

3D Printing Project Ideas

Times included are approximates and can vary based on youth involved in the program. Times include design time only, and do not take into account print time.

Personalize an item (30 minutes) – Have youth find an item on Thingiverse (or staff find one for everyone prior to workshop). Download item and import into TinkerCAD. Have youth personalize object to include initials or name. Note: Once you introduce youth to Thingiverse it can be hard to get them to design their own items because they will go onto the website and just take what others have already designed.

Examples: Earbud Case, iPhone Case

Design a flat item (30-45 minutes) – Have the youth design an item that is 3D but flat on at least three sides and not very large (30cm x 30cm x 20cm). This gives them the opportunity to begin using the TinkerCAD software by creating a design on their own, but by creating a flat design it will be easy to print and design.

Examples: Keychain, Nametag, or a Pendant

Design a taller item (60 minutes) – Have youth design an item that is 3D and flat on one side. This item can be larger and taller than previous designs (40 cm x 40 cm x 60 cm). During this design stage you will need to discuss how the item is built and how support structure will need to be created to support certain elements of their designs.

Examples: Robot, Animal, Character, Car, Cannon

Customize a LEGO Piece (60 minutes) – Have youth create a custom LEGO piece using LEGO dimensions and their imagination. Individuals could create a LEGO piece they wish existed or give them a task and have them create a piece to accomplish that task. If time is an issue, go online prior to the activity and use already designed pieces and have the youth modify them to accomplish a task.

<http://www.thingiverse.com/search/page:3?q=lego+beam&sa>

Examples: Heart shape piece, Diamond shape piece, Scoop

Design and Fill Molds (60-90 minutes) – Have youth design a mold of an object or animal they made using TinkerCAD. Once molds have finished printing, use materials to fill molds to bring their design to life. Molds could be filled with chocolate, wax, resin, hot glue, oogoo, gelatin or other substances you have available. If time is an issue, go online prior to activity and print already created mold designs from Thingiverse.

Examples: Chocolate Bunnies, Crayons, Resin, Oogoo

Design a board game (120 minutes) – Have youth work as a team to design their own board game. Have youth create a game name theme, the rules, design game pieces, and the game board. Not all items in this project need to be created using the 3D printer, but encourage each youth on the team to create at least one 3D printed item for the game.

Examples: Game Pieces, Game Dice/Spinner, Game Decorations

Design custom game pieces (120 minutes) – Have youth work together as a team to design their own theme for a common board game and create game pieces, décor, and dice/spinner to match the theme. Have youth create a game board and any theme specific rules for the game. Each team member should be encouraged to design at least one game piece.

Examples: Chess set, Checkers Set, Monopoly

Design a city (120-180 minutes) – Have youth work together to create their own city/town. Have youth design different aspects of the town or the town layout (depending on how many youth take part). One youth could design the layout of the town while others design specific locations/building in the town. Another twist on this could be to have youth design their own park

Examples: Police Station, House, Grocery Store, Town Flag

Design an Animal Habitat (180 minutes) – Have youth work together as a team to research a specific animal they are interested in. Have youth create an example of the animal, what the animal eats, where the animal lives, and other aspects important to the animal's habitat.

Examples: Woods, Pond, Desert

Design a transportation device (120 minutes) – Have youth work together as a team to design a transportation device. Have each team member create an aspect of the transportation device, such as the wheels, body, top, etc. For this project youth will have to work together as a team to make sure that each item can be assembled together.

Examples: Car, Boat, Train

Examples of 3D Printing in 4-H Projects

Below are just a few examples of how 3D printing could be incorporate into the current 4-H projects in your State. These are just a few examples and feel free to think of your own!

Aerospace – 3D print a model rocket

Small Engine – 3D print engine pieces

Citizenship – 3D print a famous building

Robotics – 3D print custom pieces for a LEGO robot or a Junk Drawer Robot

Visual Arts – 3D print an original design that can be used for artistic purposes

Natural Resources – 3D print a replica of a State fossil, bird, flower, etc.

Vet Science – 3D print a replica of an animals digestive or skeletal system

Child Development – 3D print a game that could be used to entertain younger youth

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