HEART OF HOMESCHOOL

FROM FARM TO TABLE

An All-Ages STEAM Project-Based Learning Unit

TEACHER'S GUIDE + REPRODUCIBLE STUDENT WORKSHEETS

Science • Technology • Engineering • Art • Mathematics

Driving question: How does food travel from farm to table, and how can we build a healthier, more sustainable food system?

Suggested duration: 2–4 weeks, flexible for homeschool groups and mixed-age classrooms.

Final product: A farm-to-table model, garden plan, or food-system improvement proposal with a short presentation.

Original educational resource created for Heart of Homeschool. Activities may be photocopied for family or classroom use.

TEACHER’S GUIDE | Overview

Students trace a food item from its origins to a meal, explore plant needs and food systems, practice budgeting and measurement, and propose practical improvements. The sequence follows an inquiry-to-design progression.

Learning objectives

• Sequence the stages of food production and distribution.

• Identify environmental, economic, and community challenges in food systems.

• Gather observations, measure growth, and interpret simple data.

• Apply math to pricing, recipes, land use, and food waste.

• Communicate ideas visually, orally, and in writing.

• Design, test, and explain a feasible farm-to-table solution.

Materials

Paper, pencils, crayons, seeds or dried beans, soil or damp paper towels, clear containers, ruler, kitchen scale (optional), grocery flyers or sample prices, measuring cups, recycled craft materials, and optional phone/camera. Avoid tasting unknown plants; wash hands after handling soil.

Suggested pacing

• Week 1: Introduce food journeys; investigate food waste and sources.

• Week 2: Research plant growth and food systems; begin seed observation.

• Week 3: Complete art, math, and career activities; develop designs.

• Week 4: Build or prototype, present, reflect, and assess.

Adapt for all ages: Early learners (ages 4–7): draw, point, dictate, and count with help. Elementary (8–11): write short explanations, measure, and organize data. Middle school (12–14): compare evidence, calculate, and justify decisions. High school (15+): investigate sources, analyze trade-offs, model costs, and present evidence.

TEACHER’S GUIDE | Lesson Sequence

1. Real-World Connection | Follow Your Food

Connections: Social studies, geography, reading

Ask: Where did today’s food come from? Choose a food, inspect a label or research its origin, then map planting/raising, harvest, packing, transport, store, kitchen, and table.

Resource: Worksheet 1. Invite a grocery-store or farmers-market visit; do not require travel.

2. What Is the Problem? | Food Waste Audit

Connections: Environmental science, civics, math

Discuss food waste and unequal access to fresh food without blaming families. Collect observations over 3 days, noting food types and preventable causes.

Resource: Worksheet 2. Use hypothetical examples if tracking household food is uncomfortable.

3. Learn About the Problem | Food Research

Connections: Reading, science, geography, writing

Select one crop or ingredient. Research climate, resources, growing season, handling, and distribution. Compare at least two sources for older students.

Resource: Worksheet 3. Provide age-appropriate books, labels, or credible sources.

4. Art Connection | Storyboard

Connections: Art, narrative writing, sequencing

Illustrate six stages from seed or farm to prepared meal. Add captions, textures, and a key to show people and tools involved.

Resource: Worksheet 4. Younger students can draw three stages.

5. Science | Seed Investigation

Connections: Biology, experimental design

Grow seeds under two conditions (e.g., light vs. shade while keeping water equal). Predict, measure, and record observations. Do not infer results before observing.

Resource: Worksheet 5. A paper-towel germination setup is an alternative.

6. Math | Market and Kitchen

Connections: Arithmetic, fractions, budgeting

Compare produce prices, build a meal budget, scale ingredient quantities, and graph data. Use illustrative prices rather than implying live market prices.

Resource: Worksheet 6. Offer calculators and manipulatives as appropriate.

7. Career Spotlight | People Behind Food

Connections: Career exploration, interviewing

Investigate a farmer, soil scientist, food safety worker, driver, grocer, nutrition professional, or chef. Interview if possible or use a published profile.

Resource: Worksheet 7. Discuss how careers depend on one another.

8. STEAM Challenge | Design and Explain

Connections: Engineering, design, presentation

Teams choose a problem, research constraints, sketch a solution, build a model or plan, test one aspect, and revise.

Resource: Worksheets 8–9 and assessment rubric.

TEACHER'S GUIDE | Discussion and Assessment

Inquiry prompts

• What does a plant need to grow, and how can we test that fairly?

• Which parts of the food journey use energy, water, land, or packaging?

• What are the advantages and limitations of buying locally?

• What happens when food is wasted, and what solutions are realistic?

• How do price, season, nutrition, and accessibility influence food choices?

Evidence of learning

Collect a food journey diagram, food waste observations, research notes, storyboard, plant data, market calculations, career profile, design draft, final product, and reflection. Students may submit oral or visual responses instead of written paragraphs.

Simple assessment rubric (score each 1–4)

Criterion	1: Beginning	2: Developing	3: Proficient	4: Extending
Understanding	Names few stages	Names some stages	Explains stages	Explains connections
Evidence	Little support	Some observations	Uses relevant data	Evaluates evidence
Design	Unclear idea	Partly workable	Feasible solution	Tested and refined
Communication	Hard to follow	Some clarity	Clear explanation	Clear and persuasive

Use the rubric as a flexible guide; evaluate effort and growth, not handwriting or age-dependent complexity.

Extension choices

Younger: Sort picture cards, count seeds, role-play a market. Older: Calculate food miles using verified distances, compare lifecycle impacts carefully, investigate seasonal supply, or estimate a garden's cost per harvest.

STUDENT WORKSHEET | 1. Follow Your Food

Choose one ingredient and trace its journey.

Name: _____ Date: _____ Age/Grade (optional): _____

My food

What food did you choose? Where might it grow or be produced?

_____

_____

Journey map

Show the steps: farm → harvest → processing/packing → transport → shop → kitchen → table. Add or remove steps as needed.

_____

_____

_____

_____

_____

_____

People and places

Who helps bring this food to your table?

_____

_____

_____

Think further

What surprised you about this journey?

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 2. Food Waste Detective

Observe food waste for three days, or use a made-up example.

Name: _____ Date: _____ Age/Grade (optional): _____

Observation log

Day 1: What was discarded and why?

_____

_____

Day 2

What was discarded and why?

_____

_____

Day 3

What was discarded and why?

_____

_____

Patterns

Which foods or causes appeared most often?

_____

_____

_____

Solution

Describe or draw two realistic ways to reduce waste.

_____

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 3. Research a Crop

Investigate one fruit, vegetable, grain, or other ingredient.

Name: _____ Date: _____ Age/Grade (optional): _____

My ingredient

Name and place(s) it grows:

_____

_____

Growing needs

Soil, water, sunlight, temperature, and time:

_____

_____

_____

_____

Journey

How is it harvested, stored, and transported?

_____

_____

_____

Sources

Book, label, interview, or website titles (older students: compare reliability):

_____

_____

_____

Big discovery

One fact I learned and one new question:

_____

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 4. Farm-to-Table Storyboard

Draw and caption the story of your ingredient.

Name: _____ Date: _____ Age/Grade (optional): _____

Panel 1: Start

_____

_____

_____

Panel 2: Growing

_____

_____

_____

Panel 3: Harvest

_____

_____

_____

Panel 4: Processing or packing

_____

_____

_____

Panel 5: Market or delivery

_____

_____

_____

Panel 6: Meal

_____

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 5. Seed Science Lab

Test a question about seed growth. Ask an adult to help with setup.

Name: _____ Date: _____ Age/Grade (optional): _____

Question and prediction

What will you change? What do you predict?

_____

_____

_____

Fair test

What stays the same? What changes?

_____

_____

_____

Observation table

Record day, condition A, condition B, and growth in cm (if any).

_____

_____

_____

_____

_____

Results

What did you observe? Was your prediction supported?

_____

_____

_____

Next experiment

What would you test next?

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 6. Farmers Market Math

Use real store prices or the sample prices below.

Name: _____ Date: _____ Age/Grade (optional): _____

Sample price list

Apples $2/lb; carrots $1.50/lb; potatoes $1.25/lb; tomatoes $3/lb. These are practice prices, not current quotes.

_____

Build a basket

Choose items, weights, and calculate each cost.

_____

_____

_____

_____

_____

Budget challenge

Can you make a basket for $12 or less? Show your total and change.

_____

_____

_____

_____

Kitchen fractions

A recipe needs 1/2 cup carrots for 2 servings. How much for 4 servings? For 6?

_____

_____

_____

Explain

Which item costs the most per pound? How did you decide?

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 7. Food Career Spotlight

Choose a career that helps food reach people.

Name: _____ Date: _____ Age/Grade (optional): _____

Career and responsibilities

What does this person do?

_____

_____

_____

_____

Tools and skills

What knowledge, tools, or training are useful?

_____

_____

_____

Questions

Write three interview or research questions.

_____

_____

_____

_____

Connections

How does this career work with other people in the food system?

_____

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 8. STEAM Design Planner

Design a sustainable farm-to-table solution.

Name: _____ Date: _____ Age/Grade (optional): _____

Define the problem

What specific problem will you solve, and for whom?

_____

_____

_____

Research and constraints

What do you know? Consider budget, space, water, time, and access.

_____

_____

_____

_____

Brainstorm

List or sketch at least two possible solutions.

_____

_____

_____

_____

Choose and draw

Label a plan or model with materials and dimensions.

_____

_____

_____

_____

_____

Success test

How will you know whether your solution works?

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

STUDENT WORKSHEET | 9. Build, Test, Explain

Document your prototype, model, or proposal.

Name: _____ Date: _____ Age/Grade (optional): _____

Make it

What did you build or plan? What materials did you use?

_____

_____

_____

Test it

What evidence or feedback did you collect?

_____

_____

_____

Improve it

What would you change after testing?

_____

_____

_____

Present it

Explain the problem, your solution, and how it helps.

_____

_____

_____

_____

Reflect

What did you learn about food, people, and sustainability?

_____

_____

_____

Choose your response: Draw, write, dictate, photograph your work, or use a combination.

TEACHER'S GUIDE | Answer Guidance and Reflection

Most worksheets are open-ended. Look for accurate sequencing, reasonable evidence, thoughtful reflection, and age-appropriate explanation rather than one fixed response.

Sample math answers

Two pounds of apples at $2/lb = $4. One pound of carrots at $1.50/lb = $1.50. Two pounds of potatoes at $1.25/lb = $2.50. Total = $8; change from $12 = $4. Recipe scaling: 4 servings require 1 cup carrots; 6 servings require 1½ cups. Tomatoes have the highest sample price per pound ($3).

Seed investigation notes

Germination times vary by seed and conditions. Some seeds may not sprout during the observation period. Students should record actual outcomes and consider sample size, seed quality, temperature, moisture, and fairness of the test.

Final presentation checklist

- ☐ I explained a real farm-to-table challenge.
- ☐ I used observations or research to support my ideas.
- ☐ I showed my plan, prototype, or model.
- ☐ I described one test or way to evaluate success.
- ☐ I shared one improvement I would make.

Family reflection

What is one action our family or group could try this month to reduce food waste, grow something edible, or learn more about local agriculture?

_____

_____

_____

_____