

Interactive Educational Games | Learning Design Case Study

Seven curriculum-aligned games for Grade 2: Plants & Pollinators

This portfolio presents a connected collection of browser-based games that guides Grade 2 learners from the structure of a plant to the relationships between flowers, pollinators, and healthy habitats. Each game uses a focused interaction, immediate feedback, and visible progress to turn a science concept into a short learning experience.

7	Grade 2	Web
GAMES	AUDIENCE	FORMAT

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DESIGN CONTEXT & MY CONTRIBUTION

I developed this collection in response to a practical classroom need: providing engaging, curriculum-aligned practice in a setting where teachers create many of their own resources. The games translate specific Grade 2 science objectives into short, interactive tasks that can complement explicit teaching, discussion, observation and writing.

My role was to select learning objectives, plan the activities and feedback, review the learner experience, and refine the games using AI-assisted development with Codex. This is a learning-design and prototyping project, rather than a claim that I hand-coded every component.

DESIGN RATIONALE

The sequence progresses from identifying plant structures and needs, through life-cycle sequencing and pollination, to evaluating habitat choices. Different interactions were selected for different cognitive tasks: placement for anatomy, decisions for plant needs, ordering for sequence, and simulations for cause and effect. Brief instructions, large controls and low-stakes feedback were chosen with young learners in mind.

The screenshots on the following pages provide examples of the interfaces. They illustrate the designed experience, not independently measured learning gains.

Collection Overview

The sequence moves from concrete plant structures to systems thinking. Learners first identify what a plant is made of and what it needs, then order the life cycle, investigate flower anatomy, model pollen transfer, compare plant and pollinator partnerships, and make choices that improve a habitat.

No	Game	Science focus	Core interaction
01	Build a Plant	Plant parts and their functions	Drag or tap parts into place
02	Save the Seedling	Conditions plants need to grow	Choose the helpful item each round
03	Race to Grow	Plant life cycle sequence	Order cards and find a missing stage
04	Pollen Detective	Flower parts and pollen destination	Solve four visual investigations
05	Bee's Pollination Mission	Pollen transfer and seed formation	Guide a bee between matching flowers
06	Perfect Partners	Mutual benefits of pollination	Complete 12 matching challenges
07	Pollinator Protector	Pollinator habitat care	Make seven garden decisions

Design Approach

The games use large touch targets, short instructions, low-stakes retry prompts, and visible progress. Their colourful garden settings support young learners without replacing the science content. Most experiences run as lightweight static web pages, which makes them practical for classroom computers, tablets, and interactive displays.

Curriculum Alignment

The revised curriculum opens with three two-week themes. The games sit within this early sequence and provide direct science and literacy support for Theme 3 Plants and Pollinators.

Theme	Title	Schedule	Primary focus
Theme 1	My Family	Weeks 2 to 3	AERO Social Studies and CCSS
Theme 2	Our Community and Our Place	Weeks 4 to 5	AERO Geography and CCSS RI.2.7
Theme 3	Plants and Pollinators	Weeks 6 to 7	NGSS 2-LS2 and CCSS W.2.7

Direct Links to Theme 3

Theme 3 develops the vocabulary plant, seed, root, stem, leaf, flower, sunlight, pollinate, pollen, nectar, disperse, and observe. Its literacy tasks ask learners to explain what plants need, sequence a plant life cycle, keep a plant-growth observation journal, and explain pollination through cause and effect.

Game	Theme 3 connection
Build a Plant	Plant-part vocabulary and function descriptions
Save the Seedling	What plants need and visible growth over time
Race to Grow	Life-cycle sequencing
Pollen Detective	Flower parts and pollen destination
Bee's Pollination Mission	Cause and effect in pollen transfer
Perfect Partners	Plant and pollinator relationships
Pollinator Protector	Choices that support pollinators and plant reproduction

GAME 01

Build a Plant

A hands-on plant anatomy puzzle

Learning focus Learners connect roots, stem, leaves, flower, fruit, and seeds with their locations and functions.

Curriculum connection Theme 3 vocabulary and science observation language for plant structures.

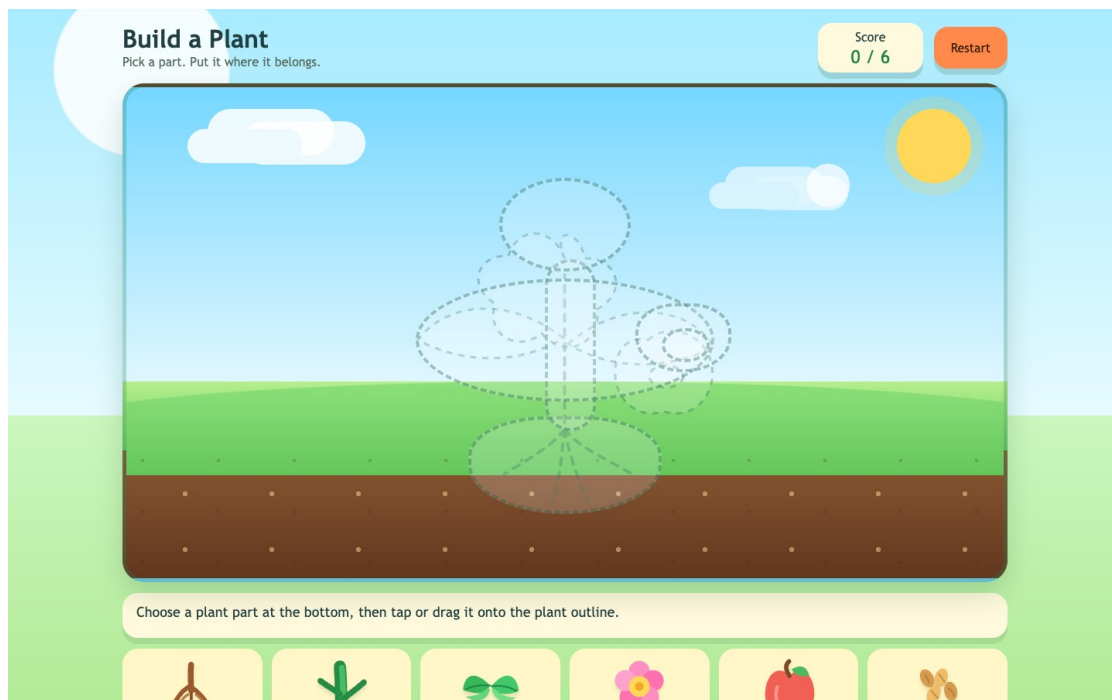
Interaction Students drag or tap six illustrated parts onto the correct positions on a plant outline.

Feedback and progression Each correct placement reveals a short function statement and increases the score out of six. Incorrect attempts prompt another try without revealing the answer. The completed plant finishes with a growth animation.

Classroom fit A strong introductory activity for naming plant structures before observation, labelling, or writing tasks.

Repository [Open project repository](#)

Representative game screen



GAME 02

Save the Seedling

A visual decision game about plant needs

Learning focus Learners distinguish the resources plants need from familiar but irrelevant objects.

Curriculum connection Theme 3 opinion-writing prompt about what a plant needs most and plant-growth observation.

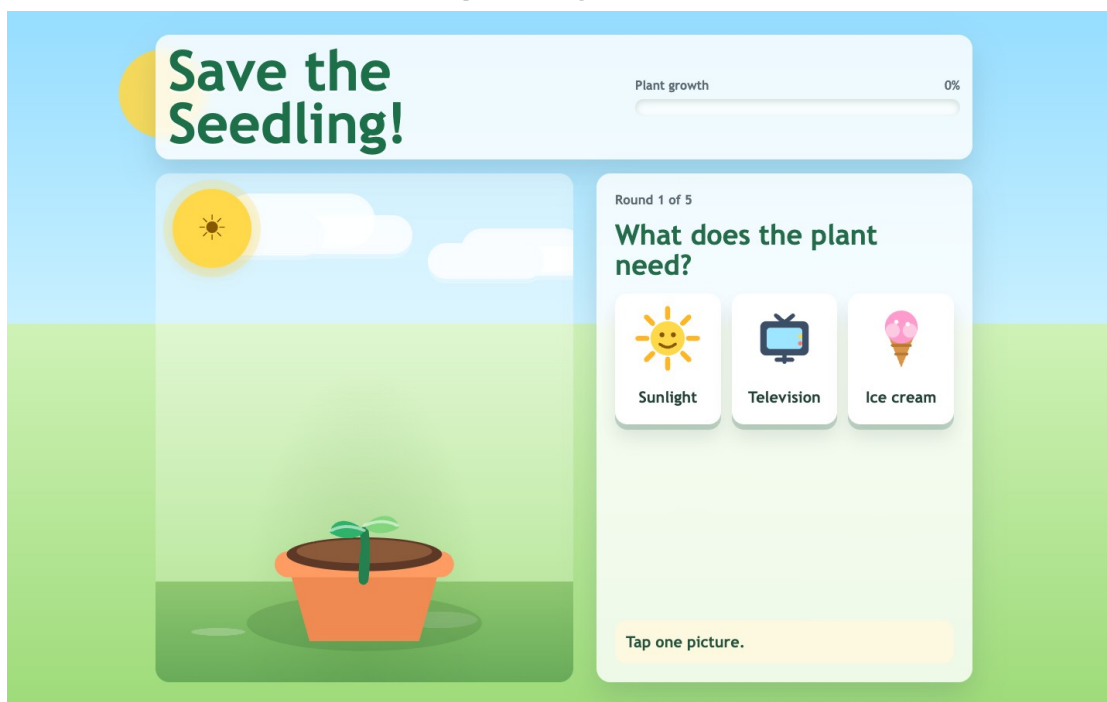
Interaction In each round, students choose one of three items. Correct choices include sunlight, water, air, soil nutrients, and enough space.

Feedback and progression The seedling grows after every correct choice, while friendly explanations support another attempt after incorrect choices. A progress bar connects each decision to visible plant growth.

Classroom fit Useful for checking misconceptions after a lesson on living things and their needs.

Repository [Open project repository](#)

Representative game screen



GAME 03

Race to Grow

A sequencing challenge for the plant life cycle

Learning focus Learners order seed, germination, seedling, mature plant, and flowering plant producing new seeds.

Curriculum connection Theme 3 reading-comprehension goal to sequence a plant life cycle.

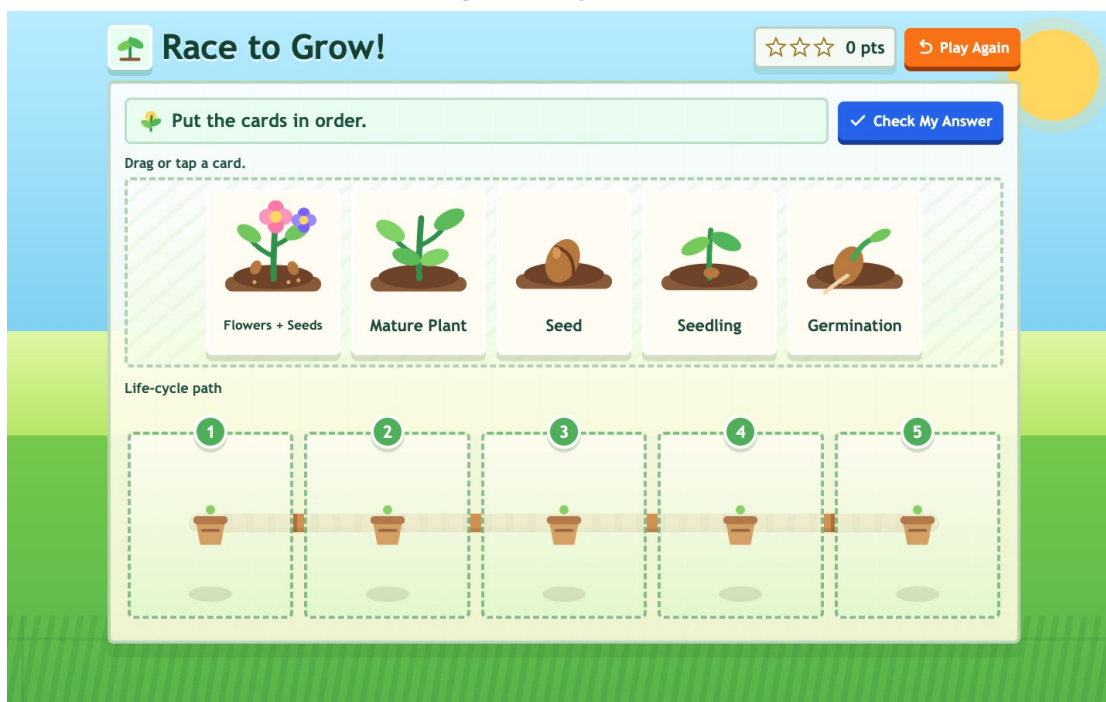
Interaction Students arrange five shuffled cards on a life-cycle path, check their sequence, and then solve a missing-stage challenge.

Feedback and progression Incorrect positions are highlighted without displaying the complete answer. A correct sequence triggers an animated life cycle, and stars or points reward progress.

Classroom fit Works well as guided practice after teaching life-cycle vocabulary or as a whole-class display activity.

Repository [Open project repository](#)

Representative game screen



GAME 04

Pollen Detective

A four-part investigation of a flower

Learning focus Learners identify petals, pollen, and the stigma, then determine where pollen must land.

Curriculum connection Theme 3 flower and pollen vocabulary with a visual cause-and-effect investigation.

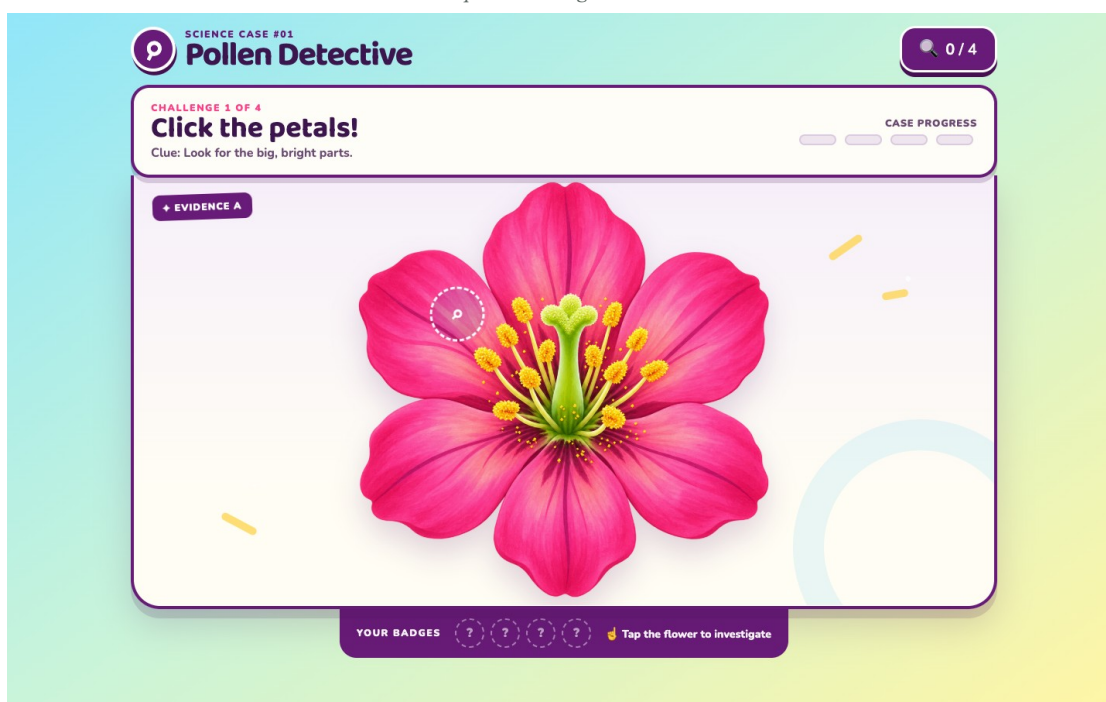
Interaction Students investigate a large flower through four visual challenges, including a close look at tiny pollen grains.

Feedback and progression Correct answers award detective badges and reveal short science explanations. The interface includes a score, progress indicator, gentle retry hints, and a Play Again option.

Classroom fit A focused bridge between flower anatomy and the process by which flowering plants make seeds.

Repository [Open project repository](#)

Representative game screen



GAME 05

Bee's Pollination Mission

An active model of pollen transfer

Learning focus Learners see how a pollinator carries pollen between flowers and helps seeds and fruit begin to form.

Curriculum connection Theme 3 cause-and-effect explanation of pollination and seed formation.

Interaction Students guide a bee between matching flowers, collect and transfer pollen, manage nectar energy, and avoid obstacles.

Feedback and progression Points and energy make the process visible, while changes to the flowers connect successful pollen transfer with reproduction.

Classroom fit A memorable simulation for explaining an otherwise microscopic process through cause and effect.

Repository [Open project repository](#)

Representative game screen



GAME 06

Perfect Partners

A matching game about mutual benefit

Learning focus Learners explore how flowering plants provide food while pollinators help plants reproduce.

Curriculum connection Theme 3 vocabulary and explanation of relationships between plants and pollinators.

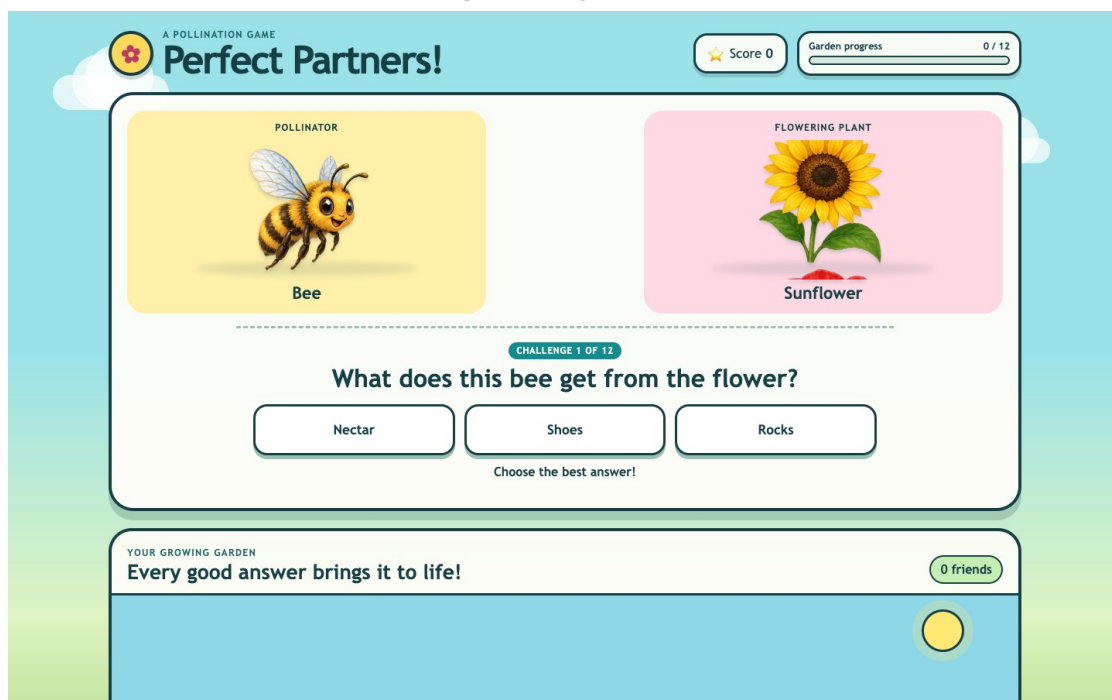
Interaction Twelve touch-friendly challenges feature a bee, butterfly, moth, beetle, hummingbird, and bat.

Feedback and progression Correct matches animate each partnership and gradually grow a thriving garden, linking individual choices to a larger ecosystem result.

Classroom fit Extends pollination beyond bees and supports comparison, classification, and discussion of animal adaptations.

Repository [Open project repository](#)

Representative game screen



GAME 07

Pollinator Protector

A habitat decision game

Learning focus Learners understand that flowers feed pollinators, pollinators help plants make seeds, and people can protect habitats.

Curriculum connection Theme 3 pollination concepts with a transition toward later learning about habitats and environmental responsibility.

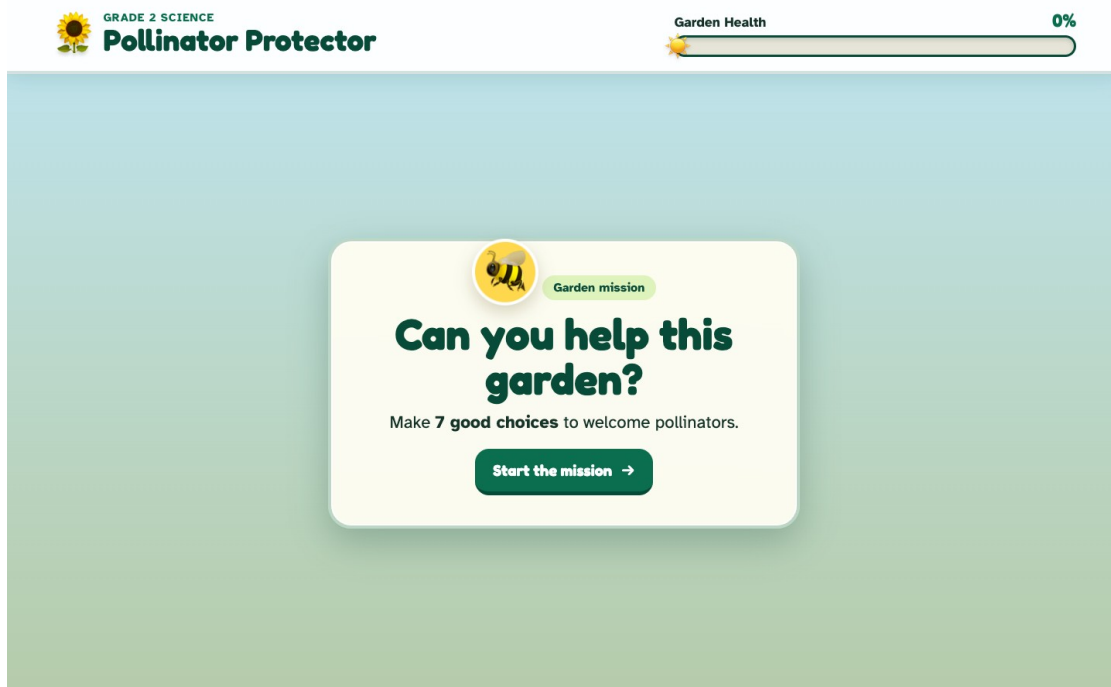
Interaction Students make seven choices about how to build a safe, healthy garden for pollinators.

Feedback and progression A Garden Health meter shows the effect of each decision. The garden becomes more colourful as health improves, and the game includes gentle retry feedback, read-aloud support, and a final recap.

Classroom fit A strong concluding experience that turns science knowledge into practical environmental choices.

Repository [Open project repository](#)

Representative game screen



Learning Design Value and Next Steps

Together, the seven games demonstrate curriculum sequencing, age-appropriate interaction design, immediate formative feedback, responsive web development, and the ability to translate science explanations into short playable tasks. The collection can support lesson introductions, guided practice, review stations, and whole-class discussion.

Collection note Repository access and live deployment availability depend on the privacy settings used for each project.

EVALUATION & REFLECTION

The collection demonstrates a curriculum-to-interaction design process, but its educational effectiveness should be evaluated rather than assumed. A useful next step would be to observe Grade 2 learners using selected games, record where instructions or interactions cause difficulty, and compare short pre- and post-activity checks of the

intended concepts. Teacher feedback could also help establish whether the games are practical within classroom routines.

I would prioritise accessibility checks, including keyboard use, readable text, colour contrast and audio alternatives, alongside checks of scientific accuracy and the clarity of feedback. These findings would guide further revisions.

PROFESSIONAL RELEVANCE

This project complements my Learning Horizons LMS case study. Whereas Learning Horizons demonstrates curriculum architecture and platform-level product thinking, these games demonstrate the design of individual learning interactions: translating objectives into tasks, scaffolding understanding, designing feedback and iterating with AI-assisted tools. Both projects are grounded in my experience as an educator and my interest in research-informed technology integration.