

Resources for Science Communication and Teaching Handout

Kristen Cooper, Plant Sciences Librarian coope377@umn.edu

Science Communication

- Identify the core lesson/take away you want your audience to take away with them
- Think about who makes up the population you'll be talking to - be prepared to talk to and teach different age groups
- Tell a story with the ABT template
 - ABT stands for AND, BUT, and THEREFORE.
 - **AND** sets up the basis of your story
 - **BUT** brings in the conflict or challenge that grabs audience attention
 - **THEREFORE** pulls things together and moves narrative toward its conclusion
 - Helps you build a single narrative and keep it moving!
 - In this case can be as short as a few sentences!
- Further resources
 - Don't be Such a Scientist: Talking Substance in an Age of Style by Randy Olson (physical copy) Houston, We Have a Narrative - Why Science Needs Storytelling by Randy Olson (ebook) Both geared toward sharing science with the public
 - Bennett, D., & Jennings, R. (2011). Successful science communication : Telling it like it is. Cambridge ; New York: Cambridge University Press. (physical copy)
 - Bowater, L., & Yeoman, K. (2013). Science communication : A practical guide for scientists. Chichester, West Sussex ; Hoboken, NJ: Wiley-Blackwell. (physical copy)
 - Schiele, B., Claessens, M., Shi, S., & SpringerLink. (2012). Science communication in the world : Practices, theories and trends. Dordrecht ; New York: Springer. (ebook)
 - Bruyas, A., & Riccio, M. (2013). Science centres and science events : A science communication handbook. Milan ; New York: Springer. (ebook)

Teaching Science

- Backward design - Start with the outcome you want from your instruction and then design activities/lessons that allow students to meet those outcomes.
 - "What should students understand as a result of the activities or content covered? What should the experiences or lectures equip them to do? How then should the activities be shaped and processed to achieve the desired results?" (Wiggins and McTighe, 2005)
- Learning outcomes
 - Think about the following
 - What you want people to get out of the visit?

- What is the purpose? Go back to your core message!
 - Then analyze your learners and the learning environment
 - Who are your learners?
 - What experience do your learners have with the content?
 - What do your learners need and what are their anticipated skills?
 - What should the learners be able to do, accomplish, or perform after completing this learning object?
 - What is the learning environment and what constraints are there in the environment?
 - Begin creating learning outcomes
 - Each learning objectives should be an observable behavior. The outcomes should be specific, student centered, and measurable. The learning objective should target one expectation or aspect of understanding that the student needs to accomplish and also highlight the conditions under which the student will accomplish this task.
 - Can follow this 3 step process for creating learning objectives
 - **Create a stem for the objective.**
 After completing the lesson, the student will be able to . . .
 After this unit, the student will have . . .
 By completing the activities, the student will . . .
 At the conclusion of the course/unit/study the student will . . .
 - **After you create the stem, add a verb:**
 analyze, recognize, compare, provide, list, etc.
 - **Once you have a stem and a verb, determine the actual product, process, or outcome:**
 Example:
 After completing this lesson, the student will be able to recognize various forms of citation.
- Further Resources
 - Wiggins, G., McTighe, J., & Ebooks Corporation. (2005). Understanding by design (Expanded 2nd ed., Gale virtual reference library). Alexandria, VA: Association for Supervision and Curriculum Development. (physical copy and ebook)
 - Alenezi H. 2015. Learning as the prize: Enhancing students' intrinsic motivation through backward design. Int. J. Pedagog. Curric. 23:1–7.
 - Childre A, Sands JR, Pope ST. 2009. Backward design: Targeting Depth of Understanding for All Learners. Teach. Except. Child. 41:6–14.

Outreach

- Resources
 - Journal of extension
 - Wilk, A., Spindler, M., & Scherer, H. (2016). Scholar development: A conceptual guide for outreach and teaching. NACTA Journal, 60(4), 385.