d.). Retrieved August 01, 2016, from <http://www.disabled-world.com/disability/types/mobility/> (Found in the Supplemental Materials)
- Task Force on Physicists with Disabilities. (n.d.). Retrieved July 26, 2016, from <http://www.aps.org/about/governance/disability.cfm> (Excerpt found in the Supplemental Materials)

**Discussion Questions**

N/A

**Further Reading and Additional Resources**

Understanding Disabilities: High School Lesson Plan:

- Understanding Disabilities: High School. (n.d.). Retrieved August 04, 2016, from <http://www.tolerance.org/supplement/understanding-disabilities-high-school>

### Extensions

N/A

### Common Core Standards

For more information on Common Core Standards, visit <http://www.corestandards.org/>.

Speaking & Listening	
CCSS.ELA-LITERACY.SL.9-10.1	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9-10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
CCSS.ELA-LITERACY.SL.9-10.4	Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
CCSS.ELA-LITERACY.SL.11-12.1	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
CCSS.ELA-LITERACY.SL.11-12.4	Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.
History/Social Studies	
CCSS.ELA-LITERACY.RH.9-10.9	Compare and contrast treatments of the same topic in several primary and secondary sources.
CCSS.ELA-LITERACY.RH.11-12.9	Integrate information from diverse sources, both primary and secondary, into a coherent understanding of an idea or event, noting discrepancies among sources.
Subject Writing (Satisfied in the optional Elaborate activity)	
CCSS.ELA-LITERACY.WHST.9-10.1	Write arguments focused on <i>discipline-specific content</i> .
CCSS.ELA-LITERACY.WHST.9-10.4	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CCSS.ELA-LITERACY.WHST.11-12.1	Write arguments focused on <i>discipline-specific content</i> .

CCSS.ELA-LITERACY.WHST.11-12.4

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

**Next Generation Science Standards**

For more information on the Next Generation Science Standards, visit <http://www.nextgenscience.org/>.

N/A