littleBits education

WHAT WE DISCOVER WHEN ART DRIVES STEAM LEARNING

LANCASTER MENNONITE SCHOOL BRINGS STUDENTS INTO STEAM EARLY -- THROUGH ART

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Lancaster Mennonite School (LMS) in Lancaster, Pennsylvania, is a private Christian school that helps students of diverse abilities and interests be all they can be. It nurtures creative and innovative learners who are prepared for college, career, and life.

LMS services 1,000 students across three campuses. Each campus incorporates STEAM topics into its curriculum every day, but most of their hands-on STEAM work in elementary school comes from a source you might not necessarily expect -- the art department!

The Importance of Art in STEAM

Jenna Longenecker is LMS's third-year art teacher; she is self-taught in STEAM and coding. Jenna was instrumental in creating a makerspace at LMS that incorporates a variety of tools, including littleBits.

While LMS is not a super tech-hungry school, administrators understand the impact of balancing hands-on project-based learning with screen-based technology. They know that a mixture of both is key to the future of work -- which is sure to be both collaborative and hands-on.

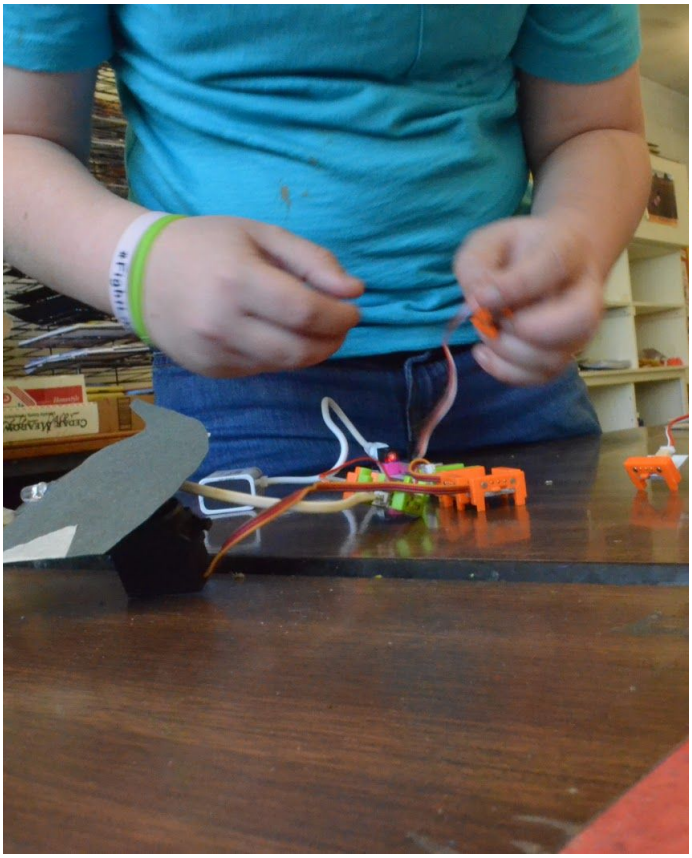
“Providing students with opportunities for hands-on, experiential learning teaches students to make connections between a variety of disciplines. It equips students to someday use these skills to solve our world's biggest problems.”

Jenna Longenecker, *Art Teacher*

But isn’t this type of work best-suited for a science or technology class? How did LMS integrate STEAM so flawlessly into art class?

Designing a STEAM Curriculum

Jenna created LMS's makerspace like a design lab. She encourages students to come up with solutions to problems and then design and test those solutions. For this reason, the makerspace is a great mixture of high-tech tools (like littleBits and 3D-printers) and recycled materials (like cardboard, popsicle sticks, paper towel rolls, bottle caps, string, rubber bands, etc.).



The key to success is coming up with interesting -- yet open-ended -- parameters that allow students to experiment with all of the tools in the makerspace. A recent project, for example, called for students to design a structure that would withstand the big bad wolf. Jenna brought in a huge window fan to "huff and puff and blow [the structures] down."

And they are exposed to STEAM in more traditional ways, as well -- via coding class, which occurs for 40 minutes every other week. Finally, students have the opportunity to extend their learning outside of class through a once-weekly STEAM Club offered to grades 3 - 5, sponsored by GoSTEAM. Students have also engineered intruder alarms for artistic treasure boxes they made.

“It's so exciting to see students make connections between art and technology and math (seemingly very different subjects). I generally think of art as a more expressive and emotional subject, so it's really exciting for me to see students using logic (in the form of degrees and algorithms) to create geometric shapes and patterns through coding and robotics.”

Jenna Longenecker, *Art Teacher*

Exposing Students to STEAM Early

Art and coding class, as well as time in LMS’s makerspace, are not the only places that students are exposed to STEAM. Jenna collaborates with teachers to incorporate STEAM into their own classrooms, including those that don't have familiarity with the subject area. She shares resources and occasionally collaborates on lesson plans that tie into teachers' everyday curriculum. Her goal is to help them build STEAM experiences for students from an earlier age so that they will be more familiar with key concepts later in life.

Providing students with access to core STEAM courses as early as elementary school increases their interest in pursuing STEAM careers, according to a study commissioned by littleBits that was

conducted in partnership with YouGov, a third-party research organization.

And for the United States to truly be competitive in STEAM fields, we need to build out a pipeline of kids who are interested in pursuing STEAM, as early as elementary school. Not only that, but we need to teach them STEAM topics in ways that are accessible to students, such as hands-on and creative learning techniques.

As Jenna knows, art is key to STEAM. It's a skill set that tech companies and others are looking for in the future of work -- and it requires three-dimensional teaching. And when you combine it with other curriculum, it becomes exponentially more powerful.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