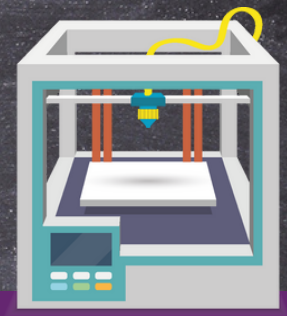
NextWaveSTEM

3D Printing Design and Applications

Designed for learners in Grades 9-12



Course Description:

Students will develop CAD modeling skills for creating 3D printable objects, practice a design process, and generate original solutions to game-based scenarios. Over these 15 lessons, 9th-12th grade students will develop intermediate 3D modeling skills alongside knowledge of 3D printing tools and industry applications.

Equipment, Curriculum, and Training Available:

- Classroom Set of 3D Printing Equipment
- 15 Lesson Hours
- Curriculum and supporting materials
- Ongoing product and curriculum support
- Professional development
- Facilitation by a trained STEM instructor (optional)

Lesson	Learning Target Examples
1. 3D Printing Technology and History	Identify the progression of technology that created modern 3D printing tools.
2. How 3D Printers “View” 3D Models	Control 3D printing software settings.
3. 3D Design Software	Create a 3D model in a CAD tool.
4. How a 3D Printer Works	Identify and set up parts of a 3D printer.
5. Project: Create a Game Piece	Produce a 3D model compatible with 3D printing.
6. From Mind to Design	Evaluate ideas through a design thinking process.
7. CAD Sketching Techniques	Modify and enhance sketch geometry.
8. Support Material and Post Processing	Configure support material to produce successful 3D prints.
9. Troubleshooting Common Problems	Identify and apply fixes for 3D printing problems.
10.Project: Two-part Assemblies	Manipulate sketch geometry for parts that fit together.
11. 3D Printing Industrial Applications	Explore the uses and applications of 3D printing.
12. Designing Solutions	Apply the design thinking process given project constraints.
13. Accessibility through 3D Printing	Explore 3D printing applications for accessibility.
14. Sustainability through 3D Printing	Analyze the sustainability benefits and trade-offs with 3D printing.
15. Project: Accessible or Sustainable Solution	Generate a solution that fits criteria and constraints