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MyStemKits.com

Foundational technology for STEM education Presenter: Ryan Legudi CEO Robo 3D ryan@robo3d.com





What Do We Know?

"In the next 20 years, 80% of all jobs will require technical skills."

- US Bureau of Statistics

"8 out of 10 most wanted employees were ones with STEM education backgrounds."

- US Department of Labor

So Why 3D Printing?

"A student can design a prototype and see how it works and, if it fails, they can modify their design and print another one. Even engineers at the professional level have to deal with failure and adjustment. Also, if we can get them comfortable with 3D printers now, if that's just the nature of their experience growing up, then they will expect to use it later in life and be comfortable with it." Markus Hartnett, Glen Grove School in Glenview, IL

"More than just having fun, I absolutely believe [3D Printing] ups their chances of choosing a career in the STEM field. It takes something that's an unknown and makes it comfortable and exciting. The looks on their faces, you can't believe what a 3D printer does to them." Yolanda Velencia, Gulliver Academy in Miami, FL

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Biggest Problem with 3D printing in Education

We have a 3D printer,

but we don't know how it works or what to do with it. We want a 3D printer,

but we don't know how to integrate it into the classroom.

If we don't **get teachers excited** about 3d printing, how are they going to **get their students excited** about it?

Our Solution cobo



300+ K-12 3D Printable Math and Science lessons, which allows teachers to use full curriculum to teach lesson plans that their students will be engaged in with hands on activities!

Robo 3D + MyStemKits ... hardware & software delivering turnkey 21st century STEM education





Success Stories



3D Printing Stories: Rebuilding Coral Reefs with 5th Graders Shelley Emslie

5th grade teacher, Big Fork Montana 22 Fifth-graders in Shelley Emslie's class have been studying the coral reef ecosystem. They are now learning how to design their coral using Tinkercad, a free app containing 3-D design and modeling tools. The students will participate in live video chats with coral reef scientists stationed in the Caribbean through Digital Explorer. Emslie currently is researching the possibility for student-created coral to contribute to some international scientists' efforts to rebuild the fragile ecosystem through 3-D printing.

<image>

"We are equipping our students to compete, excel, and succeed in a 3D world. Robo 3D printers inspire creativity, critical thinking, and problem solving." Shelley Emslie

3D Printing Stories: School Lends A Hand Aaron Sottile Calavera Middle School

Using 3D printing, students in Aaron Sottile's design and modeling class, part of the Makerspace Program at Calavera Middle School, are creating custom prosthetic hands for kids in need around the world.

> "We focus on the design process and solving problems," Sottile said. "3D printing is pretty cool technology that we are getting the kids involved with. They learn core skills and all about assembling these hands. Also, it makes the kids feel good that they can change somebody's life." - Aaron Sottile

3D Printing Stories: Max 3D prints his skating invention Max Newton California Max (14) is a student in San Diego, CA who used Robo 3D printing to design his own custom electric skateboard and start his own business Felonious Skateboards and is already selling his custom skateboards to people all across California.

> "Because I was able to learn design on my own and I had a lot of ideas, I got excited to make my own custom electric skateboard. It has been a dream of mine and 3D printing made it possible" - Max Newton

3D Printing Stories: Riley 3D prints products to fundraise **Riley 3D** Canada Riley, a 11 year old student in British Columbia has taken his design skills and passion for creating to design, sell and fundraise to bring more 3D printers to his school so he can teach design to his fellow students. He has raised \$2,000 to date.

> " You'd be so impressed with Riley's engagement, energy, and enthusiasm. We have a redesigned curriculum here in British Columbia, Canada that encourages student-driven projects now" - Principle Anthony Walters



Where foundational technology meets purpose



Perfect for developing digital literacy & 21st century skills

Combine digital tools for 3D design, 3D printing ad STEM lessons with hardware to develop 21st century skills



Develop critical thinkers

Example: Students can use the catapult kit to understand the impact of physics on distance traveled, and adjust to meet their requirements.



Develop global collaborators

Example: Students can use Skype to talk with students in Africa to help design more efficient irrigation systems for farming.



Develop innovative designers

Example: Students can use Tinkercad to design a prosthetic hand, then prototype and iterate on their 3D printer.



Develop computational thinking

Example: Students can design algorithms to control their personallydesigned 3D printed traffic light systems using electronics kits.

...and delivers innovative and engaging standards-aligned learning experiences

Promote deep conceptual understanding

Engage in global learning and experiences

Drive empathy with real-world, hands-on learning

Excite interest in STEM subjects & careers

MSRP \$999



robo E3 Safe, smart and simple

The Robo E3 new generation smart 3D printer with Wi-Fi is built for classrooms by providing safe, smart and easy-to-use features — equipped with a fully enclosed structure and HEPA filter for safety, a 5.9 x 5.9 x 5.9 inch print space, a quick removable nozzle, heated print bed, and much more!

ž Efficient 5,9" x 5,9" x 5,9" (150 x 150 x 150 mm) print size



Built-in touchscreen

Flexible, heated print bed

!0

Onboard camera



Filament run-out detection



Removable nozzle



Prints most materials types



HEPA filter

MyStemKits

An innovative and engaging K-12 solution to complement your school's STEM curriculum, powered by 3D printing technology

300+

STEM lessons tied to Common Core and NGSS

60+

new Computer Science lessons released

200+ available kits

K-5: 100+ 6-8: 150+ 9-12: 120+

25+

new 3D design challenges released



Online Lesson Plans

I've never seen them so engaged. It was the best lesson in my five years. Heather Alden Lassiter, Middle School Teacher

MyStemKits allows even the most beginner or advanced teacher to easily be able to incorporate STEM and 3D printing in the classroom.

Online lesson plans include:



Ready-to-print 3D models



Assembly instructions



Teacher guides



Student handouts and assessments



NGSS and Common Core standard alignments





MyStemKits provides multi-use & multi-disciplinary opportunities



Kit Name: Ball Bearing Kit **Potential Careers:** Physicist, Mathematician, Statistician, Data Scientist

K-5

- Practice measuring
- Create dot plots
- Use descriptive terms
- Ask questions
- Discuss gravity
- Investigate energy & motion

6-8

- Graph bivariate data
- Investigate mass
- Create scatterplots
- Determine a line of bestguess & calculate slope
- Discuss outliers
- Explore levers
- Analyze mean and absolute deviation
- Compare potential and kinetic energy

9-12

- Run statistical analyses
- Graph quadratic functions
- Explore parabolic motion
- Calculate standard deviation
- Contrast contact & noncontact forces
- Compare potential and kinetic energy
- Create regression lines
- Interpret data sets

STEM integration project:

Students can design a new lever arm to throw the projectile farther or throw a different type of projectile. Challenge: create an adjustable-length lever arm

High ROI for schools and the community

Equitable access for students and teachers with online training, support, and resources

On-demand printing of replacement parts saves time and money

Connect with local community by using 3D printers to solve community issues

Kits can be re-used for multiple lessons across different subjects, and across grade levels

Open materials so not locked in to one supplier

Multiple uses of the 3D printer (design classes, MyStemKits, community projects)

Major cost savings on 3D printed manipulatives vs. traditional methods (see example below)

MyStemKits.com

Hominid Species and Tools Kit

This kit features skulls from the major groups of hominin species as well as a modern chimpanzee, showing major changes that have occurred in the 7 million years since humans and chimps shared a common ancestor. It also features tools associated with each hominin species.



These skulls are precisely modeled to replicate either respected reproductions or actual fossil finds, and can be used to examine trends in hominin evolution, including brain size, jaw size, and tool use.

Designed for the classroom, the skulls are 1/3 scale and come with a letter indicator on the inside of each skull for teacher reference. Additionally, the jaws are attached to the top of the skull so you don't have to worry about mismatching or losing them. Each of the tools are offered at 1/2 scale for ease of storage.

Approximate Printing Cost: \$10.00

Comparable Product

Hominid Skull Set of Six

The popular Hominid Skull Set of Six includes six fossil recreations of historical finds from the hominid evolutionary tree. Set includes: BH-05 Homo erectus – Peking Man, BH-07 Australopithicus africanus –



STS-5 "Mrs Ples", BH-09 Neandertal – La Chapelle-aux Saints, BH-12 Homo ergaster – KNM-WT-1500 "Nariokotome Boy", BH-15 Australopithicus boisei – KNM 05 "Zinjanthropus", and BH-21T Australopithicus afarensis – "Lucy".

Difference - MyStemKits (MSK) includes 7 species, all males, all with jaws, and four tool replicas. Printing cost based on 1/3 scale replicas, but MSK program allows interactive scaling.

Purchase Cost: \$1,500.00

MyStemKits.com product costs less than 1% of the comparable product.*

MyStemKits: Elementary Case Study

"I feel as though it is part of my responsibility as an educator to seek new technology to incorporate into my curriculum. With students so widely immersed in the digital age, MyStemKits presented a way to bring lessons to life for them in a new and exciting way." - Christine Tarver

WHO

Christine Tarver, 5th Grade Teacher Lewis Carroll Elementary School, Merritt Island, Florida BENEFITS

Student engagement, preparing students for 21st century, assessing prior knowledge

KITS USED

Angle Tester Kit, Basic Shapes Kits (Circles, Triangles, Polygons, Quadrilaterals, & Right Solids), Composing Polygons Kit, Decomposing Shapes Kit, Partitioning Circles Kit, Partitioning Rectangles Kit



To view other MyStemKits stories, check out: <u>robo3d.com/mystemkits</u>

MyStemKits: Middle School Case Study

"The students are really motivated to focus now. Especially the lower 25% who normally lack the attention span, they're like, 'Okay, I got to get this.' That empowerment has made a huge difference. They're really answering questions at a much higher level thought process. Their retention is much better... I've done

some other activities before, but MyStem is more like the whole package"

- Ninamarie Sapuppo

WHO

Ninamarie Sapuppo, 6-9th Grade Teacher Florida State University School, Tallahassee, Florida BENEFITS

Student engagement, connecting various mathematics concepts, retention, saves time with premade lessons

KITS USED

Ball Bearing Catapult Kit, Clinometer Kit, Density Shapes Kit, Gliders Kit, Golden Ratio Kit, Pencil Quadrat Kit



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Online Training 2 full hours with quizzes

What is 3D printing

3D printing role in education

Getting started with your Robo 3D printers Ways to print

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Understanding print settings and ways to 3D print better Using MyStemKits to teach

Basics of design and design training lessons

Thank you!

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