

Food Distribution Open-Supply-Chain Model 8-Step PBLP (Grades 7–12)

Objective: To explore how open supply chains make food distribution more accessible, equitable, and efficient through a derivative effect. Learners study Thanksgiving as an example of an expanded, coordinated supply chain system in action, then analyze how open distribution models can be adapted into year-round solutions for communities facing inconsistent food access. Through STREAMSS disciplines, learners investigate transparency in sourcing, distribution flows, logistics design, and community partnerships that strengthen food security.

Round Table

❖ **Discussion Questions:**

- What is an open supply chain?
- What would an open supply chain, one designed to share information, resources, and access, look like in our community?

❖ **Purpose:** Introduce learners to the idea that food flows behave differently depending on access, visibility, and coordination. Thanksgiving demonstrates a temporary open supply chain, shorter pathways, more partners, more transparency, and more availability.

❖ **Materials:** Reflection journal

Reflection Point

❖ **Discussion Questions:**

- What breaks down in the supply chain during non-holiday months?

❖ **Materials:** Reflection journals

Knowledge Setting

Science (S): Environmental & Nutritional Stability Across the Supply Chain	❖ Objective: Understand how environmental factors, harvest cycles, and storage conditions affect food supply reliability. ❖ Activity: Study seasonal crops, food spoilage science, composting systems, and how environmental cycles impact food access. Study how open distribution models reduce waste and increase access.
Technology (T): Digital Transparency Tools in Open Supply Chains	❖ Objective: Understand how technology increases visibility and reliability of food distribution networks. ❖ Activity: Evaluate tracking, inventory dashboards, alert systems, and real-time food locator maps. Analyze how digital openness reduces uncertainty and strengthens community access.
Research (R): Investigating Local Food Flow Patterns	❖ Objective: Analyze how food is sourced, transported, and distributed in the community, from farms, stores, food banks, and donation sites, across different seasons. ❖ Activity: Collect and compare data on how much food is transported and distributed during peak holiday periods like Thanksgiving versus non-peak months such as February or June. Identify bottlenecks, transparency gaps, and periods of reduced distribution activity that create seasonal

	downtime in the community food supply chain.
Engineering (E): Designing Open, Short-Path Distribution Systems	❖ Objective: Understand how an open supply chain functions by analyzing the inputs, outputs, and internal processes required to distribute food. ❖ Activity: Evaluate how transparency, open data sharing, decentralized coordination, and shorter distribution pathways strengthen a community's ability to maintain consistent food access throughout the year.
Arts (A): Visualizing Community Food Flows	❖ Objective: Understand how mapping is used in an open supply chain to visualize inputs, outputs, routes, and access points within a community food distribution network. ❖ Activity: Analyze maps that compare existing distribution routes with open supply chain routes, highlighting how transparency, shared pathways, and clearly defined access points improve year-round food availability.
Mathematics (M): Modeling Supply Capacity & Distribution Requirements	❖ Objective: Understand how seasonal and nonseasonal factors influence cost-per-meal, distribution intervals, and overall resource allocation within a community food supply system. ❖ Activity: Analyze actual or representative data on weekly meal demand, distribution schedules, transportation and labor hours, and patterns of food surplus or waste. Identify fluctuations throughout the year.

Social Studies (SS): Policy, Access Rights & Community Supply Chain Equity

- ❖ **Objective:** Understand how government programs, nonprofit sectors, and local policies shape food flow.
- ❖ **Activity:** Identify which policies and structures support reliable distribution networks and which create barriers, especially outside of high-visibility seasons like Thanksgiving.

Project Examples

Progress Map for Project Delivery

❖ Step 1: Project Proposal

Learners gather foundational knowledge through a collaborative knowledge-setting session to prepare for a project-based learning process. They meet with community partners (if possible) and create a written proposal outlining the project focus and intended community benefit.

❖ Step 2: Initial Project Proposal and Community Engagement Plan

Learners submit proposals and reflect on community input, refining their plans. They outline how the project addresses real-world needs and aligns with learning objectives.

❖ Step 3: Research Progress Update

Learners conduct research and gather data by consulting with community partners to guide their project development and ensure accuracy.

❖ Step 4: Draft of Final Project

Learners compile findings into a working draft of their final project proposal.

❖ Step 5: Final Project Refinement and Approval for Implementation

Learners apply final feedback to strengthen their project and submit it for approval. Approved projects move forward to the community involvement and assessment phases outlined in the SOP.

Science (S): Community Food Stability & Seasonal Impact Analysis	❖ Project Example: Partner with a local farm, food bank, or community garden to study seasonal availability and storage conditions. Learners create a Seasonal Community Access Plan showing how small improvements, like expanded cold storage, coordinated harvest days, or reduced waste, produce positive downstream effects on year-round meal availability. ❖ Derivative Effect: Better seasonal planning → more reliable distribution → strengthened community access.
Technology (T): Community Open-Data Food Access Hub	❖ Project Example: Collaborate with a community center or mutual aid network to design a simple open-data system that displays distribution days, hours, volunteer needs, and inventory. ❖ Derivative Effect: Increased transparency → higher participation → fewer missed distribution cycles → stronger supply chain flow.
Research (R): Community Distribution Equity Report & Mapping Project	❖ Project Example: Work with local coalitions to collect data on distribution frequency, access points, transportation routes, and off-season gaps. Create a Community Access Equity Report highlighting structural supports and barriers. ❖ Derivative Effect: Community-informed data → better planning → stronger, more equitable distribution systems.

Engineering (E): Open Pathway Supply Chain Redesign for a Neighborhood	❖ Project Example: In collaboration with a neighborhood food program, map the current distribution process (inputs, routing, storage, outputs). Design a short-path, open supply chain model that improves year-round consistency. Should include shared storage, coordinated volunteer shifts, or simplified routing. ❖ Derivative Effect: Shorter, open pathways → increased reliability → reduced downtime → broader access.
Arts (A): Community Visualization & Barrier Awareness Exhibit	❖ Project Example: Partner with a library, cultural center, or nonprofit to produce a visual exhibit illustrating the community's food distribution system: current state vs. open supply chain model, in order to engage residents to understand barriers and engage in solutions. ❖ <i>Derivative Effect:</i> Public awareness → stronger civic involvement → increased volunteerism → enhanced supply chain flow.
Mathematics (M): Community Distribution Forecasting & Resource Allocation Model	❖ Project Example: Partner with a food bank or mutual aid group, to build a forecasting model that shows how small operational changes can stabilize food access and affordability across the year. ❖ <i>Derivative Effect:</i> Better forecasting → reduced shortages → more consistent support → stronger community distribution resilience.

Social Justice (SS): Community Policy & Infrastructure Improvement Proposal	❖ Project Example: Collaborate with local policy groups, city planning teams, or community advisory boards to examine zoning, transportation routes, and available distribution sites. Draft a Community Infrastructure Improvement Proposal recommending structural changes (e.g., expanded distribution hours, more accessible sites, multi-use community hubs). ❖ <i>Derivative Effect:</i> Improved infrastructure → smoother distribution → expanded reach → community-wide access stability.
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Community Involvement

- ❖ **Objective:** Implement learner-designed community food access projects through partnerships with local farms, food banks, neighborhood coalitions, libraries, and volunteer networks, documenting how open supply chain coordination improves consistency, access, and reliability throughout the year.

Assessment

- ❖ **Objective:** Evaluate learning, mapping accuracy, partner collaboration, system clarity, and community application.
- ❖ **Methods:** Use rubric-based assessment measuring depth of research, innovation, and community impact, complemented by peer and partner evaluations.

Feedback Loop

- ❖ **Activity:** Reflect on how open supply chain structures changed their understanding of community food access systems, mapping design, volunteer coordination, and distribution reliability.
- ❖ **Journal Prompt:**
 - Which change in inputs or coordination produced the most noticeable ripple impact, and what made that effect expand? (*Derivative effect*)
 - Where does the system still slow down, and why does that part matter for maintaining a reliable, year-round affordable distribution cycle?
 - What would strengthen the flow of information, resources, or partner coordination at the slowest point on the map?

Resume Integration

- ❖ Draft their STREAMSS-based project experience, emphasizing real-world impact, interdisciplinary research, and systems-thinking.

For more STREAMSS 8-Step Project-Based Lesson Plans, go to our website at www.steamsinitiative.org.

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