



# Science: Seeing Connections

## What if growing beans helped students see the interconnectedness of the world?

Adam taught photosynthesis in science, and wanted his class to see the interconnectedness of everything.

"My class was about to experiment with growing beans in light and dark places, and in places with light coming just from one direction. But I also wanted them to see the relationship between everything; how photosynthesis fits in with everything else, rather than treating it as an isolated fact.

"I starting a discussion with the question, 'What eats what?' After lots of specific examples about cows eating grass, birds eating worms and seeds, cats eating mice and birds, and people eating meat and vegetables, we gradually got around to the conclusion that the food chain always leads to plants. So, then we asked, 'What do plants eat?' That was harder, but it set the stage for talking about plant nutrients. The next question was, 'What do plants need to grow so that they can make food?' What do they take in from around them?' (Answer: water, minerals, sunlight, air)

"I explained photosynthesis, and then recapped using a fun video ([http://www.youtube.com/watch?v=C1\\_uez5WX1o](http://www.youtube.com/watch?v=C1_uez5WX1o)). I highlighted how plants use carbon dioxide and release oxygen during photosynthesis, and how it is the other way around for animals and people. As a result, plants, animals, and humans are all interdependent. At this point one girl suddenly burst out with the question, 'But how did it all get like that? It all fits together!' It was as if someone had turned on a light, a real moment of insight. I decided to show a few images of the food chain at the end, and asked students to reflect on its remarkable relationship and how we need to make sure that chain is not broken."

## What's going on here?

Adam saw his science lesson as a way of demonstrating the interconnectedness of creation that, for him, pointed to a meaningful creation. He also saw it as a way of provoking big questions.

He engaged students by focusing their attention on relationships so they would think about connections and perhaps experience wonder. He also created spaces for reflection.

Adam reshaped his practice by choosing his questions and their sequence carefully with attention to the story his science was telling and the reactions it might evoke. This resulted in building to a moment of understanding; his lesson was consistent with acknowledging a creator, even though he did not discuss this.

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

This discussion reflects the Christian faith in a creator God who made all things to “fit together,” as the young girl observed. Such insights enable spiritual development in students as they gradually realize more about the greatness of God. This can inspire hope and a sense of meaning as a consequence of understanding about an all-powerful, all-knowing, creator God who holds all things together in the world that he created.

## What difference does it make?

Previously, Adam’s class had grown beans; they had all understood the importance of light for photosynthesis, but they had not understood the bigger picture of ecosystems and the interconnectedness of the created world.

## Where could we go from here?

A focus on how things got to be as they are, and the use of sequences of questions to build up to insight into how intricately things fit together, can be applied to various areas of teaching within and beyond the science curriculum. For various science topics, we can effectively ask what ways of structuring the learning sequence might be most likely to lead to wonder, rather than a simple list of facts.

## Digging deeper

Belief in a good creator assures us that he has not created a meaningless universe. The pattern and complexity in the world point to a designer who created with a purpose and gives life significance. An attitude of being challenged and changed by what we learn, rather than just mastering information, means making ourselves vulnerable. It is asking, "What does this say to me and to my community?" This way of viewing learning makes both knowledge and the learner active, drawing them into a relationship.

*If thou desire to profit, read with humility, simplicity, and faithfulness; nor even desire the repute of learning. Thomas à Kempis*

Adam challenged the sacred-secular divide, which is the idea that there is a secular world and then there is religious belief, which is viewed as a private hobby that does not impact public life or any parts of the curriculum except Bible class. Here faith is impacting science in an appropriate way. The attitude of dividing religion from the rest of life has led to fragmentation of knowledge into parts often seen as unrelated to each other and God. This division of knowledge is a comparatively modern idea. The Bible sees things very differently. The entire world is God's and can reveal him (Psalm 24:1).

*Until about a century and a half ago, scientists and scholars commonly assumed that knowledge formed a coherent whole; more precisely, they assumed that all parts of knowledge ultimately could be connected because every area of knowledge focused on some aspect of one single divine creation. J. Turner*



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