Leadership in Science

Stage 1 – Desired Results	
Content: Topic for Lesson	
• Leadership in Science	

Understanding (s)/goals Participants will understand that: • *Leadership is needed in different contexts in science.* • *Leadership is a type of personal expression.* • *There are many different types of leadership styles.* • *Leadership style is flexible and depends on the match with the person (leader) and context.*	**Essential Question(s):** • How do personal values inform effective leadership styles? • How does context inform effective leadership styles in science?

Lesson objectives (outcomes):
Participants will be able to demonstrate:
- *KNOWLEDGE: Aspects of scientific careers that require leadership, different leadership styles*
- *SKILLS: Ability to articulate personal leadership style, ability to match effective leadership styles with different situations in science*

Stage 2 – Assessment Evidence	
Performance Task(s): • Small group work to identify where leadership is applied in scientific careers. • Individual work to develop personal leadership vision. • Individual work to determine natural leadership style. • Small group work to determine appropriate leadership styles for scientific careers.	**Other Evidence:** • Participant reflections on compare/contrast of application of leadership in science. • Participant reflections on how different leadership styles benefit a scientific organization and its members. • Participant reflections on leadership styles they would like to cultivate.

Stage 3 – Learning Plan

Learning Activities:
- 1. Science and leadership activity
  - Engage participants: In small groups, participants come up with 2-3 aspects of a scientist's job that require leadership characteristics.
  - Participants engage with each other: Groups create larger list by writing job aspects on board.
  - Explore topic with participants: Present list of job aspects from Nature article and compare/contrast with list on board.
- 2. Develop personal leadership vision
  - Engage participants: Participants write down a list of 10 personal values (e.g., creativity, decisiveness, honesty)
  - Participants engage with each other: Participants discuss personal values in small groups in order to brainstorm additional potential personal values they might want to include.
  - Refine personal leadership vision: Participants pare down their personal list to 2-3 core values

- 3. Leadership style is personal
    - o Engage Participants: Participants compare their core values with defined leadership styles and determine their natural leadership style and/or mix of styles
- 4. Leadership style depends on context
    - o Participants engage with each other: Participants work as a group to match scientific job aspects from activity 1 to leadership styles introduced in activity 3.
    - o Explore topic with participants: Discuss 1) How leadership styles benefit a science organization and its members? and 2) Are there leadership styles participants would like to cultivate given their personal leadership vision and interest in science?

References:
Holgate, S.A. 2012. Enhance your career with leadership skills. Science Blogs: Advice, Issues and Perspectives. doi:10.1126/science.caredit.a1200034. http://www.sciencemag.org/careers/2012/03/enhance-your-career-leadership-skills

Leiserson, C.E. and McVinney, C. 2015. Lifelong learning: Science professors need leadership training. Nature 523: 279-281.

Van Noorden, R. 2018. Some hard numbers of science's leadership problems. Nature 557: 294-296.