

# 3-D PRINT PENS

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Have fun designing, and creating your own 3-D objects. Design and create unique shapes, jewelry, cars, towers, bridges and much more!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Simple Shapes
- Make your own design
- Structures

### What's Inside?

- Printing Pens
- Printing Filament
- Patterns
- Additional Supplies



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# AEROSPACE

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Have fun engineering, designing, and building your duct tape rocket. Launch your rockets to find out how far and high yours can go!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Constellation Finders
- Straw Rockets
- Duct Tape Rockets

### What's Inside?

- Bike Pump Launchers
- Foot Pump Launchers
- PVC Pipe
- Duct Tape
- Paper
- Additional Supplies
- Masking Tape
- Straws



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# ANIMAL SCIENCE

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Animal science is fun and fascinating! With this toolkit, you learn about how cattle eat their cud, learn how animal viruses compare to that of humans, and investigate animal genetics.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Digestive Enzymes
- Animal Virus
- Owl Pellets

### What's Inside?

- Animal Cell Model
- Animal Virus Model
- Magnifying Glasses
- Additional Supplies



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# ARCHITECTURE

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Have you ever wanted to be an engineer or architect? Put your designing caps on and get to work with reading blueprints and building extravagant structures with these hands-on and exciting activities.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Designing Structures  
3-D Blueprints
- Shadow Block  
Tracing

### What's Inside?

- Magnetic Building  
Supplies
- 3-D Blueprints
- Styrofoam Cups
- Additional Supplies



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# BALLS AND TRACKS

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Take on the engineering challenge based on designs of roller coasters and ski jumps, while learning about the forces of motion! Keep the marble rolling by building a series of twists and turns!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Ski Jumps
- Loops and Spirals
- Super Coaster

### What's Inside?

- Foam Tubing Tracks
- Marbles
- Tape
- Additional Supplies



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# BALLOONS

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Pump up your learning experience and develop new science skills with a **POP!**

### Life Skill Objectives

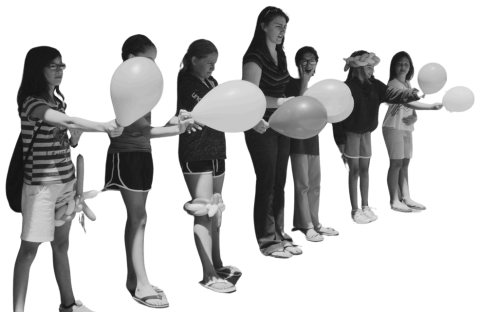
Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Throwing Balloons
- Balloons Capacity
- Spinning Balloons

### What's Inside?

- Foam Tubing Tracks
- Marbles
- Tape
- Balloons
- Additional Supplies



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# BUBBLES

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Get ready to have a splash of a good time making your bubbles! No bathtub is required!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Giant Bubbles
- Bubble Domes
- 3-D Bubbles

### What's Inside?

- Bubbles/Soap
- String
- Straws
- Bubble Wands
- Additional Supplies



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# CANDLEMAKING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Make your own candles with crayons and ignite a spark while discovering the science behind trick candles!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Trick Birthday Candles
- Votive Crayon Candles
- Balloon Luminaires

### What's Inside?

- Wax and crayons
- Scents and Dye
- Hot Plate
- Additional Supplies



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# CATAPULTS

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Launch into learning!

Aim and watch your project fly through the air at your intended target! Test to see how accurate your design is!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Spoon Catapults
- Catapult Addition
- Clothespin Catapults

### What's Inside?

- Popsicle Sticks
- Rubber Bands
- Spoons
- Balls and Marbles
- Additional Supplies



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# ELECTRICITY

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Get charged up to learn  
about electricity!

Illuminate your mind with  
these electrifying  
experiments and answer  
the questions: Do  
opposites really attract?

### Life Skill Objectives

Youth will gain critical  
thinking and problem-  
solving skills by engaging  
in hands-on experiential  
learning experiences.

### Lessons Included

- Circuits
- Flashlights
- Electromagnet

### What's Inside?

- Batteries
- Circuit Board
- Light Bubbles
- Magnets
- Additional Supplies



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# ENTOMOLOGY

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

What makes a bug an insect? Discover the answer to this question while building your own exoskeleton and seeing the world through the eyes of a bug!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Bug Sort
- Exoskeletons
- Ommatidium (Compound Eyes)

### What's Inside?

- Viewing Jars
- Exoskeletons
- Magnifying Cones



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# FOOD SCIENCE

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Become a chef and create your own recipes! Forget the phrase "Don't play with your food" its time to have fun with food science!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Bubble Gum
- Ice Cream in a Bag
- Juice Noodles
- Soda Science
- Cake Chemistry

### What's Inside?

- Measuring Cups
- Corn Starch
- Baking Soda
- Flavorings
- Additional Supplies

### What you need to provide

- Corn Starch
- Sugar



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# FELTING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Channel your creativity as you craft intricate designs with wool and a felting needle.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Felting

### What's Inside?

- Wool
- Needles
- Cookie Cutter
- Finger Protectors
- Beads
- String



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# GELLI ART PRINTING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Unleash your artistic flair by using the Gelli Printing Toolkit as you create vibrant prints using gel plates and various textures

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Gelli Art Printing

### What's Inside?

- Gelli Plates
- Paint
- Paint Rollers



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# HORTICULTURE

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Let your excitement grow as you sprout a deeper understanding of the plants around you!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Hydroponics
- Stem Propagation

### What's Inside?

- Seeds
- Soil
- Shovels
- Pebbles
- Additional Supplies



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# LITTLE BITS AND SNAP CIRCUITS

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Learn about circuits with these amazing electrical pieces and design your own device that lights up, make noise and moves.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Flash Light
- Doorbell
- 3-Wheel Vehicle

### What's Inside?

- Little Bits Technology: Inputs, Outputs, Power, Wire
- Snap Circuits
- K'Nex Metal Pieces
- Additional Supplies



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# MAD SCIENTIST

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Students will measure ingredients, learn about the different states of matter, and experiment with the science behind chemical reactions as acids and bases and become a mad scientist inventor!

Experiment with gross, wacky, and truly mad science!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Magic Potion
- Reactions Litmus

### What's Inside?

- Borax
- Baking Soda
- Vinegar
- Vegetable Oil
- Flour
- Additional Supplies



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# METALWORKING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Develop an appreciation for cultural history while trying the science of metalworking out yourself. Design your own patterns and projects from different mediums of metals.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Wire Notebook
- Wire Names
- Metal Enameling

### What's Inside?

- Stencils
- Foil
- Hammers
- Wire
- Additional Supplies



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# METAL STAMPING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Explore your inner artist through metal stamping. Metal stamping is the process of striking metal using a shaped former or cutter to make an impression and a hammer to create force. Stamping is a great way of adding pattern and texture to metal in a short space of time and can be achieved very simply using a hardened steel former and a heavy hammer.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Keychains and Jewelry
- Sonority Washers
- Pet ID Tags

### What's Inside?

- Metal for Stamping
- Dies, Hammers, Blocks
- Wire, String, Beads
- Additional Supplies



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# PAPER BRIDGES

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Discover why triangles are the strongest shape and design and construct your bridges with just paper, tape, and your ingenuity! Watch out for paper cuts!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Accordion Fold Bridges
- Rolled Paper Beams
- High Bridge

### What's Inside?

- Paper
- Tape
- Wooden Dowels
- Additional Supplies



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# POWER PROTECTORS

## 4-H STEM CHALLENGE

### Stem Discovery Toolkit

Spark an interest in STEM and inspire real-world actions. Power Protectors focuses on renewable energy providing youth the fundamental knowledge of sustainable power sources, the energy people use on a daily basis and the importance of using energy wisely.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Superhero Hideout
- Amped Up Engineering
- Energy Island Adventure

### What's Inside?



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# PRINTMAKING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Use your hands, blocks, or vegetables to create your museum-quality prints in a snap. Giant and tiny prints with a variety of paints, paper, and fabric will help you develop a better understanding of design principles.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Thumbprint
- Make Your Own Block Print Stamp
- Screen Printing
- Pendulum Painting

### What's Inside?

- Paint
- Cardstock/Paper
- Additional Supplies



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# SLIME

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Students will measure ingredients, learn about the different states of matter of solids and liquids, and experiment with the science behind chemical reactions as ingredients mix to form Slime! Experiment with gross wacky, color-changing slime.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Glow in the Dark Slime
- Color Changing Slime
- Magnetic Slime
- Bubble Slime

### What's Inside?

- Glue
- Borax
- Baking Soda
- Contact Solution
- Additional Supplies



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# SPIN ART

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Use a salad spinner and your creativity to create your museum-quality painting. Combining painting with a spinning movement will help you develop a better understanding of design and centrifugal force.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Spin Art Canvases

### What's Inside?

- Salad Spinner
- Paint
- Cardstock/Canvas Panels
- Additional Supplies



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# SOAPMAKING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Squeaky clean and full for all ages! Explore this sudsy world as you create your very own uniquely scented and fun-shaped soap!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Fizzing Bath Soap
- Invent a Scent
- Glycerin Soap Molds

### What's Inside?

- Soap Squares
- Soap Kettle
- Scents
- Dyes
- Molds
- Additional Supplies



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# SOLAR HOUSES

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Where bright ideas comes together. Learn about the energy only the sun can provide.

### Lessons Included

- Solar Houses

### What's Inside?

- Solar house paper
- solar panels
- flashlights
- tape
- lights

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.



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# SAND ART

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Express your imagination using the Sand Art Toolkit as you design stunning patterns using colorful sand.

### Lessons Included

- Sand Art

### What's Inside?

- Colorful Sand
- Sand Containers
- Funnels

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.



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# PAPER CIRCUITS

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Where bright ideas comes together. Learn about the energy only the sun can provide.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Paper Circuits

### What's Inside?

- batteries
- lights
- copper tape



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# TRANSPORTATION

## **Stem Discovery Toolkit**

Can you get to where you are going? Fly among the clouds, take a dive to the depths of the ocean and rise through the air with our modern-day take on transportation.

## **Life Skill Objectives**

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

## **Lessons Included**

- Bobsleds
- Hot Air Balloons
- Submarines
- Hovercrafts

## **What's Inside?**

- Straws
- Popsicle Sticks
- Wooden Dowels
- Additional Supplies



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# WATER SCIENCE

## Stem Discovery Toolkit

What can you do with baby diapers, sponges, and aluminum foil? Get your hands wet and learn about the principles of water!

## Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

## Lessons Included

- Plankton
- Aqueducts
- Water Wheels

## What's Inside?

- Corks
- Sponges
- Paper Clips
- Styrofoam Packing Pieces
- Additional Supplies



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# WIND ENERGY

## 4-H STEM CHALLENGE

### Stem Discovery Toolkit

Create your own gust of wind from your very own turbine! Get ready to measure its speed as it goes whirling around and around!

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Windmills
- Pinwheels
- Anemometer

### What's Inside?

- Windmill Kits
- Digital Multimeter
- Additional Supplies



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# EXPLORERS OF THE DEEP

## 4-H STEM CHALLENGE

### Stem Discovery Toolkit

Learn how to use science, technology, engineering, and math to explore Earth's oceans and how it relates to all life on the planet.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Ocean Robot Test Tank
- Ocean Expedition Board Game

### What's Inside?

- Ocean Gliders
- Additional Supplies



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# MOTION COMMOTION

## 4-H STEM CHALLENGE

### Stem Discovery Toolkit

Motion Commotion is designed to explore force and motion in the simulation of a car crash.

It also demonstrates reaction time, and how distracted driving can make a difference upon impact.

### Life Skill Objectives

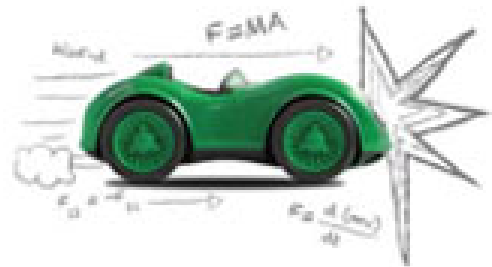
Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Momentum and Kinetic Energy

### What's Inside?

- Cars
- Yellow Track



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# GALACTIC QUEST

## 4-H STEM CHALLENGE

### Stem Discovery Toolkit

Galactic Quest explores the history of humans in space, the technology and resources needed for missions, and the obstacles humans encounter in orbit. Activities explore important STEM topics ranging from physics and engineering to computer science and space agriculture.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Decoding Cipher
- Hydraulic Claw

### What's Inside?

- Ciphers
- Hydraulic Arms



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# MARS BASE CAMP

## 4-H STEM CHALLENGE

### Stem Discovery Toolkit

The reach to land humans is on! Mars Base Camp will explore sending a mission to Mars. Mars Base Camp is a collection of activities that teaches kids 8-14 Stem skills like mechanical engineering physics, computer science, and agriculture.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Test a Mars Rover

### What's Inside?

- Cars
- Yellow Track



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# ECOBOT

## 4-H STEM CHALLENGE

### Stem Discovery Toolkit

4-H Eco-Bot Challenge explores how robots can be used to preserve and protect the environment while offering a glimpse into the future of science, technology, engineering, and math. Youth will assemble their

Eco-Bot, then discover how the robot functions. Youth will design a set of control surfaces to program the Eco-Bot to perform a simulated environmental cleanup project.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Build An Eco-Bot

### What's Inside?

- Toothbrush
- Vibrating Motor
- Foam Mounting Tape
- Button Watch Battery



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# HELPFUL HYDROGELS

## 4-H STEM CHALLENGE

### **Stem Discovery Toolkit**

Water is everywhere - in the sky, in the ground, and in our homes. However, caring for this vital resource is often a challenge for each of us. Conservation means using water wisely. Scientists and engineers have developed amazing, superabsorbent polymers, called hydrogels, that can help.

### **Life Skill Objectives**

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### **Lessons Included**

- Helpful Hydrogels

### **What's Inside?**

- Disposable Diapers
- Zipper-lock bag 1 gallon
- 9 oz Plastic Cup



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# ELECTROMAGNETIC PICKUP STICKS

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Thwack, Thomp, CRASH – you broke through the crust! The clock is ticking as you race with your electromagnet to gather iron and load it onto the spaceship. This is way more than just a magnet on a stick, your Pick-Up Stick was custom engineered by you with both an electromagnet and a grapple (claw) that grabs soup cans, paper clips, even candy. Made with TeacherGeek's custom aluminum wire, it's never been easier to make your own super-powerful battery magnet.

### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Electromagnetic Pick-Up Sticks

### What's Inside?

- Pick-up Sticks
- Bowls
- paperclips, rice, beans, bolts, screws, and gems
- Paper



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# WOOD BURNING

## 4-H STEM TOOLKIT

### Stem Discovery Toolkit

Get creative and make your own wood burning project by using wood burning pens and wood!



### Life Skill Objectives

Youth will gain critical thinking and problem-solving skills by engaging in hands-on experiential learning experiences.

### Lessons Included

- Wood Burning

### What's Inside?

- Wood
- Silicone Mat
- Wood Burning Pen
- Wood Burning Head Attachments
- Silicone Mat
- Transfer Paper
- Pen
- Pliers
- Heat Gloves



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