STEM Education Works®

Scope & Sequence

3D Printing - Foundations of Design and Innovation

3D PRINTING – Foundations of Design and Innovation

	Grade Band	Unit	Overview
3D PRINTING – Foundations of Design and Innovation	K-5	Meet the Technology	Students learn CAD basics using Tinkercad® and design and print a locker tag. Suitable for all ages and prepares for future course units.
	K-1	Let's Move Snow	Students learn about push and pull forces and investigate effective tools for moving objects. They design and create a model to move snow.
	K-1	Keeping Cool	Students observe the effect of sunlight on Earth's surface. They design a 3D-printed model to reduce the effect of sunlight on an ice pop on a hot summer day.
	K-1	Amazing Animal Teeth	Students study animal classifications based on food and teeth. They learn that teeth are tools for survival and identify teeth adapted to carnivorous, herbivorous, and omnivorous diets. They design their own teeth based on this knowledge.
	K-1	Float Your Goat	Students explore recycling using the story of *The Three Billy Goats Gruff*. They learn what can and cannot be recycled and the impact of waste on the environment. Then they create a recyclable boat to help the goats cross the river.
	2-3	Wolf Shelter	Students research severe weather in their communities, act as meteorologists to inform their peers, and create a strong shelter to withstand rain, tornadoes, snow, and heat.
	2-3	Leaf Stamps	Students learn about leaf structures and their impact on plant survival. They classify local leaves based on margins, blades, and veins, and they create Tinkercad® stamps to label the structures of a specific indigenous tree leaf, including margin, midrib, petiole, blade, and veins.
	4-5	Cleaning Waterways	Students learn about human impact on the local environment and research pollutants. They design a filtration system using Tinkercad® and a 3D printer to address pollution in a nearby water source and conserve resources.
	4-5	Prosthetic Bird Beaks	Students study bird beak shapes and types, identifying the best beak shapes for specific diets. They design and create a prosthetic bird beak using CAD software and a 3D printer to help Bob the Bird survive in his environment after an injury.
	4-5	Choosing the Right Design Tool for the Job	This unit focuses on modeling objects using different design tools. Students design a set of items in Tinkercad®, Minecraft Creative Mode, BrickLink, or physical Lego bricks, based on the tool that is most suitable for each item.
	4-5	Kids' Choice Awards	Students showcase their CAD and 3D-printing abilities by designing and printing trophies for their teachers or coaches.

NGSS Standards Alignment	NGSS Discipline	Connected Subjects	Time Required
3-5-ETS1-3	Engineering, technology, and applications of science	ELA, science, math, art, SEL, movement	2.5 hours
K-PS2-1 K-2-ETS1-1 K-2-ETS1-2	Earth and space science	ELA, science, math, art, SEL, movement	2.5 hours
K-PS3-1 K-PS3-2 K-2-ETS1-1	Earth and space science	Science, math, art, SEL, movement	3.5 hours
K-LS1-1 K-2-ETS1-2	Life science	ELA, science, math, social studies, art, SEL	3.5 hours
K-2-ETS1-2	Earth and space science	ELA, science, social studies, art, SEL, movement	4 hours
3-5-ETS1-1 3-5-ETS1-2 3-5-ETS1-3	Earth and space science	ELA, science, art, SEL, movement	5 hours
3-LS3-1 3-5-ETS1-1	Life science	ELA, science, art, SEL, movement	3 hours
3-5-ETS1-1 3-5-ETS1-3	Earth and space science	ELA, science, social studies, art, SEL	4 hours
4-LS1-1 3-5-ETS1-1 3-5-ETS1-2	Life science	ELA, science, social studies, art, SEL	3.5 hours
3-5-ETS1-1 3-5-ETS1-2	Engineering, technology, and applications of science	Science, math, art, SEL, movement	3.5 hours
3-5-ETS-1 3-5-ETS1-2	Engineering, technology, and applications of science	Science, math, social studies, art, SEL movement	2.5 hours