



FOOD TRUCK TYCOON · 5TH GRADE DESIGN CHALLENGE

Planning Guide

Duration: ~ 10 Days | 8 Activities



Activity Overview and Pacing

Activity	Name	Day	Time	Essential Question
1	Meet Your Client: The Food Truck RFP	Day 1	~50 min	What is our client asking us to design, and what would make a food truck a success?
2	How Food Trucks Work: Looking at Layouts	Day 2	~50 min	What makes a food truck's layout work well, and what menu fits our truck?
3	TinkerCAD On-Ramp: Intro to 3D Design	Day 3	~50 min	How can 3D design software help us plan our floorplan precisely?
4	Ideation: Sketching Floorplan Concepts	Day 4	~50 min	What are some different ways we could lay out our food truck?
5	Evaluate & Choose Your Concept	Day 5	~50 min	Which of our floorplan concepts best meets Riley's criteria — and how do we know?
6	Model Your Floorplan in TinkerCAD	Days 6–7	2 × ~50 min	Can we build an accurate digital model of our floorplan?
7	Build Your Prototype	Days 8–9	2 × ~50 min	Can we build a physical model of our food truck floorplan?
8	Food Truck Expo & Reflection	Day 10	~50 min	How do we show Riley that our food truck design works?

Activity Descriptions and Materials

Activity 1 — Meet Your Client: The Food Truck RFP | Day 1 | ~50 min

Essential Question: *What is our client asking us to design, and what would make a food truck a success?*

Students meet client Riley Chen, read the Request for Proposals, and unpack it into criteria and constraints. Teams form and get a first look at the sample survey and cost data. EDP Connection: Identify the Problem.

Materials:

- Handout 1: Food Truck Design RFP (one per student or team).
- Handout 2: Sample Survey & Cost Data (one per student or team).
- Engineering Notebooks.
- EDP diagram posted.

Activity 2 — How Food Trucks Work: Looking at Layouts | Day 2 | ~50 min

Essential Question: *What makes a food truck's layout work well, and what menu fits our truck?*

Teams learn common food truck zones and workflow, compare four layout styles, then use the survey and cost data to choose a 3–4 item menu that is both popular and profitable.

Materials:

- Food truck floorplan diagrams/photos, or Handout 3 as the main reference.
- Handout 3: Food Truck Style Options (one per team).
- Handout 2: Sample Survey & Cost Data, from Activity 1.

Activity 3 — TinkerCAD On-Ramp: Intro to 3D Design | Day 3 | ~50 min

Essential Question: *How can 3D design software help us plan our floorplan precisely?*

A guided tutorial builds comfort with TinkerCAD's workspace and core moves — placing, resizing, moving, rotating, grouping, and labeling shapes — through a practice “mini serving counter” build. No floorplan decisions yet.

Materials:

- Free TinkerCAD class set up with a join code; student logins tested in advance.
- Projector for live demonstration.
- Handout 4: TinkerCAD Quick-Start Guide.

Activity 4 — Ideation: Sketching Floorplan Concepts | Day 4 | ~50 min

Essential Question: *What are some different ways we could lay out our food truck?*

Teams rapid-sketch multiple floorplan ideas, then develop three labeled concepts showing all five zones within a 16-by-8-foot footprint. EDP Connection: Ideate — quantity and variety over early judgment.

Materials:

- Blank paper, rulers, colored pencils or markers.
- Five criteria (Popular, Affordable to Run, Efficient Layout, Safe, Buildable) posted for reference.

Activity 5 — Evaluate & Choose Your Concept | Day 5 | ~50 min

Essential Question: *Which of our floorplan concepts best meets Riley's criteria — and how do we know?*

Teams score their three concepts against the five criteria using a decision matrix, then commit to one concept and write a justification referencing the matrix. EDP Connection: Evaluate.

Materials:

- Handout 5: Concept Evaluation Matrix (one per team).
- Teams' three concept sketches from Activity 4.

Activity 6 — Model Your Floorplan in TinkerCAD | Days 6–7 | 2 × ~50 min

Essential Question: *Can we build an accurate digital model of our floorplan?*

Over two sessions, teams plan with the Floorplan Planner and build a to-scale digital model of their chosen concept — outer walls and labeled zones on Day 6, equipment and finishing touches on Day 7.

Materials:

- Students logged in to TinkerCAD, Activity 3 complete.
- Handout 6: Floorplan Planner (one per team).
- Scale guidance: 1 TinkerCAD unit = 1 inch, footprint capped at 16 in. × 8 in. (or real feet, per district setup).
- If a team plans to build their prototype on a shoebox, have them measure the shoebox first and model their floorplan to those dimensions in TinkerCAD.

Activity 7 — Build Your Prototype | Days 8–9 | 2 × ~50 min

Essential Question: *Can we build a physical model of our food truck floorplan?*

Teams build a physical prototype from their TinkerCAD blueprint using flexible materials — shell and zones on Day 8, equipment, signage, and finishing touches on Day 9. EDP Connection: Prototype and Test.

Materials:

- Prototype materials — Cardboard Sheets, Shoeboxes, or Recycled Cardboard (base); Card Stock; Jumbo Craft Sticks; Paper Straws; Paper Cups; plus tape, glue, scissors, and rulers.
- Cutting-tool safety rules established in advance.
- Teams' finished TinkerCAD model and Floorplan Planner.

Activity 8 — Food Truck Expo & Reflection | Day 10 | ~50 min

Essential Question: *How do we show Riley that our food truck design works?*

Teams prepare and deliver a 3–5 minute presentation arguing from evidence that their design meets every RFP requirement, followed by a gallery walk and individual reflection. EDP Connection: Communicate Your Solution.

Materials:

- Handout 7: Food Truck Expo Presentation Planner.
- Handout 8: Design Challenge Rubric.
- Gallery-walk layout for prototypes and presentation space.
- Optional: guest to play Riley, or peer judges with the rubric.

Standards Alignment

NGSS Engineering Design Performance Expectations

Standard	Description	Where It Shows Up
3-5-ETS1-1	Define a simple design problem reflecting a need, including criteria for success and constraints on materials, time, or cost.	Activity 1
3-5-ETS1-2	Generate and compare multiple possible solutions to a problem based on how well each meets the criteria and constraints.	Activities 4, 5
3-5-ETS1-3	Plan and carry out fair tests to identify which design features work as intended, including failure points, then improve the design.	Activities 6, 7

Science and Engineering Practices

Practice	Where It Shows Up
SEP: Developing and Using Models	Activity 6
SEP: Engaging in Argument from Evidence	Activity 8

Common Core Standards for Mathematical Practice

Standard	Where It Shows Up
5.NBT.B.7: Calculate decimal cost and price data to judge profit and affordability.	Activities 1, 2, 5
5.MD / 5.G: Measure and lay out a floorplan to scale within a size constraint.	Activities 4–6
MP.1: Make sense of problems and persevere in solving them.	Ongoing
MP.4: Model with mathematics.	Activities 4–6
MP.5: Use appropriate tools strategically.	Activities 3, 6, 7

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