



# Reverse the Harvest

Start with a finished aquaponics product. Work backward to skills and standards.

## HOW TO USE THIS • 8-12 MINUTES • GALLERY OR TABLE

1. Pick one card (or two, if you teach different grades). Read the product and the audience first — not the standards.
  2. Work backward in the boxes below. The test: if students never visited the Barn, could they still make this? If yes, the product is not yet Barn-specific.
  3. Steal one idea from a neighbor who grabbed a different card. Write a first Monday task that happens before any permission slip.
- If time is short: post the 12 cards as a gallery. Teachers visit 2 cards, jot on stickies, and keep this sheet.

### CARD # / TITLE

### WHAT WOULD STUDENTS HAVE TO UNDERSTAND ABOUT THE LIVING SYSTEM?

### CONTENT / STANDARDS THIS COULD CARRY (NAME THE FAMILY, NOT EVERY CODE)

### DURABLE SKILLS (COLLABORATION, SYSTEMS THINKING, TECHNICAL WRITING, EMPATHY...)

### WOULD YOU KEEP THIS AUDIENCE? IF NOT, WHO IS MORE REAL FOR YOUR STUDENTS?

### FIRST MONDAY TASK — BEFORE A FIELD TRIP IS BOOKED

### ONE SENTENCE SEED: STUDENTS WILL \_\_\_\_\_ SO THAT \_\_\_\_\_ CAN \_\_\_\_\_.

## Aquaponics project products

Do not start with standards. Start with what students will make and who will use it.

01 K-5 • AQUANEERS / SEL

### Living Loop Tour

#### FINISHED PRODUCT

Students lead a 6-minute family tour of the fish → bacteria → plant cycle at the Barn.

#### AUTHENTIC AUDIENCE

Saturday visitors + younger siblings

#### WHY THIS IS REAL

98% of students felt positive emotions after the aquaponics field trip.

02 K-5 • HEALTH + ELA

### Harvest Recipe Cards

#### FINISHED PRODUCT

Illustrated recipe cards using Barn greens, with a 'where this lettuce lived' story on the back.

#### AUTHENTIC AUDIENCE

Families + the community pantry that receives donations

#### WHY THIS IS REAL

10,000+ servings of leafy greens donated yearly.

03 3-5 • SEL BADGES

### Aquaneer Badge Evidence

#### FINISHED PRODUCT

A student portfolio proving Community, Conservation, and Economy badges with photos + captions from the system.

#### AUTHENTIC AUDIENCE

Aquaneer ceremony + classroom families

#### WHY THIS IS REAL

860 elementary students have earned the 'New Way of Thinking' certificate.

04 3-8 • SCIENCE SYSTEMS

### Nitrogen Story + Numbers

#### FINISHED PRODUCT

A labeled model of the loop plus one calculation: feed in → waste → plant biomass this week.

#### AUTHENTIC AUDIENCE

Science night families + Barn educators

#### WHY THIS IS REAL

Fish waste becomes plant food; plants clean the water for the fish.

05 6-8 • ENGINEERING

### Hallway Inspiration Pitch

#### FINISHED PRODUCT

A proposal to install a 10' × 4' Aqueous Inspiration system inside the school.

#### AUTHENTIC AUDIENCE

Principal + facilities

#### WHY THIS IS REAL

Yield: up to 18 heads of greens weekly and 15 lbs of fish a year.

06 6-8 • MATH + CIVICS

### Donation Logistics Plan

#### FINISHED PRODUCT

A harvest-to-pantry plan: pick, pack, deliver, and track servings without wilted greens.

#### AUTHENTIC AUDIENCE

Local pantry + 100 Gardens staff

#### WHY THIS IS REAL

Same closed loop that feeds fish can feed neighbors.

## Aquaponics project products

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07 6–8 · CAPSTONE

### Ask to 100 Gardens

#### FINISHED PRODUCT

An 8th-grade capstone brief: what students will study before the visit, and what they will give back after.

#### AUTHENTIC AUDIENCE

100 Gardens + Innovation Barn

#### WHY THIS IS REAL

The Barn already offers an aquaponics deep-dive add-on.

08 6–12 · HEALTH

### Taste-Test Lab

#### FINISHED PRODUCT

A protocol + data set: will students try a new green, and can they explain why it is nutrient-dense?

#### AUTHENTIC AUDIENCE

Cafeteria manager + families

#### WHY THIS IS REAL

93% tried a new food; 69% of MS/HS students reported eating more produce.

09 9–12 · CTE AL16

### Intro to Aquaponics One-Pager

#### FINISHED PRODUCT

A recruiting one-pager for the NC credit course (water quality, microbes, plants, fish, system design).

#### AUTHENTIC AUDIENCE

9th graders + counselors

#### WHY THIS IS REAL

Aquaponics I (AL16) is available to all NC high schools for graduation credit.

10 9–12 · ENTREPRENEURSHIP

### Aqueous Enterprise Plan

#### FINISHED PRODUCT

A mini business plan for a 20' × 8' school enterprise: buyers, price, jobs, weekly yield.

#### AUTHENTIC AUDIENCE

CTE advisory board or school foundation

#### WHY THIS IS REAL

70–150 heads of greens weekly; up to 150 lbs of fish a year.

11 9–12 · TECHNICAL WRITING

### Water-Quality SOP

#### FINISHED PRODUCT

A one-page standard operating procedure the next intern could follow on Monday morning.

#### AUTHENTIC AUDIENCE

Barn / 100 Gardens technicians + student interns

#### WHY THIS IS REAL

83% of student interns plan more education or a career connected to the garden.

12 9–12 · WORKFORCE

### Skills-to-Work Exhibit

#### FINISHED PRODUCT

A public exhibit mapping greenhouse tasks to jobs: water tech, food production, retail, skilled trades.

#### AUTHENTIC AUDIENCE

Career night + local employers

#### WHY THIS IS REAL

Modules include system design, water quality, microbes, plants, and fish.



## Where this fits the morning

Do not add this if the mash-up is already tight. It is a model, not a second workshop.

### Best slot

If the tour is rich and teachers are buzzing about the fish tanks: run this INSTEAD of the spark whip (swap 11:06–11:12) plus 4 extra minutes from seed-to-Monday.

If the hour is already full: skip live facilitation. Post the 12 cards on a side wall during coffee. Teachers grab one on the way to seats.

If Jenny wants a second station after noon conversations: leave the cards + recording sheets on a high-top.

### Live facilitation (10 minutes)

0:00 “You just saw a closed loop. We are going to steal a finished product and reverse-engineer the learning — the way strong PBL actually gets designed.”

0:40 Deal or post cards. One card per pair. Recording sheet out.

1:00–6:00 Silent / pair work on the six boxes. Jenny circulates with one prompt only: “Could they make this without the Barn?”

6:00–9:00 Two pairs share only the sentence seed.

9:00–10:00 Name the move: product and audience first, standards second. Then return to the mash-up.

### What Jenny protects

Do not let this become a standards scavenger hunt. If a pair starts listing NC codes, redirect: “Name the content family. Then finish the sentence stem.”

Cards 09–12 are secondary/CTE. Cards 01–03 are elementary/SEL. Mix pairs across grades when possible.

100 Gardens is a real partner in the building. Point teachers to [info@100gardens.org](mailto:info@100gardens.org) and [100gardens.org](http://100gardens.org) only at the close — not during the reverse work.

### Content families teachers can name quickly

- Science: ecosystems, matter cycles, engineering design, water quality
- Math: rate, yield, cost per head, measurement, modeling
- ELA: technical writing, argument, captioning, public speaking
- Health / nutrition: trying new foods, food systems
- CTE AL16: farming background, system design, microbes, plants, fish
- SEL / Aquaneers: responsibility, empathy, community, conservation
- Workforce: SOPs, internships, food production jobs