



Illinois 4-H | Spark Ideas. Ignite Possibilities.

Have you ever thought about inventing something? Do you have an item at home that serves a purpose, but could be made better if it were changed just a little? 3D design and 3D printing solves those problems by letting you design and print your own creation!



Exploring 4-H 3-D Printing and Design

Spark Activity: Exploring 3D Design

3D design and printing is changing our world. Items that once took weeks or months to design and have professionally made can now be quickly designed and printed in our homes.

Explore - thingiverse.com introduces you to hundreds of different ideas for 3D printing

Practice - tinkercad.com is a free, online platform you can use to play, practice and create 3D images.

Design - choose an item that you would like to print and create. Design it in Tinkercad or another CAD software that you like to work with.

Print - If you have a 3D printer at home, print your newly designed item. Don't have a 3D printer? Then, explore your community to find one available for your use - check with your school, your public library, local community college, a local science museum or youth center or check to see if there is a shared community laboratory or makerspace.



4-H Project Levels and Goals

Beginner

- Understand and apply the steps of the Engineering Design Process - Ask, Imagine, Plan, Create, Improve
- Learn how to use CAD software (i.e. Tinkercad)
- Design simple objects that do not have working parts

Advanced

- Understand the different types of 3D printing technology
- Use the Engineering Design Process to create more advanced objects or analyze existing objects to make them better
- Use CAD software to create moving objects, workable hinges, mechanics, etc.
- Describe how a 3D printer works using vocabulary such as filament, extruder, build plate, etc.

Put Your Project Into Action

Show Your Skills

- Demonstrate a 3D printer in action - at a 4-H event, school event or community event
- Create a display highlighting innovative uses of 3D printers
- Display three examples of different types of items you have made with a 3D printer

Service and Leadership

- Create and donate an item for a 4-H fundraiser
- Create gifts for new 4-H members
- Create awards/trophies for end of year 4-H banquets
- Create personal protective equipment for local health care workers
- Create signage for local schools/businesses
- Print labels in braille for businesses to become more accessible by the blind
- Set up an afterschool STEM 4-H club
- Teach others how to 3D design and print

Entrepreneurship

- Create holiday themed decorations to sell
- Create school themed memorabilia to sell (key chains, pencil holders, etc)
- Create stamps/logos for local businesses

Technology Connection

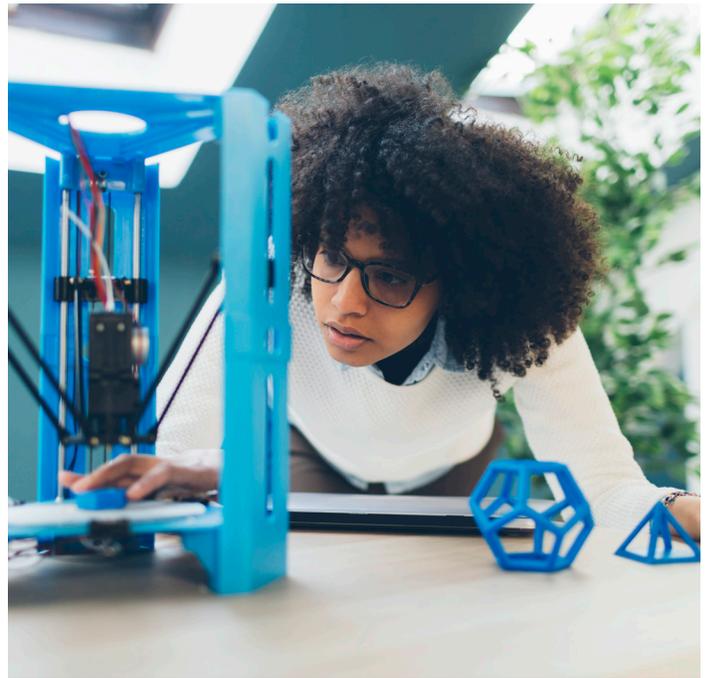
- 3D printing in medicine - casts, prosthetics, bones and even skin and other organs
- 3D printing on the International Space Station
- 3D printed musical instruments
- 3D food printing

Connecting with a Mentor

- Local manufacturing companies
- Local hobbyists
- Local school technology programs/teachers

Events

- 4-H workshops
- 4-H school programs
- “Maker” type events hosted by local libraries or science museums



Careers Related to 3D Printing and Design

Toy Manufacturer	3D Chef
Healthcare Design	Materials Scientist
Architecture	Mechanical Engineer
Automotive Designer	Software Developer

Start a Conversation

What is a problem that you currently have?
What is something you could invent to help solve that problem?
What would that invention look like?
What would your invention be made out of?
How can you make that invention?

Want to learn more?

go.illinois.edu/4H3dprintingdesign

Explore more at Illinois 4-H!

4-H.extension.illinois.edu



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