# Religious audiences and the topic of evolution: Lessons from the classroom – Response to presentation by Wes McCoy

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| Wes McCoy: | 00:19 | My name is Wes McCoy. I'm a teacher at North Cobb High School, Kennesaw, Georgia. I've been a classroom science teacher for 38 years or so. I've also just retired a few years back so I can work at the Georgia Public Broadcasting area, doing science videos, and also I can teach teachers. So I have the experience doing that as well. I'm honored to serve on this panel and Dr. Jensen's research resonates in a very strong way with my own experience teaching at a high school in northern part of the suburbs of Atlanta. Our students are a very diverse group. We are a majority minority school and we have lots of different religious traditions represented in a very healthy way, I think, in our school. Are any of you in the audience, current or former school teachers. (01:18) Okay. God bless you. So you probably also recognize the philosophy of care that was so obvious in Dr. Jensen's work. When students are assigned to my class, the very first thing I have to do is establish a relationship of trust between myself, students, and the parents. I find that most parents recognize the value of excellence in science education, and see me as a partner in providing lessons, using the most effective techniques and the best science available. My specialty, my love, is teaching 14 year olds, not everybody's favorite. I love them, ninth graders, usually it's their first day in high school when I meet them and I have the privilege of starting their high school career with enthusiasm. (02:09) We all bring, all of us, we all bring luggage that you can't check at the airport, if you understand what I'm saying. Students arrive worried about things. They come to school worried about their family. They're worried about bullying, racism, worried about their future career. Teachers need to know these concerns and help students grow by discussing them. For example, the topic of bullying is not in the national science standards, but if a student is fearful of people who exhibit bullying behavior, it's incumbent upon all the teachers at the school to help that student feel safe in our school. So we have more to do than simply address |

science standards.(02:50) How do I know that religion is likely going to be on students' minds when we discuss evolution? As you might expect, when I tell people I'm an evolution teacher, questions about religion usually surface within about 30 seconds. Every time, for 40 years. It might be tempting to tell students to simply go home and ask your parents about these things, but teachers cannot ignore a student concern. But on the other hand, I'm not a religion teacher. So what does a biology teacher do in a circumstance like that? (03:23) You begin lessons, very first day, asking students to learn how to ask questions and the questions have to be answered using science and engineering practices. Students have to ask questions daily, plan, carry out investigations, analyze data, use mathematics and computational thinking. Argue from evidence, argue from evidence and evaluate the reality of information. If all I do is fill my students' heads with facts, then they won't learn where the data comes from and they won't learn how it's analyzed. (04:00) So I interview students and give them written formative assessments. This is how I find out what they know. Usually students walk in without the basic information related to evolution. So here's what they usually don't know, first day of high school. Nearly 90% of my students don't realize that evolution occurs in a population. They think it happens in an individual. Students often describe evolution as a process that can make an animal's leg change into a fin or vice versa during the lifetime of an animal. They don't know what a population is, how population can change, how genetic recombination and crossing over causes variations in chromosomes during the production of egg and sperm cells. They don't know how mutations occur and how it can be passed on. Students think that organisms can be classified by how they care for their babies. They think that two species are related if they share water at a water hole. They often think that genetic changes are intentional. So I've got my work cut out for me. On the very first day, I've got to teach these biological processes. (05:00) When questions about religion arise, I ask my students to reflect back on the first days of class, when we were planning investigations and evaluating data. What questions can we ask and answer using scientific and engineering practices? I also add statements about evolution from a variety of organizations, which may

embrace evolution, or they may be in conflict with evolution, and I'm assuming you'll talk a bit about that kind of activity, Brianna. I want students to feel comfortable asking me about concerns they may have during our lessons. Asking the entire class to engage in an examination of a variety of statements concerning evolution allows students to assess their own comfort level with evolution, and it gives them new words and new sentences that they never heard, and they didn't even know how to think. So learning science in many ways is like learning a new language and try to give them these new words. (05:59) I'm able to affirm to my students that a spectrum of acceptance and understanding of evolution exists in many families and many faith communities. As Carl Sagan often said, "Real patriots ask questions." I also encourage my students to extend that idea to their religious life, real religious people ask questions. And I think the best way you can care about a student, to demonstrate that you care about a student, is to listen to their answers.(06:28) To end this talk, which could go on forever, I'll give what I will call a parable. It's a story not about evolution. 1992 or three, I think, I was teaching a young group of students about cell membranes and I was using cigarette smoke as an example of something that contacts cell membranes. And here's a list of all the different problems that we know that can come from smoke contacting cell membranes. (06:59) Young woman near the front was starting to exhibit a lot of behavior indicating horror at this information. And she was squiggling around in their seat and she was writing things down. Anyway, I took her aside afterwards, once we started our lab activity, I asked her what was happening. And she said, they had just had a ceremony at their home. She was a Filipina. And they had just had a ceremony in their home where the grandparents had created a ritual in which there was a lot of smoke and a brand new born baby was being passed through the smoke as a purification for this child, to generate health in that child's life. And she couldn't quite fit this idea of purification by smoke with the idea of what I was telling her about what science is saying about the effects of chemicals on cell membranes. (07:53) So I asked her if maybe there's some other way of purifying, maybe there's a spiritual way to purify baby, go home and talk to your parents about this. And the next

day she came back, she was elated because her parents said to her, that's exactly right. It is a spiritual way of purification, and don't you ever smoke cigarettes. There was an easy acceptance in that case. Anyway.

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