



NJAS Guide Notes

Exploring Nature Through Inquiry & Visible Thinking

Welcome! This system is designed for anyone guiding young explorers—whether you are a classroom teacher, a family member exploring a backyard, a museum or nature center guide, or a leader in an expanded learning program. You do not need to be a scientist or an expert to lead these activities. You just need to be curious alongside your learners.

Your Role as a Guide

Inquiry-based learning is about letting curious learners lead the way; your role is to point their attention to nature's details and let them make exciting discoveries themselves, helping them grow into confident, independent thinkers. You do not need to know all the answers. **Your greatest tool is a good question.** Ask a question, wait patiently for learners to look closer, and then ask it again. By using the same question words every session, you give learners clear, familiar language they will recognize everywhere—at the station activity flag, on the studio art placemats, and in their journal pages.

The Session Frame

Every session follows the same five steps. Only the unit and the specimen (the leaf, rock, flower, or other piece of nature being studied) change. Session length and recommended times for each grade are listed on the grade pages.

**Step 1
GATHER** Gather in a circle, in the same spot each time. Point out the boundaries: the area learners stay inside and the station flag(s). Practice the attention signal once. This cue means everyone stops, looks at the guide, and listens. A call-and-response works well: the guide calls out a phrase and learners answer, for example, “What do you notice?” ... “We stop and look!” Then read the unit’s question aloud.

**Step 2
EXPLORE** Visit one or two garden flags, using the prompts on the Quick Prompt card.

**Step 3
CREATE** At the placemat art table, demonstrate one drawing technique first, then let learners try it themselves.

**Step 4
RECORD** Learners fill in the metadata box at the top of the page: the date, time, place, and weather. Scientists record these details with every observation. Then learners add words, numbers, and pictures about what they saw.

**Step 5
SHARE** Each learner shares one thing they noticed, wondered, connected or measured.

Guiding Moves

Use these moves on any flag, placemat, or page in a journal.

Moves or Actions	What you do	What you might say
Ask the Unit Questions	Read the unit's question exactly as written.	"What do you notice?"
Show how first	Do the task yourself and think out loud, so learners see how it's done.	"I notice the edge of this leaf is jagged, like tiny teeth."
Wait	Count to five silently before you help. Thinking takes time.	
Ask for proof	Ask learners to point to what they see.	"Show me where."
Repeat and stretch	Say the learner's idea back, then add one question that takes it further.	"You see spots. How many spots?"
Connect	Link one learner's idea to another's, or to an earlier page.	"Who noticed something similar?"
Step back	Let the learner lead.	"Your turn. What will you look at next?"

Routines That Keep The Group Together

- **Use One Attention Signal:** Use the exact same signal every time—like a call-and-response or a raised hand—so learners always know it's time to focus.
- **Freeze, Look, Listen:** When learners see or hear the signal, they immediately stop moving, look at you, and listen for the next instruction.
- **Buddy System:** Learners stay in pairs to collaborate and look out for one another.
- **One Task at a Time:** Give just one clear direction and a quick time limit at a time, like "You have two minutes at this flag."
- **Move as a Team:** When moving to the next spot, signal the group to travel together in the same direction.
- **Quiet Outdoor Voices:** Keep voices soft so everyone can hear the natural sounds of birds, wind, and insects.



Outdoor Classroom & Care

Before Your Go

- Walk the space first. Look for anything unsafe: spines or thorns, water, stinging insects, uneven ground.
- Use the flags as boundaries. Say, “Stay where you can see me and the flags.”
- Set out tools (pencils, magnifiers, rulers) in a tray or bag at each flag before learners arrive.

Caring for Nature and Each Other

- **Look First, Ask Second:** Learners must always ask permission before touching or collecting any natural item.
- **Collect with Care:** Follow local site rules on what you can gather. Take only a single small piece, never a whole handful.
- **Photograph Living Wildlife:** Photograph insects and small animals instead of capturing or picking them up.
- **Magnifiers Point Down:** Never look directly at the sun, especially through a magnifying lens.
- **Leave No Trace:** Always return moved rocks, sticks, and logs exactly where you found them.
- **Plan for the Elements:** Stay comfortable by ensuring shade and water are available, with an indoor backup plan for extreme weather.
- **Count Your Gear:** Double-check that every pencil, magnifier, and ruler is accounted for before moving to a new area.
- **Wash Hands:** Make sure everyone washes their hands thoroughly after handling anything from the outdoors.
- **Empower Older Learners (Grades 7-12):** Let them help manage these routines by choosing activity spots, leading transitions, or managing the tool count.

When Learners Get Stuck

If a learner says or does this	Try saying
"I can't draw." "I'm done." "I don't have a question." Says a guess as if it's a fact Writes a number by itself Wants to keep a living insect or animal	• Today, we are drawing to see, not to make art. Show me just one shape you can see." • "Look three more times. What did you miss?" • "Point to the part you can't explain. Start with 'Why does...'" • "Is that a guess or a fact? How could we check?" • "What does the number measure? Add the unit, like inches, degrees or minutes." • "Let's take a picture instead, so it stays safe. We'll study the photo later."

Every session supports

Academic Support: science practices, literacy (words, labels, questions, citing sources), and math (counting, units, data).

Enrichment: drawing, color, rubbings, specimen archiving, and photography.

Healthy Development: outdoor movement, collaboration, and care for living things.

- **Standards alignment:** see the NJAS NGSS Alignment Rubric.
- **California expanded learning programs:** see the NJAS ELO-P Alignment Brief.
- All Educator Guides can be found at www.NewMettleFarms.com/njas-educator-resources.

Continue Learning

- **Library Collections:** build the **Rubbings Library**, **Swatch Cards**, **Viewfinder Frames**, **Measuring Strips**, and **Field Guide** pages. The Art & Placemat Guides have the instructions.
- **NMF's Student Nature Journal Series:** For grades 3–6, each journal offers nine weeks of guided observation built on the NJAS routines. Each week opens with a short scientist highlight, then asks students to draw, label, question, and count what they find, building observation skills alongside nature writing and early data skills. Available 5- and 25-classroom sets with instructional scaffolding guides.

Grades 1–2

NJAS School Age Guide

Written for second graders. The "Start here" box gives simpler first steps for first graders.

1. Gather	2. Explore	3. Create	4. Record	5. Share
3 min	10–15 min	15 min	5 min	3 min

How to Support This Age

How much to show

How learners record

Questions to ask

Drawing

Counting & measuring

Finding answers

Show every step yourself first, then do it together.

Learners finish sentence starters ("I notice...") and copy from a word bank, a short list of helpful words.

What is it? Where is it? How many? Why does it...?

Draw big, simple shapes first, then add details.

Count pairs and groups. Use tally marks: four lines and a fifth line across, in groups of five.

Look at a picture book or a field guide (a book for naming plants and animals) together.

Notice: What do you notice?

Say "I notice...", count pairs of legs or leaves, and add 2–3 labels: part names with a line to the drawing.

Wonder: What do you wonder?

Ask "Why does...?" and "How does...?" questions and write each one in a bubble around the drawing.

Remember: What does this remind you of?

Tell one way it is the same as something you know, and one way it is different.

Measure: How could you measure this?

Measure in whole inches with a ruler or Measuring Strip, and choose a weather picture for the day.

START HERE (grade 1)

- Talk and draw; the guide writes the learner's words.
- Say "I see..." and count to 20.
- The guide writes the learner's question in a bubble.
- Compare longer and shorter using blocks.

What Success Looks Like

- ☐ Draws the main shapes
- ☐ Adds 1–3 labels, with help
- ☐ Asks what, where or why
- ☐ Counts and uses tally marks
- ☐ Asks before touching
- ☐ Shares one idea with the group

Guide Tips: Raise a hand as you call "What do you notice?" so learners can see the signal as well as hear it. Give every child a job at each flag, such as holding the magnifier or counting the legs.

Grades 3-4

NJAS School Age Guide

Learners write on their own. Guides demonstrate: show a step once, then step back.

1. Gather

3 min

2. Explore

15-20 min

3. Create

20 min

4. Record

5 min

5. Share

5 min

How to Support This Age

How much to show

How learners record

Questions to ask

Drawing

Counting & measuring

Finding answers

Show a step once, then step back and let learners try it.

Learners write full sentences and add 3 or more labels to each drawing.

Why does it...? How does it...?

Add a magnified view (a close-up of one part) and label the parts.

Skip-count by 2s, 5s and 10s. Measure in whole inches and read temperature in °F.

Find one fact in a field guide and write down where it came from.

Notice: What do you notice?

Draw a magnified view, add 3 or more labels, and record counts in a tally table.

Wonder: What do you wonder?

Draw the specimen from the top, side and underneath. Find one fact and name its source.

Remember: What does this remind you of?

Use dots and short lines to show texture, layer 2 colors, and follow the rules for collecting.

Measure: How could you measure this?

Measure in inches and feet, record °F and AM or PM, and write a sentence with a number and a unit.

GO DEEPER

- Add one more view or one more label than last time.
- Turn a tally table into a simple bar graph.
- Compare your fact with a second source.
- Use two describing words for each part.

What Success Looks Like

- ☐ Adds details and a magnified view
- ☐ Adds 3 or more correct labels
- ☐ Asks why and how questions
- ☐ Uses inches, °F and tables
- ☐ Follows the collecting rules
- ☐ Points to the evidence

Guide Tips: Pair a strong writer with a strong drawer so each buddy can lead part of the page. Before sharing, ask each learner to point to the part of the drawing that proves their idea.

Grades 5–6

NJAS School Age Guide

Learners work to become independent. The guide asks a question, waits, and allows learners time to think critically and find the answer.

1. Gather

3 min

2. Explore

15–20 min

3. Create

20 min

4. Record

5 min

5. Share

5 min

How to Support This Age

How much to show

How learners record

Questions to ask

Drawing

Counting & measuring

Finding answers

Ask a question and wait. Help only after learners have tried.

Learners write sentences that include facts and name where each fact came from.

How can we find out? What would happen if...?

Show texture, color, layering and the specimen's real size.

Measure to the half inch, make simple graphs, and use the directions north, east, south and west.

Compare two sources. Do they agree? Which one can you trust more, and why?

Notice: What do you notice?

Draw accurate size and detail, use more than one describing word, and make a simple bar graph.

Wonder: What do you wonder?

Ask questions you could test, and compare what two sources say about them.

Remember: What does this remind you of?

Connect to your data or earlier pages, and explain why a specimen should stay where it is.

Measure: How could you measure this?

Measure to the half inch, work out how much something changed, and track shadows with N, E, S, W.

GO DEEPER

- Plan how you would test one of your questions.
- Measure the same specimen again next week.
- Explain which source is more reliable, and why.
- Teach your buddy one drawing technique.

What Success Looks Like

- ☐ Draws accurate size and detail
- ☐ Uses precise names and describing words
- ☐ Asks questions that can be tested
- ☐ Uses half inches and graphs
- ☐ Explains their choices
- ☐ Responds to a classmate's idea

Guide Tips: When a learner states an idea, ask "How do you know?" and wait. Let a classmate add on before you answer. Learners this age often rush, so ask them to look three more times before they record.

Grades 7–12

NJAS School Age Guide

Learners lead. The guide coaches with questions and gives them ownership of the routines.

1. Gather	2. Explore	3. Create	4. Record	5. Share
2 min	20–25 min	25 min	5–10 min	5–10 min

How to Support This Age

How much to show

How learners record

Questions to ask

Drawing

Counting & measuring

Finding answers

Coach with questions. Learners decide the next step.

Learners write claims backed by evidence and keep field notes (dated notes made on site).

Questions that can be tested or researched.

Make field sketches with shading and true proportion (parts drawn at the right size to each other).

Track how fast things change over time and record data in tables.

Use expert sources and citizen-science projects, where the public shares real observations.

Notice: What do you notice?

Make a field sketch to scale, use precise terms, and keep an observation log.

Wonder: What do you wonder?

Design a small investigation and judge how trustworthy each source is.

Remember: What does this remind you of?

Connect the specimen to the larger system it belongs to, and make care decisions backed by evidence.

Measure: How could you measure this?

Keep data tables and graphs, find how fast things change, and build a record across seasons.

GO DEEPER

- Share an observation with a citizen-science project.
- Run your investigation over several weeks.
- Lead a flag station for a younger group.
- Compare your records with another site or season.

What Success Looks Like

- ☐ Makes scaled field sketches
- ☐ Uses scientific vocabulary
- ☐ Asks investigation-ready questions
- ☐ Analyzes data
- ☐ Makes care decisions with evidence
- ☐ Leads a discussion

Guide Tips: Hand over the routines. Learners choose the flags, lead the move between flags and count the tools. Your job is to ask the next question, not to give the answer.

Sources & Acknowledgments

The NJAS routines Notice, Wonder, Remember, and Measure are New Mettle Farms' adaptation of Project Zero's See, Think, Wonder routine at the Harvard Graduate School of Education. We thank the educators and researchers whose work informs these guides.

AI Use: This guide was drafted with assistance from *Claude*, an AI model by Anthropic, using New Mettle Farms' original NJAS materials. New Mettle Farms reviewed, edited, and approved all content.

"Draft text for the NJAS School Age Guide, Grades 1–12" prompt. Claude, Anthropic, Sept.–Oct. 2026, claude.ai.

Johnson, Kelly. "Creative Connecting: Early Childhood Nature Journaling Sparks Wonder and Develops Ecological Literacy." *International Journal of Early Childhood Environmental Education*, vol. 2, no. 1, 2014, pp. 126–39.

Project Zero. "Thinking Routines." *Project Zero's Thinking Routine Toolbox*, Harvard Graduate School of Education, pz.harvard.edu/thinking-routines.

Wiederhold, Chuck. *Cooperative Learning and Higher-Level Thinking: The Q-Matrix*. Kagan Cooperative Learning, 1991.

Standards alignment: For NGSS citations and grade-level alignment, see the NJAS NGSS Alignment Rubric. For California expanded learning programs, see the NJAS ELO-P Alignment Brief.