



Make: 3D Printing

The Essential Guide to 3D Printers

By [Anna France](#)

Publisher: [Maker Media, Inc](#)

Release Date: December 2013

Pages: 222

The 3D printing revolution is well upon us, with new machines appearing at an amazing rate. With the abundance of information and options out there, how are makers to choose the 3D printer that's right for them? MAKE is here to help, with our Ultimate Guide to 3D Printing. With articles about techniques, freely available CAD packages, and comparisons of printers that are on the market, this book makes it easy to understand this complex and constantly-shifting topic.

Based on articles and projects from MAKE's print and online publications, this book arms you with everything you need to know to understand the exciting but sometimes confusing world of 3D Printing.

Table of Contents

-
1. **Hardware**
-
1. **Chapter 1 Getting Started with a 3D Printer**
 1. Choosing a Printer
 2. Buying Options: Turnkey, Kit, or DIY
 3. Software
 4. Your First Print Job
 5. 3D Printer Anatomy
 6. Next Steps: What to Make
 2. **Chapter 2 3D Printer Guide**
 1. The Challenge Prints
 2. Afinia H-Series
 3. Bukobot 8
 4. Cube
 5. Felix 1.0
 6. MakerGear M2
-

7. Printrbot Jr. (v1)
 8. Replicator 2
 9. Solidoodle 2
 10. Type A Series
 11. Ultimaker
-

2. Software

1. Chapter 3 Software for 3D Printing

1. 3D Modeling/CAD Software
2. Slicing/CAM Software
3. Printer Control/Client Software
4. What Next?

2. Chapter 4 3D Design for the Complete Beginner

1. 1. Create a Tinkercad Account
2. 2. Make a Hole
3. 3. Make the Robot Head
4. 4. Align the Head and the Hole
5. 5. Combine the Head and Hole into a Single Object
6. 6. Make the Head Hollow
7. 7. Make Your Robot's Mouth
8. 8. Make Your Robot's Eyes

3. Chapter 5 Getting Started with Slic3r

1. Step 1: Name Your Profile
 2. Step 2: Print Settings
 3. Step 3: Filament Settings
 4. Step 4: Printer Settings
 5. Step 5: Return to the Printer
-

3. 3D Scanning

1. Chapter 6 Creating and Repairing 3D Scans

1. What Is 3D Scanning?
2. 123D Catch
3. ReconstructMe
4. Cleaning and Repairing Scans for 3D Printing
5. Repairing Most Scans
6. Repairing Relief Scans by Capping
7. Scan Your World

2. Chapter 7 Print Your Head in 3D!

1. 1. Register with Autodesk 123D
 2. 2. Take Digital Photos of Your Head
 3. 3. Create a New Capture
 4. 4. Open Your 3D Model
 5. 5. Edit Your 3D Model
 6. 6. Make It "Watertight"
 7. 7. Embellish It (Optional)
 8. 8. Share Your Model (Optional)
 9. 9. Save Your Final Model as a Printable File (Optional)
 10. 10. 3D Print Your Head!
-

4. Materials

1. Chapter 8 Plastics for 3D Printing

1. Polylactic Acid (PLA)
 2. Polylactic Acid (Soft/Flexible PLA)
 3. LAYWOO-D3
 4. LAYBRICK
 5. Acrylonitrile Butadiene Styrene (ABS)
-

6. High Impact Polystyrene (HIPS)
7. Nylon
8. Polyethylene Terephthalate (PET)
9. Polycarbonate (PC)
10. High-density Polyethylene (HDPE)
11. Polycaprolactone PCL

12. Polyvinyl Alcohol (PVA)

2. Chapter 9 Industrial Materials and Methods

1. Composites and Ceramics
2. Plastics
3. Metals

5. Services

1. Chapter 10 3D Printing Without a Printer

2. Chapter 11 Service Providers

1. Upload Files and Order Prints
2. Makers Producing Parts Locally
3. Find Me a Printer
4. Professional-Grade Services
5. Boutique 3DP Design and Printing

6. Finishing Techniques

1. Chapter 12 How to Dye Your 3D Prints

1. 1. Gather Your Materials
2. 2. Soak Your Pieces
3. 3. Add Color
4. 4. Rinse
5. 5. Dry
6. 6. Show It Off!

2. Chapter 13 Post-Processing Your Prints

1. Tools and Materials
2. Tricks of the Trade
3. Friction Welding
4. Friction Welding Mismatched Surfaces
5. Friction Welding to Repair a PLA Model
6. Riveting: Friction Welding Blind Rivets
7. Using Filament to Make Solid Rivets and Hinges
8. Gluing and Filling: Creating ABS Slurry for Filler and Glue
9. Sanding 3D-Printed Plastic Parts

3. Chapter 14 Weathering Your Prints

1. 1. Pick a BaseCoat
2. 2. Pick a Metallic Paint for Worn Edges
3. 3. Start Drybrushing over the Piece
4. 4. Add Bigger Scrapes and Chipped Areas
5. 5: Add Dirt and Grunge
6. 6. That's It!

7. Applications

1. Chapter 15 The Promise of 3D Printing

2. Chapter 16 3D Printed Gallery

1. Practical Objects
2. 3D Products Now on the Market
3. 3D Printing in Medicine
4. Novel and Artistic Prints

3. Chapter 17 Dream Machine

4. Chapter 18 Desert Manufacturer

5. Chapter 19 How I Printed a Humanoid

1. Lessons Learned
 2. DIY vs. Commercial
 3. What's Next
-

8. Other Ways to Make 3D Objects

1. Chapter 20 Milling 3D Objects

1. The Subtractive Equivalent of 3DP
 2. What Do You Want to Make?
 3. DIY CNC
 4. Even More Mills
-

5. Linear Motion Systems

2. Chapter 21 White Chocolate Skulls in PLA Trays

1. Bill of Materials
 2. 1. Print the Mold Maker on a 3D Printer
 3. 2. Mix and Pour the Smooth-Sil 940
 4. 3. Demold
 5. 4. Add Slits to the Mold
 6. 5. Extract the Soy Lecithin from the Softgels
 7. 6. Melt The Chocolate
 8. 7. Let the Chocolate Cool
 9. 8. Pour the Chocolate into the Mold
 10. 9. Put the Mold in the Refrigerator
 11. 10. While Waiting, Start Printing the Candy Trays
 12. 11. Carefully Demold the Chocolate
-

3. Chapter 22 Printcrime

4. Appendix 3D Printing Resources

1. Software for Makers
 2. Slicing Software
 3. 3D Model Repositories
 4. 3D Printer History
 5. Learn to Dial in Your Printer
 6. Books
 7. Whitepapers
 8. 3DP News
 9. Physical Destinations
 10. Printers, Filament, and Parts
 11. Conferences
-