



MakerBot 3D Printing for Education

MAKERBOT 3D PRINTING FOR EDUCATION

- 1. Current Use Cases**
- 2. What is 3D Printing?**
- 3. Who uses 3D printing?**
- 4. What value does 3D Printing have in education?**
- 5. Why MakerBot?**
- 6. How much will it cost?**
- 7. What is the return on investment?**
- 8. How to ensure success?**

CASE STUDY / MAKERBOT REPLICATOR AT WHITBY SCHOOL

Where: Whitby School in Connecticut

Grade Levels: 6-8

Subject: Design Technology

Learning Objective: Understand the design process and product development cycles

Process:

- Design in 3D using Tinkercad
- Prepare for printing in MakerBot Desktop
- Print on the MakerBot Replicator Desktop 3D Printer



CASE STUDY / MAKERBOT REPLICATOR AT A. MACARTHUR BARR MIDDLE SCHOOL

Where: A. MacArthur Barr MS, New York

Grade Levels: 6-8

Subject: Technology

Learning Objective: Design, test, and iterate on real parts using existing C02 Car Project.

Process:

- Design in 3D using Tinkercad
- Prepare for printing in MakerBot Desktop
- Print on the MakerBot Replicator
- Test for weight and strength, iterate



CASE STUDY / MAKERBOT REPLICATOR 2 AT BROOKLYN TECH HIGH SCHOOL

Where: Brooklyn Tech HS, New York

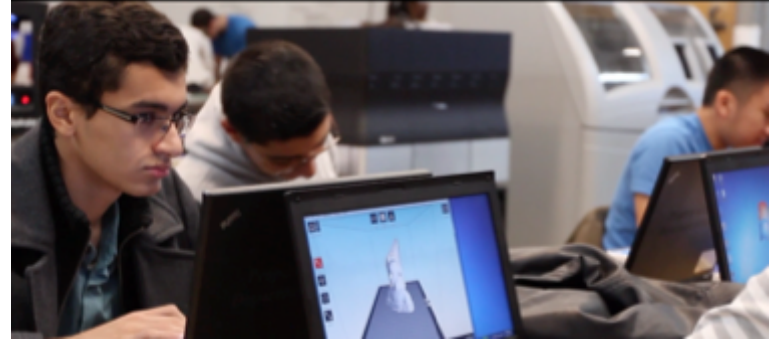
Grade Levels: 9-12

Subject: Design and Drawing for Production

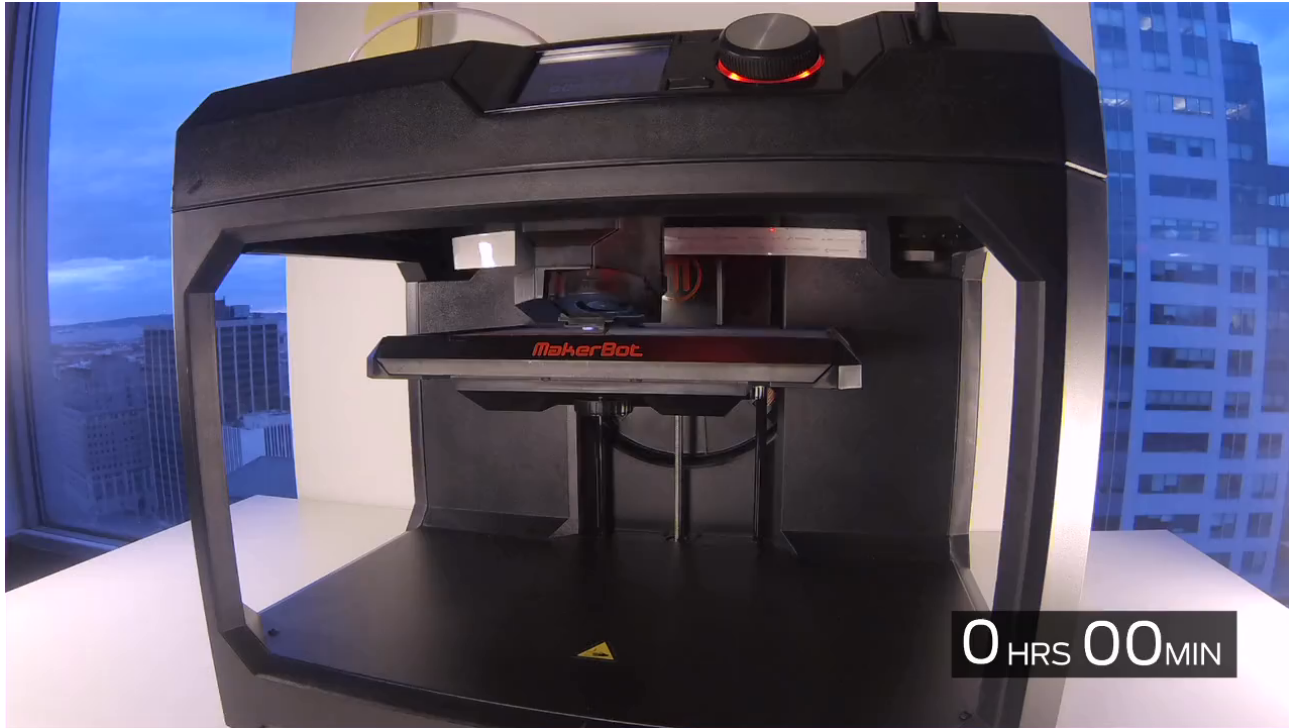
Learning Objective: Learn to accelerate the design process, Visualize complex principles

Process:

- Introduce 3D printing into required freshman course
- Allow access to senior-level design students
- Support Robotics and other extracurricular activities



WHAT IS 3D PRINTING?

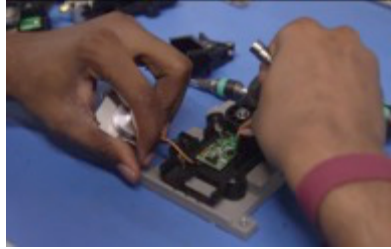


3D printing is the process of taking a digital model and making it a physical object.

WHO USES 3D PRINTING?



Engineering



Manufacturing



Architecture



Medical



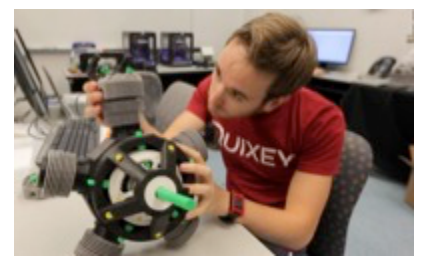
Design



Entertainment



Primary Education



University

WHAT VALUE DOES 3D PRINTING HAVE IN EDUCATION?

Satisfy Curriculum

- 3D printing and design offer a rich way to enhance and reinforce science, technology, engineering, art, math, and design skills already being taught in the classroom.

Engage Students

- 3D Printers engage students in the process of design and making all while enhancing their ability to solve problems through creative and collaborative solutions.

Prepare students for STEAM degrees and careers:

- Today's professionals use 3D printing to advance product development cycles.
- Provide students with tangible, hands-on experience in STEAM subjects and engineering fundamentals.

Involve the community

- 3D printing is an excellent way to reach out to the community (i.e. student project showcases, fundraisers, student-run classes)



WHY MAKERBOT?

MakerBot connects educators to the largest 3D printing community with the tools and know-how designed for the classroom, transforming today's learners into tomorrow's problem solvers

Largest 3D Printing Community

- Currently 100,000 3D Printers in the world, over 5,000 in schools
- Over 1,000,000 free downloadable things through Thingiverse.com

MakerBot is committed to education

- Published MakerBot in the Classroom - Free 150 page teacher handbook
- Jumpstart - free 3D design tutorials and information
- Thingiversity - Community, resources, and tools to bring 3D printing to the classroom

Safe and easy to use for both teachers and students

- Designed for no maintenance (magnetically swappable extruder)
- Products are safe to use in classrooms, non-toxic materials

HOW MUCH WILL IT COST?

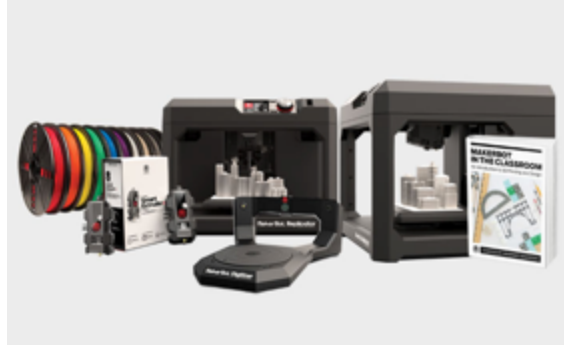
Replicator Essentials



\$3,487.99

1 MakerBot Replicator Desktop 3D Printer
1 MakerBot Smart Extruder+
10 Pack of MakerBot PLA Filaments in Large Spools
1-year MakerBot MakerCare Protection Plan
Build Plate Tape

Educator's Bundle



\$6,999

2 MakerBot Replicator Desktop 3D Printers
2 MakerCare 1-Year Plans, for Each 3D Printer
2 Smart Extruder+
10-Pack of PLA Filament in Large Spools
1 MakerBot Digitizer Desktop 3D Scanner
1 Copy of MakerBot in the Classroom

Starter Lab



30 – 40K (request quote)

4 MakerBot Replicator Desktop 3D Printer
1 MakerBot Replicator Mini Compact 3D Printer
1 MakerBot Replicator Z18 3D Printer
1 MakerBot Digitizer Desktop 3D Scanner
80 spools PLA Filament in Large Spools
MakerCare coverage plan for all hardware
Accessories: Rack, Smart Extruders, Z18 cart

WHAT IS THE RETURN ON INVESTMENT?



K-5

- Inspire curiosity in STEAM
- Create tactile learning models for complex concepts
- Establish spatial reasoning
- Early engineering concepts and process

Students at the Whitby School moved through the design process by turning a fictional city into a scale model.



6-8

- Develop design thinking skills
- Learn through iteration
- Hands-on engineering principles
- Deepen history lessons through re-creating artifacts

Students at MacArthur Barr Middle School iterated and optimized 3D printed wheels to improve their CO2 powered cars.



9-12

- Learn professional 3D design skills
- Simulate real-world engineering problems
- Develop college-readiness through advanced design thinking
- Unlock critical thinking skills required to bring an idea to reality

Students at Brooklyn Technical High School collaborated to demonstrate complex Calculus principles with 3D printed parts.

HOW TO ENSURE SUCCESS?

Provide resources & support to teachers to get started:

- Professional Development opportunities
- Estimated time to learn 3D Printing basics = 10 - 20 hours dedicated
- **MakerBot in the Classroom** handbook (digital version included)

Start with 1–2 classes as a pilot program, identify “champion”

- Test timing and integration before larger scale rollout
- Identify “champion” teacher to build program
- Recommendations: technology, science, art & design, robotics, engineering

Budget for ongoing costs

- Filament, supplies and accessories ~**\$500** per printer per year
- Protection plan for all 3D printers = **1 year included in bundle price** (MakerCare coverage)

Physical Space

- Table space for printer and materials (floor space if Replicator Z18)
- Electrical: 100 - 350 W per printer
- Networking (optional): Wifi and/or ethernet port on each printer

Computer Software

- Required Software: MakerBot Desktop (free)
- Recommended Software: Tinkercad (free), 123D Design (free), Sculpttris (free), Autodesk Suite (paid**), Solidworks (paid)



