Science Resource Package: Grade 7

Interactions within Ecosystems: Components of an Ecosystem

New Brunswick Department of Education
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Note that at the time of posting, all URLs in this document link to the desired science content. If you observe that changes have been made to site content, please contact Kathy Hildebrand katherine.hildebrand@gnb.ca, Science Learning Specialist, at the Department of Education.

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INTERACTIONS WITHIN ECOSYSTEMS: COMPONENTS OF AN ECOSYSTEM

RATIONALE

This resource package models current research in effective science instruction, and provides an instructional plan for one topic selected from the Grade 7 Atlantic Canada Science Curriculum. This curriculum includes STSE (Science, Technology, Society, and Environment) outcomes, Skills outcomes, and Knowledge outcomes – all of which are important for building a deep understanding of science and its place in our world.

As has been true of our ancestors, we all develop “explanations” about what we observe which may or may not be valid. Once ideas are established, they are remarkably tenacious and an alternate explanation rarely causes a shift in thinking. To address these misconceptions or alternate conceptions, students must be challenged with carefully selected experiences and discussion.

A key part of this instructional plan is accessing prior knowledge. It is recorded in a way that it can and will be revisited throughout the topic. The intent is to revise, extend, and/or replace students’ initial ideas with evidence-based knowledge.

Science is not a static body of facts. The process of exploring, revising, extending, and sometimes replacing ideas is central to the nature of science. Think of science as an ongoing evidence-based discussion that began before our time and that will continue after it. Science is often collaborative, and discussion plays a key role. Students’ learning of science should reflect this as much as possible.

The intent of this instructional plan is to encourage a constructivist approach to learning. Students explore an activity, then share, discuss, and reflect. The telling of content by the teacher tends to come after, as an extension of the investigation (or experience) explored by the students.

The learning is organized into cycles. The partial conceptions and misconceptions are revisited in each cycle so that students’ ideas will be revised. Each cycle will result in deeper and/or extended learning.

Hands-on activities are part of the instructional plan. Inquiry activities tend to be most structured in the first cycle. The teacher provides the question to investigate and gives a procedure to follow. In subsequent cycles, less structure tends to be given. For
example, students may be given a question and asked to develop an experimental plan which they then implement. The goal is to move towards open inquiry in which students generate a testable question, develop an experimental plan using available materials, implement the plan, record relevant observations, and make reasonable conclusions. The included activities are meant to start this journey.

**Discussion** and **written reflections** are key parts of the lessons. Discussion (both oral and written) is a vehicle that moves science forward. For example, when scientists publish their evidence and conclusions, other scientists may try to replicate results or investigate the range of conditions for which the conclusion applies. If new evidence contradicts the previous conclusions, adjustments will be required. Similarly, in this instructional plan students first do, then talk, then write about the concept. A section on supporting discussion is included in this resource package.

**Assessment** tasks are also included in the instructional plan and assess three types of science curricular outcomes: STSE, Skills, and Knowledge. These tasks are meant to be used as tools for letting the teacher and the students know where they are in their learning and what the next steps might be. For example: Has the outcome been met or is more learning required? Should more practice be provided? Is a different activity needed?

When assessment indicates that outcomes have been met, it will provide **evidence of achievement**. This evidence may be sufficient and further formal testing (paper-pencil tests) may not be required to demonstrate that outcomes have been met.
Background Information

Prior Knowledge:
- In gr.4, students studied habitats.
- In gr.6, students have looked at the variety of life in a local ecosystem, classification and characteristics of organisms.

Common Misconceptions:
Dead organisms are abiotic.

Did You Know?
Ecosystem: all the interacting biotic and abiotic parts of an area; an ecosystem can be large or small, but must contain all of the abiotic and biotic features.

Habitat: the natural environment where an organism lives

Biome: areas of similar climate containing certain kinds of organisms, particularly plants; examples are desert, grassland, and forest

Population: a collection of organisms of the same species found in a specific geographic area

Abiotic: a term applied to non-living physical or chemical factors in the environment; for example: air, water, and soil

Biotic: a term applied to living components in the environment such as humans, plants, birds, microorganisms, and insects

Producer: organism that makes its own food using abiotic components such as water, air, nutrients, and sunlight

Consumer: organism that cannot make its own food; eats other organisms

Decomposer: organism that feeds on dead plants or animals; breaks complex molecules into simpler nutrients.

Further information on decomposers can be found at:
http://www.rspb.org.uk/youth/learn/foodchains/decomposers.asp
Instructional Plan

Access Prior Knowledge

- Say: Scientists make observations. What does this mean? How do you do it?
- How do scientists collect data on the natural world?

The purpose is to get students thinking about using their 4 senses (not taste) to observe the world around them and to really slow down, be still and observe instead of taking a quick look and jumping to conclusions. By slowing down and taking the time to observe, students may notice things they wouldn’t notice otherwise and making more interesting discoveries.

Activity (optional)

Tell students: We're going to be studying ecosystems and will need to fine-tune our observation skills.

- Have bags with different kinds of uncooked pasta mixed together, hold one up at the front of the class and ask students what they observe. Have students make a list. Try to get them to realize that what looks all the same may not be.
- Have one student at each group hold a bag of pasta about one meter from the group. What observations can the other group members add to their lists?
- Have the bag of pasta placed on the table in the center of the group. Have students add further observations to their list.
- Ask: What have you noticed about making observations? Expect ideas like: can see more details close up; what looked the same really is not

In small groups, have students discuss the natural world – What is in the natural world? What are habitats? What other words are about nature? They should make a list of vocabulary and an explanation of as many as they can. They should write the words on half sheets of paper, large index cards or large sticky notes with marker.

- Ask the groups to share one idea at a time, round robin style. Arrange the cards on a wall or bulletin board, clustering those that go together. These will be revisited during subsequent classes.
In science, words often have precise meanings. Sometimes the meaning is somewhat different from when it is used in regular, non-scientific ways.

Students will make a foldable for vocabulary in this portion of the unit.

- Take a sheet of paper and fold it in half the long way (a hot dog fold).
- Fold the paper top to bottom three times to divide the length into eight equal parts.
- Cut along these lines on the front only to create 8 flaps.
- The vocabulary words will be printed on the front of the flap with its meaning written inside when the flap is opened. Small diagrams may also be used.

Habitat has been used in the discussion so it will be the first term placed on the foldable.

Options for storing foldables:
- in a large zippered plastic bag. The bag can be hole-punched and put inside a duotang or binder. A strip of wide tape folded over the left edge of the bag before punching the holes will keep the bag from ripping.
- glue into notebooks or duotangs
- display them on bulletin boards

Post student versions of curricular outcomes on chart paper (see page 21). Inform students that these outcomes will be addressed over the next portion of the unit. Point out to students which outcomes are being addressed in each activity.
Interactions within Ecosystems: Components of an Ecosystem

1st Cycle

Curriculum Outcomes

- 109-13 Explain the importance of choosing words that are scientifically and technologically appropriate.
- 208-3 Define and delimit questions and problems to facilitate investigation.
- 209-4 Organize data, using a format that is appropriate to the task or experiment.
- 306-3 Describe interactions between biotic and abiotic factors in an ecosystem.

Remind students about the idea of habitat and introduce the term ecosystem.

You may find Bill Nye’s “Biodiversity” video helpful. Watch the section called Ecosystems. It can be found at http://learning.aliant.net/school/index.asp Type the title into the search box. When you click on the picture, the video will start with a table of contents to the right of it. Click on the ecosystem subheading to go to that portion. There is no need to view the entire video. (You need to register to use the videos on the Aliant site. Registration is free. If you try to watch the video without logging in, you are prompted to do so.)

Have students add “ecosystem” to their vocabulary foldable.

Biotic and Abiotic Activities

Part 1

Take students outside to a local ecosystem (schoolyard, suburban street, stream, field, forest). Have students work with a partner to observe living and non-living things in the ecosystem. Things observed should be classified as living and non-living and recorded on a chart. Remind the students to use a variety of senses and like with the pasta, more details can be observed from close up.

Back in the classroom, have students share results with the whole class and make a class chart of living and nonliving things.

Introduce terms: biotic and abiotic. Have students add these terms to the vocabulary foldable.

The video “Habitats and Biomes: Ecosystems of the World” describes ecosystems, biotic, abiotic, habitat. View these sections: Introduction, What is an Ecosystem, Living Within an Ecosystem, Different Ecosystems – Different Living Things. It can be found at http://learning.aliant.net/school/index.asp Type the title into the search box. When you click on the picture, the video will start with a table of contents to the right of it.
Interactions within Ecosystems: Components of an Ecosystem

Part 2

Use pictures (some pictures are provided on pages 23-26 or calendar pictures are sometimes good) or watch a video of a particular ecosystem.

Have students, in small groups or partners, create a chart of biotic and abiotic parts of the ecosystem.

✓ Assessment:
During the student activity, make notes on outcomes (or parts of outcomes) you observe being addressed. Process skill outcomes are part of the curriculum and should be assessed. Using the observation chart or the checklist (see pages 28-31) on a clipboard may be helpful to you. Develop your own code for quick notes.

A suggested code:

√  observed and appropriate,
WD  with difficulty,
RTT  refused to try,
A   absent.

This chart may be used on multiple days, using a different coloured pen or pencil each day and putting the date in the corner. You may not have a symbol or note for every child every day. Some teachers like to focus on a group or two each time. However you choose to make note of your observations, you will always have a sense of who you need to take more notice of and who might need extra support. The information will also help you when it is reporting time.

A variety of videos can be found at http://learning.alianet.net/school/index.asp Type the title into the search box. When you click on the picture, the video will start with a table of contents to the right of it. Some possible found at this site are:

Coastal Dunes – sections: Lithosphere to Fauna
Deserts – a Bill Nye video
Forest Habitats
Fragile Ecosystems – section on Reef Ecology
Ocean Life – a Bill Nye video on ocean ecosystems
Ocean Habitats: Shoreline and Reef
The Tropical Rainforest Habitat
Reflection: Class Discussion

- Have students share their observations and thoughts on biotic and abiotic components of ecosystems. See teacher’s note about encouraging classroom talk on pages 18-19.

- Revisit the cards created during the Accessing Prior Knowledge activity on page 4. Does any of this information need to be revised or added to? Is there other information we should put on cards to add?

Reflection: Journaling

Which is more important - biotic or abiotic parts of the ecosystem? Why?

☑️ Assessment:

Journal entries should not receive a score or mark. A positive comment followed by a question to refocus attention or suggest the next step in learning is very effective. Note which students show an understanding of the difference between the biotic and abiotic parts of an ecosystem and that they interact.

Possible extension:

Investigate the abiotic and biotic factors of your habitat. Discover Your Place in Your Habitat Activity described at http://www.hww.ca/hww2.asp?id=117

Other activities from http://www.hww.ca/hww.asp?id=5&pid=0 might be used as extension activities throughout this unit.
2nd Cycle

Curriculum Outcomes

109-1 Explain that observations and identification of similar characteristics enables classification in an ecosystem.
109-12 Distinguish between terms that are scientific or technological and those that are not.
109-13 Explain the importance of choosing words that are scientifically and technologically appropriate.
209-4 Organize data, using a format that is appropriate to the task or experiment.
211-5 Defend a given position on an issue or problem on the basis of their findings.
306-3 Describe interactions between biotic and abiotic factors in an ecosystem.
304-2 Identify the roles of producers, consumers, and decomposers in a local ecosystem, and describe both their diversity and their interactions.

Biotic Roles Activity

Provide the class with a list of living things (see page 22) and have a discussion about how we could organize these organisms. Make a list of possible ways. The list generated by the student should be somewhat diverse (e.g., size, plants/animals/others, nocturnal, herbivores/carnivores, etc.)

Discuss how there are many ways to classify things. Scientists work to classify organisms and the way they classify them depends on what they are looking at or for.

Ask the students to sort the organisms by the job they do.

Assessment:

On observation chart (or other record), note how students are performing on the skill outcomes.
**Reflection: Class Discussion**

What types of headings did students come up with? Which headings from different groups are kind of the same?

Share the sorting rules (kinds of jobs) the students came up with. Tell students the names scientists give to the groups they have come up with. (For example, organisms that eat other animals are carnivores), other terms: herbivores, omnivores, consumers, producers, decomposers (note: that carnivore and herbivore are apt to fit groups the students create but the curriculum talks about consumers – want to get to consumers, producers and decomposers).

Have students add the terms consumer, producer, decomposer to their vocabulary foldable.

**Reflection: Journaling**

Look at pictures of an ecosystem (or books on ecosystems/biomes or video of): identify and list consumers, producers, decomposers. Name some characteristics of each group.

**Assessment:**
Journal entries should not receive a score or mark. A positive comment followed by a question to refocus attention or suggest the next step in learning is very effective. Make a note of which students show an understanding of the differences among consumers, producers, and decomposers.

**Assessment:**
You have traveled to the island of Ecomagic. You observe an interesting and previously unknown creature. Is it a consumer, producer, or decomposer? Describe your creature, whether it is a consumer, producer or decomposer and provide evidence that supports your conclusion.
Students tend to understand the roles of consumers and producers because they are very familiar with many of these sorts of organisms. Decomposers are less familiar.

Ask students: *Think of your school or community – what happens to the waste that nobody wants?* (Expect answers like: some goes to the landfill, some gets recycled, some is sewage)

Ask: *What wastes are produced in nature? How does nature get rid of waste?* - Dead animals, dead plants, leaves, scat (manure).

[http://www.teachersdomain.org/asset/tdc02_vid_decompose/](http://www.teachersdomain.org/asset/tdc02_vid_decompose/) A good 3 minute video showing time lapse decomposing.

**More on Decomposers Activity**

Note that if the rubric is to be used for assessing student work, it should be given to students and discussed before the investigation. Examples of previous experimental write ups should be displayed. If this is new to students, the process should be modeled by the teacher several times before expecting students to complete one independently.

Have students demonstrate that earthworms help break down dead organic material. They will make a pop bottle ecosystem for earthworms (with earthworms and dead leaves), and compare it to an ecosystem without earthworms (dead leaves only) and perhaps to another with no earthworms or dead leaves.

Note that it will take time to see the results from this investigation. If materials are difficult to collect make one set of containers for the whole class to observe. Involve students in writing the question and determining how to control variables.
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Materials:
- 2 L pop bottles with covers or dish pans or aquaria
- Soil
- Dead leaves
- Earthworms (from a garden or from the pavement when it rains)

Have students generate a question they can investigate about whether earthworms help break down organic material.

They will design and carry out a procedure to get data to answer their question.

Information about earthworms and making a pop bottle ecosystem are given at the following site.
http://www.icewatch.ca/english/wormwatch/programs/introduction.html
http://www.icewatch.ca/english/wormwatch/activities/bottle.html constructing a pop bottle ecosystem for earthworms
http://www.icewatch.ca/english/wormwatch/activities/invest2.html Earthworms in action

There is also an activity described in Project WILD called Eco-Enrichers. This activity book is obtained by attending an inservice. More information can be found at
http://www.wildeducation.org/programs/project_wild/prog_wld.asp

✓ Assessment:
On observation chart (or other record), note how students are performing on the skill outcomes.

- Students should write up their question, materials and procedure to hand in.
- Have students self-assess their write up before handing it in to you. Give students the guidelines (see “got it” column) and ask them to comment on how well their work meets each criteria. The third column will be for you to give feedback (see sheet on page 27).

✓ Assessment:
Note if students are able to write up a lab report or if mini-lessons on specific parts of the report are needed. The following rubric may be helpful.
Reflection: Class Discussion

Ask: What do you think the world would be like without decomposers? Who has a compost pile at their house? Can you tell us what your family does to it?

Revisit this discussion after their ecosystems have had a chance to work.

Reflection: Journaling

You create (put in a number) kg of compost weekly. How big would your compost pile be after a year? Are compost piles really that big? Why or why not?

Assessment:

Journal entries should not receive a score or mark. A positive comment followed by a question to refocus attention or suggest the next step in learning is very effective. Make a note of which students show an understanding that decomposition changes materials so that they may be recycled.
Possible Extension:

Look at an ecosystem with reduced decomposition such as a bog. Museums sometimes have artifacts discovered buried in bogs that would have rotted in many environments. These artifacts, made of materials such as leather and wood, have lasted because of reduced decomposition.

The Project WET resource has an activity called “People of the Bog” in which students create a bog environment with some buried artifacts and compare it to a mini-composter.

More information about the Project WET K-12 Curriculum and Activity Guide (1995) can be found at http://www.cwra.org/branches/ProjectWet/goals.aspx This resource is obtained by attending a Project WET inservice. Information about facilitators can be obtained from Susan Bone, Education & Engagement Unit – Atlantic Environment Canada, Dartmouth, NS (ph) 902-426-1704
Interactions within Ecosystems: Components of an Ecosystem

4th Cycle

Curriculum Outcomes

- 211-5 Defend a given position on an issue or problem on the basis of their findings.
- 304-2 Identify the roles of producers, consumers, and decomposers in a local ecosystem, and describe both their diversity and their interactions.

Interactions in an Ecosystem Activity

- Bring students to an area where they are able to form a large circle.

- Assign each student a role - either a biotic or an abiotic component. (air, water, falcon, bear, flower…) Make sure you have visible name tags for each student, so that everyone knows who is what.

- Give a ball of twine to the student that is “Air” and ask: “What relationship can AIR have with one other component in this circle?” Have that student say that relationship (“Bear needs air to live.”) and toss the ball of twine to the student that has “Bear” name tag.

- That student (Bear) looks around to find what relationship a bear might have with another component in the circle. Student says “Bear eats Salmon”, then toss the ball of twine to the “Salmon” student. Keep going for 10 minutes. You might have to intervene and suggest possible interaction to ensure all students get included in the exercise.

- After the game, ask students to identify what they have observed. Here are possible observations:
  - The string looks like a spider web.
  - All organisms have relationships to at least one other organism
  - All organisms need air and water

An alternate game:

Demonstrate interactions among organisms in this “Interdependence Shuffle”
http://www.fieldmuseum.org/thisoldhabitat/pdfs/Activity4.pdf

Each student is given a component of an ecosystem (the site above has cards to print) and a piece of string about 2 m long. One at a time students read their card and give the other end of their string to an organism that they have an interaction with.

After all are linked, find out which organisms are holding the most strings and which the least. (Predators will have the least, producers and decomposers the most.)
An additional activity:
The Explore Learning site has simulations called Gizmos. The simulations may be useful to further explore the interactions among living things. Try “Food Chain”, “Interdependence of Plants and Animals”, or “Rabbit Population by Season” at http://www.explorelearning.com/index.cfm?method=cResource.dspResourcesForCourse&CourseID=306

The “Gizmo” site allows unregistered users to run each Gizmo for 5 minutes a day. It is also possible to sign up for a free trial. Membership is not free.

Think like a scientist
 Asking good questions is an important skill in science. Initially students will need support. Model the skill with the whole class and students will begin to have the confidence to contribute. After some practice, students will be able to generate questions successfully individually.

Present students with a situation and ask them to generate questions that could be investigated scientifically. (These situations and questions do not have to be limited to those that can be done in a classroom.)

Situation:

There are an increasing number of non-native plant and animal species that have been introduced or found their way into ecosystems in Canada and around the world. For example: fire ants in Nova Scotia, moose in Newfoundland, zebra mussels in the Great Lakes, and rabbits in Australia. European earwigs, European starlings, pigeons, dandelions and purple loosestrife are some examples that can be found in New Brunswick.

Write a question concerning the impact of a non-native species on local ecosystems that could be investigated scientifically.

Reflection: Journaling
Think about an individual organism. What does it need? Draw its relationships. What does it need to have in its ecosystem/community?

✔ Assessment:
Journal entries should not receive a score or mark. A positive comment followed by a question to refocus attention or suggest the next step in learning is very effective.
Make a note of which students show an understanding that an organism has a variety of relationships. Do they include both biotic and abiotic relationships?
Possible Videos

The Bill Nye video “Food Web” may help review and summarize at this point, especially the following sections: Introduction, The Tangled Web, Plants are Important, Where Does Food Come From, Check It Out - The Food Web, and The Food Pyramid.

It can be found at http://learning.aliant.net/school/index.asp Type food web into the search box. When you click on the picture, the video will start with a table of contents to the right of it. Note that you can click on any part of the contents list to go to that portion. There is no need to view the entire video. (You need to register to use the videos on the Aliant site. Registration is free. If you try to watch the video without logging in, you are prompted to do so.)

The same site also has “The Pond”. The following sections may be especially useful: Steps in the Food Chain and The Detritus Pathway.

✔ Assessment:

The town is going to (fill in a situation with a local connection), how will that affect the community/ecosystem?

(For example: build a new highway through the forest, fill in a marsh for building a new bowling alley, build a causeway across an inlet)

➢ Other Resources

Clive Dobson & Gregory Gilpin Beck, WATERSHEDS: a practical handbook for healthy water Firefly Books, 1999


Possible Extensions:

http://www.hww.ca/hww.asp?id=5&pid=0 has lesson plans on a variety of habitat and ecosystem issues
Supporting Class Discussion

No one person is as smart as all of us together.

Page Keeley, in the book “Science Formative Assessment” (2008), uses the analogy of ping-pong and volleyball to describe discussion interaction. Ping-pong represents the back and forth question-answer pattern: the teacher asks a question, a student answers, the teacher asks another question, a student answers, and so on. Volleyball represents a different discussion pattern: the teacher asks a question, a student answers, and other students respond in succession; each building upon the previous student’s response. Discussion continues until the teacher “serves” another question.

A “volleyball” discussion encourages deeper student engagement with scientific ideas. Students state and give reasons for their ideas. Through the interaction, ideas may be challenged and clarified. Extensions and applications of ideas may arise as well. Discussions should avoid the personal and always revolve around ideas, explanations and reasons. The goal is for students to achieve better understanding.

Share the ping-pong and volleyball analogies with your students. Good discussion takes practice. You and your students will improve. Many teachers find discussion works best if all students can see each other, such as in a circle, at least until they become accustomed to listening and responding to each other.

As the teacher, you will need to:
- establish and maintain a respectful and supportive environment;
- provide clear expectations;
- keep the talk focused on the science;
- carefully orchestrate talk to provide for equitable participation.

It is important to establish discussion norms with your class. Your expectations may include:
- Everyone has a right to participate and be heard.
- Everyone has an obligation to listen and try to understand.
- Everyone is obliged to ask questions when they do not understand.
- The speaker has an obligation to attempt to be clear.

At first, discussions are apt to seem somewhat artificial. Initially, a bulletin board featuring carton talk bubbles with suggested sentence starters may be helpful.

- I respectfully disagree .
- I had a different result .
- Could you show how you got that information?
- When I was doing ____, I found that .
- Even though you said ____, I think .
- The data I have recorded in my notebook is different from what you shared. I found .
It is helpful if teacher questions refer to a big idea rather than specifics. (Could humans and chickens move their bones without muscles?) Questions should be phrased so that anyone can enter into the conversation. Opinion questions are especially good for this (What do you think . . . ? How do you think . . .? What if . . .? Why . . .?).

Provide plenty of wait time for students. Students give more detailed and complex answers when given sufficient wait time. Allow wait time after student responses. When students are engaged and thinking, they need time to process other responses before contributing. If the discussion is not progressing, have students engage in partner talk. Partner talk enables the teacher the opportunity to insert “overheard” ideas.

Helpful teacher prompts:
1. What outcome do you predict?
2. Say more about that.
3. What do you mean by . . . ?
4. How do you know?
5. Can you repeat what ___ said in another way?
6. Does anyone agree or disagree with . . . ?
7. Does anyone want to add to or build on to . . . ?
8. Who understands ___’s idea and can explain it in their own words?
9. Let me see if I have got your idea right. Are you saying . . . ?
10. So you are saying that . . .
11. What evidence helped you to think that?
12. Okay, we do not agree. How does each position fit the evidence? What else could we find out?

References:

Materials List

Assorted dry pasta
Baggies
Empty 2 L pop bottles, dish pans, aquaria
Soil
Dead leaves
Earthworms
Student Version of Outcomes

109-1 Tell how organisms in an ecosystem can be classified by identifying similar characteristics.

109-12 Identify when a term has a scientific meaning.

109-13 Explain why it is important to use words with precise scientific meanings.

208-2 Propose questions from practical problems that can be investigated.

208-3 Clarify questions to help in choosing what the procedure of investigations should be.

209-1 Carry out procedures controlling the major variables.

209-4 Organize data in a way that is appropriate for the investigation.

211-5 Using your findings, explain and support your conclusions.

304-2 Identify the roles of producers, consumers, and decomposers in a local ecosystem, and describe both their diversity and their interactions.

306-2 Describe how matter is recycled in an ecosystem through interactions among living things.

306-3 Describe interactions between biotic and abiotic factors in an ecosystem.
# Biotic roles: living things list

<table>
<thead>
<tr>
<th>Biotic roles</th>
<th>Living Things</th>
</tr>
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<tbody>
<tr>
<td>alders</td>
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<tr>
<td>algae</td>
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<td>ants</td>
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<td>bats</td>
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<td>beetles</td>
<td>owls</td>
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<td>birch</td>
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<td>grass</td>
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<td>trout</td>
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<tr>
<td>houseflies</td>
<td>violets</td>
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<tr>
<td>fir</td>
<td></td>
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<tr>
<td>leeches</td>
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<td>lily pads</td>
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</table>
Forest ecosystem

Drawn by Odette Barr

New Brunswick Science Resource: Grade 7
Field ecosystem

Drawn by Odette Barr

New Brunswick Science Resource: Grade 7
Mixed forest ecosystem

Drawn by Odette Barr

New Brunswick Science Resource: Grade 7
Tidepool ecosystem

Drawn by Odette Barr
## Student Self-assessment

<table>
<thead>
<tr>
<th>“Got it”</th>
<th>Student self-assessment</th>
<th>Teacher feedback</th>
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<tbody>
<tr>
<td>Question is <strong>stated clearly</strong> and in a <strong>testable</strong> form</td>
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<tr>
<td>Materials list includes all <strong>necessary</strong> and <strong>appropriate</strong> items.</td>
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<tr>
<td>Written steps <strong>are detailed</strong> and in <strong>sequential order</strong>. Steps are detailed enough that <strong>variables are controlled</strong>. Procedure <strong>could be replicated</strong>.</td>
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<tr>
<td>Spelling and grammar <strong>errors are absent or rare</strong>.</td>
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## Observation Chart Sheet

### Outcomes:

<table>
<thead>
<tr>
<th>Name</th>
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<th>Name</th>
<th>Name</th>
<th>Name</th>
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## Checklist Sheet

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Correlations with Cycles</th>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td><strong>STSE</strong></td>
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<tr>
<td>109-1 Explain that observations and identification of similar characteristics enables classification in an ecosystem</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; cycle: Mark/record observations from activity and class discussion</td>
<td></td>
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<tr>
<td>109-12 distinguish between terms that are scientific or technological and those that are not</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; cycle: Mark/record observations from activity and class discussion</td>
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<tr>
<td>109-13 Explain the importance of choosing words that are scientifically and technologically appropriate</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; cycle: Foldable; mark/record observations during activity and class discussion 2&lt;sup&gt;nd&lt;/sup&gt; cycle: Foldable; mark/record observations during class discussion; journal entry</td>
<td></td>
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<tr>
<td><strong>SKILLS</strong></td>
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<tr>
<td>208-2 Identify questions to investigate arising from practical problems and issues.</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; cycle: Mark/record observations during activity; student write up</td>
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<tr>
<td>208-3 Define and delimit questions and problems to facilitate investigation</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; cycle: Mark/record observations during activity Parts 1 and 2</td>
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<tr>
<td>209-1 Carry out procedures controlling the major variables.</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; cycle: : Mark/record observations during activity; student write up</td>
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<tr>
<td>209-4 Organize data, using a format that is appropriate to the task or experiment</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; cycle: Charts in activity Parts 1 and 2 2&lt;sup&gt;nd&lt;/sup&gt; cycle: Student product from activity; journal entry; assessment question pg.10 3&lt;sup&gt;rd&lt;/sup&gt; cycle: : Mark/record observations during activity; student write up</td>
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<td>211-5 defend a given position on an issue or problem on the basis of their findings</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; cycle: Mark/record observations from activity and class discussion; assessment question pg.10 4&lt;sup&gt;th&lt;/sup&gt; cycle: Mark/record observations during the game; journal entry; assessment question pg. 17</td>
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<td><strong>KNOWLEDGE</strong></td>
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<tr>
<td>304-2 identify the roles of producers, consumers, and decomposers in a local ecosystem, and describe both their diversity and their interactions</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; cycle: Mark/record observations from activity and class discussion; journal entry; assessment question pg.10 4&lt;sup&gt;th&lt;/sup&gt; cycle: Mark/record observations during the game; journal entry; assessment question pg. 17</td>
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<tr>
<td>306-2 Describe how matter is recycled in an ecosystem through interactions among plants, animals, fungi, and microorganisms</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; cycle: : Mark/record observations during activity and class discussion; student write up; journal entry</td>
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<tr>
<td>306-3 Describe interactions between biotic and abiotic factors in an ecosystem</td>
<td>1st cycle: Chart in activity Part 2; mark/record observations during class discussion; journal entry 2nd cycle: Mark/record observations from activity and class discussion; assessment question pg.10 3rd cycle: Mark/record observations during activity and class discussion; student write up; journal entry</td>
<td></td>
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</tbody>
</table>
Observation Checklist

| 109-1 Explain that observations and identification of similar characteristics enables classification in an ecosystem |
| 109-12 distinguish between terms that are scientific or technological and those that are not |
| 109-13 Explain the importance of choosing words that are scientifically and technologically appropriate |
| 208-2 Identify questions to investigate arising from practical problems and issues |
| 208-3 Define and delimit questions and problems to facilitate investigation |
| 209-1 Carry out procedures controlling the major variables |
| 209-4 Organize data, using a format that is appropriate to the task or experiment |
| 211-5 defend a given position on an issue or problem on the basis of their findings |
| 304-2 identify the roles of producers, consumers, and decomposers in a local ecosystem, and describe both their diversity and their interactions |
| 306-2 Describe how matter is recycled in an ecosystem through interactions among plants, animals, fungi, and microorganisms |
| 306-3 Describe interactions between biotic and abiotic factors in an ecosystem |
## Student Record

<table>
<thead>
<tr>
<th>Outcome goal</th>
<th>Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can explain how organisms in an ecosystem can be classified with similar characteristics. (109-1)</td>
<td></td>
</tr>
<tr>
<td>I can identify when a term has a scientific meaning. (109-12)</td>
<td></td>
</tr>
<tr>
<td>I can explain why it is important to use words with precise, scientific meanings. (109-13)</td>
<td></td>
</tr>
<tr>
<td>I can propose questions that can be investigated. (208-2)</td>
<td></td>
</tr>
<tr>
<td>I can clarify questions to help in choosing the procedure for investigations. (208-3)</td>
<td></td>
</tr>
<tr>
<td>I can carry out procedures controlling the major variables. (209-1)</td>
<td></td>
</tr>
<tr>
<td>I can organize data in a way that is appropriate for the investigation. (209-4)</td>
<td></td>
</tr>
<tr>
<td>I can use my findings to explain and support my conclusions. (211-5)</td>
<td></td>
</tr>
<tr>
<td>I can identify the roles of producers, consumers and decomposers in an ecosystem, describing their diversity and interactions. (304-2)</td>
<td></td>
</tr>
<tr>
<td>I can describe how matter is recycled in an ecosystem through interactions of living things. (306-2)</td>
<td></td>
</tr>
<tr>
<td>I can describe interactions between biotic and abiotic factors in an ecosystem. (306-3)</td>
<td></td>
</tr>
</tbody>
</table>