Ecosystems
a Research Project
For 3rd, 4th, & 5th Grades
Created by Lisa Lilienthal
About this Packet

Included are:

- lesson plans
- Fan-N-Pick cards & directions for brainstorming activity
- list of websites for research
- note-taking pages
- example notes
- bibliography poster
- transitions/linking words poster
- example student report
- publishing pages for: deserts, grasslands, temperate forests, tropical rain forests, tundra, & wetlands
- blank publishing pages for other ecosystems
- student editing checklist
- grading rubric
- “I learned” follow-up activity cards

*NEW UPDATES AT THE END*
Common Core Standards

- **3rd Grade**: W.3.2 a-d Write informative/explanatory texts to examine a topic and convey ideas and information clearly. Introduce a topic and group related information together; include illustrations when useful to aiding comprehension. Develop the topic with facts, definitions, and details. Use linking words and phrases (e.g., also, another, and, more, but) to connect ideas within categories of information. Provide a concluding statement or section. W.3.7 Conduct short research projects that build knowledge about a topic. W.3.8 Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort evidence into provided categories.

- **4th Grade**: W.4.2 a-e Write informative/explanatory texts to examine a topic and convey ideas and information clearly. Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. Link ideas within categories of information using words and phrases (e.g., another, for example, also, because). Use precise language and domain-specific vocabulary to inform about or explain the topic. Provide a concluding statement or section related to the information or explanation presented. W.4.7 Conduct short research projects that build knowledge through investigation of different aspects of a topic. W.4.8 Recall relevant information from experiences or gather relevant information from print and digital sources; take notes and categorize information, and provide a list of sources.

- **5th Grade**: W.5.2 a-e Write informative/explanatory texts to examine a topic and convey ideas and information clearly. Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension. Develop the topic with facts, definitions, concrete details, quotations, or other information and examples related to the topic. Link ideas within and across categories of information using words, phrases, and clauses (e.g., in contrast, especially). Use precise language and domain-specific vocabulary to inform about or explain the topic. Provide a concluding statement or section related to the information or explanation presented. W.5.7 Conduct short research projects that use several sources to build knowledge through investigation of different aspects of a topic. W.5.8 Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources.
It seems like the terms *ecosystem* and *biome* are often used interchangeably. I mainly use the term *ecosystem* with my students. However, many of the websites use the word *biome*. Even so, there is a difference between biomes and ecosystems.

**What is a biome?**

A biome is a large region of the world that has similar plants, animals, and other organisms that are adapted to the climate, weather, and terrain of that region. Biomes are considered the world’s major communities or habitats. A biome can be thought of similar ecosystems throughout the world grouped together.

**What is an ecosystem?**

An ecosystem is smaller than a biome. It is a community of living things and the physical environment. Plants, animals, and other organisms interact with each other and with their environment in an ecosystem.
Prewriting/Brainstorming

- To activate prior knowledge about ecosystems, do the Fan-N-Pick activity. I like to print several sets of the cards on cardstock and laminate them to use each year.
- The cards show illustrations of the ecosystems that students will be able to choose from for their research projects. They say, "What kinds of animals do you think live in wetlands?" and "What do you link the plant life is like in wetlands?"
- Discuss the questions with students before doing the activity.
- For the animal question cards, students should look at the illustrations and use prior knowledge to guess what kinds of animals they think might live in the ecosystem. They can also tell why they think an animal might live there. For example, alligators might live in wetlands because they live in areas with water.
- For the plant question cards, students should look at the illustrations and think of what kinds of plants might grow in the ecosystem, if there are many or few plants, and if they grow close together or not.
Prewriting/Brainstorming continued

**Fan-N-Pick**

- Each pair (or small group) of students should have a set of question cards.
- Without looking at the cards, student A fans the cards and says, “Pick a card, any card!”
- Student B picks a card and reads it out loud, giving student A five seconds of think time. Because the cards have illustrations, student B should also show the card to student A after reading to help student A think of answers.
- Student A answers.
- Student B places the card in a discard pile.
- Students switch roles, repeat, and continue.
- I also do this activity with groups of 3 or 4 students. When student B reads the card, student C answers. Then students D and A add any additional ideas to Student C’s answer. The cards rotate clockwise with student B fanning, C picking and reading, and D answering. A and B then follow up with addition ideas, and so on.
Prewriting/Brainstorming continued

• After the Fan-N-Pick, introduce the ecosystem research project, explaining what an ecosystem and biome are.
• Decide if you will assign ecosystems or let students pick. I do a combination of both. I duplicate enough Choose Your Ecosystem cards to have a fairly even distribution of ecosystems in my classroom since I want the students to work in groups to teach each other about the ecosystems as a concluding activity. I do this project each year with my 3rd graders. I have six classes with 23 to 26 students in each class. I’ll duplicate 4 cards for each ecosystem, plus one extra set. I randomly call students up to choose from the given cards. If I run out of cards, the lucky student(s) can choose any ecosystem from my extra set.

Resources/Note-Taking

• Decide on resources. Check your school/local library for books on the specific ecosystems. I have included a list of websites that I use with my students for research. To introduce the websites, gather your students around a computer. If you have a computer hooked up to a television or projector, even better. Introduce the websites to the students.
Resources/Note-Taking continued

• This is a great time to have a discussion about plagiarism. I tell my students that when taking notes, they cannot copy down an entire sentence. They may copy words and phrases only and use the words and phrases to write their own sentences.

• Teach a mini-lesson on note-taking. I have included a sample ecosystem project for the taiga that you can use to demonstrate expectations for this project. Pick a section about the taiga from a book or website and read it aloud. I started with the Earth Floor/Biomes website. Demonstrate rereading and picking out key words and phrases for important information and writing new phrases and sentences using bullet points on the note-taking pages.

• Duplicate note-taking pages for your students and have them begin taking notes from books and/or websites. I do the majority of the research in our computer lab. If you don’t have a way for students to easily use computers for research, you can print out information about the different ecosystems for students to use.

• I have my students list the sources on their note page (the name of the book or website). I have included a bibliography page to use if you want your students to list the sources in the proper format.
**Drafting**

- After students have gathered notes, show them how to organize and group information in each section of their notes. I like to have them use different colored highlighters, pencils, or markers to underline or circle information in each section that goes together.
- Demonstrate using the example notes to write an example rough draft for the taiga that includes sections for *What Is a Taiga?, Where Is the Taiga Located?* (with a map to shade in), *Animals in the Taiga, Plants in the Taiga, and Taiga Facts* (example included).
- Have students use their notes to start writing their rough drafts.
- I’ve also included a transitions/linking words poster. Students can refer to it as they write to be sure that they are using these types of words.

**Revising/Editing**

- Conduct individual and/or peer revising and editing conferences. I have included an editing checklist that your students can use. I find that some students need a lot of help with revising. When they think they’re done, I have them ask me, “How can I make it better?” I’ll ask them questions about their topics and give suggestions for changes or additions to improve their writing.
**Publishing**

- I've included publishing pages for each ecosystem and some blank pages. The cover for each ecosystem can be colored.
- Students should illustrate their ecosystem along with the animals and plants on the blank areas. The map should be shaded with the location of their ecosystem.
- The illustrations look really nice if students follow these steps:
  1. Draw the picture with a pencil.
  2. Outline the picture with a thin black marker (I buy them in bulk at an office store)
  3. Color neatly with colored pencils or crayons. (If using crayons, keep the pages separate until done to prevent the crayons from marking the back of other pages.)
- Staple all the pages into a booklet when done.

**Sharing/Feedback**

- I have included “I learned...” cards. Students who have studied different ecosystems should work in small groups to share their booklets. Group members should fill out the cards to show what they have learned from the presenter.
What kinds of animals do you think live in deserts?

What kinds of animals do you think live in grasslands?

What kinds of animals do you think live in temperate forests?

What kinds of animals do you think live in tropical rain forests?

What kinds of animals do you think live in the tundra?

What kinds of animals do you think live in wetlands?
What do you think the plant life is like in deserts?

What do you think the plant life is like in grasslands?

What do you think the plant life is like in temperate forests?

What do you think the plant life is like in tropical rain forests?

What do you think the plant life is like in the tundra?

What do you think the plant life is like in wetlands?
Choose Your Ecosystem

- Desert
- Grasslands
- Temperate Forests
- Tropical Rain Forests
- Tundra
- Wetlands

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Websites for Research

- **Windows to the Universe**: (deserts, grasslands, temperate forests, tropical rain forests, & tundra)  [http://www.windows2universe.org/earth/ecosystems.html]
- **Kids Do Ecology**: (wetlands, deserts, grasslands, temperate forests, tropical rain forests, & tundra)  [http://kids.nceas.ucsb.edu/biomes/index.html]
- **Oracle Think Quest**: (deserts, grasslands, temperate forests, tropical rain forests, & tundra)  [http://library.thinkquest.org/11353/ecosystems.htm]
- **Blue Planet Biomes**: (deserts, grasslands, temperate/deciduous forests, tropical rain forests, & tundra)  [http://www.blueplanetbiomes.org/]
- **Biomes of the World**: (deserts/desert scrub, grasslands, temperate forests, tropical rain forests, & tundra)  [https://php.radford.edu/~swoodwar/biomes/#]
- **Earth Floor/Biomes**: (deserts, temperate/deciduous forests, tropical rain forests, & arctic tundra)  [http://www.cotf.edu/ete/modules/msese/earthsysflr/biomes.html]
- **The World’s Biomes**: (wetlands, deserts, grasslands, temperate forests, tropical rain forests, & tundra)  [http://www.ucmp.berkeley.edu/glossary/gloss5/biome/]
- **Defenders of Wildlife**: (wetlands only)  [http://www.defenders.org/wetlands/basic-facts]
Define your ecosystem.
What is a ____________________?

Where is your ecosystem located?
Ecosystem

List animals that live in this ecosystem. How are the animals adapted to this ecosystem?

List plants that live in this ecosystem. How are the plants adapted to this ecosystem?
Ecosystem

Tell other information about this ecosystem.

What sources did you use for information?
Bibliography
Cite your sources!

Books
Author (last name, first name). Book Title. City: Publisher, Date of Publication.

Encyclopedias

Magazines
Author (last name, first name), “Article Title.” Name of Magazine. Volume Number, (Date): Page Numbers.

Internet
URL (Uniform Resource Locator or WWW address). Author (or item's name), Date.

Computer CD
Disc Title: Version, Date. “Article Title,” Pages. Publisher.
Transitions/Linking Words

- above all
- additionally
- after all
- afterward
- again
- all in all
- along with
- although
- also
- another example
- as a result
- as soon as
- as well as
- at first
- at last
- because
- before
- beginning with
- besides
- but
- clearly
- consequently
- despite
- during
- especially
- except
- even though
- finally
- first
- first of all
- for example
- for instance
- for one thing
- for the most part
- fortunately
- frequently
- furthermore
- gradually
- however
- in addition
- in conclusion
- in fact
- in other words
- in summary
- in the first place
- including
- initially
- instead
- it started when
- later
- later on
- last
- lastly
- likewise
- most important
- nearly
- nevertheless
- next
- obviously
- of course
- once
- one important
- one way
- otherwise
- overall
- previously
- second
- secondly
- since
- soon
- similarly
- still
- suddenly
- surely
- to begin with
- to conclude
- then
- therefore
- third
- until
- usually
- when
- while
- yet
Define your ecosystem. What is a **Taiga**?

- cold biome/ecosystem
- long cold winters
- short, cool summers
- moderate moisture that varies all year
- needle leaf forest biome
- largest biome in the world
- rainy summers
- main seasons are winter and summer
- snow in winter
- cool, high elevations

Where is your ecosystem located?

- northern hemisphere
- near polar region
- North America, Europe, Asia
- below tundra
## Ecosystem: The Taiga

### List animals that live in this ecosystem. How are the animals adapted to this ecosystem?

- **birds:** bald eagle, chickadee, woodpecker
- **large mammals:** elk, moose, deer, bears, wolves
- **small mammals:** lynx, bobcats, squirrels, chipmunks, weasels, snowshoe hares, beavers
- **some animals migrate in cold weather**
- **some animals hibernate**
- **some animals have adapted by having thick fur or feathers to keep warm**

### List plants that live in this ecosystem. How are the plants adapted to this ecosystem?

- **limited plant life due to cold**
- **many conifer trees with cones**
- **evergreen trees:** fir, spruce, pines
- **deciduous tree:** tamarack
- **some broadleaf trees:** birch, aspen
- **evergreen trees have needles**
- **staying green saves growing energy**
- **needles lose less moisture which is important when ground is frozen**
- **animals won’t eat needles for moisture because of chemical on needles**
- **cone-like shape helps snow fall off and keeps branches from breaking**
- **dark green color of needles helps to absorb more heat from the sun**
- **shrubs:** blueberries
Tell other information about this ecosystem.

- glaciers once covered a lot of North America
- glaciers receded and caused large holes in the earth which have become lakes and bogs
- millions of insects gather near bogs and ponds in summer and birds migrate to eat them
- moss grows on bogs
- taiga means forest in Russian
- boreal forest is another name for taiga
- fires often occur in summer which helps remove old trees so new ones can grow

What sources did you use for information?

- Earth Floor/Biomes website
- Biomes of the World website
- World Biomes website
- Oracle ThinkQuest website
- Kids Do Ecology website
Taiga
The taiga is a needle leaf forest biome, and it is the largest one in the world. It is a very cold ecosystem due to its northern location and high elevation. There is moderate moisture that varies all year. The main seasons in the taiga are winter and summer. The winters in the taiga are long and extremely cold. Not surprisingly, there is a lot of snow. The summers are very short and cool with a lot of rain.
Where Is the Taiga Located?

The taiga can be found near the polar regions of the world. It is located in the northern hemisphere, just below the tundra. North America, Europe, and Asia are continents where the taiga can be found.
Animals in the Taiga

There are many animals in the taiga. Birds such as bald eagles, chickadees, and woodpeckers make the taiga their home, but many migrate south in the winter. Large mammals like moose, elk, deer, bears, and wolves can be found in the taiga. Small mammals like lynx, bobcats, squirrels, and snowshoe hares also live there. Fortunately, animals have adapted to the cold climate of the taiga. Some mammals hibernate in the winter. Others have thick fur to keep them warm.
Plants in the Taiga

The taiga has limited plant life due to the harsh, cold climate. There are many conifer trees, which are trees with cones. It is common to see evergreen trees with needles like fir, spruce, and pines. Staying green all year surely helps them save growing energy. Also, their needles loose less moisture which is important when the ground is frozen. Additionally, the cone shape of these trees helps the snow fall off and keeps branches from breaking. Deciduous trees like the tamarack and shrubs like blueberries can also be found in the taiga.
Glaciers once covered a lot of North America where the taiga is now located. When the glaciers receded, large holes were left in the earth which filled with water and became lakes and bogs. Each summer, millions of insects gather near the mossy bogs and ponds in the taiga. Therefore, many birds migrate to the taiga in the summer to feast on the insects. Another common occurrence in the summer is forest fires. Fortunately, these fires help the taiga by removing old trees so that new trees can grow into a beautiful forest once more. Taiga actually means forest in Russian, and boreal forest is another name for taiga.
I hope you have enjoyed learning about the taiga. Here is list of sources I used for my information.

- Earth Floor/Biomes website
- Biomes of the World website
- World Biomes website
- Oracle ThinkQuest website
- Kids Do Ecology website
Deserts

by ____________________

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What Is a Desert?
Where Are Deserts Located?
Plants in Deserts
Grasslands

by ____________________

Lisa Lilienthal 2013
What Are Grasslands?
Where Are Grasslands Located?
Plants in Grasslands
Temperate Forests

by ____________________

Lisa Lilienthal 2013
What Is a Temperate Forest?
Where Are Temperate Forests Located?
Animals in Temperate Forests
Rain Forests

by

Lisa Lilienthal 2013
What Is a Tropical Rain Forest?
Where Are Tropical Rain Forests Located?

reece

Lisa Lilienthal 2013
Animals in Tropical Rain Forests
Plants in Tropical Rain Forests
Where Is the Tundra Located?
Animals in the Tundra
Tundra Facts
Wetlands

by ____________________

Lisa Lilienthal 2013
Where Are Wetlands Located?

[Blank lines for text]
Wetlands Facts
## Editing Checklist

I read my writing ALOUD to check for errors.

I capitalized the beginning of my sentences.

I capitalized proper nouns (names of people, places, and things).

I capitalized the word "I".

I used correct punctuation at the end of sentences.

I used commas when listing.

My sentences are complete. Each sentence has a noun and verb.

I have no run-on sentences.

I have checked the spelling of words that did not look correct.
<table>
<thead>
<tr>
<th>Holistic Writing Rubric</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4~Exceeds Standards</strong></td>
</tr>
<tr>
<td>All or most of the following are shown based on grade level standards.</td>
</tr>
<tr>
<td>• Clearly and thoughtfully develops the topic; explains ideas with strong supporting details.</td>
</tr>
<tr>
<td>• Ideas are linked with smooth transitions to support logical organizational structure; has an interesting introduction and conclusion.</td>
</tr>
<tr>
<td>• Uses engaging and expressive language; uses varied sentences that flow smoothly.</td>
</tr>
<tr>
<td>• Shows strong command of capitalization, punctuation, grammar, and spelling.</td>
</tr>
<tr>
<td><strong>3~Meets Standards</strong></td>
</tr>
<tr>
<td>All or most of the following are shown based on grade level standards.</td>
</tr>
<tr>
<td>• Clearly focuses and develops the topic; explains ideas with supporting details.</td>
</tr>
<tr>
<td>• Begins with a topic sentence, organizes ideas logically, and provides a conclusion; some transitions are present.</td>
</tr>
<tr>
<td>• Uses descriptive language, and sensory details; uses varied sentences that mostly flow smoothly.</td>
</tr>
<tr>
<td>• Shows basic command of capitalization, punctuation, grammar, and spelling.</td>
</tr>
<tr>
<td><strong>2~Approaches Standards</strong></td>
</tr>
<tr>
<td>All or most of the following are shown based on grade level standards.</td>
</tr>
<tr>
<td>• Somewhat focuses and develops the topic; relevant details are limited.</td>
</tr>
<tr>
<td>• Shows some organization but may lack some logic and structure; introduction and conclusion may not be developed.</td>
</tr>
<tr>
<td>• Uses simple or dull words and language; uses similar sentences that don’t always flow smoothly.</td>
</tr>
<tr>
<td>• Shows inconsistent use of capitalization, punctuation, grammar, and spelling.</td>
</tr>
<tr>
<td><strong>1~Emerging/Developing</strong></td>
</tr>
<tr>
<td>All or most of the following are shown based on grade level standards.</td>
</tr>
<tr>
<td>• Mentions the topic; uses unclear or irrelevant details.</td>
</tr>
<tr>
<td>• Has little or no organization; lacks coherence; introduction and conclusion may not be present.</td>
</tr>
<tr>
<td>• Writing seems lifeless; uses unclear or repetitive words; uses simple or incomplete sentences.</td>
</tr>
<tr>
<td>• Shows consistent misuse of capitalization, punctuation, grammar, and spelling.</td>
</tr>
</tbody>
</table>
Update

• When I created this unit, I did so with my class in mind. I only included ecosystems that I had several resources for.

• Since then, I have had some special requests to add other ecosystems and/or change ecosystem names to match textbooks/resources in my customer’s classrooms. I have been happy to accommodate those requests, and will continue to do so (lisa.m.lilienthal@gmail.com)

• I have also decided to include those requests in this packet to better meet the needs of various teachers who purchase this packet.

• In the pages that follow, you will find brainstorming cards and publishing templates for:
  • Taiga
  • Deciduous Forest (same as Temperate Forest)
  • Freshwater
  • Saltwater
  • Ocean (same as saltwater)
  • Savanna
What do you think the plant life is like in freshwater ecosystems?

What do you think the plant life is like in saltwater ecosystems?

What do you think the plant life is like in deciduous forests?

What do you think the plant life is like in the taiga?

What do you think the plant life is like in oceans?

What do you think the plant life is like in the savanna?
Fan-N-Pick Cards

What kinds of animals do you think live in freshwater ecosystems?

What kinds of animals do you think live in saltwater ecosystems?

What kinds of animals do you think live in deciduous forests?

What kinds of animals do you think live in the taiga?

What kinds of animals do you think live in the ocean?

What kinds of animals do you think live in the savanna?
Taiga

by ____________________
What Is a Taiga?
Where Is the Taiga Located?
Animals in the Taiga
Plants in the Taiga
Deciduous Forests

by ___________________
What Is a Deciduous Forest?

_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
_____________________________________________________________________
Where Are Deciduous Forests Located?
Animals in Deciduous Forests
Plants in Deciduous Forests
Freshwater

by ____________________
What Is a Freshwater Ecosystem?
Where Are Freshwater Ecosystems Located?

[Blank lines for writing]
Plants in Freshwater Ecosystems
What Is a Saltwater Ecosystem?

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Where Are Saltwater Ecosystems Located?
Plants in Saltwater Ecosystems
Where Are Oceans Located?
Where Are Savannas Located?
Animals in Savannas
Plants in Savannas
Thank You!

Very much for purchasing my Ecosystems Research Packet! I appreciate your business. Please leave feedback for me on my TPT page. I’d love to know what you think! Check out my store: 
http://www.teacherspayteachers.com/Store/Lisa-Lilienthal

I have many writing activities and lots of freebies you might like. 

Happy Writing! ~ Lisa Lilienthal