

Science Comes to Life Using MyStemKits Curriculum

A high school biology teacher helps his students conceptualize challenging information using 3D printed manipulatives

Challenge

Bob Wallace, a now retired high school biology teacher in Crawfordville, Florida, was resolute in his goal that his students graduate with a full range of academic skill sets and technical knowledge that would prepare them for a successful future. In his over 30 years of teaching, he found that textbooks alone could rarely explain important concepts that kept his students engaged. This led to difficulties comprehending the information being presented. For example, his students had trouble conceptualizing how ‘crossing over’ (genetic recombination) happens during mitosis and meiosis.

Wallace employed a variety of strategies to explain difficult science concepts to his students and was consistently on the lookout for options that would keep his students engaged. He stated, “Over the years, I’ve used a lot of different things. I have done drawings on boards, still magnets, and I’ve used beads – the beads go bouncing all over the place and you end up losing all of them.”

BENEFITS

- Increased student engagement
- Improved understanding of difficult concepts
- Deeper discussions on new information
- Saves time with premade lessons

Key Solution

During a workshop offered by the Florida Center for Research in STEM (FCR-STEM), Wallace learned about [MyStemKits](#) curriculum. He was intrigued by the collection of **over 330 STEM lessons**, aligned to Next Generation Science Standards (NGSS), and its focus on 3D printed materials. The lessons and Design Challenges work in tandem with a 3D printer to produce manipulatives that help students better understand STEM concepts. Each MyStemKits lesson includes 3D printable files, a teacher guide, an extensive lesson plan, and student assessments, activities, and handouts. Wallace loved how MyStemKits threw out the flat world of a textbook in favor of real-world manipulatives that students could interact with and analyze. He also appreciated the simple set up, making the learning curve less intimidating and burdensome.

KITS USED: Chromosomes Kit, Darwin’s Finches Kit, Hominid Species and Tools Kit



Benefits

After Wallace implemented the MyStemKits curriculum in his classroom, he noticed a substantial increase in student engagement. His first kits were the Chromosomes Kit, Darwin's Finches Kit, and Hominid Species and Tools Kit. As was previously mentioned, his students had difficulty conceptualizing genetic recombination during mitoses and meiosis. Using the 3D-printed chromosomes, his students could easily swap colors on the chromosomes to see exactly what happens. Because they were able to manipulate the chromosome, his students successfully grasped the concept of recombination!

For the Darwin's Finches Kit, Wallace presented the beak models on a table and encouraged his students to identify the differences between them. When students completed the lesson, he led his students into a deeper discussion of key findings and concepts. Eventually, his students were designing their own experiments while he acted as observer. He commended the MyStemKits teacher

material saying, "The lesson plans are very good. A teacher can print the lesson for students, put it in front of them, and the students can follow along on their own and learn."

"The students come to class, learn while having fun, and all of a sudden you hear them talking... 'Oh wow! Look at the teeth on this!' They're not going to get that from looking at a book. I never hear comments like that from them when learning through a book. With MyStemKits, they start developing ideas on their own."

- Wallace relating experience with Hominid Species Kit

Besides the 3D-printed models, students also used tools not typically used before. For example, when facilitating a lesson from the Hominids Kit, students used a caliper to measure the specimens. This sparked further conversations on the

differences between each model such as the size of the jaws to the shape of the teeth. Wallace was excited to report, “The students come to class, learn while having fun, and all of a sudden you hear them talking about...‘Oh wow! Look at the teeth on this!’ They’re not going to get that from looking at a book. I never hear comments like that from them when learning through a book. With MyStemKits, they start developing ideas on their own.”

He went on to note that before MyStemKits, his students were not motivated to graph data, yet much of the standard course requires testing this skill.

Oftentimes, his students complained or did not complete the assignment. When 3D printing was used, he found that motivating his students to graph was no longer an issue. He said, “I (told) them these are 3D printed. Since they don’t get experience with that, that hooks them! Because they get excited about having something cutting edge – 3D technology – they are willing to do the graphing.”

Wallace found that using the MyStemKits curriculum positively impacted how lessons were delivered, providing a unique – and fun – way to grasp difficult concepts. He said, “This is fantastic for getting students motivated. I would highly recommend. At low costs and simple to use, you can take this and run with it. Science (was) really coming to life for them!”

“ The MyStemKits teaching tools are all 3D printed and the students love it - that hooks them!”

- Bob Wallace

To watch Bob Wallace’s video testimonial, click [here](#).

*Reprinted from 2018



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MyStemKits.com is the online platform for all MimioSTEM curriculum. From ready-to-print 3D models, STEAM design challenges, and virtual STEM kits, to lesson plans for the MyBot robots and Labdisc portable sensors, MyStemKits has everything an educator needs to incorporate MimioSTEM products right away. Enhance STEM teaching and learning in any classroom environment with MimioSTEM.