Eco-Inquiry's Multiple Forms of Assessment

Eco-Inquiry provides a variety of assessment strategies designed to help you evaluate the learning you value. These include embedded assessment challenges, ongoing assessment suggestions for each lesson, portfolios, students self-evaluations, and concept mapping.

Embedded Assessment Challenges

Three authentic assessment challenges are embedded within each Eco-Inquiry module. One occurs mid-way through each module, and two are culminating challenges. Some are Performance Assessments for which students create products and exhibitions, while others are Written Assessments that require students to analyze written problems or challenges, then write responses.

All of the embedded assessments are a natural outgrowth of students' learning, and are written as lesson plans. They require students to use and demonstrate their knowledge, skills, and habits of mind in situations that are relevant to their immediate lives, and/or that simulate challenges that adults face.

Each assessment challenge is defined on a "Challenge Sheet." The "Scoring Sheet" provided for each assessment will help you evaluate students' work, as well as communicate to students the criteria by which their work will be judged.

Ongoing Assessment

An "Ongoing Assessment" section occurs near the end of each Eco-Inquiry lesson (see page 7). Making assessment part of your daily routine will help you take stock of your students' learning and plan future instruction. Daily assessment can be as simple as taking a few minutes to reflect on how your students responded to activities and questions, doing quick, focused check-ins with small groups, or taking notes when you have time to stand back and observe your students engaged in tasks. Be sure to record ordinary as well as outstanding indicators of your students' learning.

Portfolios

Portfolios are your students' autobiographies of themselves as learners. Portfolios contain collections of work samples that students select and organize to show their achievement of milestones, as well as their growth over time. Gathering portfolios is suggested near the end of each Eco-Inquiry module (Lessons 1.9, 2.6, and 3.7).

Establishing a portfolio culture in your classroom makes you, your students, and their families partners in monitoring and assessing student growth. Through participating in the portfolio process, students learn to set standards that help them distinguish between high quality and mediocre work. Portfolios also cultivate excitement and respect for learning as a process of individual growth and change.

SETTING STANDARDS The portfolio process should begin with the class deciding what constitutes good work in science. Before students can gather evidence of their science achievement, they need to have a clear sense of what they should aim to achieve.

Two activities that are suggested in the Introduction—"Dress the Scientist" (pages 11–12) and "Creating a Company" (page 16)—ask students to think about what knowledge, skills, and attitudes are desirable for doing science. Another option for beginning a discussion of science standards is to ask an open-ended question such as *What behaviors are important for doing a good job in science?* Yet another possibility is to tell students the titles of the Eco-Inquiry "Proficiency Standards" categories for Skills and Habits of Mind, then have them specify behaviors for each. Specific Knowledge standards will be difficult for students to generate, so a single standard such as "understands important ecological concepts" can suffice.

A Good Scientist:

is curious
knows how to experiment
works well with others
is a careful observer
asks questions
can explain and predict things
keeps good records
has self-control
has respect for living things
is patient
is honest
tries to stay positive
can give and take suggestions
knows a lot about nature

The class can make a wall chart of its science standards, and/or each student can make a personal list of standards using "The Ladder of Growth" on page 37. "The Ladder of Growth" can also serve as a self-evaluation prompt. Each time students submit a portfolio, they can decide whether they are at the Trainee, Apprentice, or Scientist level—kid-friendly terms for the Novice, Proficient, and Advanced levels of the "Proficiency Standards." Some teachers use "The Ladder of Growth" as part of the company theme by having "employees" submit portfolios to move up the company career ladder.

Have your students take stock of their lists of science standards each time they are ready to submit portfolios—probably two to four times a year. Their ideas of what's important for doing science will grow and change as they gain science experience.

What Goes Into Portfolios

◆ *Work Samples.* A presentation portfolio contains pieces of work that a student selects from a folder or notebook of all the work s/he completed during a given time frame. The work should provide evidence of the student's science abilities. The following types of work could go into an Eco-Inquiry portfolio:

- journal entries
- C-Mail forms
- concept maps
- peer reviews
- drawings
- data sheets
- completed projects and assignments
- "Scoring Sheet" forms
- "Group Work Evaluation" sheets
- "Reflections" sheets

Each piece of work should be dated, and could also indicate if the work was done independently, as a group, or with teacher assistance.

◆ *Student Comments.* A crucial element of portfolios is students' explanations of why they selected each piece of work. You can copy and cut a supply of the "Portfolio Work Sample Comments" sheet on page 38 so that students can attach one to each work sample in their portfolios. As students comment on each work sample, they personalize, reflect on, and communicate their learning process and achievements.

◆ *Summary Statement.* The "Portfolio Cover Sheet" on page 39 provides a chance for students to summarize their abilities as science learners. This gives them practice in presenting their strengths and qualifications, as they would do in a letter of application for a job.

◆ *Teacher Feedback.* There is a space on the "Portfolio Cover Sheet" for you to add your insights on each student's growth and achievement in science.

◆ *Family Feedback.* The letter to parents on page 40 involves the students' families in reflecting on the work presented in portfolios. Sending portfolios and letters home a week or so before parent conferences can help to focus such meetings.

Managing a Portfolio System

◆ *Choose a Portfolio Container.* Experimenting with a variety of portfolio containers is the best way to decide which works best for you and your students. Manilla file folders are one option, but it helps to adapt them to prevent papers from falling out. Adding a spine binder clip to each, or taping the sides to make them into a pocket works well. Three-ring binders fitted with plastic sleeves for work samples that students do not want to hole-punch are another portfolio option. Pocket folders or accordion file folders also work well.

A convenient filing system will help you streamline the portfolio process. Many teachers set up boxes where students can keep their ongoing work portfolios, as well as their presentation portfolios.

- *When to Gather Portfolios.* One option is to have your students assemble portfolios near the end of each Eco-Inquiry module. Portfolios can also be assembled at the end of a longer time frame, such as at the close of each grading period. In this case, Eco-Inquiry work samples might be just some of the items representing students' growth during that period.

  A year-end portfolio that contains work from all subject areas is a powerful way to reflect on growth during an entire school year. Consider having students create a culminating portfolio, and then write a cover letter to the teacher they'll have next year to present who they are, what they are interested in and good at, and what they want to work on.

- *Reporting Portfolio Results.* Some teachers use portfolios as a percentage of students' grades, whereas others use them for their narrative assessment value alone. Since individual pieces within a portfolio often have already been graded, a portfolio grade can be based on the quality and thoughtfulness of the portfolio's composition and reflections.

Student Self-Evaluations

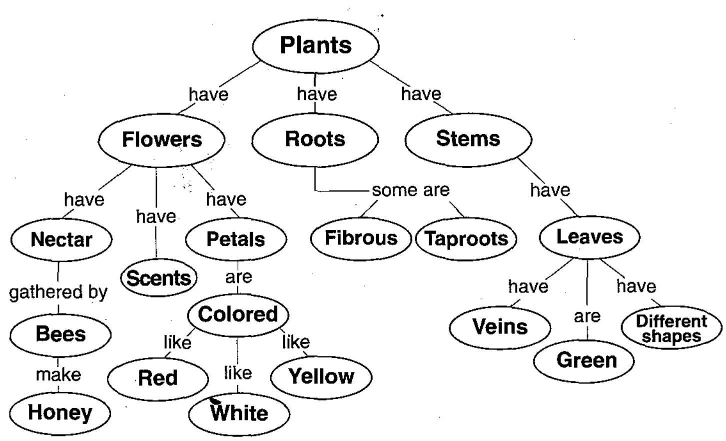
Each of the assessment techniques described thus far in this section provide opportunities for students to be active participants in assessing their learning. Two additional self-evaluation tools are "Reflections" on page 41 and "Group Work Evaluation" on page 42.

Suggestions for when to have students complete these sheets are provided within Eco-Inquiry lesson plans, but they can be used whenever you want to raise students' awareness of their progress, efforts, and need for improvement. In addition to being beneficial for students, these self-evaluation tools will give you insight into students' reflective thinking abilities.

Concept Mapping

Creating concept maps is a powerful way to help students organize, display, examine, and assess what they're learning. Concept maps are diagrams that show how subconcepts are related to a main concept and to each other. The maps are usually arranged hierarchically, with the broadest, most inclusive concept on top or in the center. Subconcepts then appear below or around the main concept. Linkage words can be added to the lines that join the concepts to clarify relationships.

Introduce concept mapping to students by showing them a simple concept map, such as this one on plants.

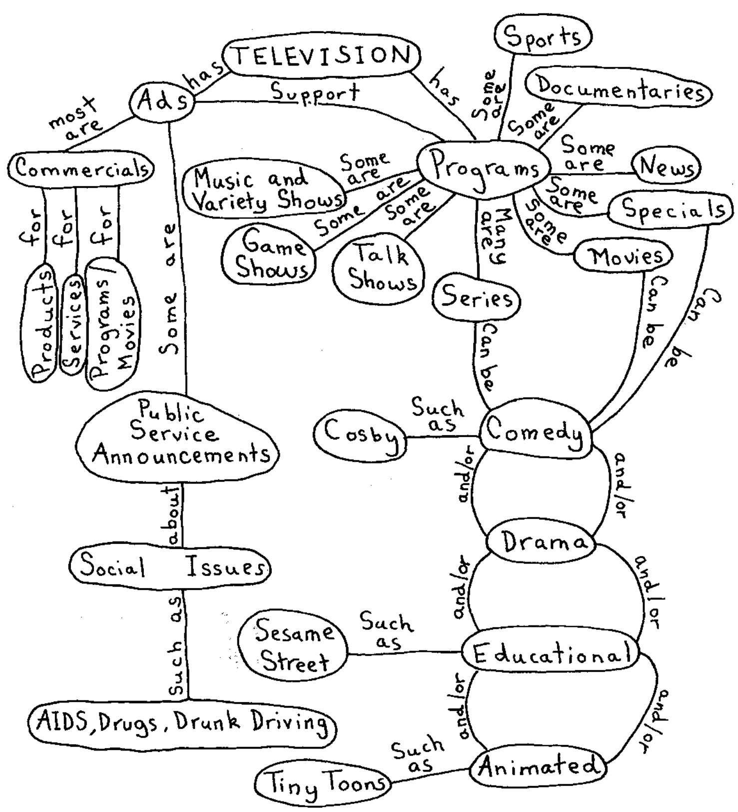


Next, encourage students to think about a familiar topic, such as sports, pets, music, fashion, food, or television. Ask them to generate a list of words that they associate with the topic. Then have someone find two words in the list that are related. Write these side-by-side with a line between them. Ask for a word that could go on the line to explain how the two words are related. Students often have trouble generating words that specify how concepts are related, so it helps to create and post a list of possible linkage words.

Concept Map Linkage Words:

becomes	includes
make	for
is/are	need
has/have	which are
some are	with
release	take up
uses	go between
used by	contain/are in
such as	cause
can be	from
like	shows

Finally, students can work in groups or as a class to organize their list of ideas into a concept map.



Concept mapping is suggested in the "Extensions" of lessons near the beginning and end of each module (see Lessons 1.3, 1.8, 2.1, 2.5, 3.1, and 3.6). A set of ecology concept map cards is provided on pages 43–44 for use during these activities. You can give a set of some or all of the cards to small groups of students so that they can easily play with a variety of arrangements. When they've settled on layouts, they can copy them onto large sheets of paper and add linkage words.

Making a group concept map is not easy because individuals think about relationships among ideas differently, all of which can be correct. However, the process is valuable because it forces students to explain, defend, and change or solidify their understandings.

Concept maps will also help you assess your students' thinking at a glance. Imagine seeing a map in which a group of students has shown microbes as part of the abiotic environment. You could ask students to explain their map so that you understand their reasoning. Then you could target subsequent discussions and instruction at helping them understand that microbes are living things.

In addition to assisting in the process of learning, concept maps are a tangible learning product. Concept maps can provide visible evidence of what students already know as they begin a new study, and can show how their thinking has grown and changed by the end. This makes concept maps ideal for portfolios, for sharing with parents, and most importantly for fostering students' pride in, and awareness of their learning.

Proficiency Standards

Knowledge—Nature of Science

Scientists as People

N
- Scientists are geniuses, or strange, unusual people.
- A typical scientist is a mad-looking white male who wears a lab coat and works with chemicals, and/or someone who is antisocial and nerdy.
- Science is best suited as a career for men.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Scientists are regular people who are intelligent, educated, and hard-working.
- Scientists show a wide range of human characteristics (emotion, fallibility, diversity of lifestyles and personality) just like any other group of people.
- Scientists' knowledge, skills, and attitudes are more fundamental to their work than the clothes they wear, how they look, or what equipment they use.
- Careers in science are open to a wide range of people.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Characteristics helpful for doing science include being: curious, open-minded, able to give and take criticism, cooperative, creative, logical, observant, methodical, patient, diligent, good at communicating, and able to learn from mistakes.

Science as Inquiry

N
- Predictions should be proven correct. If not, scientists have to keep repeating an experiment until it comes out right.
- Most scientific investigations are dangerous and/or thrilling, and are done in laboratories.
- A single scientist investigates a range of topics in a given week—from bombs to butterflies.
- Experiments, verifications, and application of results happen in a matter of days.
- Scientific knowledge is unchanging.
- The main purpose of science is to make the world better, such as by finding cures for diseases.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Experimental science requires asking questions, making predictions, controlling variables, and doing replicates.
- Scientific inquiry is done in many different places, not just in laboratories.
- Most scientists have a specialty in the biological, physical, earth, or social sciences, that they study in depth over many years.
- It is important to gather data carefully and systematically, and to keep good records of experiment procedures and results.
- Scientists have to rely on evidence to draw conclusions and support their claims.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Outcomes of scientific inquiries are uncertain, and experiments sometimes fail.
- Scientists can learn as much from negative results as from results that support their predictions.
- Results of scientific investigations usually lead to new questions.
- Scientific knowledge builds over a long time period.
- All scientific knowledge is subject to revision, so conclusions are temporary.

Science as a Community Activity

N
- Scientists work in isolation.
- Most scientific work is "top secret" so scientists keep results to themselves.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Many scientists often work in collaboration with other scientists.
- Scientists use peer review to get helpful criticism and ideas from other scientists.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Scientists spend a lot of time communicating with other scientists by writing papers, giving presentations, and having discussions.
- The checks, balances, and sharing within the scientific community are essential to the process of building valid scientific knowledge.

Knowledge — Food Webs

Food for Plants

N
- Soil, water, and air are food for plants.
- Plants take in food and make their own food.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Plants need soil, nutrients, water, and air to live, but these are not food.
- Plants meet their food needs differently than animals do because they cannot eat or take in food.
- Plants use soil, water, carbon dioxide, and energy from sunlight to make their own food (sugars), using the process of photosynthesis.
- Plants use the food they produce to grow and stay healthy.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Some food energy is stored inside plants, and some is released as heat when plants use the food to grow and function.

Food for Animals

N
- Anything an animal takes in is food.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Animals need food, water, and air to live.
- Animals get food from eating plants or other animals.
- Animals get both nutrients and energy from food.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Unlike plants, animals take in food and break it into small particles in their guts.
- Some food energy is stored inside animals, and some is released as heat when animals use the food to grow and function.

Feeding Interactions in Ecosystems

N
- Big things eat smaller things.
- An ecosystem is where plants and animals live.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- An ecosystem is an area where living things interact with each other and their physical environment.
- Plants are called producers in an ecosystem because they produce food.
- Animals and microbes are called consumers in an ecosystem because they consume plants and/or animals for food.
- Consumers include: herbivores that eat plants; carnivores that eat animals; omnivores that eat plants and animals; and decomposers that eat dead plants, dead animals, and animal wastes.
- The flow of food from producers to all types of consumers is called a food chain.
- No matter what an animal eats, it depends on the green plants that are at the base of its food chain.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Most organisms and microbes eat and are eaten by more than one thing.
- A food web is the connections among everything animals and microbes in a location eat and are eaten by.
- If a population of plants, animals, or microbes in a food web increases or decreases significantly, the sizes of the populations of other organisms in the web may also change.

Knowledge — Decomposition

Cause of Decomposition

N
- Dead things disappear on their own as time passes.
- Physical conditions, such as wind, rain, battering, and trampling, cause dead things to break down and disappear.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Some dead things get eaten by bugs, but dead things also decompose because of physical conditions.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Dead things decompose because decomposer organisms use them for food.
- Dead things do not decompose without the action of decomposers.

Decomposer Organisms

N
- The only organisms that eat dead plants and animals are things like insects, earthworms, and vultures.
- All microbes are germs that cause diseases.
- Microbes are not living things.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Decomposers are animals and microbes that use dead plants and animals and their wastes as food.
- Microbes are everywhere, but are usually invisible to the naked eye.
- Microbes are living things.
- Decomposer microbes get nutrients and energy by consuming food.
- Some bacteria and fungi are decomposer microbes that use dead plants and animals as food.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Bacteria and fungi consume dead material by being inside or beside it, releasing chemicals to break the material down, then absorbing the tiny particles of nutrients and food energy.

Conditions for Decomposition

N
- Things decompose better in certain conditions, like where it is wet, because the condition itself (e.g., the water) makes them decompose.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Most microbes grow best in warm, moist conditions.
- Microbes grow best on dead material that is high in nutrients and energy, and is easy to digest.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- When more decomposers grow on dead material, it decomposes more quickly.
- When people change environmental conditions, decomposition may speed up or slow down.

Knowledge — Nutrient Cycling

Nutrients

N
- Nutrients are like good food.
- Nutrients provide energy.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Nutrients are tiny particles of matter, not energy.
- Nutrients are the building blocks of all living things.
- Nutrients are in food, living things, and the physical environment.
- Living things grow and stay healthy by taking nutrients into their bodies.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Living things that aren't getting the right kinds or amounts of nutrients often show physical symptoms of stress, such as discolored leaves on plants.

Fate of Decomposed Matter

N
- When things decompose, the matter they were made of disappears.
- When things decompose, some of the matter they were made of goes into the ground, but much of it vanishes from existence.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Decomposed matter goes into the ground as tiny particles.
- Decomposed matter might disappear from sight, but the material it was made of does not disappear from existence.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- Decomposed matter becomes part of the organisms that consume it, or it is released into the soil, water, or air.
- Matter is not created or destroyed, but is recycled into new forms.

Flow of Nutrients in an Ecosystem

N
- Nutrients float in the air, not necessarily driven by any particular biological or physical processes.
- Nutrients go from one thing to another like a disease travels from person to person.

N+
- Shows some ideas from Novice level and some from Proficient level.

P
- Nutrients are passed along food chains from plants to animals, from animals to animals, and from dead plants and animals to decomposers.
- Decomposers release nutrients from dead material into the physical environment.

P+
- Shows some ideas from Proficient level, and some from Advanced level.

A
- A nutrient cycle is the flow of nutrients back and forth between living things and the physical environment.
- Nutrient cycles are driven partly by biological processes such as the uptake of materials from the physical environment by plants, and the consumption of food and the release of wastes by animals.

Skills

Defining Questions

N
- Doesn't form questions when encountering new experiences or ideas

N+
- Asks mostly general or superficial questions

P
- Forms focused questions based on experiences

P+
- Forms questions about ideas and interpretations, as well as about concrete experiences
- Distinguishes between testable and non-testable questions

A
- Refines testable questions to guide inquiry
- Forms new questions based on findings

Planning and Investigating

N
- Doesn't make an investigation plan
- Tries things out unsystematically
- Can't determine what could be important to watch or measure

N+
- Outlines a general plan for answering a question, but doesn't specify details
- Doesn't plan to control all variables
- Relies heavily on defining an investigation while doing it

P
- Understands rationale for the procedures of a fair test (controlled experiment)
- Makes (with guidance) a sequenced and detailed plan for what variables to change and control, and what indicators to observe, measure, and compare
- Can explain how the planned experiment will help answer the research question
- Predicts possible outcomes
- Doesn't always carry out details of plans, such as controlling variables

P+
- Plans a controlled experiment without guidance
- Works through the steps of the plan systematically, accurately, and thoroughly
- Makes reasonable adjustments to the plan while going along

A
- Does a sufficient number of tests to get reliable results
- Uses supplemental experiments to feed into the main experiment
- Critiques and refines experimental design in retrospect
- Uses experiment results to devise new investigation plans

Observing and Measuring

N
- Sees only obvious things Notices few details or changes; poor discrimination ability
- Doesn't use all senses

N+
- Makes somewhat focused and active observations, but their quality, depth, breadth, and accuracy is inconsistent

P
- Uses all senses to notice details, patterns, similarities, and differences
- Can quantify observations using appropriate measurements

P+
- Follows a regular program of observation and measurement
- Makes objective and accurate observations and measurements consistently

A
- Judges how frequent and accurate observations and measurements need to be for an experiment, and makes them accordingly
- Uses discerned patterns and relationships to focus further observations

Skills — Continued

Keeping and Transforming Records

N
- Keeps no records, or sloppy, indecipherable records

N+
- Keeps records sporadically
- Records information on some, but not all, important indicators

P
- Makes a chart or other organized system for keeping records
- Records all important indicators, but not regularly enough to document changes or trends

P+
- Transforms (with guidance) quantitative records into graphs or tables, but these might lack appropriate labels
- Uses clear, accurate, descriptive, and objective language and drawings to present qualitative results

A
- Keeps accurate, comprehensive, systematic, and frequent records
- Transforms records (without guidance) into a form that communicates results clearly
- Labels graphs and charts appropriately

Interpreting Information

N
- Makes little attempt to look for patterns in data and draw conclusions
- Clings to original ideas despite contradictory evidence
- Doesn't use new information to enrich prior ideas

N+
- Takes some, but not all data into account when drawing conclusions
- Uses evidence selectively to support predictions

P
- Recognizes patterns in data and relationships among variables
- Uses results to draw conclusions, even when contrary to expected results
- Draws appropriate conclusions, but may be unable to explain the supporting evidence

P+
- Relates results back to research question—doesn't just report what happened
- Integrates and interprets results from several replicates
- Draws conclusions that are supported by data
- Can explain the supporting evidence
- Doesn't overstate evidence or make unsubstantiated inferences

A
- Identifies and explains errors or weaknesses in experiment, and the impact these have on conclusions
- Changes and/or enriches prior ideas with new information

Collaborating

N
- Works in isolation; withdrawn and/or untrusting
- Tends to be domineering and/or hostile, to the detriment of group goals and enrichment

N+
- Cooperates passively
- Doesn't initiate plans and activities
- Doesn't volunteer to take on responsibilities
- Tends to stray off task

P
- Pulls own weight as an active and positive group member
- Communicates well with group members
- Performs a variety of jobs willingly

P+
- Helps manage group process by doing one or more of the following: sets goals, makes plans, allocates responsibilities, involves all members, resolves disputes, and keeps group on task
- Listens to, respects, and builds on ideas of others

A
- Balances personal and group needs effectively and consistently to maximize the learning of all and the quality of the final product

Habits of Mind

Proficiency Levels

N
- Uses few of the listed traits
- Has some awareness or understanding of the traits
- Shows glimmers of the listed traits in action, or a desire to develop them

N+
- Shows a few of the listed traits sporadically

P
- Shows many of the listed traits, but may require prompting to use them.

P+
- Shows more of the listed traits more often

A
- Has internalized the habit of mind
- Uses the habit spontaneously, without reminders
- Applies the habit when appropriate to achieve goals and produce high quality work

Curiosity

- Notices and is inquisitive about things
- Desires to know what things are, and how and why they work as they do
- Shows discomfort with incomprehension
- Works to understand by asking questions and pursuing answers
- Values learning new things

Perseverance

- Stays on task to reach a goal
- Puzzles over a problem to gain clarity, get a solution, or devise a better approach
- Relies on own mind as a resource for problem solving
- Controls impulsiveness that would be detrimental to achieving goals
- Tolerates and works through frustration, confusion, and ambiguity to achieve goals

Open-Mindedness

- Considers multiple possibilities and approaches
- Seeks out different points of view
- Can reason from alternative perspectives
- Reconsiders own ideas in light of input from others
- Uses input to improve work
- Shifts gears when a strategy isn't working

Respect for Evidence

- Generates accurate and reliable evidence by watching patiently, measuring carefully, and revising or repeating procedures
- Presents evidence in an honest, unbiased, objective fashion, even when it contradicts expectations
- Recognizes how prior ideas and perspectives can influence interpretation of evidence
- Uses evidence to make appropriate claims and build arguments
- Suspends judgments and conclusions until has sufficient and convincing evidence
- Carefully evaluates the evidence behind claims and the credibility of sources
- Shows appropriate and productive skepticism for claims that don't make sense

Reflection

- Monitors own thinking and progress toward goals
- Uses personal standards for evaluating success and effectiveness of own actions
- Identifies own strengths, limitations, and ways to improve
- Can provide and explain evidence of growth
- Evaluates the ideas of others to give useful feedback

Class Observations

Date:________________________ Activity: ______________________________

Area Being Assessed: _______ Knowledge _______Skills _______ Habits of Mind

Specific Standard:____________________________

Name	Proficiency level (N, N+, P, P+, A)	Comments

LEARNING PROFILE

Student Name ______________________________

Put a checkmark and date in the box corresponding to each proficiency level attained.

			N	N +	P	P+	A
KNOWLEDGE	NATURE OF SCIENCE	Scientists as People					
		Science as Inquiry					
		Science as a Community Activity					
	FOOD WEBS	Food for Plants					
		Food for Animals					
		Feeding Interactions in Ecosystems					
	DECOMPOSITION	Cause of Decomposition					
		Decomposer Organisms					
		Conditions for Decomposition					
	NUTRIENT CYCLING	Nutrients					
		Fate of Decomposed Matter					
		Flow of Nutrients in an Ecosystem					

		N	N +	P	P+	A
SKILLS	Defining Questions					
	Planning and Investigating					
	Observing and Measuring					
	Keeping and Transforming Records					
	Interpreting Information					
	Collaborating					

		N	N +	P	P+	A
HABITS OF MIND	Curiosity					
	Perseverance					
	Open-Mindedness					
	Respect for Evidence					
	Reflection					

The Ladder of Growth

Desired Characteristics

What knowledge, skills, and attitudes are important for doing science?

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

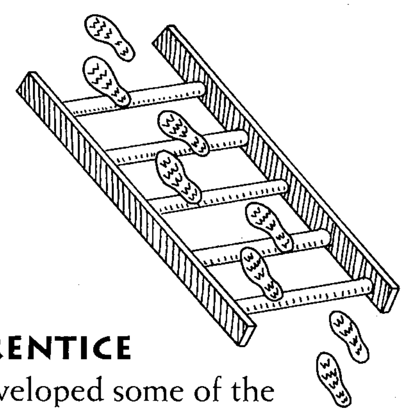
☐ ____________________________________

☐ ____________________________________

☐ ____________________________________

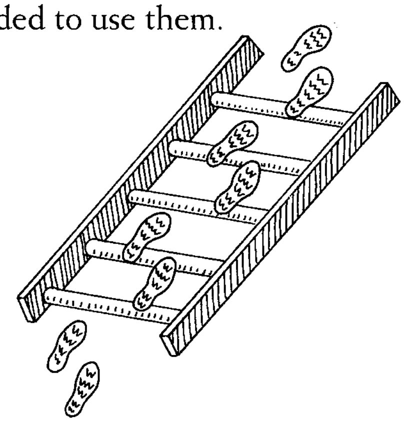
Scientist

Shows all of the desired characteristics.
Uses them regularly.



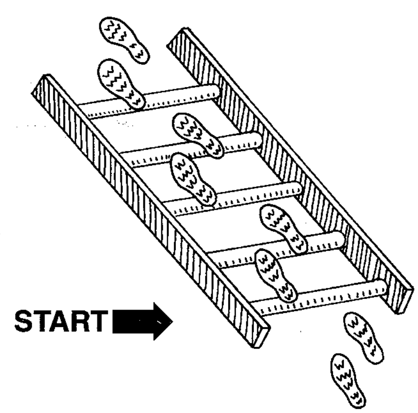
Apprentice

Has developed some of the desired characteristics. Needs to be reminded to use them.



Trainee

Is able to develop the desired characteristics, but doesn't use them very much yet.



NAME(S)____ DATE__________

PORTFOLIO WORK SAMPLE COMMENTS

NAME ____________________________________ DATE __________

I chose this item for my portfolio because it shows ____________________

____

____

From this work I learned ____

____

I could improve it by ____

____

Reviewer's Initials: ______________

NAME ____________________________________ DATE __________

I chose this item for my portfolio because it shows ____________________

____

____

From this work I learned ____

____

I could improve it by ____

____

Reviewer's Initials: ______________

NAME(S)________________________________ DATE__________

PORTFOLIO COVER SHEET

What are your science qualifications? Describe what your work in this portfolio and during class demonstrates about your knowledge, skills, and attitudes:

Outline your future goals and learning plan:

Comments:

Signed: ________________________ Date: ________________

Dear Parent,

Your child has created a portfolio of work that demonstrates growth and accomplishments. You might want to look over the portfolio on your own, then go through it with your child, asking questions such as:

What sample are you most proud of? Why?

How did you do this?

What was most challenging?

What are your goals for future work? How will you achieve them?

After you've reviewed and discussed the portfolio, please sign below and have your child return this letter to me. I'd also be interested in your responses to the questions at the bottom of this sheet.

Thank you for taking the time to reflect on your child's growth as a learner.

Sincerely,

1. What did looking at and discussing the portfolio samples tell you about your child as a learner?

2. Were you drawn to any particular piece of work, and/or were you surprised by anything? What and why?

3. What needs to be addressed to improve your child's learning?

4. Other comments and suggestions:

Signed: ______________________________ Date: __________

NAME(S)______________________________ DATE__________

REFLECTIONS

1. Rate each item as ✓+ (high), ✓ (medium), or ✓- (low).

My effort	
My participation in class	
The quality of my work	
My satisfaction with my work	

2. Often in class I feel ______________ because ______________

____

3. Something hard or confusing has been ______________

____

4. Something interesting or fun has been ______________

____

5. Ways I could improve my performance are______________

____

6. Describe in detail something you've done in class that shows how you are a learner, thinker, and/or problem solver:______________

____

____

____

____

NAME(S)________________________________ DATE__________

GROUP WORK EVALUATION

1. What did your group accomplish? ____________________

____

2. Rate your contributions in the ME column as ✓+ (a lot), ✓ (a fair amount), or ✓- (not much).

   Then rate your group as a whole in the GROUP column, using ✓+ (all members), ✓ (most members), or ✓- (few or no members).

	ME	GROUP
Helped plan and organize		
Shared information and ideas		
Respected different opinions and suggestions		
Helped others learn and get involved		
Helped get the work done and done well		
Took responsibility to work out difficulties		

3. What helped your group succeed? ____________________

____

4. What held your group back? ____________________

____

5. How could your group do better in the future? ____________________

____

Ecosystem	Abiotic	Air
Water	Soil	Sunlight
Heat Energy	Biotic	Plants
Animals	Microbes	Bacteria

Fungi	Producers	Consumers
Herbivores	Carnivores	Decomposers
Decomposition	Warmth	Moisture
Food	Nutrients	Nutrient Cycles