How to Bring Thunder Laser into Classroom

1

What’s the STEM Education?

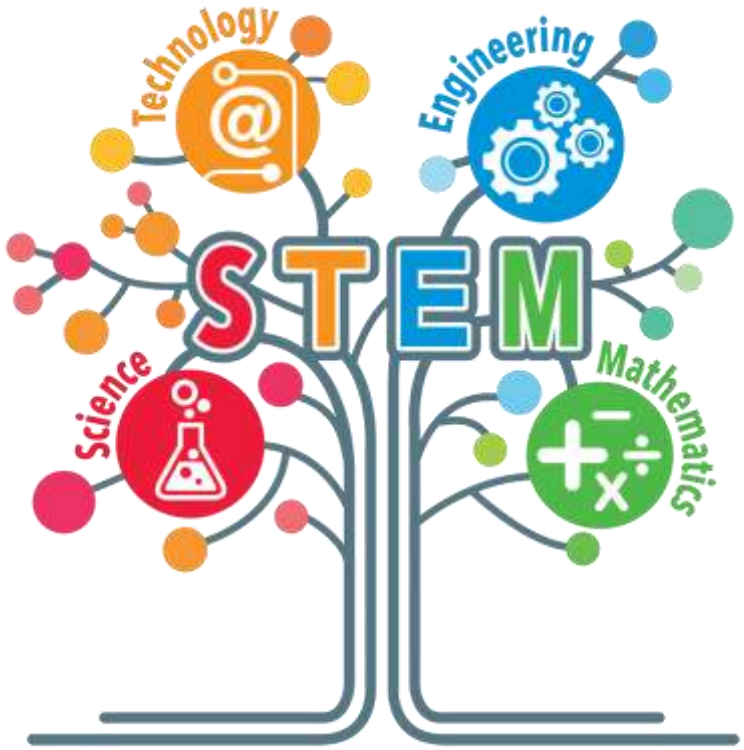
●STEM education

STEM education is an educational philosophy and model of education that emphasizes practice-based, interdisciplinary policies.

In the U.S., STEM is an integrated discipline or an integrated program, and the main mode of STEM learning is project-based learning, so it can be useful for developing students' interdisciplinary problem-solving ability, and cultivating students' 21st-century skills, including critical thinking, creativity, cooperation, and communication skills.

In China, STEM education has been introduced in the field of science and technology education since 2001, and the research on STEM education began to flourish after 2012, and STEM and creator education was written into the education informatization document of the Ministry of Education in 2016, since then STEM education has entered into a booming stage in China, and has made remarkable progress in education practice, education research and education policy. Since then, STEM education has entered a booming stage in China and made remarkable progress in educational practice, educational research and educational policy.

STEM education has been developed to varying degrees in different countries around the world, such as the United Kingdom, Germany, Finland, Israel, Australia, Japan, and South Korea.



Hardware and Software for STEM Education

- Programming software: Scratch, Blockly, MakeCode

- Open source hardware: Arduino, Raspberry Pi, micro-bit

- Digital processing equipment: laser cutter, 3D printers, CNC mill

2 Tools for STEM Education

01 Handmade Tools


Craft knife


Scissors

The creative handicraft class, renowned for its engaging nature and fun-filled activities, has always been a hit among students. Using ice cream sticks, paper boxes, and other materials as the main raw materials, students create their works of art with purely handmade tools like craft knives and scissors.

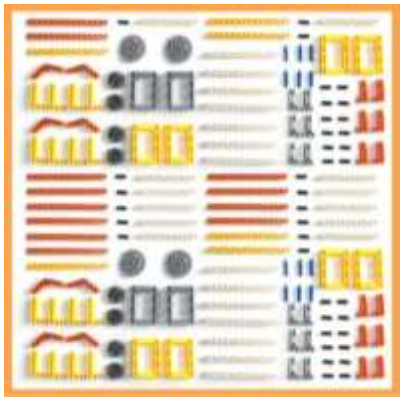
Advantages

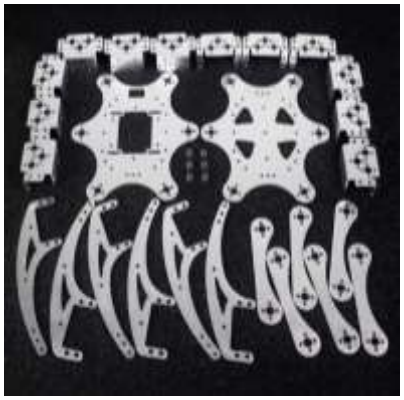
- easy to operate
- cost-effective

Disadvantages

- Rough appearance
- inefficient in creation
- Hard to share or upgrade

02 Brick Kits





With the development of robotics education, the use of block kits for building works of art has become popular.

Advantages

- Easier to construction
- Nice appearance

Disadvantages

- Frequent repetition in creations
- higher costs
- students' creativity limited

03 Digital Tool: 3D Printer

With the rise of maker education, digital tools have become a standard fixture in campus makerspaces due to their precise processing and ease of sharing and iteration.

Advantages

- Integrated molding
- Exquisite workmanship
- Easy to share and upgrade
- High technological portability

Disadvantages

- limited processing dimensions
- limited range of processing materials

03 Digital Tool: Laser Cutter

Gradually, the high efficiency of laser cutting machines has greatly satisfied the need for rapid prototyping, making them a powerful assistant in various maker competitions.

Advantages

- High processing efficiency
- Low cost for batch processing
- High creative freedom
- Exquisite workmanship
- Easy to share and upgrade
- High technological portability

Disadvantages

- Large space occupation
- Relatively high initial cost

3 Laser Technology in STEM education

Various Materials, Unlimited Creativity

When a wide range of materials meets laser technology, the possibilities for creativity become limitless - anything can be created.

Daily necessities

Decorations

Teaching aids

Toys

Precise Modeling, Structural Upgrades

The integration of laser technology with open-source hardware enhances the engineering structure of creations and elevates their aesthetic appeal.

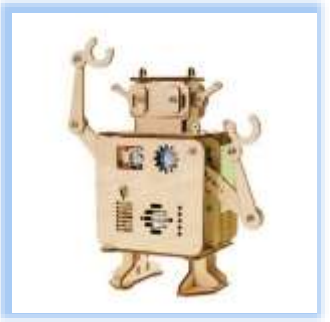
Palace Lantern

Boredom Box

Wheat Bear Battle Car

Exam Cheating Prevention System

Mini Piano



Welcoming Robot

Tongue-wagging Bluetooth Speaker

Safety Stairs Preventing "Retrograde Walking and Running/Jumping"

Laser Cut + DFRobot Boson

Laser Cut + Arduino

Flying Shark
Racing Car

Crazy Basketball
Machine

Handmade Electric Guitar

Shining Canton Tower

Starry Moonlight Lamp

MIDI Piano and Drum Kit

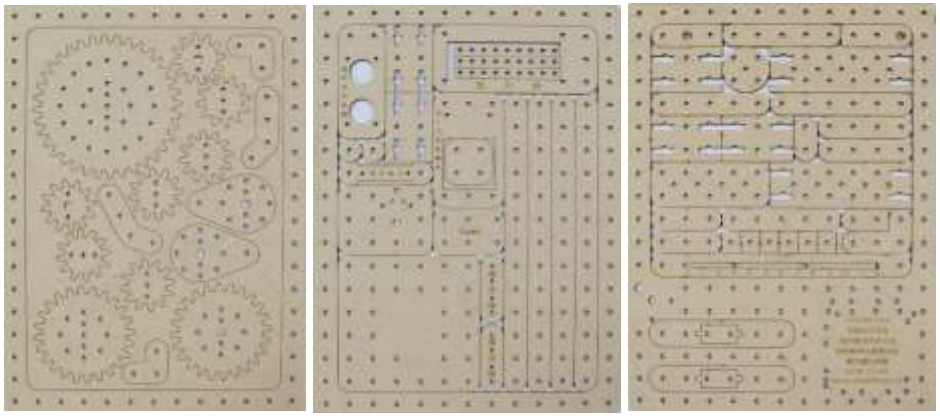
Laser Cut + mPython

Laser Cut + MIDI

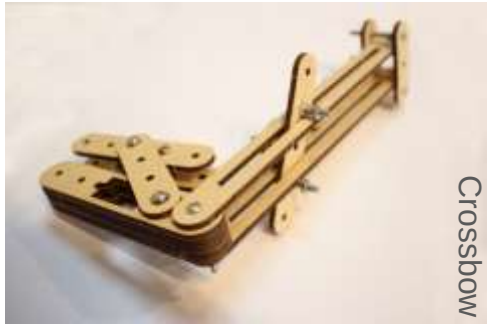
Flexible and Versatile, Creations for All

With just a single set of open-source Laserblock, robots of various shapes and designs can be created, significantly reducing the cost of robot education and realizing the educational vision of enabling everyone to engage in creation.

Laserblock Standard Edition



Swing



Crossbow

Laser Cut + Open-Source Creativity

Timed fan

Smart Parking Lot

Plant Companion

Remote Door Opening

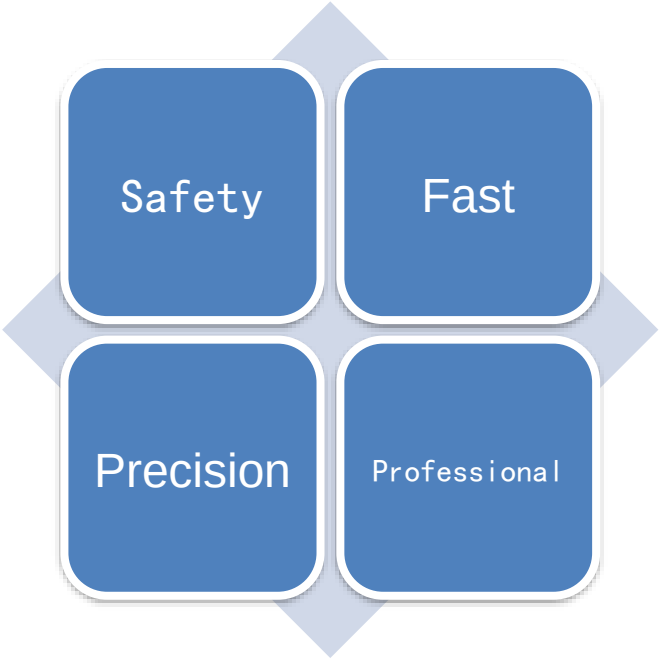
Laser Cut+ IoT (The Internet of Things)

Note: Example from "Internet of Things, So Easy!".

4

Thunder Laser STEM Solutions for School

1.Laser Cutter - The Ultimate Tool for Creation



Safety is the Foundation

Education is paramount, but safety precedes all. Educational laser cutters must possess multiple safety protection devices to provide the most comprehensive safety guarantee, ensuring users can create with confidence.

Key Management Mode

Sealed Body Design

Automatic Shutdown upon Opening

Temperature Alarm

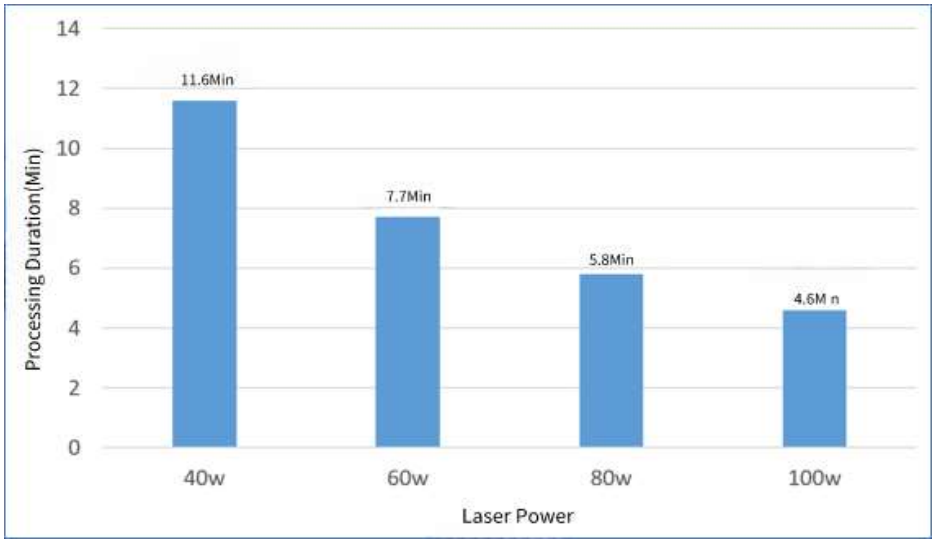
Emergency Stop Switch

Operational Status Indicator

Efficiency is the Core

As a crucial component of advanced manufacturing technology, laser cutters excel in processing efficiency. Moreover, the higher the laser power, the greater the processing efficiency.

Processing Time for a Hollow Cube with 120mm Edges at Different Power Levels



Precision is the Key

Quality comes from attention to detail, from core components to minute parts, from mechanical design to installation and debugging. Every step is crucial, ensuring precise and top-tier processing results, so that users can enjoy the joy of creation.

3D Relief Sculpture

Paper-cutting Art

Stacked Art

Image Engraving

Professionalism is the Guarantee

Professional-grade laser cutters are equipped with a variety of processing platforms, enabling users to unleash their boundless creativity and create without limitations.

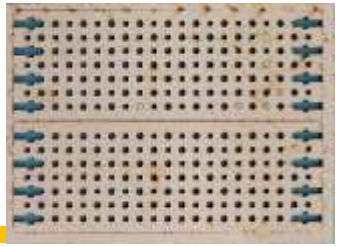
Large Platform

Process multiple components at once,
Create large-sized and practical works,
Enhance processing efficiency.

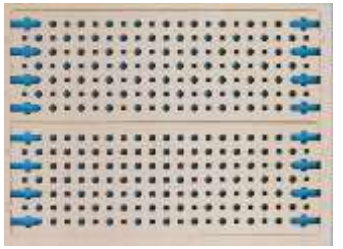
Blade Strip Platform

Levitated processing material.
Minimizing laser reflection from the backside.
Offering optimal processing results.

Honeycomb Platform Cutting Works



Blade Strip Platform Cutting Works



Lifting Platform

With a one-touch lifting platform,
easily process large objects,
big boxes or large watermelons,
let your creativity run wild.

Rotating Platform

The ultimate tool for cylindrical objects,
whether it's a glass cup or a bamboo cup,
360° coverage,
a must-have for customized gifts.

2.The Drawing Master - Modeling Software LaserMaker

LaserMaker is a free, universal laser modeling software developed for the scientific and technological innovation market, compatible with all mainstream laser cutters on the market.

Official Website：www.lasermaker.com.cn

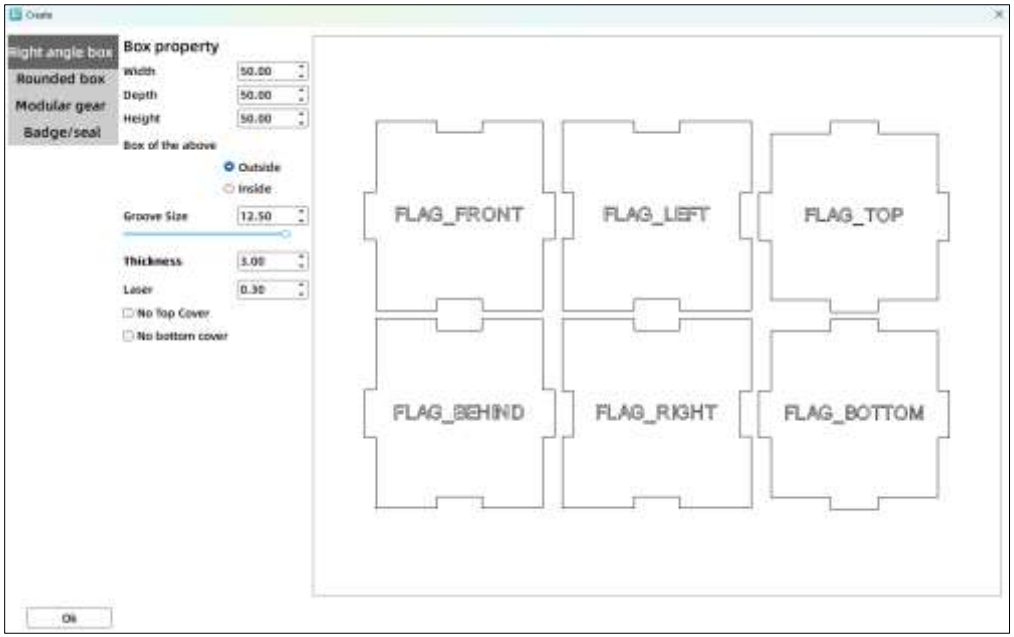
- With a clean and concise interface, LaserMaker facilitates rapid modeling and further enhances understanding of laser technology and processing principles.
- Born for laser creation, LaserMaker is highly educational and suitable for both theoretical and practical learning.

LaserMaker Features

Rapid Drawing

LaserMaker boasts convenient and efficient drawing tools, including modeling templates and a diverse image library, enabling rapid drawing capabilities.

Convenient Drawing Toolbox



One-Click Box Generation

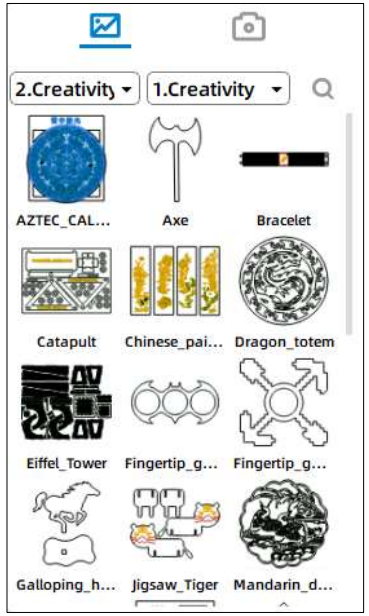
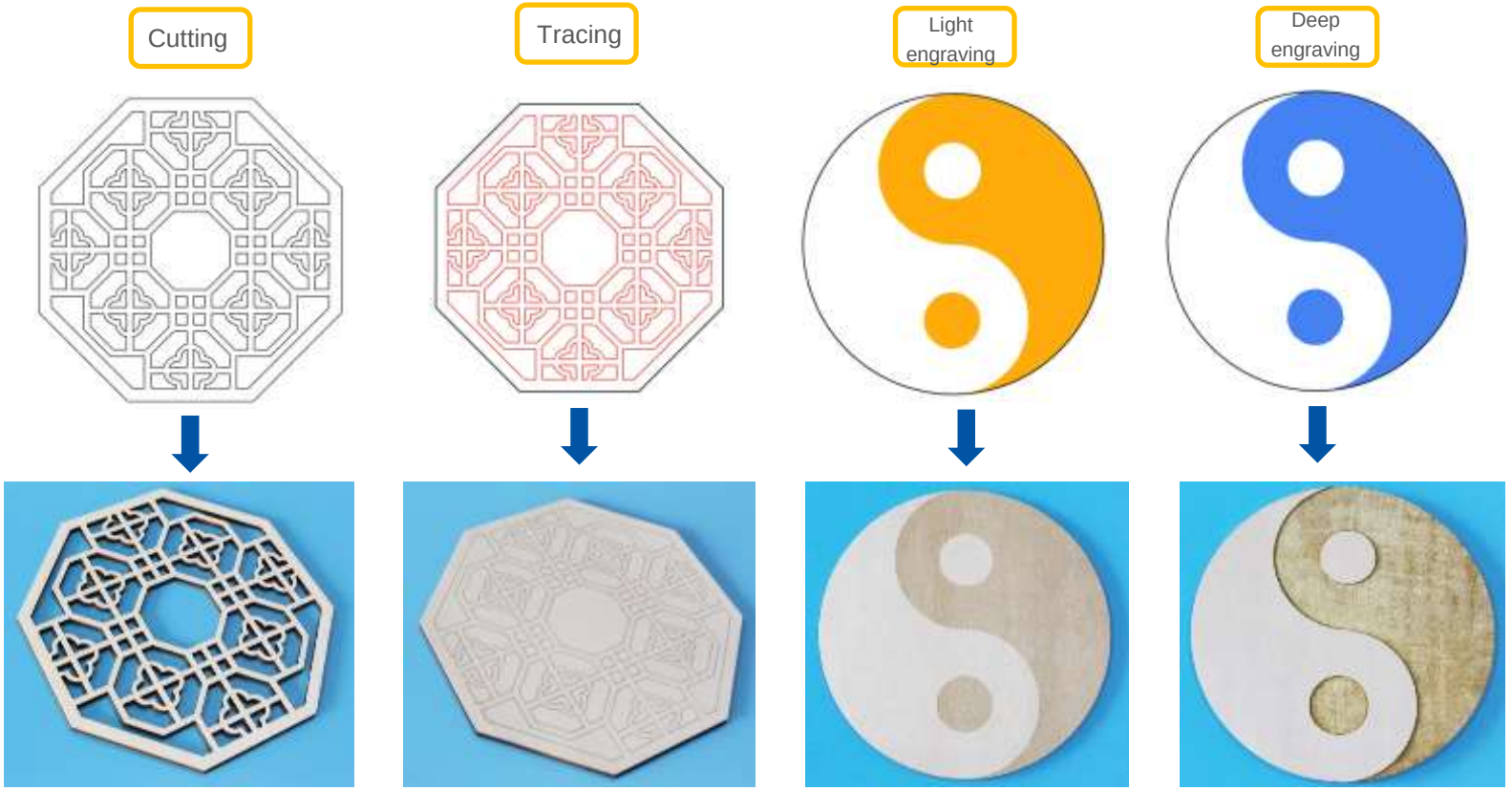


Image Libraries

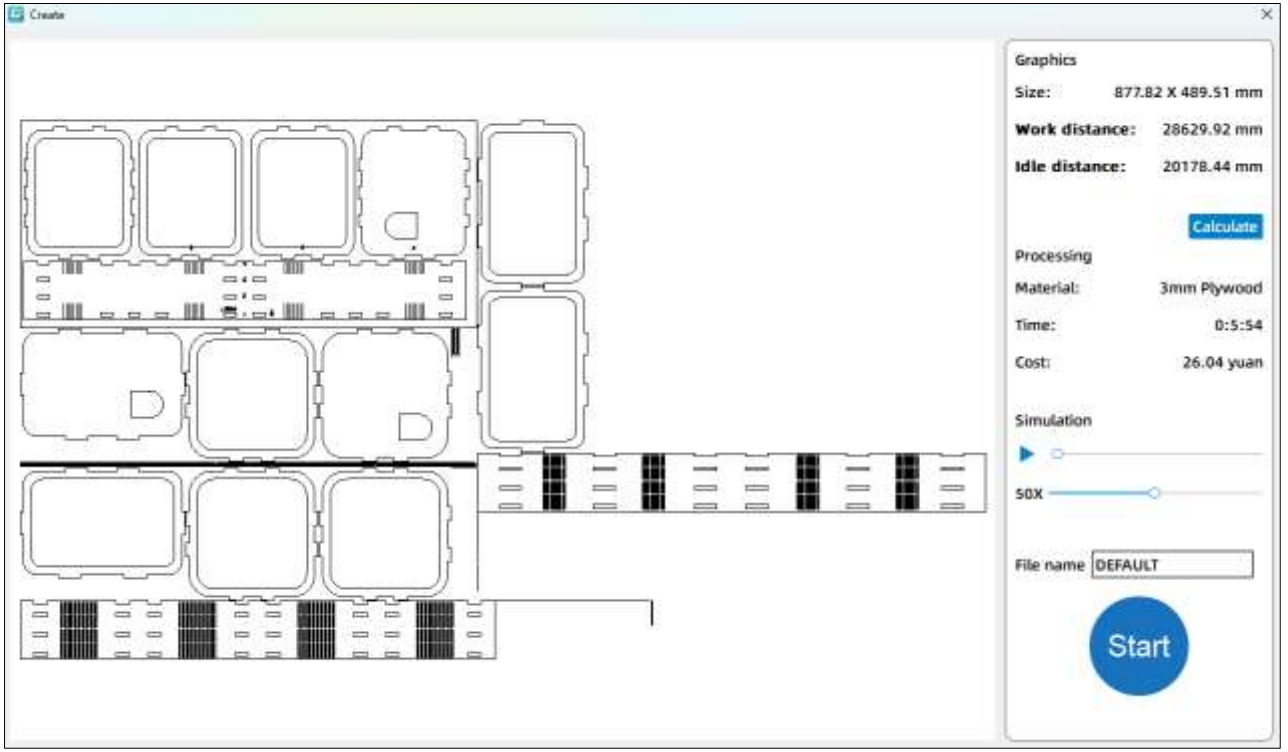
Multi-Craft

Integrated with processing techniques, LaserMaker offers four processing modes: cutting, tracing,light engraving, and deep engraving.



One-Click Simulation

LaserMaker also features a laser cutting simulation function. With a single click, users can preview the manufacturing process and effect, allowing them to intuitively and conveniently connect design with production, improving the efficiency of design debugging and reducing material waste.



3. Courses of Thunder Laser

The laser STEM education curriculum focuses on students at different stages, based on educational theories such as multiple intelligences theory, STEAM education philosophy, and project-based learning theory. It aims to cultivate students' creative and innovative abilities, critical thinking and problem-solving skills, communication abilities, and collaborative capabilities.

Course Features

- Detailed modeling steps suitable for beginners in laser modeling
- Comprehensive content covering four major themes with a total of 117 class hours
- Suitable for students of multiple grade levels, with interdisciplinary integration
- Includes lesson plans, courseware, and design drawings to meet the need for rapid course delivery

Examples of our course

course catalog	pedagogical content	Lesson
The Clockwork Principle - Pull Cord Fan	Learning about clockwork by making a drawstring fan	2 lessons
Magnetic Properties - Mysterious Pendulum	Learning about the properties of magnetism by making a mysterious pendulum that	2 lessons
hydrodynamics - motorized gliders	Learning about fluid mechanics, such as air, by building motorized gliders	2 lessons
Infrared - remote control fan	Knowledge of infrared switches through hands-on	2 lessons
automatic rotating seat	To make a rotating stand driven by a motor, which can be used for displaying other works	2 lessons
pulley block - line lift	Learning about pulley blocks through the content of this lesson, the	2 lessons
energy conversion - small motors	Learning about the interconversion of electrical energy-mechanical energy-electrical energy	2 lessons
My heavy-duty tank	Learning to combine complex models and motor engineering design concepts that	2 lessons
energy conversion - hand-cranked generators	Learning about kinetic-magnetic-electrical energy interconversions	2 lessons
The Magic of Electricity - F1 Capacitor Cars	Learning about capacitor charging and discharging points through design	2 lessons
Magical light - light-controlled trolley, the	Learning about photosensitive components	2 lessons
Magic Water - Hydraulic Excavator, The	Learning about hydraulics	2 lessons
Theme creation - wielding creativity	Integration of the lessons learned, leading to the creation of themes	2 lessons

4.Technical Support

Advanced training

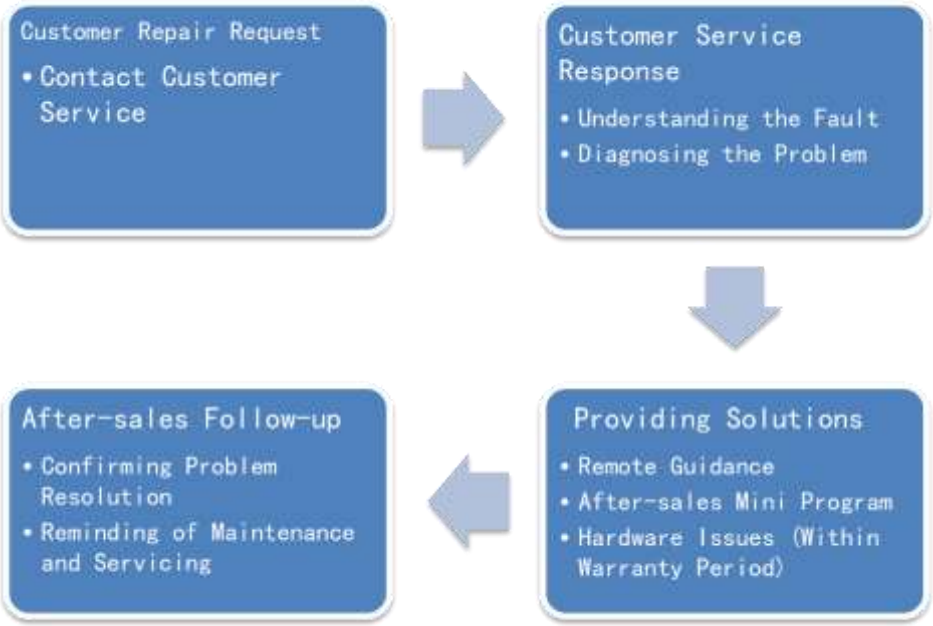
Training Process

Training Content

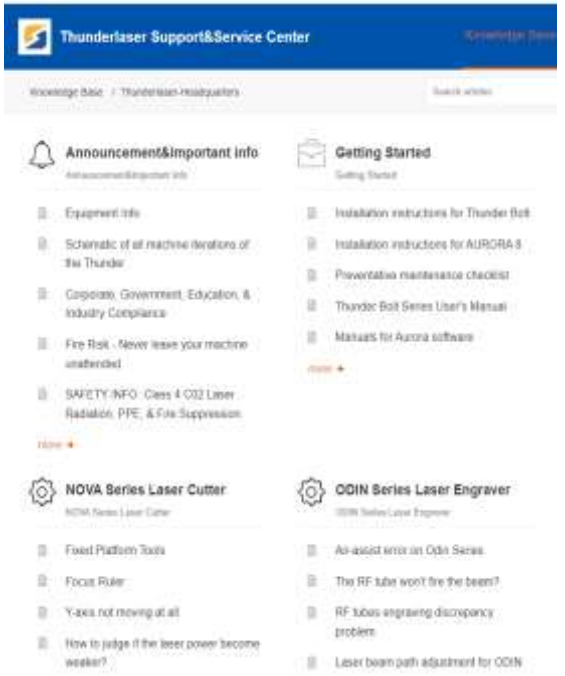
Training level	Training objectives	Training content
Level 1	• To learn the basic operations of the equipment. • To learn the basic operations and functions of the software. • Master the design and creation of basic graphic works.	1.Installation, use and maintenance of equipment 2.Introduction to software 3.Graphic works project production
Level 2	• To master the operation skills of the equipment. • To be skilled in software functions. • To master the design and creation of simple three-dimensional works.	1.Advanced course of laser processing 2.Laser modeling software 3.Three-dimensional project creation
Level 3	• To be skilled in using the software, and be able to draw moderately complex structural parts. • To be able to imitate the design and creation of complex works.	1.Application course of laser processing materials 2.Design and creation of works based on structure 3.Skill application of laser creation 4.Project creation with different materials and structures
Level 4	• To be able to deal with all kinds of problems with the equipment and software. • To be familiar with drawing all kinds of common structural parts. • Be able to create complex works freely.	1.Structural design of educational competition for makers 2.Design and creation of works based on control board 3.Project creation based on open source hardware

Professional After-sales Support

After-Sales Process



After-Sales Platform

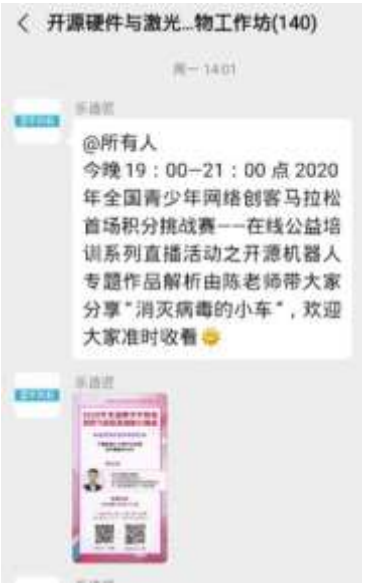


5.Laser Community

Laser groups for exchanging ideas

Interesting project drawings and live courses will be shared regularly, bringing together domestic A-list makers to exchange and share ideas online in real time, answering questions from peers.

WeChat communication group sharing



Famous Maker Teachers' Public Welfare Answers

Long Lichang

Teaching and research staff of educational technology in application promotion department of Guangzhou Audio-visual Education Center
Co-founder and principal of Hongmian Maker Space of Guangzhou Audio-visual Education Museum
The third batch of famous teachers of basic education system in Guangzhou

Wu Junjie

Teacher of Information Technology and Physics in Beijing Jingshan School
Founder of Maker Education Inclusive Course
Researcher of STEAM education

Gao Weiguang

Guangzhou Baiyun Middle School Maker Teacher
The First Maker Teacher Training Tutor of Central Audio-visual Education Center
Excellent teachers in southern Guangdong

Xie Zuoru

Chairman of the Expert Committee of Maker Education of China Electronics Society
Head of Wenzhou Middle School Maker Education Studio
Teacher of Special Grade in Zhejiang province

Chen Fujun

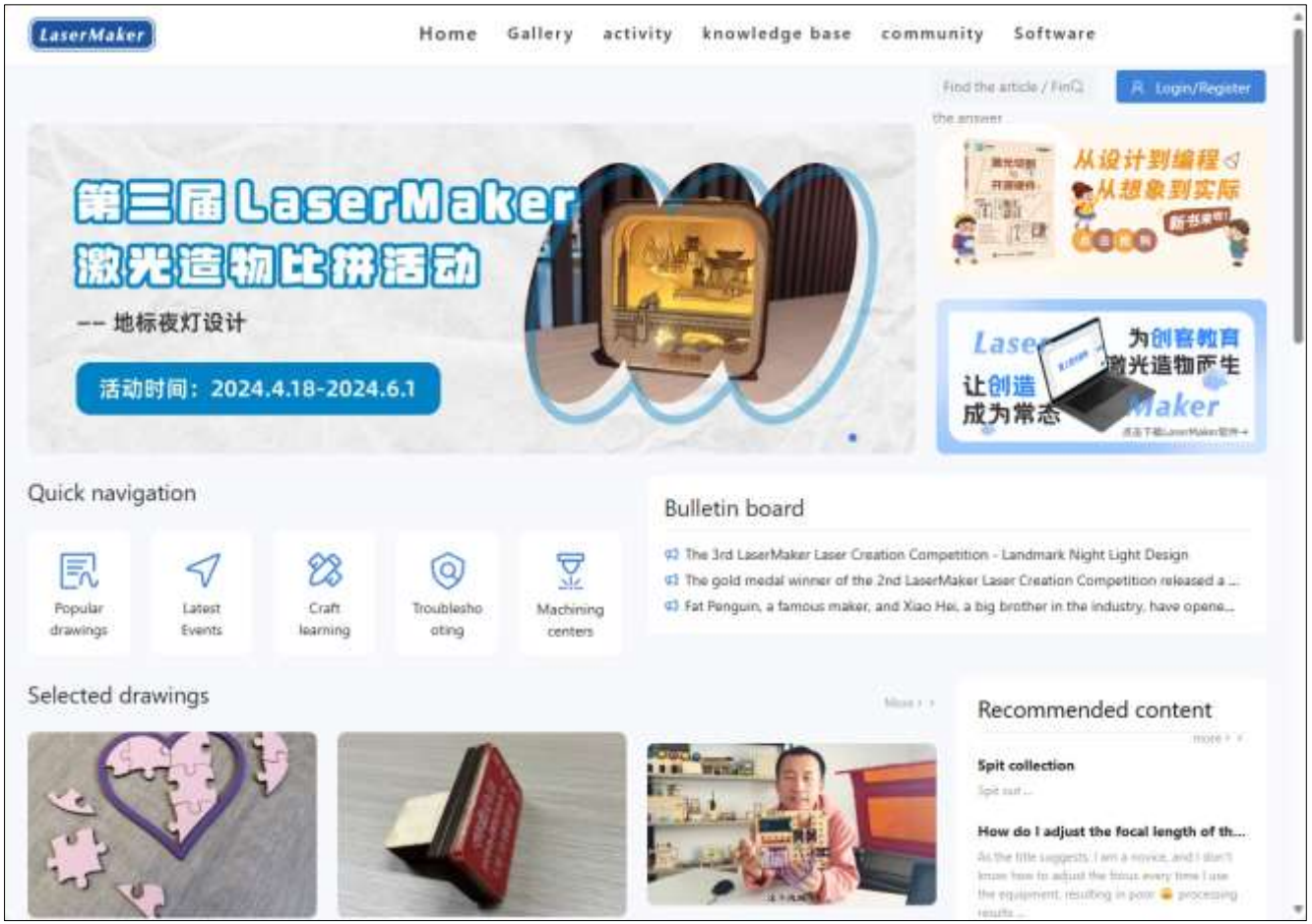
Founder of Duoyuanyoubei Robot
Supervisor of National Junior Robot Technical Grade Examination
Supervisor of National Youth 3D Creative Design

Teng Jianhui

Principal of Aizhizuojiang Maker Space
Researcher of Qingdao Zhongchuang Artificial Intelligence Technology
Partner of Maker Education Inclusive Course

Laser Forum

The forum covers two major modules of laser creation and open-source robotics, regularly sharing laser-related posts, it offers over 1,000 design drawings for download.



Forum URL:www.lasermaker.com.cn

6. Teacher Training

To carry out laser teacher training, so that teachers can actively explore and develop science and technology education models and courses through laser knowledge grasp and practical experience accumulation, and then better cultivate students' innovative spirit and practical ability.

Up to now
Thunder Laser helps
teacher training
Supported Sessions 70+
Cities Covered 30+

Specialized training course on creativity education

National/Provincial Quality Enhancement Training for Secondary Teachers

Open Source Robotics Series Teacher Training

Laser STEAM Inclusive Teacher Training

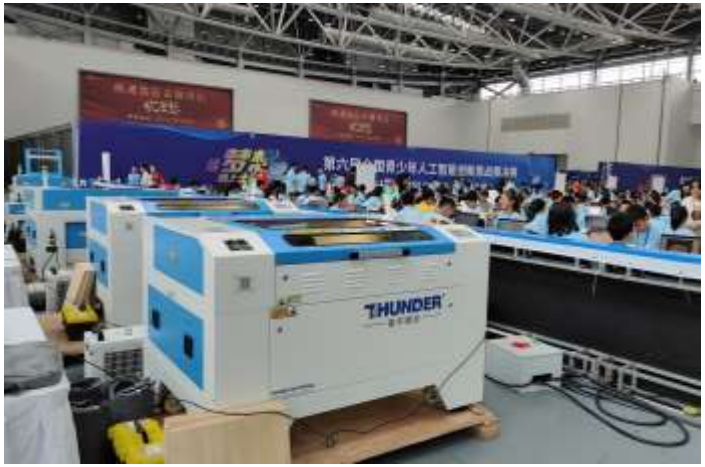
7.Maker Competition

From theory to practice, to actively participate in the maker competition, help students use drawing software and laser cutting machine to make the outlook and structure of works, and improve their practical ability and innovation ability in laser creation.

Up to now
Thunder Laser helps
maker competition
Supported Sessions 120+
Cities Covered 60+

National Information Literacy Enhancement Practices for Teachers and Students

China University Student Engineering Practice and Innovation Competition



National Youth Artificial Intelligence Innovation Challenge

National Primary and Secondary School Creation Competition

Equipment - Software - Courses - Services - Community - Training - Competitions

Thunder Laser: Unleash Your Creativity

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