CURRICULUM GUIDE

3D Print QUEST

Module 1
The Basics

From first click in Tinkercad to a finished, printable bubble wand in 9 weekly lessons and 391 photo steps.



Includes 9 lesson plans, 9 Design Log worksheets, an answer key and a Builder rubric.

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MODULE AT A GLANCE

From first click to a finished design

One lesson a week for 9 weeks. Each lesson reuses the skills before it and adds new ones, so the steps grow from 39 to 56 as students get faster. Every lesson ends with a printable object kids can take home.

Big ideas

- Every 3D design is built from simple shapes.
- Holes are shapes too: they cut away.
- Done means exported as an .STL.
- Exact millimeters make parts fit.
- Align and Group make one clean object.
- No Tinkercad experience needed to start.

#	Lesson	Steps	New Tinkercad skills
1	**Spinning Top**	39	Dragging basic shapes onto the workplane, Resizing shapes with the handles, Raising a shape with the black cone arrow, Turning the view cube to check every side, Exporting an .STL
2	**Spaceman Pencil Topper**	34	Typing exact dimensions in millimeters, Using the Align tool, Combining a cylinder, sphere and box
3	**Nameplate**	37	Changing how many sides a polygon has, Adding the Text shape, Using hole shapes, Grouping shapes, Centering in both directions
4	**Cookie Cutter**	36	Pressing D to drop a shape to the workplane, Importing an .SVG outline, Raising one shape inside another, Drawing a custom design with the Scribble tool
5	**Croc Charm**	41	Placing letters on a base, Duplicating shapes (Ctrl + D), Lining up a row of shapes
6	**Cord Clip**	43	Rotating 90° (hold Shift to snap), Measuring a real cord to size the hole, Making a personalized name block
7	**Bookmark**	50	Building thin, precise parts (1.5 mm), Right-aligning shapes, Building a “U” hole, Adding custom text
8	**Winners Award**	55	Using the Round Roof shape, Rotating a part, Resizing text to fit, Building a separate base
9	**Bubble Wand (capstone)**	56	Using the Tube and Torus shapes, Changing shape settings (wall thickness, sides), Rotating 15°, Designing their own wand shape

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TEACHING THE MODULE

The weekly routine

The same five steps run every week, so students know what to do without waiting for you.

1. **Assign:** Pick the week's lesson in the Lesson library and assign it, or open the whole module so students move through it in order.
2. **Build:** Students sign in with the class code, tap their name, and follow the photo steps with Tinkercad open beside them, or build along with the lesson video.
3. **Turn in:** Students upload their .STL (or .OBJ / .3MF). The app checks that they finished every step first.
4. **Print:** Open the Print queue, spin each design in 3D, then approve and print it, or send it back with a note.
5. **Badge:** Students earn the lesson's Builder Badge on their Quest Path. Print the matching badge chip from Resources.

What's in this pack

Printable	How to use it
Lesson plans (9)	Goal, skills, vocabulary, materials, lesson flow, watch-fors, an extension and three check questions.
Design Log worksheets (9)	Students sketch, check off skills, test their print and reflect. Print them, or post them in Google Classroom.
Answer key	Answers to every lesson's check questions.
Builder rubric	One 4-level rubric for any lesson, scored out of 20.

Support for students who need it

- Pair them with a classmate who finished that lesson.
- Let them build along with the lesson video.
- Focus on the core steps and skip the extension.

Challenge for fast finishers

- Do the extension, then redesign it without the steps.
- Move ahead on the Quest Path.
- Be a "Tinkercad helper" for classmates.

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PRINTING GUIDE

Printing Module 1 designs

Print in PLA. Most designs print flat on the bed with no supports; parts that move or fit together need the small gaps from the steps.

Tip	What to do
Check before printing	Spin the design in 3D in the Print queue. Look for floating parts, holes that didn't cut, and walls thinner than about 1 mm.
Batch prints	Combine several students' small designs on one plate to save time.
Cookie Cutter	Use food-safe practices. Many teachers use the cutters for play dough instead.
Winners Award	Print the award and the base as separate parts, then press or glue them together.
Bubble Wand	Print the loop flat. Thicker walls hold up better in water.
Badge chips	40 mm with a keyring hole. Print one when a student earns a badge. Find them under Resources in the app.

Quick checks (exit-ticket style)

- How do you make a shape exactly 20 mm wide?
- What does a hole shape do when it overlaps a solid?
- Why do we group shapes before exporting?
- What file type do we send to the printer?
- How would you change this design to make it your own?

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LESSON PLAN · LESSON 1

Spinning Top

39 photo steps | Builder Badge #1 | Grades 3–9



LEARNING GOAL

Students build a top from three stacked shapes, then export it as an .STL file ready to print.

New Tinkercad skills

- Dragging basic shapes onto the workplane
- Resizing shapes with the handles
- Raising a shape with the black cone arrow
- Turning the view cube to check every side
- Exporting an .STL

Vocabulary

workplane | shape | handle | dimensions | export | .STL

Materials

- Computer or Chromebook with Tinkercad (signed in)
- 3D Print Quest class code
- 3D printer and PLA filament
- A timer or stopwatch for testing

Lesson flow

1. **Warm up:** Show a real spinning top. Ask: what simple shapes is it made of?
2. **Build:** Assign the lesson in 3D Print Quest. Students follow the photo steps with Tinkercad open beside them, or build along with the video.
3. **Check:** Students fill in the Build it checklist on their Design Log as they go. Circulate and watch for the tip below.
4. **Turn in and print:** Students export an .STL and turn it in. Spin each design in the Print queue, then approve and print it or send it back with a note.
5. **Test and reflect:** Students test their print and finish the Test it and Reflect sections. Use the check questions below as an exit ticket.

WATCH FOR

Shapes floating above or sinking into each other. Show the black cone arrow for raising a shape.

EXTENSION

Test which top shape spins the longest, then redesign to beat your record.

Check for understanding · answers in the Answer Key

1. How do you make a shape bigger or smaller?
2. How do you lift one shape on top of another?
3. What file type do we send to the 3D printer?

Teacher notes

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Name _____ Date _____

3D PRINT QUEST · DESIGN LOG · BUILDER BADGE #1

Spinning Top

1 Plan it: sketch your design

2 Build it: check off each skill

- [ ] I dragged three shapes onto the workplane
- [ ] I raised a shape with the cone arrow
- [ ] I exported an .STL
- [ ] I resized a shape with the handles
- [ ] I checked every side with the view cube
- [ ] I turned it in

3 Test it

How many seconds did your top spin?

Try 1	Try 2	Try 3

4 Reflect

What would you change to make your top spin longer?

TEACHER CHECK ☐ Approved ☐ Printed ☐ Badge earned Initials _____

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