Science: Magnets and Wonder

What if a lesson on magnetism inspired wonder and curiosity?

Natalie was introducing a new unit on magnetism. During this unit, she wanted to teach in a way that kept the mystery and wonder, yet covered the science content.

“I taught the lesson as I usually did. The students had an opportunity to explore and discover what they could about magnets using a range of materials. I gave them magnets, and let them find what materials were attracted to the magnets as they went around the classroom. As a class, we discussed what they noticed about the magnets from their ‘exploring.’ We recorded what we knew and what we had found out about magnets, with the intention of referring back to this at the end of the unit.

“I wanted to set the tone for the unit, so I finished this introductory session with a series of attractive images of iron filings and magnetic fields to create a ‘wow’ factor. I am a fairly expressive person, so I used my body language to express my own wonder and excitement. I also talked about how people through the ages have been fascinated by magnetism. Magnets have seemed mysterious, even miraculous, to many people because they can move things at a distance through invisible forces.

“I then talked a little about how scientists have gradually understood more and more about the way magnetism works. I asked them, ‘If we can describe how something works in scientific terms, is wonder and a sense of mystery is an appropriate response?Does magnetism stop being amazing or beautiful if we can understand it? Does a spectacular sunset stop being amazing if we can describe scientifically how it is being produced? Is it a mistake to think that scientific explanations make things ordinary?’ I commented that if we really pay attention, then understanding the complexity of the world can lead us to greater wonder at what God has made, not less.

“I put up a few questions about magnetism that I wanted to explore as the unit progressed, such as how magnets can affect other things from a distance; I encouraged the students to do the same. I also added to the display Albert Einstein’s quote about there being ‘something behind things, something deeply hidden’. I put up the question, ‘What do you think he meant? Do you agree?’”

What's going on here?

Natalie saw her science lesson as a place for wonder and mystery, and thinking about big questions, instead of just quickly learning the material. She left the students thinking they had only just begun to find out about magnetism, and there was so much more to explore!

Natalie engaged students in exploring the subject matter in order to generate questions—not just answers—and in experiencing its beauty and mystery.

She reshaped her practice by modeling questions and wonder through her body language, by encouraging students to raise questions, and by using images that could provoke a response of wonder.

What does this have to do with faith, hope, and love?

As a Christian, Natalie believes that there is no line between the sacred and the secular. Faith is not limited to a religious part of life, but applies to all of life, including science. Science can show people the wonders of God's world and lead to worship. In the classroom, she helped her students to see that science can make us think about the big questions of life, and that faith can leave us stunned by the beauty and complexity of the world.

What difference does it make?

Natalie was trying to stop the attitude that says, "Magnetism: done it, check it off the list." She wanted her class to finish the unit with the feeling that there was much more to explore. By not limiting the type of questions they could ask, Natalie contributed to breaking down the sacred-secular divide and the perception that science and faith, or explanations and wonder, are in opposition.

Where could we go from here?

There are many areas of science where a 'wow' factor can be incorporated without changing the lesson very much. Encouraging questions can become a feature of learning in any lesson.

Digging deeper

Pliny the Elder, St. Augustine of Hippo, Isaac Newton, and the young Albert Einstein all were amazed by magnetism. Einstein later wrote there was "something behind things, something deeply hidden." They all were impressed by the power of magnets to move things without touching them. Familiarity with the phenomenon has led to some loss of wonder at this incredible force; we take it for granted, even though it is one of life's wonders.

Augustine's wonder at magnets led him to praise God. Newton was a man of faith. They did not draw lines between the sacred and the secular. To accept no divide between sacred and secular means seeing faith as integral to all subjects and all areas of life, including science. Exploring a subject from a Christian perspective might involve exploring the big issues, asking ethical and religious questions, and making connections across a range of areas. As St. Augustine put it, all truth is God's truth, for there is a deep interconnectedness in the world (Acts 17:28)

Mention "spirituality" and most people think in terms of something vague and other-worldly. In contrast, the spirituality of the Bible is very much of this earth. Matter—the stuff of this world—is given the thumbs-up by God at creation when he declares the world "very good" (Genesis 1:31). The things of this world can stimulate a spiritual experience that, for some, leads to worship, from the smell of cooking to the wonders of magnetism and the elegance of math.

Curiosity and questioning are not the opposite of faith. On the contrary, they can feed faith and be asked from within or outside a relationship with God. Curiosity is not idle speculation, and questioning is not doubt; they are part of being alive to God's world.

> ***The first key to wisdom is defined, of course, as assiduous and frequent questioning. Peter Abelard***

> ***The important thing is not to stop questioning. Curiosity has its own reason for existing. One cannot help but be in awe when he contemplates the***

> *mysteries of eternity, of life, of the marvelous structure of reality. Albert Einstein*

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