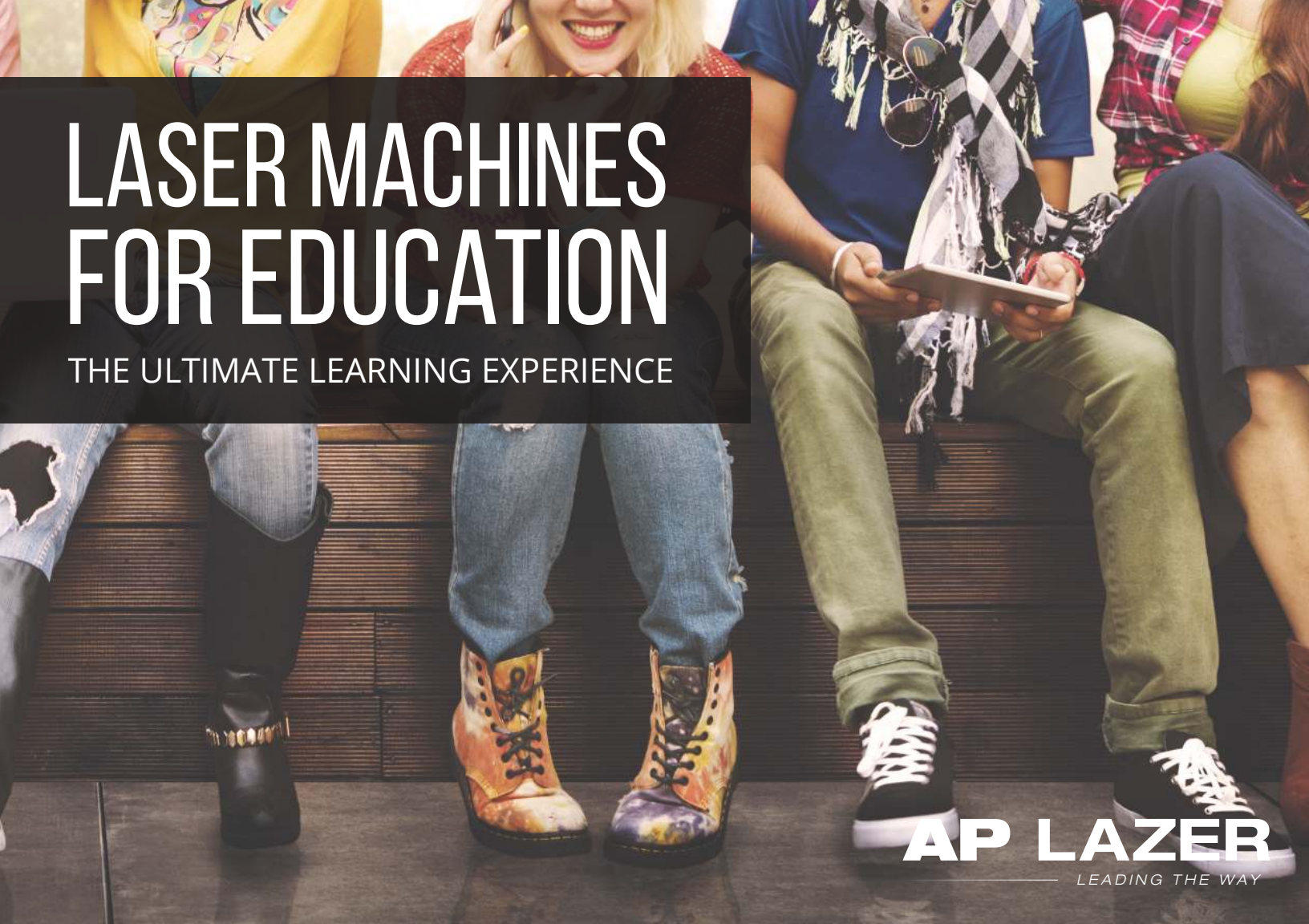

LASER MACHINES FOR EDUCATION

THE ULTIMATE LEARNING EXPERIENCE

AP LAZER

LEADING THE WAY

CONTENTS

1. WHAT IS A LASER AND WHAT CAN YOU DO WITH ONE?.....03
2. LASER MACHINE BENEFITS FOR CLASSROOMS 07
3. LASERS AND STEAM: WHAT'S THE CONNECTION?.....12
4. COMMON QUESTIONS FROM EDUCATORS.....22
5. WHY AP LAZER? 26
6. WHAT EDUCATORS ARE SAYING ABOUT LASERS 32
7.WHAT'S INCLUDED 36
GET YOUR SCHOOL A LASER!.....40

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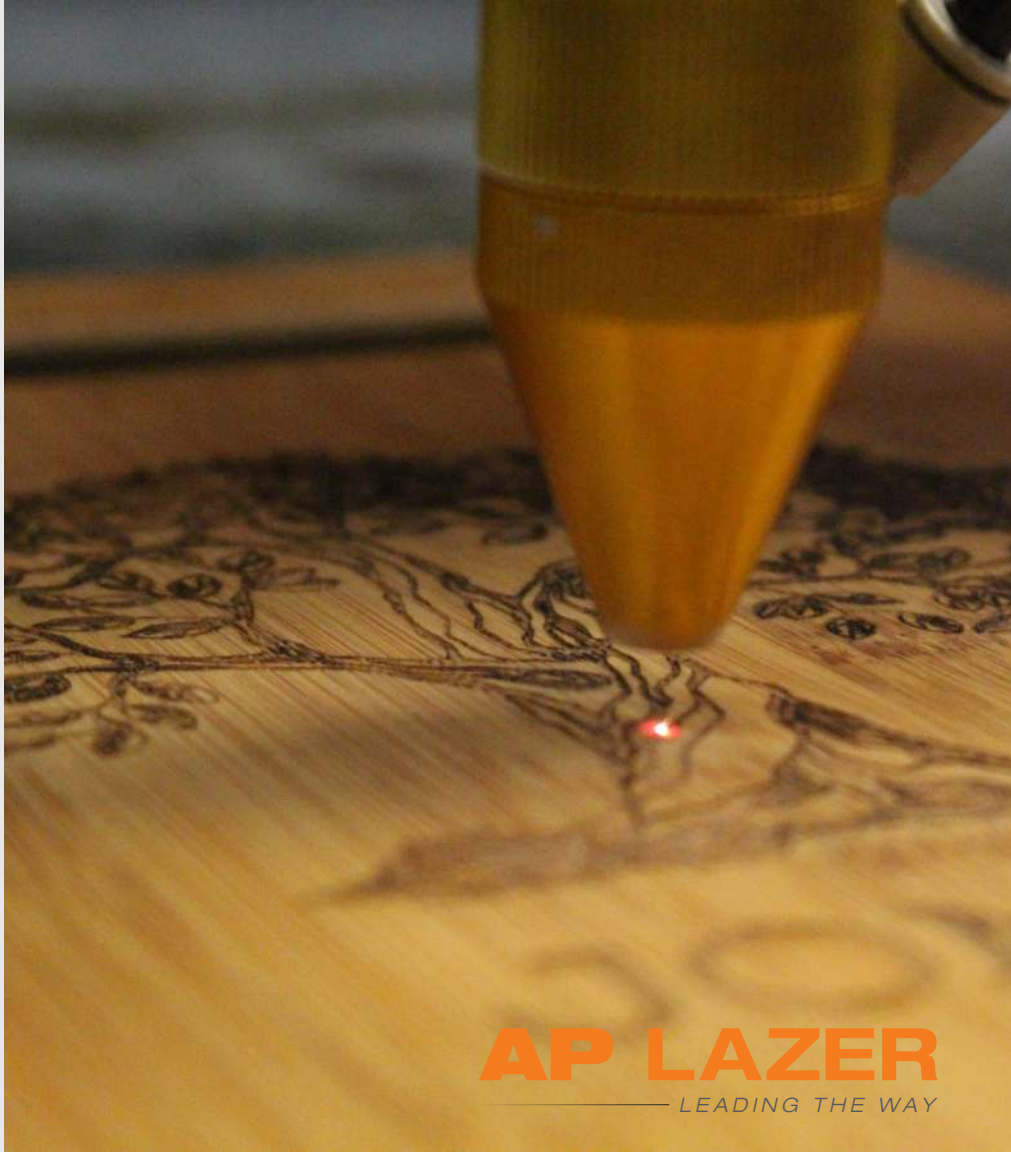
1 WHAT IS A LASER AND WHAT CAN YOU DO WITH ONE?

A Laser machine produces a laser beam from a C02 laser tube. The intense laser beam light reflects through a system of mirrors through a nozzle. Within the nozzle, the laser if focused through a lens where a very concentrated beam is created allowing for cutting and engraving many materials.



LASERABLE MATERIALS

Cut/Engrave Acrylic

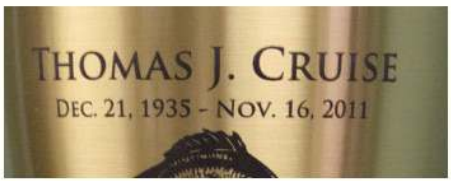
Cut/Engrave Wood

Cut/Engrave Leather

Engrave Glass

Engrave Brick

Cut Cardboard & Paper



Engrave Metal

Cut/Engrave Fabric

Engrave Granite

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ENDLESS POSSIBILITIES

With the ability to cut or engrave nearly any material, laser machines are truly the greatest STEAM tool on the market.

"If money were no object, the laser cutter would be my No. 1 tool, as it is perhaps **the most versatile tool that I have ever used.**"

Casey Shea, California high school math teacher and "Maker Educator"

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2 LASER MACHINE BENEFITS FOR CLASSROOMS

EASY TO LEARN

Lasers work like a printer, but with a laser beam instead of ink. Students import their artwork, input the correct speed and power settings for their material and “print” the job to the laser.

It’s an ideal tool for students of all ages; students can begin with simple projects (creating a text box with their name) and work into more complex 3d concepts.

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MANY APPLICATIONS

A laser provides dozens of real life applications. Get students engaged in the use of lasers and they will be ready for the world ahead.

- › Advertising
- › Architecture
- › Packaging
- › Clothing
- › Medical Industry
- › Label Production
- › Signage
- › Furniture
- › Prototyping
- › Plastic Processing
- › Food and Plantal
- › Automotive
- › Laser Engraving

...And More!

"The number of things we could find to use this machine for are countless! There isn't a program offered today which hasn't been changed with the incorporation of technology. This is why we selected a laser engraving system, and **it has definitely improved our curriculum."**

George Danford, Career Center Director

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RAPID RESULTS

500X FASTER THAN A 3D PRINTER!

Keep excitement strong and engagement steady within students. A simple 3D letter would take hours to produce with a 3D printer, while a laser can produce the same letter in minutes. A lasers speed allows an entire class of students to complete their own small projects within one class period.

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One-eighth inch plywood is an inexpensive material available at your hardware store and can be used make beautiful wooden creations; create custom whiteboards for classroom use with showerboard; readily available cardboard is great for prototyping designs and even the final product in many cases.

AP LAZER

LEADING THE WAY

3 LASERS AND STEAM: WHAT'S THE CONNECTION?

A laser features 3 axis motion with computer numerical control. Lasers support a broad STEAM, or “Design Thinking” program without needing a ton of special training. Integrating laser systems into K-12 can help illustrate complex design and engineering principles.

AP LAZER

LEADING THE WAY

LASERS AND SCIENCE

Physics
The laser beam is light physics generated in a controlled tube, a key component of the laser machine.

Electricity
The power supply can be presented in a learning diagram of how the energy from regional power plants transmit power via power lines with transformers that step down the voltage to 110 volts.

Mirrors
A laser makes for an interesting discussion of how a simple mirror can reflect a powerful laser beam. (Just like the shield of Captain America!)

Refraction and Optics
A diagram easily shows how individual light photon beams that are parallel can be concentrated to a point based on the curvature of the lens.

Material Science
Because each material reacts differently to the laser beam, engraving and cutting different materials is an exciting educational exercise in material science.

AP LAZER
LEADING THE WAY

LASERS AND TECHNOLOGY

Motherboard
The entire laser system is technology in and of itself! The motherboard controls the X and Y axis and communication between the computer and the laser. It controls the firing of the laser to make sure it fires at the right time and the right place.

Software
Many different softwares can be used to create laser ready files. Understanding how different file types work prepares students for technology-based careers.

Computer
Basic computer skills are becoming necessary for nearly every industry.

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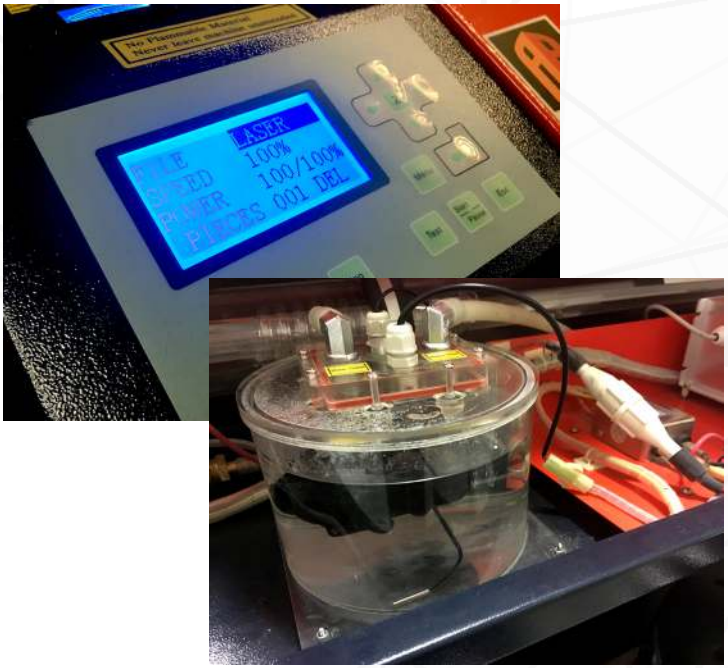
LASERS AND ENGINEERING

Complex Motions
X and Y axis motion controls allows the laser to move quickly in complex motions for cutting and engraving. Z-table movement is integrated to the controller to allow the user to move the z-table up and down.

Control Panel
The control panel is programmed to receive images and text and communicates with the machine controls to run the intended cut or engrave.

Machine Components
The power supply, safety switches and cooling system components are engineered to work together to make the laser system run seamlessly.



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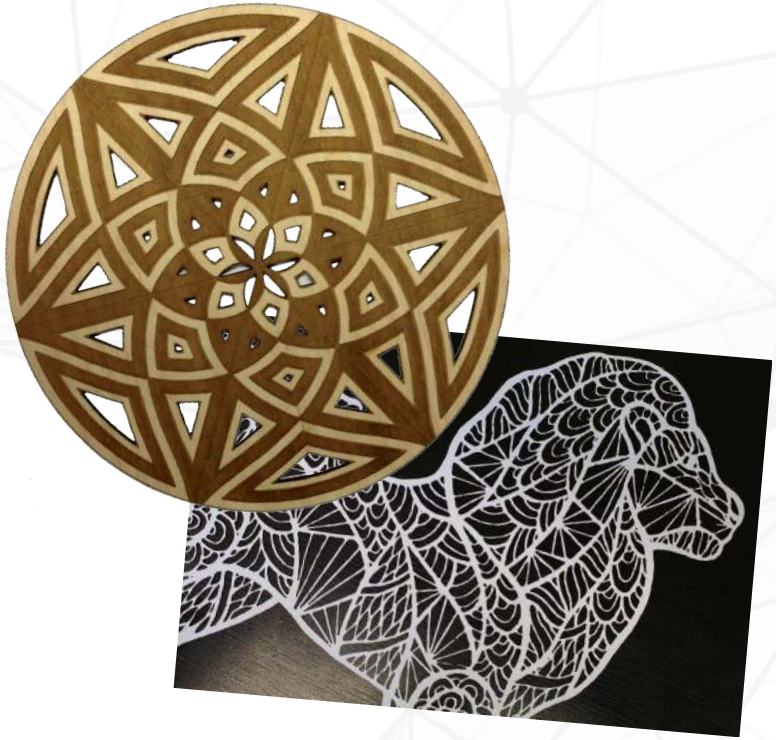
LASERS AND ART

Design
Students will refine their computer design skills when producing laser-ready art.

3D Thinking
Students will develop the ability to think in 3D when using a laser; cutting on a 2D plane and producing 3D pieces.

Artistic Thinking
Although a laser will allow students to create hundreds of useful and unique items, being familiar with art and design can turn the ordinary into the extraordinary!

Excel in other Areas
With art and creativity, students can make new discoveries and take STEM concepts to new levels.



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LASERS AND MATH

Geometry of Shapes
When engraving a cylindrical objects, students will calculate the curve to account for engraving distortion.

2D to 3d
When creating 3D objects out of 2D materials, students will use math to make sure pieces fit together and angles are correct.

Mathmatical Theroms in Practice
For example, the converse of Thales Theorem is useful when you are trying to find the center of a circle. Students can apply this theory when laser cutting out, or engrave on a circle.

AP LAZER
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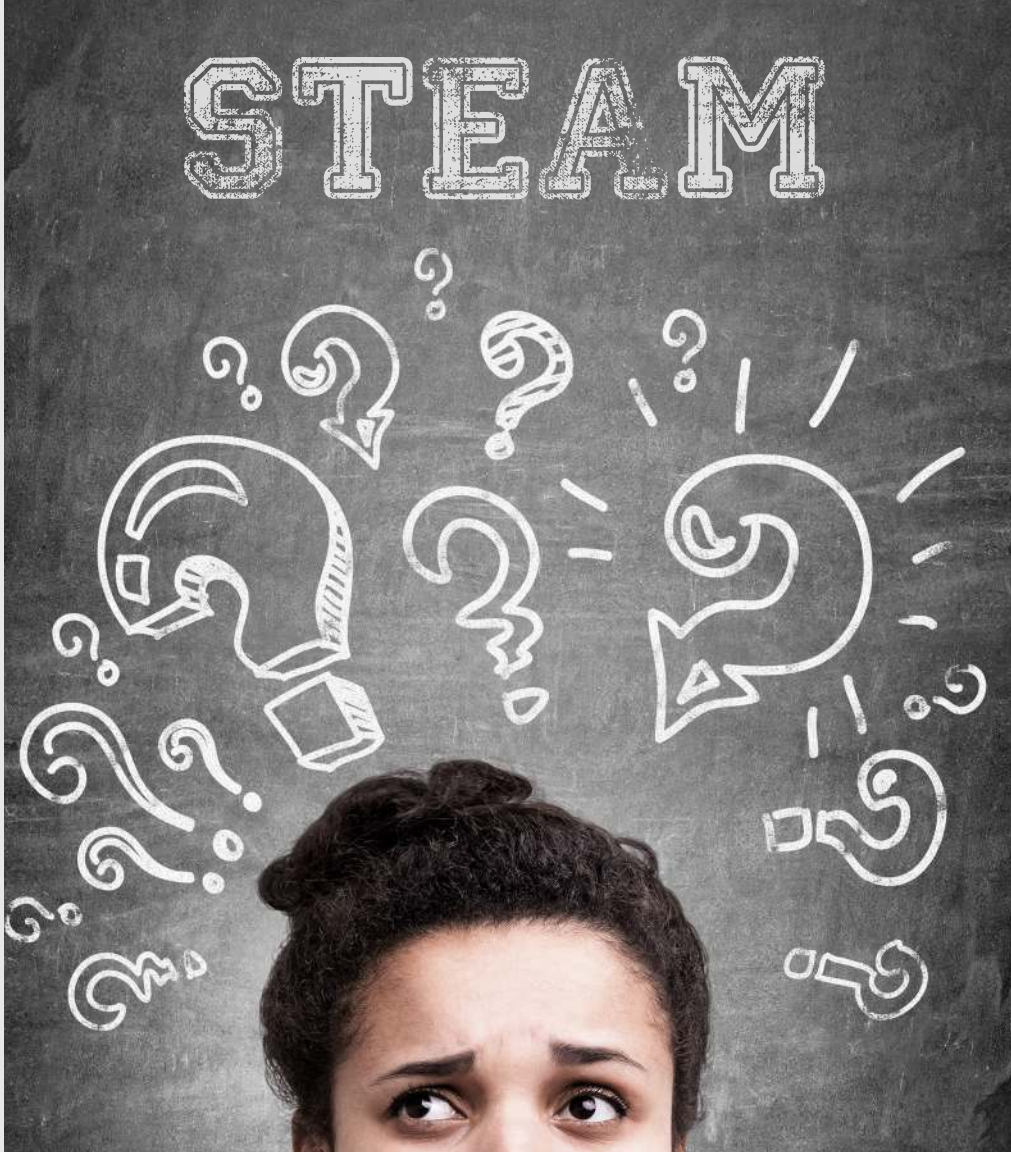
By **engaging students in STEAM concepts through their own interests**, laser technology allows teachers to **transform students into thinkers and builders well before they reach the job market.**



"Our AP Lazer is the most **used tool in our inventory.** It's versatile, approachable and provides **rapid results.** The laser gives the students an opportunity to develop "Design Thinking". **It teaches an understanding of the X, Y, and Z axes without learning a complex operating system like our CNC router."**

Joel Gordon, Arkansas Regional Innovation Hub

AP LAZER

LEADING THE WAY

ENDLESS LEARNING OPPORTUNITIES

Getting students excited about STEAM concepts is easy when they can learn through their own interests!

Theater students can use the laser for sets, props and costumes. Athletes can engrave things like baseball bats, gloves, shoes and sports balls. Artistic students can work on their design skills while producing art with the laser. The musically inclined can engrave names or inspirational quotes onto music instruments. **The best part? It's easy enough for a 10-year-old to use.**

AP LAZER
LEADING THE WAY

4 COMMON QUESTIONS FROM EDUCATORS

Q: Is AP Lazer Safe for Student use?

Yes! There are safety switches on each of the main doors which will not allow you to run a laser job while the doors are open. The Water Flow Safety switch detects coolant flow and works to prevent the laser from firing if the coolant is too low. These safety features are installed in accordance with federal and international regulations. Additionally, AP Lazers are equipped with a venting system that removes fumes from materials being engraved or cut. As always, you should check the materials MSD sheet before attempting to laser cut or engrave them.

AP LAZER
LEADING THE WAY

Q: How will my school pay for AP Lazer?

If your school does not have funds available for technology purchases, there are dozens of STEM funding opportunities, all it takes is a little research and work. Stemfinity.com contains over 1,000 grant opportunities throughout the United States.

Believe it or not, AP Lazer can actually generate funds. (No, we're not talking about laser printing money!) AP Lazer creates dozens of fundraising opportunities; student projects can be auctioned off, and your school can even save money by producing your own signage, trophies and more!

Q: Who can use AP Lazer?

AP Lazer is such a versatile piece of technology, nearly any department of your school can take advantage of it. Teachers and administration, theater students, athletes, art students and math whizzes can all use the laser. Lasers can be incorporated into a fab lab or woodshop class. One thing is for sure: wherever there is a laser, there is curiosity and excitement among both students and educators.

"I'd like them to **be inspired.** Kids in general are naturally curious. It doesn't matter what their ethnicity is or their background is; **they're curious."**

Sean O'Malley, Rutgers University

5

WHY AP LAZER?

AP Lazer systems are turnkey packages and come with everything you get your fab lab ready for student learning!

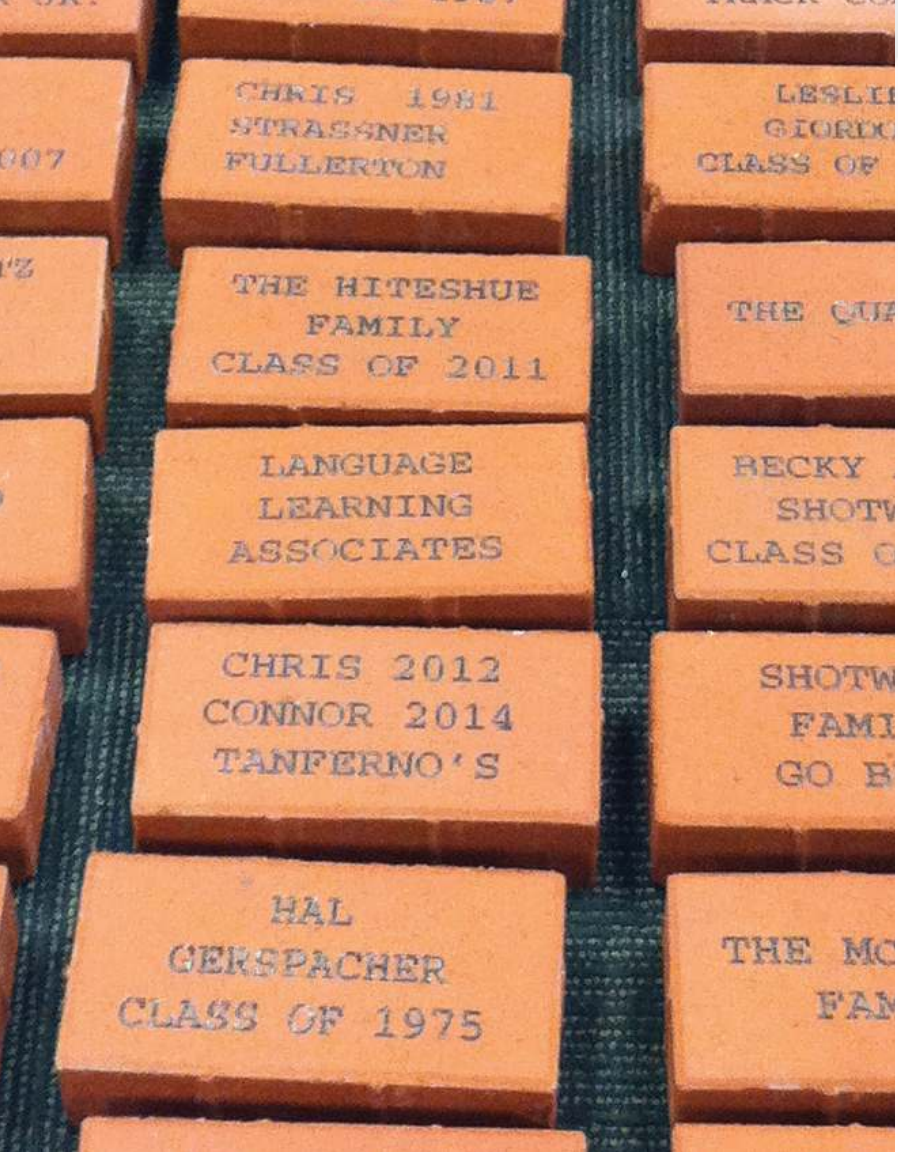
THE AP LAZER DIFFERENCE

AP Lazer is unlike any other laser machine on the market. A patented two-part design allows students to take creativity and learning to new heights. A roll out home base means any size or weight item can be engraved!

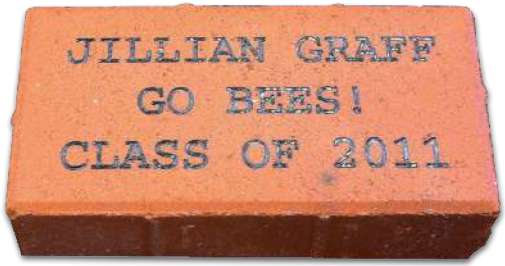
AP LAZER
LEADING THE WAY

Laser engrave directly on flooring by removing the laser top completely.

Level the machine top with any job surface using the E-Z Leveling System.



High power, 80w-100w laser tubes makes producing fundraising bricks a breeze! (An easy revenue generating opportunity!)



AP LAZER
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A single brick fundraiser has the potential to pay for your school's AP Lazer!

Sell 315, $100 bricks!

Sell 210, $150 bricks!

Sell 157, $200 bricks!

Sell 105, $300 bricks!

AP LAZER

LEADING THE WAY

Place heavy objects on the Mechanical Lift Cart to roll them directly under the laser head.

Placing the home base underneath the laser top to use AP Lazer like a traditional 'boxed-up' laser machine.

AP LAZER
LEADING THE WAY

6 WHAT EDUCATORS ARE SAYING ABOUT LASERS

"To me, the best answer to "Why a laser cutter" **isn't the project ideas, but rather a connection between digital and physical mindsets**... So many of our students are comfortable on a laptop, picking up skills in Illustrator or any other vector drawing program with comfort and ease. **Being able to make those things into a physical reality gives them an "in" into making, which is a hook into engineering, art, intuitive physics, ... etc**.

George Jemmott, The Nueva School

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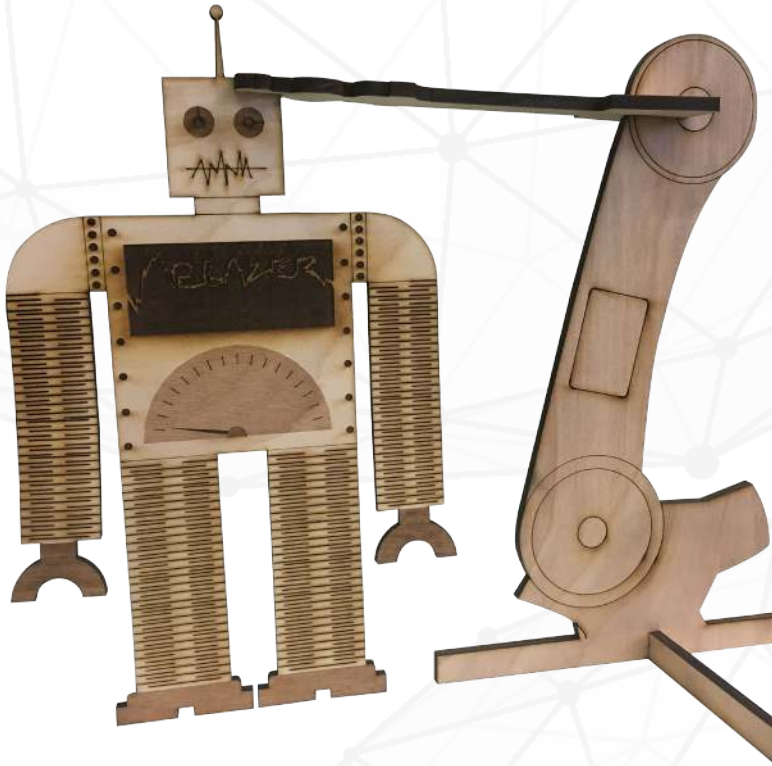
Even though they are a lot more expensive, I think that **laser cutters are a better tool than 3D printers** if you have to pick only one. They are also **radically less temperamenta**l than 3D printers, as well as **faster**, and bluntly, not a device for making endless amounts of plastic crap.

Kenton Hoover, Director of Operations at The Tehiyah Day School

AP LAZER
LEADING THE WAY

Laser Cutters are a big up front investment, but tend to be **inexpensive to operate, inexpensive to design for,** require **less teacher support** both in design and operation and provide a **rapid throughput that keeps student project energy moving,** while providing a level of **polish** and **zazz** that knives, scroll saws and drills cannot easily match.

Steve Westwood, Educator



AP LAZER

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7 WHAT'S INCLUDED

Standard Package*

1. Home Base with Utility Carriage (Z-table)
2. Protective Eyeglasses
3. Rotary Table
4. Blower
5. Mechanical Lift Cart
6. Air Assist
7. Laptop
8. CorelDraw Suite X7
9. Photograv Software

*SN1812 Excluded.

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ON SITE
SET UP
ASSISTANCE
*SN1812 Excluded.

24/7
TECH SUPPORT

3 YEAR
PARTS
WARRANTY

APL
UNIVERSITY

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TAKE THE NEXT STEP!

U.S. Patented

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