

Grade 2: Module 3: Labs

3 – Extend Stage

Labs: Extend Stage

Days 11–22

Labs continue to take place in four stages, and the purposes of each remain the same (see Module 2 Extend stage).

What stays the same from previous stage(s):

- During the Extend stage, the guiding questions remain the same as in previous stages.
- During the Extend stage, students continue to visit two Labs per day.

What is different from previous stage(s):

- The Extend stage begins with two “transition days.” These days—described briefly at the beginning of each In the Lab section—give teachers time with their whole class to introduce new materials, introduce new layers of complexity to the task, model various Lab skills and behaviors, and clear up any confusion before students return to a more independent Lab experience.
- During the Extend stage, the learning targets change to reflect students’ work in the Labs.
- During the Extend stage, students are given a greater variety of materials.



Extend Stage: At-a-Glance

Guiding Question

Create Lab

How can I create a scientific drawing of a plant?

Engineer Lab

How can I use my knowledge about seeds and pollination to design tools to help in these processes?

Explore Lab

How can I use scientific inquiry to discover the needs of plants?

Imagine Lab

How can I use poetry and movement to learn more about seeds and pollination?

Learning Target(s)

Create Lab

I can create an accurate and detailed drawing of a flower.

Engineer Lab

I can explore materials and methods to help the process of pollination.

I can design a tool that helps the process of pollination.

Explore Lab

I can conduct an investigation to discover the needs of plants.

I can make observations about plants.

I can make conclusions about plant needs based on the investigation.

Imagine Lab

I can build knowledge about seeds and pollination through poetry.

I can improve my reading fluency by reading poetry aloud.

I can create movement to match poetry about seeds and pollination.

Ongoing Assessment

Create Lab

Create Lab Checklist (SL.2.1, SL.2.3)

Engineer Lab

Explore Lab Checklist (SL.2.1 and SL.2.3)

Explore Lab

Imagine Lab Checklist (W.2.7, SL.2.1, and SL.2.3)

Imagine Lab

Engineer Lab Checklist (RL.2.4, RF.2.4, SL.2.1, SL.2.3)

The Daily Schedule remains the same across the Practice and Extend stages (see Practice stage).

Extend Stage: Storytime

Teaching Notes

Purpose:

- Review the Storytime Teaching Notes in the Launch and Practice stage documents as needed.

In advance:

- Choose a text from your classroom library or the Grade 2: Labs Recommended Storytime and Research Book List (in the Labs Teacher Guide)
- Consider creating a focus question for Storytime (see example in the Experience section below).
- Post: Focus question (optional).

Materials

- Labs song (one to display)
- Text for Storytime (chosen by teacher; see Teaching Notes)

Experience

- Follow the routine established in Modules 1–2 to engage students with the Labs song and text for Storytime.

Extend Stage: Setting Lab Goals

Teaching Notes

Purpose:

- Recall that Setting Lab Goals is a time to activate and reinforce executive functioning skills by focusing students' attention, making a plan for their time, exhibiting self-regulation, and following instructions.

Logistics:

- During the Extend stage, Lab groups visit two Labs for 20 minutes each.
- On the “Transitioning to Extend Stage” day, students' goals will be based on their knowledge of the Labs thus far. On subsequent days, students' goals can be more finely tuned to the learning targets, materials, and habits of character unique to the Extend stage.

In advance:

- Post: Guiding question for each Lab, learning target(s) for each Lab, and Labs schedule.

Materials

- Learning target(s) (one to display for each Lab; see Practice Stage: At-a-Glance for the specific target(s) for each Lab)

- ☑ Labs schedule (one to display)
- ☑ Labs notebook (one per student)
- ☑ Pencils (one per student)

Experience

- Tell students that today they will visit two Labs.
- Review the **learning target(s)** and **Labs schedule** with students.
- Invite students to open their **Labs notebook** and follow the routine established in Modules 1–2 to guide them through setting goals:
 - Review the sentence starters at the top of the page.
 - Invite students to notice what Lab they will visit first and second and to make a goal for each Lab.
 - Direct students to record their goals for the day in their Labs notebook using a **pencil**.
- Invite students to put on their imaginary lab coats and goggles to show they are ready for learning and fun!

Extend Stage: In the Labs

- Refer to the In the Labs section below for detailed plans on each specific Lab.

Extend Stage: Reflecting on Learning

Teaching Notes

Purpose:

- Similar to Modules 1–2, the cycle of goal-setting and reflecting is meant to increase student ownership and intentionality. Continue to support students with predictable structures of reflection and familiar sentence frames.

In advance:

- Post: Sentence frames or picture clues for any reflection questions you will use regularly (optional).

Materials

- ☑ Labs song (one to display)
- ☑ Learning target(s) (one to display for each Lab; see Practice Stage: At-a-Glance for the specific target(s) for each Lab)
- ☑ Labs notebook (one per student)
- ☑ Pencils (one per student)

Experience

- Gather students back together whole group by singing (the conclusion of) the **Labs song**.
- Remind students of the **learning target(s)** for their Labs and guide them through their reflection:
 - Invite students to review their goal in their **Labs notebook**.
 - Ask a reflective question and remind students of the sentence starters at the top of the page.
 - Invite students to signal and share with a partner when they are ready.
 - Invite students to record their reflection in their Labs notebook using a **pencil**.
- Invite students to give a neighbor a high-five and take off their imaginary Lab coat and goggles to indicate the end of the Lab experience.



Extend Stage: In the Create Lab

Guiding Question

- How can I create a scientific drawing of a plant?

Learning Target

- I can create an accurate and detailed drawing of a flower.

Teaching Notes

How this stage of this Lab builds on previous stage(s):

- Students continue to create scientific drawings. This primarily consists of students drawing with accuracy and detail.

What is new about this stage of this Lab:

- Students apply their scientific drawing skills to draw flowers. This serves three purposes:
 - It deepens students' scientific understanding as they look more closely at the form of flowers.
 - It allows students to extend this skill to a more complex subject (from leaves to flowers.)
 - It scaffolds students toward the Choice and Challenge product: creating a scientific drawing of a whole plant.

Logistics:

- Similar to Module 2, on the first day, students work as a whole class to transition to the Extend stage. During the remaining days, they spend 20 minutes each in two Labs with their Lab groups.

In advance:

- Consider the storage system students have been using (individual folders or shared bins) for drafts in progress.

- Prepare:
 - Technology needed to display a flower or a high-quality photograph of a flower.
 - The Create Lab by placing flowers, flower images, flower templates, and drawing supplies at the workstations (for the transition day) in the Create Lab space (for the remainder of the Extend stage.)

Materials

Continued materials:

- ☑ Magnifying glasses (one per pair)
- ☑ Paper (blank; two or three pieces per student)
- ☑ Pencils (one per student)
- ☑ Colored pencils (variety of colors; a cup to share per workstation)

Additional materials:

- ☑ Flowers or photographs of flowers (one flower for teacher modeling; a variety of different flowers, or photographs of flowers, per workstation)

Experience

Transitioning to the Extend Stage (whole class):

- Gather students in the whole group meeting area. Remind them to sit next to their assigned partner in their Lab group.
- Welcome students back to the Create Lab.
- Tell students they will continue their work as scientists by closely observing and learning about plants and plants parts.
- Give students specific, positive feedback on making such great progress in their skills as artists in creating scientific drawings: observing closely, drawing accurately, and including details.
- Tell students that, during the Extend stage, they will be applying these skills to a new and more complex subject: flowers.
- Distribute the **flowers or photographs of flowers** and **magnifying glasses** to each partnership.
- Tell students they will need to put on their scientific drawing glasses when observing this flower.
- Dramatically put on a pair of imaginary glasses, inviting students to do the same. Say:

“There! Now I can see all the details!”
- Turn and Talk:

“Thinking like an artist and looking closely like a scientist, name all the different parts and details of your flower that you would need to include if you were creating a scientific drawing.”
- Circulate and listen in as students discuss, coaching partnerships to notice shapes, numbers of leaves, colors, and visible parts of the flower.
- Display a flower or a photograph of a flower.
- Tell students that there are four important attributes, or parts, of flowers they need to observe closely: the center, the shape and size of the petals, the number of petals, and the colors.

- Tell students you need their help in observing this flower closely.
- Using a total participation technique, invite responses from the group:
 - “How would you describe the center of my flower? Is it flat? Is it circular? Can you see the piston?”*
 - “What shape are the petals? Are they long and skinny? Are they rounded?”*
 - “How many petals are there?”*
 - “What about the size of the petals? Are they smaller than the center? The same size?”*
(Consider using your fingers to roughly estimate the size of the petals in comparison to another part of the flower, showing perspective.)
 - “What colors would I need to accurately draw this flower?”*
- Once students have tried this as a whole group, invite them to return their attention to their own flower.
- Say:
 - “Now take another look at your flower with your partner. As I repeat these questions, take turns answering about the flower in front of you.”*
- Repeat the questions above, giving student partnerships time to observe their flower and answer each question.
- Tell students they have already done the hardest part of drawing scientifically: closely observing their subject and identifying its important details.
- Tell them that today and over the next few days, they will be practicing the skill of drawing like scientists.
- Remind students that when scientists draw, they are sure to:
 - Closely observe their subject
 - Identify the important details (shape, color, lines, etc.)
 - Use the whole page (a zoomed-in drawing)
 - Accurately include details and colors
 - Label the parts of the drawing
- Using **paper**, a flower, and a **pencil**, follow the same process from the Create Lab in the Launch stage to model how to begin a scientific drawing.
- Using a total participation technique, invite students to give feedback on your drawing as you work.
- Assign each Lab group a workspace and invite them to get started.
- Circulate and support students as they work. Encourage them in the process of tearing, cutting, and layering paper; of respectfully sharing materials with their Lab group; and of showing perseverance when they are having difficulty.
- At the conclusion of In the Lab time, signal students to clean up their Lab space. Cleaning up scraps of paper, glue sticks, scissors, and storing materials may need to be modeled the first time they do this.
- Give Lab groups or individual students specific, positive feedback for responsible and respectful cleanup behaviors.
- As Lab groups are ready, transition them back to the whole group area for Reflecting on Learning.



Extend Stage: In the Engineer Lab

Guiding Question

- How can I use my knowledge about seeds and pollination to design tools to help in these processes?

Learning Targets

- I can explore materials and methods to help the process of pollination.
- I can design a tool that helps the process of pollination.

Teaching Notes

How this stage of this Lab builds on previous stage(s):

- Students continue to use challenges as a way to build their understanding of the natural processes of seed dispersal and pollination.
- Students explore with a variety of materials, learning which materials work most effectively, in order to prepare for their work as designers.

What is new about this stage of this Lab:

- During the Extend stage of the Explore Lab, shift from seed dispersal to pollination.

Habits of character:

- Students are working with a variety of materials as they complete their pollination challenges. Respect will be an important habit of character in using these materials appropriately as well as cleaning up and storing materials properly after their use.

Logistics:

- Similar to Module 2, on the first day, students work as a whole class to transition to the Extend stage. During the remaining days, they spend 20 minutes each in two Labs with their Lab groups.

In advance:

- Consider available technology to display “A Letter from the Bees.”
- Prepare the Engineer Lab by:
 - “Coloring” the flour by mixing in ground-up yellow chalk dust.
 - Creating “flowers” by pushing pipe cleaners (pistons) through the bottom of small paper cups (flowers).
 - Placing all materials to explore pollinating at workstations.
 - Creating supportive design partnerships within Lab groups.

Materials

Continued materials:

- ☑ Labs notebook (one per student and one for teacher modeling)

Additional materials:

- ☑ “A Letter from the Bees” (one to display)
- ☑ Photographs of pollinators (two for teacher modeling; several in the Engineer Lab)
- ☑ Pipe cleaners (several to share)
- ☑ Small paper cups (two per student)
- ☑ Flour (yellow-colored; one cup to share)
- ☑ Timer (one per pair)
- ☑ Q-tips (several per student)
- ☑ Paintbrush (several to share)
- ☑ Cotton balls (several to share)
- ☑ Pencil (one per student)
- ☑ Masking tape (one roll to share)

Experience

Transitioning to the Extend Stage (Whole Class):

- Display “A Letter from the Bees.”
- Read the letter aloud to students, allow students to read in partnerships, or invite student volunteers to read, depending on the reading and language readiness of students.
- Turn and Talk:
 - “What is the problem with which the bees need help? How do you know?” (There is not enough of them to get the important job of pollination done.)
 - “How might we be helpful to the bees? What could we do?” (We could create a process or design a tool to help the bees with their job.)
- Tell students that sometimes, when nature needs help to complete a natural function (such as pollination), engineers get busy designing tools or methods to help out.
- Tell students that one way engineers do this is by closely observing the ways in which this process is done naturally, and then creating tools that mimic, or recreate, this process.
- Display a **photograph of a pollinator**.
- Turn and Talk:
 - “What natural process is happening in this photograph? How do you know?” (Responses will vary, depending on photograph chosen.)
 - “What aspect, or part, of this pollinator is helping this animal complete this process? What makes you think that?” (Responses will vary, depending on photograph chosen.)
- Guide students toward the idea that pollinators’ bodies have specific qualities that help them complete the process of pollination. (Example: The fuzzy legs of the bees help them pick up pollen, and the pointed beak of the hummingbird helps it reach inside flowers, both accessing nectar and picking up pollen.)
- Tell students that you have collected many materials for them to explore as engineers and designers. Some of these materials may be more helpful, or effective, than others in creating a tool for pollination. Their job is find out which materials work best.
- Show students the “flower” they will be using for their design process: a **pipe cleaner** pushed through the bottom of a **paper cup**.

- Tell students that the pipe cleaner (the small part within the cup) is acting as the piston of the flower. The paper cup is acting as the petal of the flower.
- Show students the cup of colored **flour**. Tell them this substance will act as the pollen.
- Post and review the initial steps of their design challenge:
 1. Partner A will act as the **timer**, giving the other partner 15 seconds to transfer the pollen.
 2. Partner B will choose a material (**Q-tip, paintbrush, cotton ball, pencil, or pipe cleaner**) to use in the pollination.
 3. Partner B will transfer as much pollen as he or she can from the pollen bowl onto the “piston” in 30 seconds.
 4. Both partners will record their findings in their **Labs notebook** in the form of a sketch. The sketch should show the amount of “coverage” achieved in 15 seconds.
 5. Partners switch roles and try a new material.
- Answer clarifying questions.
- Remind students that they might not finish all of the challenges today and that is okay. By using the checklist, they can keep track of the challenges they still need to complete.
- Invite students to begin exploring.
- Circulate and support them as they work. Reinforce the habit of character of respect as needed.
- At the conclusion of In the Lab time, signal students to clean up their Lab space.
- Give Lab groups or individual students specific, positive feedback for responsible and respectful cleanup behaviors.
- As Lab groups are ready, transition them back to the whole group area for Reflecting on Learning.
- As students arrive to the whole group, invite them to provide positive feedback to as many of their peers as they can for 15–30 seconds before being seated. Model an example as necessary.



Extend Stage: In the Explore Lab

Guiding Question

- How can I use scientific inquiry to discover the needs of plants?

Learning Targets

- I can conduct an investigation to discover the needs of plants.
- I can make observations about plants.
- I can make conclusions about plant needs based on the investigation.

Teaching Notes

How this stage of this Lab builds on previous stage(s):

- Students continue to conduct the experiment they designed in order to discover, first hand, how plants react to a variety of conditions and, therefore, what plants need in order to survive and grow.

What is new about this stage:

- N/A

Logistics:

- Similar to Module 2, on the first day, students work as a whole class to transition to the Extend stage. During the remaining days, they spend 20 minutes each in two Labs with their Lab groups.

Materials

Continued materials:

- Plants (four for class to share)
- Magnifying glasses (several to share)
- Rulers (several to share)
- Labs notebooks (one per student)
- Colored pencils (variety of colors; one set per student)

Experience

Transitioning to the Extend Stage (Whole Class):

- Welcome students to the Explore Lab.
- Remind them of the primary goal of the Imagine Lab: to conduct an investigation that will determine what plants need to survive and to grow.
- Remind students of the process they agreed upon during the Launch stage:
 1. Students observe **four plants** over multiple weeks (one plant with both sunlight and water; one plant with sunlight but with no water; one plant with water but with no sunlight; and one plant with no sunlight and no water).
 2. Students visit each plant on days they visit the Explore Lab to observe the plants using different tools (including **magnifying glasses** and **rulers**).
 3. Students collect data about each plant in their **Labs notebooks** (including using **colored pencils** to make a drawing of each plant).
- Direct students to the next, appropriate page of the Labs notebook for observing and recording their observations about the plants.
- Guide students in completing which day of the investigation they are on (with Day 1 being the day they recorded the baseline information) because multiple days have passed since their last observation.
- Direct students toward the first plant for observation.
- Support students as they move from plant to plant, ensuring they visit all four plants in the 20 minutes available.
- Support students in making accurate measurements and counts, as well as being detailed in their observations and sketches for color and “standing” of the plants.
- When students visit the Explore Lab for the final time, they should complete the Investigation: Final Day, Reflecting on the Data and Making Conclusions page in the Labs notebook.
- At the conclusion of In the Lab time, signal students to clean up and return their materials to the Lab space.
- As Lab groups are ready, transition them back to the whole group area for Reflecting on Learning.



Extend Stage: In the Imagine Lab

Guiding Question

- How can I use poetry and movement to learn more about seeds and pollination?

Learning Targets

- I can build knowledge about seeds and pollination through poetry.
- I can improve my reading fluency by reading poetry aloud.
- I can create movement to match poetry about seeds and pollination.

Teaching Notes

How this stage of this Lab builds on previous stage(s):

Students continue to:

- Build their understanding of seed dispersal and pollination through poetry and movement.
- Use movement to show their understanding of seed dispersal and pollination and the poetry about these topics.
- Build reading fluency through the practice of reading poetry, reading aloud, and repeating readings of an increasingly familiar text.

What is new about this stage:

- During the Extend stage, students are invited to think of other imaginative ways, using other imaginative materials as well as movement, to represent their seed and pollination poetry.
- Similar to Module 2, on the first day, students work as a whole class to transition to the Extend stage. During the remaining days, they spend 20 minutes each in two Labs with their Lab groups.

In advance:

- Choose a poem to use as a brainstorming text when setting up the day's activity.
- Place the shared poem about seeds and pollination at each workstation.
- Prepare the Imagine Lab with the imaginative play materials from Modules 1–2 (e.g., building blocks, white boards, puppets, dress-up materials).

Materials

Continued materials:

- ☑ Poems about seeds and pollination (from the Launch stage; one per workstation and one to display; for teacher read-aloud)
- ☑ Imaginative play materials (variety; from Modules 1–2)

Experience

- Welcome students back to the Imagine Lab.
- Give students specific, positive feedback on their ability to show respect for materials and collaborate with one another when using poetry and movement to show all they know about seeds and pollination.

- Tell students that, now that they have had so much great practice with using their bodies to express poetry, it is time to try out a new challenge!
- Direct students' attention to the workstations set up around the room.
- Tell students that each workstation contains a different kind of imaginative play material as well as poems about seeds and pollination.
- Tell students that when they visit each station they will try to use that material, in addition to movement if appropriate, to represent the poetry.
- Invite students to help brainstorm how this might look by first reading (or rereading) a poem about seeds or pollination.
- Display and read a **poem about seeds and pollination**.
- Using a total participation technique, invite responses from the group:
 - *“What is this poem about? How do you know?” (Responses will vary, depending on the poem.)*
- Turn and Talk:
 - *“What actions might you include if you were using just movement to represent this poem?”*
- Say:
 - *“Now that we have an idea of what this poem is about, and what movements we might use to represent this poem, let’s brainstorm how we might use some of our other great imaginative play materials to act out or represent this poem.”*
- Direct each Lab group to a workstation, instructing students to not begin working quite yet.
- Once students are at their workstations, say:
 - *“Now that you see what materials are in front of you, I am going to read this poem again. While I am reading, I want you to think, ‘How could I use these materials to represent, or re-enact, this poem?’”*
- Tell students there is a copy of the poem at their workstation as well, so they can follow along.
- Read the poem again, slowly, fluently, and without interruption.
- Invite students to discuss with their Lab group:
 - *“How could you use these materials in representing or re-enacting this poem?” (Responses will vary, depending on the poem.)*
- After students have had the chance to discuss, invite groups to try it out.
- Remind students that they should continually go back to the text, bit by bit, to make sure they are representing each part of the poem.
- Circulate and support students as they work, helping them work collaboratively and assisting them in the reading of the poem, as needed.
- After a few minutes, invite students back to the whole group area.
- Invite each Lab group to share how they used their imaginative play material to represent the poem (e.g., with pictures, with actions, by building the set, etc.).

- If time allows, students may return to a different workstation and try it out again using a new kind of material.
- Tell students that, over the next days, they will have the opportunity to do this with new and different poems, and with all of the materials available to them in the Imagine Lab.
- At the conclusion of In the Lab time, signal students to clean up their Lab space.
- Give Lab groups or individual students specific, positive feedback for responsible and respectful cleanup behaviors.
- As Lab groups are ready, transition them back to the whole group area for Reflecting on Learning.