# Lesson 5: Improve Your Design + Print Prep

3D Printing Center - Village School

v1

2025

# Welcome Back Designers!

**Look What We've Created!**

*Show printed containers from Lesson 3*

- **Your containers** are real objects!
- **Problem-solving designs** from last lesson
- **Amazing progress** in just 4 lessons!

# What Worked Well?

**Examining Our Prints**

**Let's analyze together:**

- **What** printed successfully?
- **What** had challenges?
- **Why** did some work better than others?
- **How** can we improve?

# The Power of Iteration

**Making Things Better**

**Iteration means:**

- **Looking** at what you made
- **Finding** ways to improve it
- **Making** changes
- **Testing** again

*Real designers do this all the time!*

# Common Printing Issues

**Learning from Problems**

- **Walls too thin** - make them thicker (2mm+)
- **Overhangs failed** - add support or redesign
- **Parts don't fit** - check measurements
- **Rough surfaces** - simplify complex curves

# Today's Mission

**Improve and Perfect**

**You can:**

- **Fix problems** with existing designs
- **Make** your problem-solver better
- **Start** a completely new project
- **Prepare** your best work for printing

# Design Improvement Focus

## Key Areas to Check

- **Wall thickness** - at least 2mm
- **Part connections** - do they fit together?
- **Size** - is it practical to use?
- **Details** - add personal touches
- **Functionality** - does it solve the problem?

# Improvement Time (25 minutes)

**Choose Your Path**

- **Option 1:** Fix your container design
- **Option 2:** Improve your problem-solver
- **Option 3:** Start something completely new
- **Option 4:** Combine ideas from multiple projects

# Design Guidelines Reminder

**Printability Checklist**

- ☒ **Walls** at least 2mm thick
- ☒ **Size** fits on build plate (200mm x 200mm)
- ☒ **Holes** at least 3mm diameter
- ☒ **Overhangs** less than 45 degrees
- ☒ **Bottom** has flat surface for bed adhesion

# Advanced Techniques

**For Experienced Designers**

- **Chamfers** and **fillets** for smooth edges
- **Text** and **engravings** for personalization
- **Multiple parts** that fit together
- **Moving parts** (if you're feeling ambitious!)

# Teacher Consultation

**Get Expert Advice**

**Bring your design to teacher for:**

- **Printability** check
- **Improvement** suggestions
- **Technical** problem solving
- **Advanced** feature help

# Peer Review

**Learn from Each Other**

**Partner up and:**

- **Show** your improved design
- **Explain** what you changed
- **Ask** for feedback
- **Give** constructive suggestions

# File Preparation

## Getting Ready to Print

**Export Process:**

1. **Select** your best design
2. **Click** “Export”
3. **Choose** “STL” format
4. **Name** it clearly
5. **Download** to save

*Update this if we print straight to Polar 3D from Tinkercad*

# File Naming

**Make It Clear**

**Good names:**

- "Sarah_Pencil_Holder_v2.stl"
- "Mike_Phone_Stand_Final.stl"
- "Emma_Keychain_Improved.stl"

**Bad names:**

- "Design1.stl"
- "Untitled.stl"
- "Thing.stl"

# Quality Check

**Before You Export**

**Ask yourself:**

- **Is this** my best work?
- **Would I** be proud to show this?
- **Does it** solve the problem I identified?
- **Is it** ready for printing?

# Print Queue Planning

## Managing Expectations

- **Not all** designs can be printed (time limits)
- **Teacher** will select 2-3 per class
- **Best designs** get priority
- **Everyone** will see results next lesson

# Documentation

**Record Your Process**

**Write down:**

- **What** you improved
- **Why** you made changes
- **What** you learned
- **What** you'd do differently next time

# Reflection Questions

## Think About Your Journey

- **What** was hardest about improving your design?
- **What** new skills did you learn?
- **How** has your thinking about design changed?
- **What** would you tell a new student?

# Show and Tell Prep

**Getting Ready for Next Lesson**

**Think about:**

- **How** you'll present your work
- **What** problem your design solves
- **What** you're most proud of
- **What** you learned in the process

# What We Accomplished

**Today's Learning**

- **Analyzed** printed objects critically
- **Improved** existing designs
- **Applied** design principles
- **Prepared** files for printing
- **Documented** our process

# Coming Up Next

**Lesson 6 Preview**

**“Reflection and Future Thinking”**

- See your final prints!
- Present your best work
- Reflect on the whole journey
- Think about future possibilities

# Cleanup Time!

**5 Minutes to Pack Up**

- **Save** all your work
- **Export** your final design
- **Clean** your workspace
- **Put away** materials

**Outstanding improvement work today!**