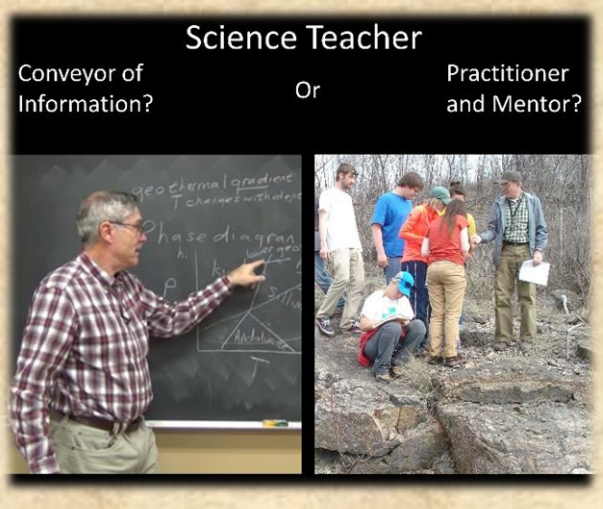
Issues in Earth Science
"Topics for Debate"
Issue 9, May-June 2018

This essay responds to the seed thesis: "Science teacher: conveyer of information or practitioner and mentor?"

Teaching Science Through Curiosity and Discovery

by

Anthony Larson



Students often ask their teachers questions in the classroom. Teachers are knowledgeable in their content, so they answer the students' questions and move on. The students are happy their questions are answered and the teacher is happy they can move on to the next topic. This is where we, as teachers, find

ourselves on a daily basis. This is the easiest way to get through the day, and we feel like we engaged the students by creating the curiosity required for them to ask a question.

There is a problem with this scenario. Those students will have more questions in the future, but they will not know how to find their answers without asking somebody for the answer directly. Teachers should help the students explore their curiosities to find the answers for themselves. This is how real science works.

I often find myself teaching my students the information required for the Minnesota State Science Standards. When I was a new teacher, this information-driven teaching was the easiest way to survive through the first couple of years. I find it hard to find the energy to redo my curriculum in order to change from this style, but I have come to a recent realization: "Why redo my curriculum when I can just throw out my curriculum and help the students create their own learning experience?"

We are in an era of information. Students are going to find information and, when they find it, they tend to believe it. This is similar to the students who ask

questions and receive an answer from their teacher, simply believing what they are told. To counter this trend toward 'hearing is believing,' teachers have an obligation to teach students how to explore in such a way as to test whether the supposed facts are true or not. Teachers can help students understand the concepts in the education standards by having them prove the ideas through exploration.

Teachers try to do this through lab exercises they find online, in a textbook, from a colleague, or just create themselves. These techniques are great, but the real science has already been done for the students. Rather than give the students a lab exercise, teach them basic concepts, give them a problem, and tell them to design an experiment, make observations, or construct arguments to explore their problem. Students will design their own lab exercise to find a solution to their problem. This will make the shift from a teacher-centered classroom to a student-centered classroom. The only work needed from the teacher would be to offer prompting and guidance on how to approach each problem. Students will get better at this with practice and eventually gain the ability to work through their questions rather than just ask them.

One advanced warning: be flexible with time because the students need to be able to operate at their own pace. Also, be prepared to conduct unplanned explorations when a student poses a question that would warrant exploration.

If teaching continues to be the delivery of information, then we teachers may need to be about the business of finding new jobs. Information is easy to come by in today's world where almost anything can be found and learned through the internet. Teachers need to be able to offer something that cannot be obtained elsewhere. We need to offer skills for students to practice the process of science rather than listen and regurgitate information that has been theorized by others. It is mandatory for teachers to work with the students as a mentor to help them through their own discovery.

These skill are not only important because it allows students to truly get a “taste” of science, but they are also skills that apply to every aspect of everyday life inside and outside of the classroom or field of science. If science teachers change the way they teach to a more

practitioner-based model, they will create generations of lifelong learners and problem solvers.

Anthony Larson is an 8th grade earth science teacher in the Twin Cities Metro Area of Minnesota. He has been teaching for 6 years with a diverse student population, and he loves teaching and learning from his students. Anthony holds a B.S. in Earth Science teaching from Minnesota State University Moorhead and an M.A. in Educational Leadership from Concordia University, Portland.

Image Credit: Russ Colson

Link to Seed Thesis for "Science teacher: conveyer of information or practitioner and mentor?"--by Russ Colson

Find more essays and stories at Issues in Earth Science.
©2018 Issues in Earth Science