Inclusive Strategies for the Science Classroom

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Inclusive strategies in our science classes include all of the above in some form. We strive to make our classroom and our teaching welcoming for all students, regardless of their social identity, gender-identity, ableism, cultural or sexual orientation, race, and a multitude of others.

No student wants to be “othered.” To be othered means feeling invisible, having a voice unheard, and an identity undervalued. Teenagers in particular want to fit in, to belong, and to feel accepted. By having inclusive science classrooms, we can strive to reach this goal.

Within STEM fields, many groups have been othered and not welcomed to the profession. A microscope does not care who looks through it, yet the STEM establishment seems to: only 13 percent of STEM professionals are Hispanic. A mere 25 percent are Black. These figures are distressing and prevent a symphony of talent and conversation to occur in these fields of study.

The STEM pipeline is leaky and we, as science teachers, must do all we can to ensure that all of our students know the STEM career door is open to them if they choose to enter. However, once they enter that door, we must do all we can to keep them exploring and engaging in STEM careers in order to reduce the current attrition rate.

In our classrooms, we want our students’ authentic voices and selves to be present and expressed. By doing so, they will be more likely to see STEM as a welcoming place for all. Do we provide many opportunities for our students’ authenticity to flourish? Do we offer alternative assessments to showcase our students’ talents? By doing so, we make our learning spaces more inclusive for all.

Having students provide input into what content they learn and how they learn it is empowering to all students, and can still be done in such a way to ensure that standards and three-dimensional learning are addressed.

When studying gas laws in chemistry, why must students push through one formulaic problem after another without understanding why gas laws are vital to their everyday lives and experiences? These problems do not address the individual or collective needs of the students, and can deter students from even engaging with the problems. Science teachers who respond to the question “Why are we doing these problems?” with “They are on the test” only serve to alienate students even more.

By providing an inclusive classroom, there will be less need for redirection, consequences, and oppressive strategies, because the students will have greater ownership of their work. The classroom environment also provides space for building meaningful relationships among students, the teacher, and the curriculum, making the entire classroom ecosystem a healthier place for all members.

The time is now for more attention to be paid to providing an inclusive environment for all learners. Our STEM pipeline depends on it. Our future as a progressive scientific country depends on it. Our scientific literacy depends
on it. The health and well-being of all members of the educational community depends on it. Our ultimate goal for an inclusive science classroom is to make sure all of our students can bring their authentic selves to school and feel that they belong, while providing engaging, responsive, and stimulating learning environments.

Possible Alternative Assessments to Foster an Inclusive Science Classroom

- Podcast creation
- Course blog with students writing posts about the phenomena they are experiencing
- Multi-genre project
- Social media profiles (centering around the content)
- Tying students’ identities to the sciences
- Sharing, through artwork, how their culture views the science content
- Creating a music playlist related to what they are learning
- Sharing videos relating to the content; evaluating the videos for misconceptions that are perpetuated in the videos
- Creating a “Shark Tank” project that addresses content being uncovered
- Getting involved in a citizen science project related to their identities
- Shadowing a mentor in a STEM field and creating a project focusing on their findings and experiences
- Writing an autobiography addressing how they perceive science in terms of their identities
- Researching a BIPOC STEM professional, one with a difference, or one from various cultures, and portraying them in class
- Writing a bedtime story focusing on science content in such a way the stories could be read to elementary students.
- Designing a billboard “selling” concepts, phenomena, or science and engineering processes
- Designing a book jacket
- Writing a book review on a STEM book
- Creating a science-based calendar
- Designing a mobile that reflects themselves in science
- Drawing a cartoon
- Creating stop motion videos of scientific processes
- Writing an editorial
- Writing a play for the class to perform
- Preparing an entry for Wikipedia
- Creating a flip book
- Creating graffiti sharing about STEM, STEM concepts, or STEM processes
- Writing a speech
- Engaging in a debate
- Creating a job application and completing it for their ideal STEM career
- Evaluating hypothetical or actual scientific grant proposals
- Sharing myths from various cultural backgrounds that address science
- Creating a parody
- Designing a poster using Canva or some other technological tool
- Creating a questionnaire and gathering data on a particular science topic from friends, family members, and some social media groups
- Writing riddles, limericks, jokes, or puns about content or crosscutting concepts
- Creating a film, commercial, or other media depicting a NGSS standard
- Writing tweets for a mock Twitter account related to the science class