Growing Science: Inquiry, Identity, and Stewardship in Kindergarten Gardens

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INTRODUCTION:

This inquiry explores how garden-based and place-based learning support science inquiry, student agency, and ecological care in kindergarten. Instead of memorizing facts, students become nature detectives, noticing, wondering, and learning through real sensory experience.

The school garden becomes a living laboratory where science grows through touch, voice, and curiosity.

One child pressed a fuzzy lamb's ear leaf between their fingers and declared,
"It feels like a cloud!"
I joked, "Have you felt a cloud before?"—but the metaphor stuck.

INQUIRY QUESTION:

How can place-based and garden-based science instruction support inquiry, ecological understanding, and environmental stewardship in kindergarten?

RATIONALE:

Garden-based learning helps students connect science to their senses, stories, and surroundings. At Jefferson Elementary, one kindergartener gently touched a tulip and asked:

"I wonder what tulip pollen tastes like?"
Moments like this show how curiosity and embodied learning ignite real scientific thinking. This project is rooted in joy, equity, and connection to place.

WHAT THE RESEARCH SAYS

- 90% of studies show science gains from garden-based learning (Williams & Dixon)
- Multilingual learners thrive through sensory, collaborative discovery (Vygotsky, Boyd)
- Integrated gardens boost literacy, math, and SEL (Wells et al.)
- Students develop identity, agency, and voice in the garden (Sobel, Blair, Swihart)
- Equity grows when families contribute cultural plant knowledge (Finney, UW Bothell)

SCAN ME

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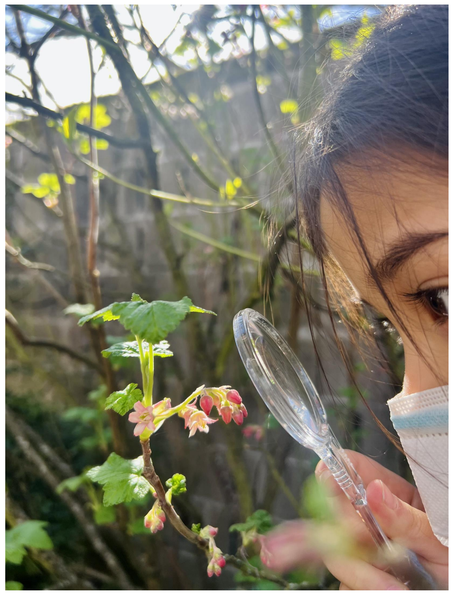
WA K–5 Standards Connection

NGSS K-LS1-1: *Students observe what plants need to grow.*
ELA RI.K.1: *Students ask and answer questions from garden books.*
SEL Standard 1: *Students reflect on their feelings while learning outdoors.*

Aligned to WA TPEP Criteria 2–5: Effective Instruction, Individual Needs, Intentional Content, Inclusive Environments



Inquiry begins with noticing and wonder.

LEARNING THEORIES BEHIND THE GARDEN

- Constructivism (Piaget): Kids build knowledge through hands-on discovery
- Sociocultural Theory (Vygotsky): Learning grows through talk, play, and shared noticing
- EcoJustice Education (Finney): Gardens offer a path toward land literacy and justice
- UDL: Inclusive tools like sketching, drawing, and peer modeling ensure every child is a scientist

TOOLS FOR WONDER, VOICE & ACCESS

Clipboards, visuals, and journals invite students to sketch, wonder, and name what they notice.
These tools support belonging, sensory access, and multilingual learners. They help students see themselves as scientists and culture-holders. Apps like Seek extend curiosity and language, offering new ways to explore and share.

Inventing plant names through drawing and voice—many ways to share science ideas.

STRATEGIES FOR EQUITY & ENGAGEMENT

- Roles like "Tool Manager" give everyone a job
- Adaptations include raised beds, gloves, and calm corners
- Visuals and sketching support multilingual learners
- Garden learning honors diverse knowledge and family care for land

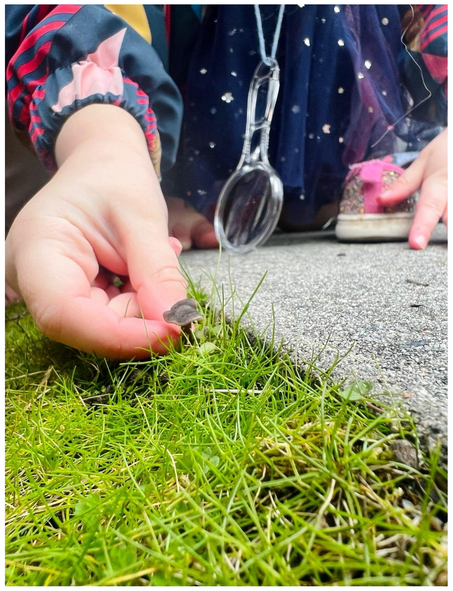
Shared sketching time builds community, focus, and voice

GARDEN REFLECTIONS & STUDENT VOICE

In the garden, inquiry sounds like wonder.

*"**What's that spiky thing?"***
"I think it's a caterpillar."
"I think I know what it is…"

These moments show how science begins—with noticing, sharing, and naming.



"Someone touch it—it's squishy."
"It's squishy."
"What does it feel like?"
"Rubber."

"Can we grow enough for everyone?"

FROM WONDER TO STEWARDSHIP

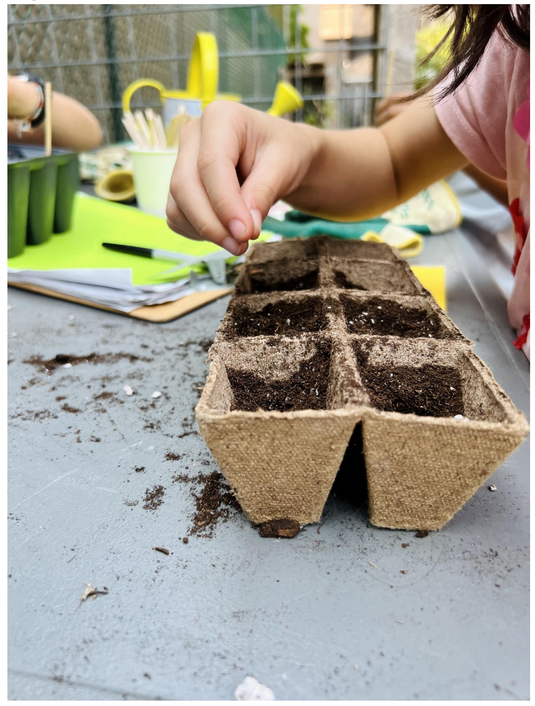
*"**Can we grow enough for everyone?"***
Moments like this show how curiosity becomes care. Stewardship begins with noticing, sharing, and imagining together.

Hands-on care builds ecological empathy.

No raised beds? Use windowsills or containers. Short on time? Teach writing, math, or SEL in the garden. Need help? Partner with families or Master Gardeners.

SUSTAINING THE WORK

Ongoing family partnerships, rotating student roles, and the tradition of passing down garden journals help this learning grow across seasons.



All photos taken by Austin Aumell, 2022–2024.

"I don't wanna go home. I love the garden so much."

Family Knowledge & Culture

A child once said, "***My mom knows that plant. We cook with it.***"
Moments like this turn the garden into a space for sharing stories, culture, and pride. Students' ecological and cultural knowledge is seen as essential science. Gardens carry histories of access, labor, and joy. Next year, I'll co-create a native plant garden with student jobs like Water Watcher—someone who checks the soil and reminds us when plants need care. We'll use journals and Seesaw to track science thinking, and invite families to share their traditions.