FOOD TRUCK TYCOON · 5TH GRADE SYSTEMS CHALLENGE

Planning Guide

Duration: 5 Days | 5 Activities

Activity Overview and Pacing

Activity	Name	Day	Time	Essential Question
1	What is a System?	Day 1	~60 min	How do the steps in a process connect to make a whole system work?
2	Flowchart Symbols and Simple Sequences	Day 2	~50 min	How do symbols help us communicate a process clearly and precisely?
3	The Decision Diamond	Day 3	~50 min	How do decisions affect the path through a process — and what happens when things go wrong?
4	Mapping Your Food Truck Process	Day 4	~50 min	How can a flowchart help us understand and improve the way our food truck works?
5	Building, Debugging, and Sharing Your Flowchart	Day 5	~60 min	How can a clear flowchart help others understand and follow a complex process?

Activity Descriptions and Materials

Activity 1 — What is a System? | Day 1 | ~60 min

Essential Question: *How do the steps in a process connect to make a whole system work?*

Students are introduced to systems thinking through a physical warm-up and the classic Human Robot activity, discovering that sequence matters. Closes by connecting the Input / Process / Output framework to a food truck.

Materials:

- Prop ingredients for Human Robot demo (jar with lid, paper “bread,” stand-in for peanut butter and jelly).
- Optional: whiteboard or chart paper for student instructions.
- Engineering Design Logs.

Activity 2 — Flowchart Symbols and Simple Sequences | Day 2 | ~50 min

Essential Question: *How do symbols help us communicate a process clearly and precisely?*

Students learn the four core flowchart symbols (oval, rectangle, diamond, arrow), build a flowchart together as a class, then practice independently with the Grilled Cheese Protocol — their first complete, working flowchart.

Materials:

- Handout 1: Symbol Matching Cards (one set per group, cut apart).
- Card Stock (assorted colors) — for printing the Symbol Matching Cards (Handout 1).
- Symbol Key anchor chart or slide (stays posted for the rest of the unit).
- Plain paper and pencils.
- Optional: colored markers for YES/NO path coding.

Activity 3 — The Decision Diamond | Day 3 | ~50 min

Essential Question: *How do decisions affect the path through a process — and what happens when things go wrong?*

Students go deeper with the decision diamond, seeing how it creates branches and loops. They build a decision-rich flowchart of their own, then swap with a partner for a peer debugging session using sticky-note feedback.

Materials:

- Plain paper and pencils.
- Sticky notes, two colors if possible (“I can follow this” / “I got stuck here”).
- Symbol Key from Activity 2, still posted.
- Optional: green and red markers for YES/NO paths.

Activity 4 — Mapping Your Food Truck Process | Day 4 | ~50 min

Essential Question: *How can a flowchart help us understand and improve the way our food truck works?*

Groups choose one real food truck process, connect the work to the Ideate and Evaluate stages of the EDP, and draft a flowchart using the Planning Template. Digital tool options (Lucidchart, Google Drawings) are introduced for groups ready to go digital.

Materials:

- Plain paper and pencils for drafts.
- Handout 2: Food Truck Flowchart Planning Template (one per group).
- Symbol Key, still posted.
- Optional: Lucidchart or Google Drawings access.
- Class data charts or food truck notes from the Data Challenge, if available.

Activity 5 — Building, Debugging, and Sharing Your Flowchart | Day 5 | ~60 min

Essential Question: *How can a clear flowchart help others understand and follow a complex process?*

Groups finalize their flowcharts against a self-check list, then put them to the test in a Flowchart Gallery Walk: classmates try to follow each chart step-by-step and leave feedback. Closes by looking ahead to the Design Challenge.

Materials:

- Completed flowchart drafts from Activity 4 (paper or digital).
- Handout 3: Peer Debugging Checklist (one per student).
- Two colors of sticky notes (“This works” / “I got stuck here”).
- Tape for posting flowcharts.
- Optional: computers or tablets for digital versions.

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.	Activities 4, 5

Science and Engineering Practices

Practice	Where It Shows Up
SEP-2: Developing and Using Models	Activities 2–5
SEP-6: Constructing Explanations and Designing Solutions	Activity 5
SEP-8: Obtaining, Evaluating, and Communicating Information	Activities 3, 5
Computational Thinking: Decomposition and Algorithms	All Activities

Common Core Standards for Mathematical Practice

Standard	Where It Shows Up
MP.1: Make sense of problems and persevere in solving them.	Ongoing
MP.3: Construct viable arguments and critique the reasoning of others.	Activity 5
MP.6: Attend to precision.	Activity 5

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