Master Maker Build-Off: Expanded Teacher Binder

Project Overview

The Master Maker Build-Off is a 10-day, student-centered STEM challenge designed to promote design thinking, collaboration, creativity, and coding integration. Students select a project, pitch their idea, prototype, iterate, and showcase their final product. It aligns with NYS Standards for Science, Technology, Engineering, and Math, and integrates ISTE standards for student learning and innovation.

Standards Alignment

New York State Intermediate Technology Education Standards:

- MST Standard 1: Analysis, Inquiry and Design
- MST Standard 2: Information Systems
- MST Standard 5: Technology
- MST Standard 6: Interconnectedness
- MST Standard 7: Interdisciplinary Problem Solving

ISTE Standards for Students:

- 1. Empowered Learner
- 4. Innovative Designer
- 5. Computational Thinker
- 6. Creative Communicator
- 7. Global Collaborator

Daily Plans and Procedures

Day 1: Launch + Pitch

Learning Objective: Students will understand the challenge, explore project options, and draft a pitch.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting

- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 2: Planning + Research

Learning Objective: Students will create a project plan and identify roles, materials, and goals.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 3: Prototype Sprint 1

Learning Objective: Students will begin building or coding an initial prototype.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 4: Prototype Sprint 2

Learning Objective: Students will revise and continue building, addressing design flaws.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 5: Checkpoint + Twist

Learning Objective: Students will self-assess, apply a project twist, and revise goals.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 6: Iterate + Improve

Learning Objective: Students will refine their builds based on feedback and performance.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 7: Add Functionality

Learning Objective: Students will enhance functionality with coding, sensors, or interaction.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 8: Finalize Build

Learning Objective: Students will complete builds and prepare presentation materials.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting

- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 9: Showcase Prep

Learning Objective: Students will rehearse, finalize visuals, and complete reflections.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Day 10: Maker Expo

Learning Objective: Students will present projects, receive feedback, and reflect on learning.

Materials Needed: Project kits, pitch sheets, coding tools, twist cards, reflection forms

Procedure (80 minutes):

- - 0–10 min: Welcome, objective overview, reminders
- - 10–20 min: Team check-in or individual goal setting
- - 20–65 min: Core work time (build, code, test, revise)
- - 65–75 min: Progress logging, troubleshooting, peer feedback
- - 75–80 min: Exit ticket or daily reflection prompt

Master Maker Build-Off: Simplified 10-Day Teacher Packet (45-Minute Classes)

Overview

This version of the Master Maker Build-Off is streamlined to fit into 10 days of 45-minute class periods. It emphasizes creative problem-solving, quick prototyping, and student voice, while maintaining structure and pacing. Projects are scaled down for manageability while still encouraging deep thinking and engagement.

Standards Alignment

- NYS MST Standards 1, 2, 5, 6, 7
- ISTE Standards 1, 4, 5, 6, 7

Example Projects

- Mini Chain Reaction Machine: 3-step Rube Goldberg setup with simple trigger.

- Marshmallow Crash Test: Design a small vehicle to keep a marshmallow safe using 2 crash tests.

- Quick-Teach Game: Create a card/board game or simple Scratch game to teach a classroom concept.

- School Fix-it Pitch: Identify a school issue and sketch or prototype a creative solution.

- Mini World in a Box: Create a diorama or Minecraft EDU scene with a guided written or audio tour.

- 1-Day Invention Pitch: Invent a product, sketch a model, and pitch it Shark Tank-style.

Daily Pacing Guide

Day 1: Intro + Choose Project

Goal: Students explore project options, choose one, and begin their pitch sheet.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting

- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 2: Finish Pitch + Plan

Goal: Students complete pitch sheet and begin materials list/sketching.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 3: Start Build or Draft

Goal: Students begin prototyping using provided materials.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 4: Build Progress

Goal: Students continue prototyping and work toward a functional v1.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 5: Peer Feedback Day

Goal: Students share builds for feedback and document suggestions.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 6: Revise and Improve

Goal: Students revise their prototype using feedback.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 7: Polish Final Build

Goal: Final details and prep for presentation.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 8: Presentation Planning

Goal: Students write scripts, rehearse, and create visual support.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 9: Showcase Round 1

Goal: Half of the class presents their projects.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Day 10: Showcase Round 2 + Reflection

Goal: Remaining students present, followed by written reflection.

- Class Time Breakdown (45 mins):
- - 0–5 min: Warm-up / Daily goal setting
- - 5–35 min: Project work (build, code, test, revise, write)
- - 35–40 min: Team check-in / Peer share
- - 40–45 min: Daily log or exit ticket

Teacher Tips

- Keep a large visible progress board in the classroom.

- Use twist cards or surprise constraints to inject energy midway.

- Limit materials to avoid decision fatigue. Simplicity fuels creativity.

- Celebrate first builds as much as polished ones.

- Encourage teams to document 'failures' as learning wins.

Master Maker Build-Off: Daily Assignment Sheets

Day 1 – Launch + Pitch

What project are you choosing?

Why does this project interest you?

Who are you building this for?

What's your big idea or goal for this project?

Day 2 – Planning + Research

List the materials you'll need:

What tools or tech will you use (coding, sensors, etc)?

Sketch or describe your first design idea:

What roles do each team member have?

Day 3 – Prototype Sprint 1

What did you build or try today?

What worked better than expected?

What problems did you run into?

What's your next step for tomorrow?

Day 4 – Prototype Sprint 2

What did you improve today?

Describe one challenge and how you solved it:

What are you most proud of so far?

What still needs to be built?

Day 5 – Checkpoint + Twist

Describe your progress so far:

How did your team respond to feedback?

What twist did you receive?

How are you changing your project to respond to the twist?

Day 6 – Iterate + Improve

What did you test today?

What feedback did you get from a peer?

How did you improve or change your project?

Next improvement idea:

Day 7 – Add Functionality

What features or code did you add today?

What part of your project works the best?

What's still confusing or not working yet?

What will you focus on next time?

Day 8 – Final Touches

What final details did you polish today?

Is your project ready to present? Why or why not?

Do you need to fix or update anything?

What do you still want to test?

Day 9 – Showcase Prep

What will you say during your presentation?

What do you want people to notice about your project?

How are you preparing your display?

Are you ready to present? If not, why?

Day 10 – Maker Expo

What was the best part of today's showcase?

What feedback did you receive?

What did you learn from seeing other projects?

What are you most proud of?