



5TH GRADE DESIGN CHALLENGE

Food Truck Tycoon

Teacher Facilitation Guide

Duration: ~2 Weeks (10 50-Minute Class Periods)



CHALLENGE OVERVIEW

Students take on the role of food truck designers. A new food truck owner, Riley Chen, sends the class a Request for Proposals (RFP) asking design teams to plan a brand-new food truck from the inside out. Using sample survey and cost data, teams choose a menu, research how real food trucks are laid out, sketch and evaluate floorplan ideas, model their floorplan in TinkerCAD, build a hands-on prototype, and present their design at a culminating Food Truck Expo.

This Design Challenge is written to stand alone — it includes its own sample survey and cost data, so a class does not need to complete the Data or Systems Challenge first. Teams that did complete those challenges will recognize the menu-and-profit thinking from the Data Challenge and the workflow thinking from the Systems Challenge.

BY THE END OF THIS CHALLENGE, STUDENTS WILL BE ABLE TO:

- Read a Request for Proposals (RFP) and identify criteria and constraints.
- Use sample survey and cost data to choose a menu that is popular and affordable to make.
- Generate and sketch multiple food truck floorplan concepts.
- Use a decision matrix to evaluate concepts and choose the strongest one.
- Build a to-scale floorplan model using TinkerCAD.
- Build a physical prototype of their food truck design.
- Apply the full Engineering Design Process, from identifying the problem to communicating a solution.
- Present and defend their design at a Food Truck Expo.

MODULE STRUCTURE

- **Activity 1** — Meet Your Client: The Food Truck RFP (Day 1)
- **Activity 2** — How Food Trucks Work: Looking at Layouts (Day 2)
- **Activity 3** — TinkerCAD On-Ramp: Intro to 3D Design (Day 3)
- **Activity 4** — Ideation: Sketching Floorplan Concepts (Day 4)
- **Activity 5** — Evaluate & Choose Your Concept (Day 5)
- **Activity 6** — Model Your Floorplan in TinkerCAD (Days 6–7)
- **Activity 7** — Build Your Prototype (Days 8–9)
- **Activity 8** — Food Truck Expo & Reflection (Day 10)

MATERIALS

- Engineering Notebooks (one per student).
- Computers or Chromebooks with internet access for TinkerCAD (free class account).
- Prototype building materials: cardboard boxes or shoeboxes, cardstock, craft sticks, straws, paper cups, tape, glue, scissors, rulers.
- Optional: a 3D printer for printing a small custom piece (not required — see Teacher Tip in Activity 6).

Companion Handouts:

- [Handout 1 — Food Truck Design RFP](#)
- [Handout 2 — Sample Survey & Cost Data](#)
- [Handout 3 — Food Truck Style Options](#)
- [Handout 4 — TinkerCAD Quick-Start Guide](#)
- [Handout 5 — Concept Evaluation Matrix](#)
- [Handout 6 — Floorplan Planner](#)
- [Handout 7 — Food Truck Expo Presentation Planner](#)
- [Handout 8 — Design Challenge Rubric](#)

STANDARDS ALIGNMENT

NGSS Engineering Design & Science and Engineering Practices

- **3-5-ETS1-1** — Activity 1: Students define the design problem from the client's RFP, identifying criteria (popular, affordable, efficient, safe, buildable) and constraints (truck size, materials, budget).
- **3-5-ETS1-2** — Activities 4–5: Students generate multiple floorplan concepts and compare them against one another using a decision matrix.
- **3-5-ETS1-3** — Activities 6–7: Students plan, model, and build a prototype, then check it against the design criteria and make improvements.
- **SEP: Developing and Using Models** — Activity 6: Students build a digital TinkerCAD model before constructing their physical prototype.
- **SEP: Engaging in Argument from Evidence** — Activity 8: Students use their data and design choices to argue that their food truck meets the RFP.

Common Core Math Practice

- **5.NBT.B.7** — Activities 1–2 and 5: Students use decimal cost and price data to calculate profit per item and judge affordability.
- **5.MD / 5.G** — Activities 4–6: Students measure and lay out a floorplan to scale within a given size constraint.
- **MP1 Make sense of problems** — The challenge is open-ended; teams work through a real design problem with more than one valid solution.
- **MP4 Model with mathematics** — Teams translate real-world measurements into a scaled floorplan and a 3D model.
- **MP5 Use appropriate tools strategically** — Teams choose when to sketch by hand and when to model in TinkerCAD.

KEY VOCABULARY

RFP (Request for Proposals)	A letter a client sends asking design teams to solve a problem and explaining what the design needs to do.
Criteria	The things a successful design must do (popular, affordable, efficient, safe, buildable).
Constraints	The limits a design must stay within (size, materials, budget, time).
Floorplan	A drawing or model that shows the layout of a space from above.
Workflow	The path a worker follows to get a job done, step by step (for example: prep → cook → serve).
Prototype	An early working model of a design, built to test ideas.
CAD (Computer-Aided Design)	Using software such as TinkerCAD to build a 3D model on a computer.
Budget	The amount of money available to spend.
Decision matrix	A tool for scoring competing design ideas against a set of criteria.
Iteration	Making a design better by testing it, learning from the results, and making changes.

ACTIVITY 1

Meet Your Client: The Food Truck RFP

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

TIME
~50 min

Students meet their client, Riley Chen, and read Riley's Request for Proposals. They unpack it into a clear design problem with criteria and constraints, form teams, and get a first look at the sample survey and cost data they will use all challenge long.

SETUP & MATERIALS

- Print one copy of the Food Truck Design RFP (Handout 1) and the Sample Survey & Cost Data (Handout 2) per student or team.
- Have Engineering Notebooks ready.
- Post the Engineering Design Process (EDP) diagram where the class can see it.
- Decide teams of three in advance, or plan a method for forming them today.

Part 1 — Warm-Up: Food Truck Talk: 10 min

Open with a quick conversation to activate background knowledge.

DISCUSSION PROMPTS — FOOD TRUCKS YOU KNOW

- *Have you ever eaten from a food truck, or seen one? What did you notice?*
- *Why do you think someone would want to run a food truck instead of a regular restaurant?*
- *What do you think it would be tricky about cooking and serving food out of a small truck?*

Part 2 — Read Riley's RFP: 20 min

Distribute the RFP and read it together as a class. Have students highlight (1) what Riley wants, and (2) the five requirements. Introduce the words criteria (what the design must do) and constraints (the limits it must stay within). As a class, list the five criteria on the board: Popular, Affordable to Run, Efficient Layout, Safe, and Buildable.

TEACHER TIP

Riley's RFP is written so the requirements translate into five plain-language criteria: Popular, Affordable to Run, Efficient Layout, Safe, and Buildable. Keep returning to these five words throughout the unit — they become the columns of the decision matrix in Activity 5 and the rows of the final rubric.

Part 3 — Teams & First Look at the Data: 20 min

Form teams of three. Hand out the Sample Survey & Cost Data (Handout 2) and explain that this stands in for real customer research — a class of students were surveyed about which menu items they would buy, and each item's cost to make and selling price were recorded.

Teams will use this data starting in Activity 2 to choose their menu. For today, just have teams skim the data and notice which items seem most popular.

Close by previewing the rest of the unit using the Challenge Structure list.

EXIT TICKET

In one sentence, what is Riley asking your team to design?

List two criteria and one constraint from the RFP.

Name one menu item from the data sheet that looks popular to you.

EDP CONNECTION — IDENTIFY THE PROBLEM

Point to the EDP poster. Students are now in the “Identify the Problem” stage — reading the RFP is how engineers define what they need to design and why. Have students place a sticky note on this stage of the poster as they begin.

ACTIVITY 2

How Food Trucks Work: Looking at Layouts

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

TIME
~50 min

Teams study how real food trucks are laid out, learn the names of common zones, and then use the sample survey and cost data to choose the menu their truck will sell. The menu they choose will shape the equipment their floorplan needs to include.

SETUP & MATERIALS

- Print or project a few simple food truck floorplan diagrams or photos (search “food truck floor plan diagram” for kid-friendly examples), or use the Food Truck Style Options handout as the main reference.
- Print the Food Truck Style Options (Handout 3), one per team.
- Sample Survey & Cost Data (Handout 2) from Activity 1.

Part 1 — Zones & Workflow: 15 min

Introduce the common zones inside a food truck: the prep counter (where ingredients are prepped), the cooking equipment (grill, fryer, oven), storage (for ingredients and supplies), the serving window (where customers order and pick up food), and walk space (room for workers to move safely). Introduce the word workflow — the order steps happen in, such as prep → cook → serve.

DISCUSSION PROMPTS — ZONES & WORKFLOW

- *Why might it matter where the cooking equipment is placed compared to the serving window?*
- *What could go wrong if there isn't enough walk space inside the truck?*
- *Why do you think workflow order (prep, then cook, then serve) matters for speed?*

Part 2 — Compare Food Truck Styles: 15 min

Hand out the Food Truck Style Options. Walk through the four layout styles together: Side Walk-Up Window, Double Window (Order + Pickup), Open-Counter Truck, and Compact Drink/Dessert Cart. Discuss how each style changes the workflow and how much room is needed.

Part 3 — Choose Your Menu: 20 min

Using the Sample Survey & Cost Data, teams choose 3–4 menu items for their food truck. Items should be popular with surveyed customers AND affordable enough to make a good profit. Teams record their menu choice and a one-sentence reason for each item, using real numbers from the data sheet as evidence.

TEACHER TIP

Some teams may want to pick only the most popular items, without checking the cost data — or only the cheapest items, without checking popularity. Push teams to use both columns. A great menu item is one that customers want AND that makes the truck money.

DISCUSSION PROMPTS — MENU CHOICES

- *Which menu item are you most excited about, and why?*
- *Did the data ever surprise you — for example, a popular item that isn't very profitable?*
- *How might your menu choice affect the equipment your floorplan will need?*

ACTIVITY 3

TinkerCAD On-Ramp: Intro to 3D Design

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

TIME
~50 min

Students get their first hands-on experience with TinkerCAD. Through a guided tutorial, they learn the workspace and the core moves — placing shapes, resizing, moving, rotating, grouping, and labeling with text. No floorplan decisions yet; the goal is comfort with the tool so Activity 6 can focus on their own design.

SETUP & MATERIALS

- Set up a free TinkerCAD class with a join code (tinkercad.com → Teacher/Classes). Pre-create student logins if your district requires it.
- Test that the site loads on student devices and that login works before class.
- Project your own TinkerCAD screen to demonstrate live.
- Print the TinkerCAD Quick-Start Guide (Handout 4).

Part 1 — Tour the Workspace: 10 min

If students are new to TinkerCAD, demonstrate the basics on the projector: the workplane, the shapes panel, and the view cube for rotating the camera. Have students log in and place their first shape. Keep everyone together at this stage.

Part 2 — Guided Build: A Mini Serving Counter: 30 min

Lead a step-by-step build that practices every move students will need for their floorplan:

- Drag a box onto the workplane; set its size with the dimension handles (a simple counter shape works well).
- Add a second, taller box behind it for a piece of equipment, like a grill.
- Move and rotate the equipment box so it sits neatly against the counter.
- Add a text shape, type a short label like “GRILL,” and resize and position it above the shape.
- Group the counter and equipment together so they move as one piece.
- Practice undo, duplicate, and the view cube until the moves feel comfortable.

TEACHER TIP

Expect a wide range of speeds the first time. Pair fast finishers as “CAD helpers,” and keep the projected steps visible so students can self-pace. It's fine if the model isn't perfect — comfort with the tool, not polish, is today's goal.

Part 3 — Save & Reflect: 10 min

Make sure every student has saved a design to their account (TinkerCAD autosaves, but confirm they can find it again). Quick reflect: what was easier than expected? What's still confusing?

ACTIVITY 4

Ideation: Sketching Floorplan Concepts

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

TIME
~50 min

Teams generate several distinct floorplan concepts before committing to one. They sketch labeled designs that show the zones, the workflow, and where their chosen menu's equipment fits. The emphasis is on quantity and variety of ideas — the raw material for the evaluation in Activity 5.

SETUP & MATERIALS

- Provide blank paper, rulers, and colored pencils or markers.
- Post the five criteria (Popular, Affordable to Run, Efficient Layout, Safe, Buildable) for reference.
- Remind teams that their floorplan must fit inside a 16-foot-long by 8-foot-wide rectangle — a typical small food truck size.

Part 1 — Rapid Idea Generation: 15 min

Run a quick brainstorm: each team member silently sketches two rough floorplans (about 2 minutes each), then the team shares. Rule: no judging ideas yet — get them all on paper. Encourage variety in window placement, zone order, and shape.

Part 2 — Develop Three Concepts: 25 min

Each team selects and develops three of their strongest concepts into labeled sketches. Each sketch should show every zone (prep counter, cooking equipment, storage, serving window, walk space), roughly where the menu's equipment goes, and approximate dimensions.

SKETCH CHECKLIST

- Can someone else understand the layout just from your sketch?
- Are all five zones labeled (prep, cook, storage, serving window, walk space)?
- Does the floorplan fit inside 16 feet by 8 feet?
- Could this be built from cardboard, cardstock, and craft materials?

Part 3 — Share & Stick: 10 min

Teams post their three concepts. Do a quick gallery glance so teams see the range of ideas in the room before they evaluate in the next activity.

EDP CONNECTION — IDEATE

Students are now in the “Ideate” stage. Brainstorming means generating many ideas without evaluating them yet. Encourage quantity over quality at this stage. Remind teams that as they sketch floorplans, they should also think about where their chosen menu's equipment fits — the equipment is part of the design.

ACTIVITY 5

Evaluate & Choose Your Concept

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

TIME
~50 min

Teams use a decision matrix to score their three concepts against the five criteria, turning a gut feeling into a defensible choice. Teams select one concept to model and build, and justify the decision.

SETUP & MATERIALS

- Print the Concept Evaluation Matrix (Handout 5), one per team.
- Teams' three concept sketches from Activity 4 on hand.

Part 1 — Set Up the Matrix: 10 min

Review how a decision matrix works: criteria down the side, concepts across the top, scored 1–5 in each cell, then totaled. Discuss as a class whether any criterion should count more (weighting). For example, Safe might be a “must-pass” gate rather than a score.

Part 2 — Score the Concepts: 25 min

Teams score each concept against Popular, Affordable to Run, Efficient Layout, Safe, and Buildable, writing a short reason for each score (not just a number). They total the columns and identify the winner. Encourage debate — if scores are close, that's a real engineering conversation.

DISCUSSION PROMPTS — DEFEND YOUR SCORES

- *What evidence (from the data sheet or your sketches) supports your score for “Affordable to Run”?*
- *Did the highest-scoring concept surprise you? Why or why not?*
- *Is there a concept you liked but the matrix ranked low? What does that tell you?*

Part 3 — Commit & Plan: 15 min

Teams circle their chosen concept and write a one-paragraph justification referencing the matrix. They then make a quick build plan: what to model first in TinkerCAD, who does what, and what materials they'll need starting Day 6.

TEACHER TIP

Watch for teams that pick a favorite and reverse-engineer the scores to justify it. Push them to score honestly first, then choose. If a team genuinely disagrees with the matrix result, that's a great moment — ask what criterion the matrix is missing, and let them add or weight it rather than ignore the tool.

EDP CONNECTION — EVALUATE

This is the “Evaluate” stage of the EDP. Students are now systematically comparing design options against defined criteria — exactly what engineers do. The decision matrix makes the evaluation process explicit and evidence-based.

ACTIVITY 6

Model Your Floorplan in TinkerCAD

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

TIME
2 x ~50 min

Over two class sessions, teams plan and build a to-scale digital model of their chosen floorplan in TinkerCAD, using the skills from Activity 3 on a real design instead of a practice shape.

SETUP & MATERIALS

- Students logged in to TinkerCAD with Activity 3 complete.
- Print the Floorplan Planner (Handout 6), one per team.
- Suggest teams use 1 TinkerCAD unit = 1 inch, and remind them their whole floorplan must fit inside 16 inches by 8 inches at that scale (1 inch = 1 foot) — or work in real feet if your district's TinkerCAD setup allows it.

Part 1 (Day 6) — Plan and Model the Layout: ~50 min

Before opening TinkerCAD, each team completes the Floorplan Planner: they list their zones and equipment, and sketch their plan one more time with real dimensions labeled. Then teams build the outer walls of their truck and place a labeled box for each zone (prep counter, cooking equipment, storage, serving window, walk space). Note: If teams will be using shoeboxes, have them measure the shoeboxes and sketch use these dimensions for their floorplan.

DESIGN CHECK — BEFORE YOU MOVE ON

- Does your model match the dimensions on your Floorplan Planner?
- Are all five zones included and labeled?
- Is there a clear, unblocked walk space connecting prep, cook, and serve?

Part 2 (Day 7) — Add Equipment & Finish the Model: ~50 min

Teams add simple shapes for major equipment (grill, fryer box, freezer, counter), label each with text, and group pieces that belong together. Remind students to keep shapes simple — boxes and cylinders are enough to show an accurate floorplan; fancy detail is not the goal. Teams finish by saving their model and taking a labeled screenshot for their Expo presentation.

TEACHER TIP

If your school has a 3D printer, printing is optional, not required — one small labeled piece (like a sign or a counter) is a fun bonus, but the learning goal is designing an accurate floorplan in CAD, not having a printed part. If devices or internet are unreliable, pair students up and have one team member model while the other plans the next step on paper.

TIME TO ITERATE? If a team finishes their TinkerCAD model early, don't let them just wait — have them compare their model to Riley's five criteria one more time and make one real improvement (move the serving window, widen a walkway, add a missing piece of

equipment). This keeps the engineering habit of iteration alive without needing a separate class period for it.

ACTIVITY 7

Build Your Prototype

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

TIME

2 x ~50 min

Over two class sessions, teams build a physical prototype of their floorplan, using their TinkerCAD model as the blueprint. Teams may choose whichever combination of materials works best for their design: a cardboard box or shoebox as the truck's shell, with cardstock and craft materials for walls, counters, and equipment.

SETUP & MATERIALS

- All prototyping materials out and organized: cardboard sheets, boxes or shoeboxes, cardstock, craft sticks, straws, paper cups, tape, glue, scissors, rulers.
- Establish cutting-tool safety rules before anyone starts.
- Teams' finished TinkerCAD model (screenshot or device open) and completed Floorplan Planner on hand.

Part 1 (Day 8) — Build the Shell & Zones: ~50 min

Teams choose a base (a cardboard box or shoebox works well) and use their TinkerCAD model to add interior walls, counters, and dividers from cardstock so all five zones are visible inside. The goal is a rough but accurate layout — good enough to check against the plan, not a finished product.

SAFETY & BUILD NORMS

- Cutting tools stay on the table; cut away from your body; one cutter per team at a time.
- Check your build against your TinkerCAD model often, not just at the end.
- Keep zones roughly the same size as your plan — don't shrink a zone just to fix a mistake.

Part 2 (Day 9) — Add Equipment, Signage & Finishing Touches: ~50 min

Teams add small props for equipment (paper cutouts, craft sticks, small boxes) in each zone, add their food truck's name and a simple logo or sign, and do a final check that the prototype matches their TinkerCAD model and Riley's five criteria. Teams should be ready to show and explain their prototype at tomorrow's Expo.

TEACHER TIP

TIME TO ITERATE? Teams that finish early should not start over-decorating — instead, have them do one honest check against the five criteria and the Floorplan Planner, then make one targeted improvement (a sturdier counter, a clearer walk space, a missing

equipment label). Real engineers always look for one more way to improve a design before calling it done.

EDP CONNECTION — PROTOTYPE AND TEST

Students are now in the “Prototype and Test” stage. Modeling digitally first (TinkerCAD) and then building by hand mirrors real engineering practice. Remind students that prototypes are meant to be checked and improved, not perfect on the first try.

ACTIVITY 8

Food Truck Expo & Reflection

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

TIME
~50 min

Teams prepare and deliver a short presentation, arguing from evidence that their food truck meets every requirement in Riley's RFP. The unit closes with a gallery walk and individual reflection.

SETUP & MATERIALS

- Print the Food Truck Expo Presentation Planner (Handout 7) and the Design Challenge Rubric (Handout 8).
- Set up a gallery-walk layout for prototypes and a space for presentations.
- Optional: invite a guest to play Riley, or use peer judges with the rubric.

Part 1 — Prepare Your Presentation: 15 min

Using the Presentation Planner, teams prepare a 3–5 minute presentation that covers: the problem from Riley's RFP, their menu and the data behind it, their floorplan and prototype, and why their design is popular, affordable, efficient, safe, and buildable. Every team member speaks.

PRESENTATION MUST INCLUDE

- The design problem in Riley's own words (the five criteria).
- The menu they chose and the survey/cost data that supports it.
- Their floorplan and prototype, with the five zones pointed out.
- A clear case for why the design meets all five criteria.
- An honest note on one limitation and what they would try next with more time.

Part 2 — Food Truck Expo Gallery Walk: 25 min

Teams present to Riley and/or set up for a gallery walk where classmates view each prototype and score it on the rubric. Encourage specific, kind feedback: one strength and one suggestion per team.

Part 3 — Reflection: 10 min

Students complete an individual reflection: what they're proud of, what the data taught them, and how using TinkerCAD changed their design. Close with Riley's thank-you to the class.

TEACHER TIP

The presentation lands best when there's a real audience. A guest "Riley" (an administrator, a parent, an older student) raises the stakes and the quality. If that's not possible, rotate teams as judges using the rubric — being on both sides of the presentation deepens the practice of arguing from evidence.

EDP CONNECTION — COMMUNICATE YOUR SOLUTION

The Expo presentation is the "Communicate Your Solution" stage of the EDP. Engineers must present their work clearly, backed by evidence. Reference the full EDP poster one final time and celebrate the complete cycle students have completed.

LOOKING AHEAD

You just took a food truck from an idea all the way to a tested floorplan and a working model — using the exact same design process real engineers use. The skills you practiced here, sketching ideas, scoring them honestly, modeling in CAD, and building a prototype, are skills you'll keep using in every design challenge ahead.

Companion Handouts

Handout 1 — Food Truck Design RFP

Read together as a class in Activity 1.

REQUEST FOR PROPOSALS

Dear Design Team,

I am opening a brand-new food truck, and I need your help! I want my truck to be a big hit with customers. But I don't know the best way to set everything up inside.

That's where you come in. I am asking your team to design a floorplan for my food truck. Here is what I need:

Popular: Use the survey data to pick menu items that lots of customers want to buy.

Affordable to Run: My truck has a budget. Pick menu items where I can charge a fair price and still make a good profit.

Efficient Layout: My truck is small — only 16 feet long and 8 feet wide! Your floorplan needs to give my workers enough room to cook, serve, and move around safely.

Safe: My truck needs to follow basic safety rules. Keep cooking equipment away from walkways, and make sure nothing could tip over or block the exit.

Buildable: Your design needs to work in real life. Show me your plan with a 3D model AND a model you build with your hands.

Show me your best floorplan idea, your menu, and your data. Convince me your design will be a success!

Thank you,
Riley Chen
Future Food Truck Owner

DISCUSSION QUESTIONS

1. What is Riley asking your team to design?
2. Which of the five criteria do you think will be hardest to meet? Why?
3. What is one question you have about the RFP?
4. Write a one-sentence problem statement for your team:

Handout 2 — Sample Survey & Cost Data

Twenty students were surveyed and asked which menu items they would buy from a food truck. Use this data, along with the cost and price for each item, to choose your team's menu in Activity 2.

Menu Item	Students Who'd Buy It (out of 20)	Cost to Make	Selling Price	Profit per Item
Lemonade (16 oz)	14	\$0.25	\$2.00	\$1.75
Mini Donuts (3-pack)	16	\$0.40	\$2.00	\$1.60
Hot Dog + Bun	15	\$0.75	\$3.00	\$2.25
Chips + Salsa	9	\$0.50	\$2.50	\$2.00
Pretzel	11	\$0.60	\$2.50	\$1.90
Grilled Cheese	17	\$0.80	\$3.50	\$2.70
Waffle Cone Ice Cream	18	\$0.75	\$3.00	\$2.25
Taco (beef or chicken)	13	\$1.00	\$4.00	\$3.00
Nachos	12	\$1.00	\$4.00	\$3.00
Smoothie (16 oz)	14	\$1.25	\$4.50	\$3.25
Loaded Fries	16	\$1.00	\$4.50	\$3.50
Pizza Slice	17	\$1.50	\$5.00	\$3.50

TEACHER TIP

Teams may want to add an item not on this list. Have them estimate a realistic cost and selling price for it and use the same thinking — the goal is comparing popularity to profit, not the specific item.

Handout 3 — Food Truck Style Options

Choose one layout style to start from, or design your own (with teacher approval). Every option must fit inside a 16-foot by 8-foot truck.

Style	How It Works	Good Fit For
Side Walk-Up Window	One long order-and-pickup window down one side of the truck.	A short, simple menu — easy for one or two workers to run.
Double Window (Order + Pickup)	Customers order at one window and pick up food at a second window.	Busier menus where moving the line faster matters.
Open-Counter Truck	A fold-down counter runs the whole length of one side.	Trucks that want customers to see the food being made.
Compact Drink/Dessert Cart	A smaller footprint with simple equipment, like a blender or freezer.	Drink- or dessert-only menus, like smoothies or ice cream.

Handout 4 — TinkerCAD Quick-Start Guide

A pocket reference for the moves you will use most. Keep it handy while you work.

Action	How to Do It
Place a shape	Drag it from the right-hand Shapes panel onto the workplane.
Resize	Drag the white corner handles, or type exact numbers in the boxes that appear.
Move	Drag the shape, or use the arrow keys for small, precise moves.
Rotate	Click the shape, then drag the curved rotation arrows that appear around it.
Group / Ungroup	Select multiple shapes → Ctrl+G to combine into one. Ctrl+Shift+G to separate.
Label with text	Drag a text shape onto the plane, type your label, then resize and place it.
Camera / View	Use the view cube (top-right corner) to look from above — great for checking a floorplan.
Save / Export	TinkerCAD autosaves to your account. Take a screenshot of your finished model for your presentation.

Handout 5 — Concept Evaluation Matrix

Score each of your three concepts 1 (weak) to 5 (strong) on every criterion, and write a short reason for each score. Total each column. The concept with the highest total is your strongest candidate — but talk it over as a team before you decide.

Criterion (1 = weak · 5 = strong)	Concept A	Concept B	Concept C
Popular — Will customers want to buy from this truck?	Score: ____ Reason:	Score: ____ Reason:	Score: ____ Reason:
Affordable to Run — Will the menu make a good profit?	Score: ____ Reason:	Score: ____ Reason:	Score: ____ Reason:
Efficient Layout — Is there room to work and move safely?	Score: ____ Reason:	Score: ____ Reason:	Score: ____ Reason:
Safe — No hazards; easy to supervise?	Score: ____ Reason:	Score: ____ Reason:	Score: ____ Reason:
Buildable — Can we model and build it in class?	Score: ____ Reason:	Score: ____ Reason:	Score: ____ Reason:
TOTAL (out of 25)	____ / 25	____ / 25	____ / 25

OUR CHOICE — We choose Concept ____ because:

Handout 6 — Floorplan Planner

Plan your floorplan before you start modeling in TinkerCAD. The clearer your plan, the faster and more accurate your model and prototype will be.

What menu items will your truck sell?

What equipment do you need (circle all that apply): Grill · Fryer · Oven · Freezer · Blender · Other: _____

Which zones will your floorplan include? (check all)

- ☐ Prep counter
- ☐ Cooking equipment
- ☐ Storage
- ☐ Serving window
- ☐ Walk space

Sketch your floorplan here (label real-world dimensions in feet):

Dimension	Planned Size (ft)	Notes
Overall length (max 16 ft)		
Overall width (max 8 ft)		
Counter length		
Serving window width		

Handout 7 — Food Truck Expo Presentation Planner

Plan a 3–5 minute presentation for Riley. Every team member speaks at least once. Fill in notes for each part before you practice.

1. THE PROBLEM

In Riley's words, what does our food truck need to do? (Reference all five criteria.)

Notes:

2. OUR FOOD TRUCK

What is our truck's name, and what menu did we choose?

Notes:

3. OUR FLOORPLAN & PROTOTYPE

What does our floorplan look like, and why did we lay it out this way?

Notes:

4. OUR DATA

What survey and cost data did we use to choose our menu?

Notes:

5. WHY IT WORKS

Why is our design popular, affordable, efficient, safe, and buildable? (Back each claim with evidence.)

Notes:

6. HONEST REFLECTION

One limitation of our design, and what we would try next if we had more time.

Notes:

Who says what: _____

Handout 8 — Design Challenge Rubric

Assessment type (circle one): Self-assessment · Peer assessment · Teacher assessment

Category	1 — Beginning	2 — Approaching	3 — Meets	4 — Exceeds	Score
Design Process	Does not show evidence of EDP steps.	Shows some steps but skips criteria or ideation.	Defined criteria, generated multiple concepts, used the matrix to select one.	Defined criteria precisely, generated 3+ distinct concepts, justified selection with matrix data.	___/4
Floorplan & CAD Model	No TinkerCAD model, or model does not match the floorplan.	Model exists but has major sizing errors or missing zones.	Modeled an accurate floorplan in TinkerCAD with all five zones.	Floorplan model is accurate, clearly labeled, and closely matches the final prototype.	___/4
Prototype	Prototype is not built or not playable as a floorplan.	Prototype is partially built; missing zones or major structural issues.	A complete prototype built from available materials that matches the floorplan.	Prototype is sturdy, well-crafted, and clearly matches the CAD model.	___/4
Use of Data	No survey or cost data used.	Some data referenced but no clear menu reasoning.	Used survey and cost data to choose a popular, affordable menu.	Menu choice is strongly justified with specific data and clear reasoning.	___/4
Meets the RFP	Design does not address Riley's criteria.	Design meets 1–2 of the 5 RFP criteria.	Design is popular, affordable, efficient, safe, and buildable.	Design clearly and compellingly meets all 5 criteria with strong evidence.	___/4
Presentation & Teamwork	Presentation is missing or only one member presents.	Presentation is present but lacks structure or evidence; not all members speak.	Clear 3–5 min presentation; all members contributed; argued from evidence.	Polished, persuasive presentation; all members contribute meaningfully and specifically.	___/4

TOTAL SCORE: ____ / 24 _____

Strengths: _____

Areas to improve: _____

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