TreesGreenville Companion Curriculum

Presented by Michelin North America

Effectively Using the Outdoor Classroom

Middle School Curriculum for Interdisciplinary Studies

Written & Edited by Allison Peake

MICHELIN
A better way forward

TREES greenville
plant
promote
protect

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Introduction

The following curriculum is written with the intent to provide interdisciplinary opportunities in the use of a school's tree garden, outdoor classroom or learning environment. Lessons provided are for middle-school level subjects for a standard 6^{th} – 8^{th} grade system. It is a cross-curricular program aligned with South Carolina's State as well as National and Core Standards. Lessons are content specific, grade-level appropriate, and give the students and teacher a chance to go outdoors and integrate the natural environment into a unit of study. Lessons for all four core areas (English, Mathematics, Science, and Social Studies) and standard grade-level classes (for example, Earth, Life, and Physical Science standards specific for 6^{th}, 7^{th}, and 8^{th} grade) are included. Each lesson is an expanded version with such components as aligned standards, unit of study, essential questions, multi-step procedures, assessment, and extensions. The primary purpose of these lessons and plans is to encourage the use of an outdoor classroom amongst all disciplines, not just environmental or earth science. It is the hope that this curriculum guide will inspire teachers to develop their own ideas of use above and beyond what is presented in order for the outdoor classroom to become an integral part to the school, its curriculum, and all students' learning.

Background

Teachers, this curriculum guide is intended for you to use at any point in your teaching where the lesson aligns with your unit of study. Many materials, including worksheets and rubrics, are included for your use in order to make the use of these lessons as easy and convenient as possible. All lessons are correlated to South Carolina State Standards as well as the latest National and Common Core Standards. Each lesson also includes:

A. Background information
B. Guiding Questions
C. Essential Questions
D. Materials List
E. Daily Procedure Plans
F. Assessments
G. Alternatives for students with disabilities
H. Extensions for gifted students

The following subjects are covered in this curriculum guide:

English

Mathematics

Science

Social Studies

In addition, there are a handful of lessons at the end of the curriculum guide that specifically focus on the goal of the TreesGreenville organization which is planting, maintaining, and preserving trees.

Please feel free to edit and change lessons to make them more appropriate for your style, unit of study, or type of student you are working with. Again, this is to encourage you to use your school's outdoor classroom more frequently and to incorporate a more interdisciplinary approach and thinking for you and your students as they learn the required material. Thank you for taking your classroom outdoors!

English

Effectively Using the Outdoor Classroom
Middle School Curriculum for Interdisciplinary Studies

ENGLISH

6th Grade

"Visual Literacy: The nature of a photograph"

UNIT: Visual Literacy

Unit Essential Question: What skills are needed to read a photograph?

LESSON: Using nature photography to develop visual literacy

Lesson Essential Question: How can I create a picture to share information? How do I interpret and gather information from a picture?

STANDARDS ADDRESSED

National

Common Core – Reading Standards for Literacy

Integration of Knowledge and Ideas: 7. Integrate visual information (e.g., in charts, graphs, photographs, videos, or maps) with other information in print and digital texts.

South Carolina

Standard 2: The student will read and comprehend a variety of informational texts in print and nonprint formats.

Indicator E2-2.4: Create responses to informational texts through a variety of methods (for example, drawings, written works, oral and auditory presentations, discussions, and media productions).

Indicator E2-2.6: Analyze information from graphic features

Indicator E2-6.5: Create written works, oral and auditory presentations, and visual presentations that are designed for a specific audience and purpose.

Guiding Questions

1. How is information related to an audience through pictures or photographs?
2. What skills are needed to read a photograph?
3. How can information be analyzed from graphic material?

Background Information

Readers seldom think of photographs as an informational text, but in reality "a picture is worth a thousand words." Our students are bombarded with visual images every day, yet few of them have ever thought about the skills necessary to read a photograph. This lesson can be taught independently or to develop a unit of study. Photography fits most naturally in the curriculum through historical photographs that support a text study. For instance, Dust Bowl migrant photographs to complement The Grapes of Wrath, or Holocaust photos to support The Diary of Anne Frank. However, they can also be used in a unit on bias and propaganda, answering such questions as, "How do politicians or historians use photographs to shape public opinion?"

Lesson Objective(s)

Students will be able to:

1. Analyze information from a graphic
2. Develop visual literacy through analysis of a photograph
3. Share an informational message through their own graphic work
4. Identify the skills needed to read nonprint material

Materials/Resources

Photo Observation Chart
Sample photos for Activating Strategy
Digital camera or Flip video camera (or equivalent) for students to share
Use of computer for editing/printing/sharing photographs

Activating Strategy

Using a Photo Observation Chart:

In the beginning, students have to be taught to pay attention to details, even small details, in a photograph. The photo observation chart is designed to make them list each element they see. It also narrows their focus in the beginning. Choose several compelling pictures either on your own or from those provided and have students practice the chart approach to analysis at least three times before moving to analytical questions. Focus on the inference process and why they draw those conclusions.

Procedure

DAY ONE

Successful photo analysis (reading a photograph) involves attention to detail and a questioning mind. Aren't those the same skills we want in good readers? We are teaching a real life application to the reading comprehension skills.

All good analysis begins with a close reading. Ask students to study a selected photograph in silence for several minutes, picking out details that may even seem to be insignificant on first glance. Then guide their analysis using the question below. You might try dividing the questions between groups. However, at some point there needs to be a whole class discussion about the observations.

Analysis Questions For Photographs:

1. What clues give an indication about the time period?
2. Is there anything in the photo you cannot identify?
3. Where was the photo taken? What clues lead you to that conclusion?
4. Why do you think the photographer shot this photograph?
5. What element of the photograph's composition seems to be prominent? Why?
6. Was the composition of the photograph arranged by the photographer or was it natural?
7. If the photographer arranged the composition, why did he make those decisions?

8. How does the lighting impact the tone of the photograph? How is this similar to tone in written expression?
9. What do the facial expressions or the body language of the people in the photo indicate?
10. What do you notice about: The clothes people wear?...The way they are posed?...Their hands?
11. What might be happening outside the frame of the photo?
12. What are the people in the photo looking at?
13. What are they thinking?
14. What time of day is the photograph taken?
15. What message is the photographer trying to convey?
16. What title might you give to the photograph?

Another approach to questions: Levels 1, 2, and 3

Level I: (just state the facts)

a. Describe the colors, lines, shapes, texture, and space you see in the image.
b. What do you notice first in this picture? Where is your eye led?
c. How many faces do you see?
d. What are the people wearing? How are they posed?
e. Where are their hands resting?
f. Are you looking up or down at the people in the image?
g. When was this picture made?

Level II: (begin to analyze and interpret) In your opinion,

a. What are the people in the photograph looking at?
b. What are the expressions on their faces?
c. What are they thinking?
d. At what time of day might the photograph have been taken?
e. Where was the photograph taken?
f. What do you think they are doing?

Level III: (connect the image to historical context) Based on what you know about the time period,

a. Who are the people in the photograph?
b. What message do you think the photographer was trying to convey?
c. What is the situation of the people depicted? Point out some visual elements in the photograph that tell you about their situation.
d. If possible, how would you help the people in this photograph?
e. Might a photograph of this nature be made today? Why or why not?
f. What alternative title would you give this photograph?

DAY TWO

Photo tampering and Photo-ethics:

A study of modern photography also requires a discussion about photo-ethics. Staged photo ops, retouched photos, and digitally altered photos present the viewer with a responsibility to view with a critical eye. This level of analysis also includes an awareness of bias and/or propaganda techniques.

See sites below for more information:
http://www.cs.dartmouth.edu/farid/research/digitaltampering/
http://www.nppa.org/professional_development/business_practices/ethics.html
http://www.mediachannel.org/views/dissector/propaganda.shtml

Now students will have an opportunity to create their own photographic work and have it analyzed by their classmates. s. Escort students to the outdoor classroom/learning garden and explain they will use their surroundings to inspire them to take their own photograph to personally answer the question "What does nature means to me?" Their photo should relate their answer/message they want to get to across in a nonverbal form of communication. Tell students that their photo will be analyzed by their classmates for information. Depending on the level of student, have students print and/or save their photo at home or during class time. If an assessment is desired, a rubric for photographic work is included in the appendix.

Students can share their photo in small groups or whole class. Have classmates answer analysis questions on each piece, including what they believe the photographer's answer to the themed-question is. This work can also be turned in for assessment purposes. Further, photos can be shred on the teacher's website, a photo gallery of images can be displayed in the hall or inside the classroom. A competition of the work can even be done with some classes where art teachers can be invited to choose a 'Best of Show."

Closure (Reflection)

Have students respond to the following question: How have my habits in viewing photography changed because of the knowledge gained in this unit?

Assessment

Multiple options exist for informal and formal assessment, many of which were included above. Also, students from one class can examine and assess the work of students in another class (with names withheld for privacy requests).

Adaptations (for students with learning disabilities)

Make sure to allow more time for these students, especially when editing, saving, and Printing their photographic work.

Extensions (for gifted students)

Ask students to take multiple photos with a related theme that they place into an online Presentation or slideshow for sharing and assessment.

Possible connections to other subjects: Art, Media/Library education, and Science

*Sample photos provided relate to books typically found on a Sixth Grade Reading List as listed:
Photo One: *African Princess: The Amazing Lives of Africa's Royal Women*
Photo Two: *Chasing Vermeer*

Photo Three: *Holes*
Photo Four: *In the Year of the Boar and Jackie Robinson*
Photo Five: *Island of the Blue Dolphins*

Photo Observation Chart:

List your photo observations

PEOPLE	OBJECTS	ACTIVITIES

Based on your observations, list at least three things you could have inferred from this photograph.

1.

2.

3.

SAMPLE PHOTOS:

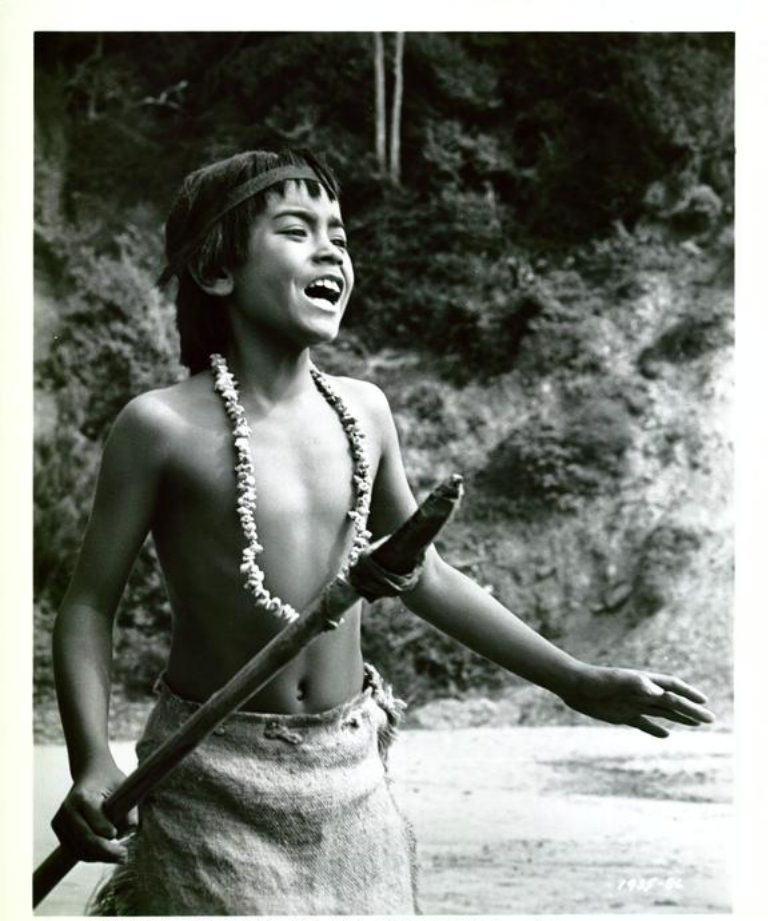
Photo One:

Photo Two:

Photo Three:

Photo Four:

Photo Five:



ENGLISH

7th Grade

"Letters as Primary Documents"

UNIT: Effective Persuasive Writing

Unit Essential Question: How do I create a persuasive piece that includes a stated position and supporting evidence for a specific audience?

LESSON: Writing Letters to the Editor

Lesson Essential Question: What are the elements to writing a successful Letter to the Editor?

STANDARDS ADDRESSED

National

Common Core – Writing Standards

Text Types and Purposes:

1. Write arguments to support claims with clear reasons and relevant evidence.
2. Write informative/explanatory texts to examine a topic and convey ideas, concepts, and information through the selection, organization, and analysis of relevant content

South Carolina

Standard E1-5: Create persuasive pieces (for example, editorials, essays, speeches, or reports) that develop a clearly stated thesis and use support (for example, facts, statistics, and firsthand accounts).

Standard E3-5: The student will write for a variety of purposes and audiences.

Indicator E3-5.1: Create informational pieces (for example, résumés, memos, letters of request, inquiry, or complaint) that use language appropriate for the specific audience.

Standard E3.2: The students will read and comprehend a variety of informational texts in print and nonprint formats.

Indicator E3-2.3: Analyze informational texts for author bias (including word choice, the exclusion and inclusion of particular information, and unsupported opinion).

Guiding Questions

1. What is the difference between fact and opinion?
2. How do you detect author bias?
3. What are components to writing a persuasive piece of writing (such as a Letter to the Editor)?

Background Information

The opportunity to discover the flaws in newspaper letters to the editor, how to evaluate the ensuing consequences, and how to write their own letters can help beginning persuasive writing students, who have had little practice at forming arguments, begin to

conceptualize for themselves the ways that principles of persuasive discourse apply in particular writing situations. The study and application of these principles can provide a point of departure from which students can advance their reading and writing to more complex forms of argument. An assignment in which the need to integrate emotions and values is essential to an argument sharpened by the students' focus on the way language functions in persuasion. Overall, the students' close attention to language will get them beneath the surface of a letter and to the motives and judgments behind the words.

Lesson Objective(s)

Students will be able to:

1. Choose and research a current local or national issue.
2. Review persuasive writing structure and business letter format.
3. Determine the criteria for effective letters.
4. Explore the ways that purpose and audience influence a message.
5. Develop arguments and support ideas with evidence.

Materials/Resources

Newspaper or Computer with online access to newspapers
How to Communicate with Journalists, from FAIR (provided)
Tips on Writing Letters to the Editor, from the ACLU (provided)
Write an Opinion Piece or a Letter to the Editor for Your Local Newspaper, from NCTE (provided)
Newspaper Summary Article Questions (provided)
Persuasion Map Planning Sheet (provided)
Letter to the Editor Peer Review Questions (provided)

Preparation

Arrange for current issues of local, regional, or national newspapers for the classroom. Each student should have a newspaper for this activity. You may ask each student to bring a newspaper from home. If computer access allows, you can also use online newspaper sites. In addition to local newspaper sites, you can use resources from the Newseum collection of Today's Front Pages. Students will need to be able to print articles from online newspapers or to return to those pages throughout this lesson.

Print copies of the 'Newspaper Article Summary Questions', 'Persuasion Map Planning Sheet', and 'Letter to the Editor Peer Review Questions.'

Activating Strategy

<u>Using the Outdoor Classroom as Persuasive Writing Inspiration:</u>
Take the students to the Outdoor learning environment. Ask them to bring a notebook and writing instrument with them. Once outside, tell them a fictional story (that you will share with them as though it were true at first) about this week being the last week for the school's outdoor area. For example, share with them that the Principal has decided the outdoor space is no longer important and instead, it will be bulldozed down, taken out, and turned into parking spaces. Note that you want to make the 'situation' one you know most students would disagree with. Ask them to respond how they fell about this new school decision in a one-page free writing assignment. Give them 10-15 minutes to write

a page. Once done, ask them to show and share with a partner what they wrote. Next, ask partners to share with the whole group what their neighbor's feelings and opinions are of the situation and how they were able to tell that from their writing. Finally, explain to them that you shared a fictional story and their outside area is safe, but that was an exercise to have them focus their feelings and opinions on persuasive writing. They will be starting a unit on writing Letters to the Editor where knowing how to be persuasive will be important.

Procedure

DAY ONE

1. Ask students to share any experiences that they have with letters to the editor of newspapers or magazines that they read.
2. Pass out newspapers to the class, and ask students to find the letters to the editor in their papers.
3. Give students a few minutes to skim through the letters, and jot down characteristics that they see in the letters.
4. Gather the class and ask them to share the characteristics that they have noted. Record their observations on the board or on chart paper.
5. Be sure that students notice the connections between the letters and the various articles in the newspaper. Some letters directly respond to previously published articles, others respond generally to topics covered in the newspapers, and some focus on general issues of interest to the newspaper's readers.
6. Emphasize that students will have the opportunity to choose topics that interest them for their letters, based on articles that they find in a current issue of the newspaper.
7. Have students spend 15–20 minutes skimming the newspapers and reading any articles that grab their attention.
8. After students have had the opportunity to explore their newspapers, arrange the class into small groups.
9. In these groups, ask students to discuss the topics and articles that interested them with one another.
10. Ask students to choose one of the articles for their focus, and complete the 'Newspaper Article Summary Questions' for that article.
11. Collect the 'Newspaper Article Summary Questions' at the end of the session, and review the work before the next session. Provide any feedback as necessary.
12. For homework, have students read all the letters to the editor in their copy of the newspaper. Ask students to pay attention to the characteristics which the letters have in common and what features makes a letter successful.

DAY TWO

1. Begin with a review of the activities that students completed in the previous session.
2. Share any general feedback on the topics that students have chosen, based on your review of the 'Newspaper Article Summary Questions', and pass back the sheets to students.
3. Answer any questions that students have on the project at this point.
4. Ask the class to share characteristics that they noticed as they read the letters to editor for homework. Record their responses on the board or on chart paper.
5. If necessary, ask questions such as the following to guide students' observations:
    - What did you notice about the organization of the letters?

    - How were details used in the letters?
    - What kinds of details were used?
    - How do the letters persuade their readers?
    - Which letters seemed best?
    - What is the difference between an acceptable letter and a great letter?
6. Once the list is fairly complete, review the items, and make any additions or corrections.
7. Ask students to suggest general categories that fit the characteristics (e.g., formatting issues, structure, and ideas).
8. Arrange the characteristics into these general categories, creating a checklist or rubric for students' letters.
9. Pass out copies of the 'Persuasion Map Planning Sheet', and use the information to analyze a letter to the editor from one of the newspapers.
10. Demonstrate how to use the Persuasion Map to begin gathering and organizing ideas for students' letters.
11. Allow students the rest of the session to begin planning their papers with the Persuasion Map.
12. Remind students to refer their 'Newspaper Article Summary Questions' as useful.
13. As students work, circulate through the room, providing feedback and support.
14. If time allows, review the first sentences of several letters from the editor, and ask students point out the similarities between the sentences. Based on these examples, have students write their own sentences. Review the way to punctuate the titles of articles and the newspapers in these opening sentences.
15. If desired, point students to one or more of the guidelines for composing letters to the editor listed in articles provided.
16. For homework, ask students to compose a first draft of their letters. Explain that the letters will be exchanged for peer review during the next session.

DAY THREE

1. Review the criteria for effective letters to the editor that students created during the previous session, and answer any questions that students have about the project or their drafts.
2. Pass out copies of the 'Letter to the Editor Peer Review Questions.'
3. Arrange students in pairs, and ask partners to exchange and read one another's drafts.
4. After reading the drafts, have them fill out the 'Letter to the Editor Peer Review Questions' to provide feedback.
5. After students have shared and received feedback, allow time for the students to revise their drafts.
6. For homework, ask students to revise their drafts, based on the feedback that they have received. Explain that students will type their final drafts during the next class session.

DAY FOUR

1. Review the criteria for effective letters to the editor that students created, and answer any questions that students have about the project or their drafts.
2. Focus students' attention on reading their drafts for minor errors before students move to type their letters.

3. Remind students to punctuate the title of their articles in quotation marks, to italicize newspaper titles, and to place direct quotations from the article in quotation marks. If desired, use the ReadWriteThink lesson plan "Inside or Outside? A Mini-Lesson on Quotation Marks and More" as a mini-lesson at this point.
4. Allow the rest of the session for students to type and print their letters.
5. Collect students' letters, worksheets, and drafts at the end of the session.

Closure (Reflection)

If desired, ask students to print two copies of their letters, and mail one copy of each letter to the newspapers that students are responding to. Encourage them to do this on their own if an issue comes up that they feel passionate about in their local, regional, or national community.

Assessment

Check drafts and worksheets for completion and effort. Look in particular for indications of improvement over the series of drafts that students complete for the assignment. Assess students' final drafts using the criteria for effective letters to the editor that students created during the second session of the lesson. If you prefer a more formal rubric, use the Persuasive Letter Rubric in the Appendix.

Adaptations (for students with learning disabilities)

Make sure to allow more time for these students, especially when editing, saving, and Printing their work.

Extensions (for gifted students)

- As a book report alternative, have students write letters to the editor from the perspective of a character in a book they have read.
- After writing their letters, have students conduct research on the issues that they have chosen. The letters can serve as students' preliminary thoughts on the issue. Challenge each student to find at least 3 library resources on the issue and use those resources to expand the letter into a more formal proposal for changes that readers should consider making or actions that they should consider taking.
- Modify the lesson by assigning students topics for their letters.

Possible connections to other subjects: Media/Library Education, Science, Social Studies

From FAIR (Fairness and Accuracy in Reporting) 2011:

How to Communicate with Journalists

There are 101 excuses for not writing or calling the media when you see unfair, biased or inaccurate news coverage: "I don't know enough"; "I'm too busy"; "My computer crashed."

Communicating with journalists makes a difference. It does not have to be perfect; not all letters to journalists need to be for publication. Even a one-sentence, handwritten note to a reporter can be helpful. If you take the time to type a substantive letter, send copies of it to two or three places within the media outlet-perhaps to the reporter, his or her editor, as well as to the letters-to-the-editor department.

If media outlets get letters from a dozen people raising the same issue, they will most likely publish one or two of them. So even if your letter doesn't get into print, it may help another one with a similar point of view get published. Surveys of newspaper readers show that the letters page is among the most closely read parts of the paper. It's also the page policy-makers look to as a barometer of public opinion.

When you write to journalists, be factual, not rhetorical. Do not personally attack them; that's more likely to convince them that they're in the right. Address them in the language that most journalists are trained to understand: Call on them to be responsible, professional, balanced and inclusive of diverse sources and viewpoints.

Letters that are intended for publication should usually be drafted more carefully. Here are some tips to keep in mind:

Make one point (or at most two) in your letter or fax. State the point clearly, ideally in the first sentence.

Make your letter timely. If you are not addressing a specific article, editorial or letter that recently appeared in the paper you are writing to, then try to tie the issue you want to write about to a recent event.

Familiarize yourself with the coverage and editorial position of the paper to which you are writing. Refute or support specific statements, address relevant facts that are ignored, but do avoid blanket attacks on the media in general or the newspaper in particular.

Check the letter specifications of the newspaper to which you are writing. Length and format requirements vary from paper to paper. (Generally, roughly two short paragraphs are ideal.) You also must include your name, signature, address and phone number.

Look at the letters that appear in your paper. Is a certain type of letter usually printed?

Support your facts. If the topic you address is controversial, consider sending documentation along with your letter. But don't overload the editors with too much info.

Keep your letter brief. Type it whenever possible.

Find others to write letters when possible. This will show that other individuals in the community are concerned about the issue. If your letter doesn't get published, perhaps someone else's on the same topic will.

Monitor the paper for your letter. If your letter has not appeared within a week or two, follow up with a call to the editorial department of the newspaper.

Write to different sections of the paper when appropriate. Sometimes the issue you want to address is relevant to the lifestyle, book review or other section of the paper.

An increasing number of broadcast news programs (60 Minutes, All Things Considered, etc.) also solicit and broadcast "letters to the editor." Don't forget these outlets.

Please sign your letters as an individual or representative of a community group, not as a member of FAIR.

Please send us a copy of your letters (published and unpublished) to FAIR. Address them to the attention of the activist coordinator.

How to Write an Op-Ed

Op-eds are longer than letters to the editor, and there is more competition for space. You may want to call the paper for length requirements (usually 600-800 words).

Try to write on a controversial issue being covered at that time. If you can use a professional title that suggests authority, do so. If you work for an organization, get permission to sign the op-ed as a representative of that organization.

Feel free to send it to papers far from where you live, but avoid sending it to two newspapers in the same "market." (Sending to the San Francisco Examiner and the Seattle Times is OK, but not to the Examiner and the San Francisco Chronicle.) "National" newspapers like the New York Times, Los Angeles Times, Washington Post, Christian Science Monitor and USA Today generally do not accept op-eds that are also being offered to other papers. But you can easily submit the same piece to five or ten local dailies in different regions—greatly increasing your chances of being published.

Assure the op-ed editor in your cover letter that the piece has not been submitted to any other paper in their market. If, on the other hand, you sent it to only one paper, let that paper know you are offering them an exclusive.

In writing op-eds, avoid excessive rhetoric. State the subject under controversy clearly. You are trying to persuade a middle-of-the-road readership. If you rely on facts not commonly found in mainstream media, cite your sources hopefully as "respectable" as possible.

Try to think of a catchy title. If you don't, the paper will be more likely to run its own—which may not emphasize your central message. (Even if you do write your own headline, don't be surprised if it appears under a different one.)

Be prepared to shorten and re-submit your article as a letter to the editor in case it does not get accepted as an op-ed.

Tips on Writing Letters to the Editor

Letters to the editor are great advocacy tools. After you write letters to your members of Congress, sending letters to the editor can achieve other advocacy goals because they:

•reach a large audience.
•are often monitored by elected officials.
•can bring up information not addressed in a news article.
•create an impression of widespread support or opposition to an issue.

Keep it short and on one subject. Many newspapers have strict limits on the length of letters and have limited space to publish them. Keeping your letter brief will help assure that your important points are not cut out by the newspaper.

Make it legible. Your letter doesn't have to be fancy, but you should use a typewriter or computer word processor if your handwriting is difficult to read.

Send letters to weekly community newspapers too. The smaller the newspaper's circulation, the easier it is to get your letter printed.

Be sure to include your contact information. Many newspapers will only print a letter to the editor after calling the author to verify his or her identity and address. Newspapers will not give out that information, and will usually only print your name and city should your letter be published.

Make references to the newspaper. While some papers print general commentary, many will only print letters that refer to a specific article. Here are some examples of easy ways to refer to articles in your opening sentence:

•I was disappointed to see that The Post's May 18 editorial "School Vouchers Are Right On" omitted some of the key facts in the debate.

•I strongly disagree with (author's name) narrow view on women's reproductive rights. ("Name of Op-Ed," date)

•I am deeply saddened to read that Congressman Doe is working to roll back affirmative action. ("Title of Article," date)

From NCTE: National Council of Teachers of English

Write an Opinion Piece or a Letter to the Editor for Your Local Newspaper

(Last edited January 2010)

Letters to the editor and opinion pieces are very powerful advocacy tools. The editorial section of a newspaper is widely read by the public and is monitored by elected officials. In a letter to the editor or opinion piece, you can bring up information not addressed in a news article, and can create the impression of widespread support or opposition to an issue. When you write a letter to the editor, be sure to do the following.

Adhere to word count requirements. This information can usually be found, online and in print, on the same page as the letters that are published. Generally, as few as 250 words are the maximum.

Open with a strong statement, and be sure to place the most important information at the beginning. Often, letters and pieces are edited to fit the space available in that issue of the newspaper -- most often they are cut from the bottom up, so placing the important information anywhere but at the top could result in its being omitted.

Use a personal story or illustration to make your point in plain language. If at all possible, tie your letter to a recent piece of news, editorial, or a prior letter to the editor, and, if you do so, reference the title and date of the article in your letter. If you are referring to a newspaper article, send your letter as soon as possible after an article has been published in the paper.

Use email to submit your letter. Editors like email because they will not have to re-key your letter for print. An email address for the letter to the editor/opinion sections of the newspaper will likely be found on the editorial page (print or online). Send your letter or opinion piece to weekly and community newspapers as well. The smaller the newspaper's circulation, the more likely your letter will be published.

In your signature line include your name, daytime and evening telephone numbers, email address, and mailing address so the paper can verify that you wrote the letter. Some editors may write or call to confirm your information. Only your name and city will be published.

If your letter or opinion piece does run in the newspaper, please send us a clipping or a link: SLATE Responses, NCTE, 1111 W. Kenyon Road, Urbana, IL 61801-1096; fax: 217-278-3761; slate@ncte.org.

Newspaper Article Summary Questions

1. What is the title of the article you are considering?

2. What is the main idea of the article?

3. Fill in the table below to outline the main points in the article. Use the back if you need additional space.

Main Point	Connection to Main Idea

4. What is your final impression of the main points included in the article? How do they combine to support the main idea?

5. What ideas do you have for the letter that you will write in response to this article? What position will you take and why?

Persuasion Map Planning Sheet

Goal or Thesis

A goal or thesis is a statement that describes one side of an arguable viewpoint.

- What is the thesis or point you are trying to argue?

Main Reasons

You will need some good reasons to support your goal or thesis.

Briefly state three main reasons that would convince someone that your thesis is valid.

- Reason 1
- Reason 2
- Reason 3

Facts or Examples

What are some facts or examples you could state to support this reason and validate this argument?

- Fact or Example 1
- Fact or Example 2
- Fact or Example 3

Conclusion

A piece of persuasive writing usually ends by summarizing the most important details of the argument and stating once again what the reader is to believe or do.

Letter to the Editor Peer Review Questions

1. Does the letter begin with a salutation and end with a signature block?

2. What article is the letter writer discussing? Is the article named in the first sentence or paragraph?

3. In the first paragraph, what main reason does the letter writer give for responding to the article? What position is the letter writer taking on the issue?

4. What specific points does the letter writer use to support the position taken in the letter?

5. How does the letter conclude? Is the conclusion appropriate for the letter?

6. What advice would you give the author of this letter?

7. What did you like the most about this letter? Why?

Effectively Using the Outdoor Classroom
Middle School Curriculum for Interdisciplinary Studies

ENGLISH

8th Grade

"Carl Sandburg & Poetic Devices"

UNIT: Poetry
Unit Essential Question: What literary devices do poets use to create an image for their audience?

LESSON: Carl Sandburg and Personification in Poetry
Lesson Essential Questions: How did Carl Sandburg use personification in many of his poems? How can I use personification in my own poetry on my environment to create an image for my audience?

STANDARDS ADDRESSED

National

Common Core Standards – College and Career Readiness Anchor Standards for Language (6-12): Vocabulary Acquisition and Use: Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

South Carolina

Standard 8-1 - The student will read and comprehend a variety of literary texts in print and nonprint formats.

- Indicator 8-1.1: Compare/contrast ideas within and across literary texts to make inferences.
- Indicator 8-1.2: Explain the effect of point of view on a given literary text.
- Indicator 8-1.3: Interpret devices of figurative language (including extended metaphor, oxymoron, and paradox).
- Indicator 8-1.4: Analyze a given literary text to determine its theme.
- Indicator 8-1.5: Analyze the effect of the author's craft (including tone and the use of imagery, flashback, foreshadowing, symbolism, irony, and allusion) on the meaning of literary texts.
- Indicator 8-1.6: Create responses to literary texts through a variety of methods (for example, written works, oral and auditory presentations, discussions, media productions, and the visual and performing arts).
- Indicator 8-1.7 Compare/contrast literary texts from various

Guiding Questions

1. Who was Carl Sandburg?
2. What types of figurative language did Carl Sandburg use in his poetry?
3. What is personification and how did it contribute to the imagery of Sandburg's poetry?
4. How can I use personification to create an image for my own poetry?

Background Information

Carl Sandburg, a noted American poet, began his life poor, the son of Swedish immigrants. He was a hard-working young man; he quit school after graduating eighth grade and did many odd jobs including dishwashing, delivering milk, laying bricks, and

even shining shoes before he became a traveling hobo. While travelling he saw many things which influenced his political views and soon he wrote about many of the injustices and observations he encountered. He was not only an author but a political organizer and reporter of the social climate at the time. After reporting for the *Chicago Daily News* and publishing a handful of books on poetry and children's stories, Sandburg soon found himself internationally recognized for his work and the winner of the 3 Pulitzer Prizes – two for poetry and one for his biography on Abraham Lincoln. Late in life, the Sandburg family moved to Flat Rock, North Carolina where Carl continued to write and his wife, Lillian raised prize-winning goats. He died at his home in North Carolina in 1976 and his home became property of the National Park Service.

Sandburg used literary devices throughout his poetry creating brilliant imagery for his audiences. Personification was one of his most used devices. Two poems that illustrate this technique best are "Fog" and "Chicago."

Lesson Objective(s)

Students will be able to:

1. Identify literary devices/figurative language in a poem, including the use of imagery and personification
2. Identify the importance of the use of figurative language/literary devices in a poem
3. Translate the identification of literary devices into one's own written work

Materials/Resource

Carl Sandburg's poem *Fog* (provided)
Carl Sandburg's poem *Chicago* (provided)
Student journal/notebook
Whiteboards or Individual pieces of white paper (for each student)

Activating Strategy

- Pass out a whiteboard or piece of white paper to each student. Tell the students you are about to read them a poem by Carl Sandburg. The poem is short so they need to listen carefully because they will be asked to do something after.
- Tell the students that you want them to concentrate and visualize what the poem is talking about so you are going to ask every student to close their eyes as you read.
- Once all students' eyes are closed, Read Carl Sandburg's poem *Fog*. (For emphasis, you may read it twice.)
- Now ask all the students to take no more than five minutes and draw on their board or paper what they *visualized* when they listened to the poem. (What images came to mind when the poem was read?)
- At the end of the five minutes, walk around the room and choose three student drawings you find most captivating as it relates to the poem. Share with the class (Possibly have prizes for the winners!)

Procedure

DAY ONE

1. Once you have completed the activating strategy, review the following terms:
    a. Figurative language: a technique poets (and others) use to create strong imagery. Figurative language conveys meaning beyond the literal meaning of the words.
    b. Simile: a type of figurative language in which two seemingly unlike things are compared using *like* or *as*.
        i. *Payday loans are like a blight on one's financial soul.*
    c. Metaphor: a type of figurative language that directly compares two unlike objects.
        i. *During the day it was a thunderous surge of cars, a great insect rustling.*
    d. Personification: a type of figurative language in which animals, inanimate objects, or ideas are given human qualities.
        i. *The wind howled its disapproval as we opened the front door.*
    e. Synecdoche: a part of something substituted for the whole.
        i. Romeo, give me thy heart and we shall enjoy our love.

        (*You may add to, delete, or edit terms from the above list to better fit your class)
2. Have students make a chart:
        i. The chart should contain 5 columns, labeled at the top with the terms you reviewed: *Figurative Language Example, Simile, Metaphor, Personification, Synecdoche*.
        ii. The chart should contain 5 – 10 rows.
        iii. Explain that the students will write down specific examples of figurative language with line numbers in the left hand column. They will then put a check mark in the appropriate column to identify what type of figurative language is being used.
    b. To help them get started on the chart and know what to do, post or re-read *Fog* by Carl Sandburg. Choose a line in the poem to write in the first row underneath the labels and then identify the figurative language used. (An example is provided for you after the lesson).
    c. Write a paragraph, essay, or a few sentences explaining the effect of figurative language on the poem as a whole. Be sure to use specific examples from the poem as evidence.
3. Now read/post Sandburg's *Chicago* poem.
4. Ask students to use these two poems to fill in the rest of their chart. After the chart is filled in, help students visualize the examples by making Venn diagrams, comparing the two objects in the examples.

DAY TWO

5. Review the techniques, chart, and poems from the previous day. Explain that today you will be taking students outside to take on the role of Carl Sandburg themselves. They will use the outdoor classroom/tree garden to be their inspiration just as Sandburg used elements in nature (fog) and his environment (the city of Chicago) to inspire him.
6. Ask students to choose one of the two poems that were talked about in class.
    a. If they choose *Fog* then they will be asked to select an object from outside and write their own poem, reflective of Sandburg's *Fog*, where they personify the

object and create strong imagery for the audience. The poem must be at least five lines long.
    b. If they choose Chicago, then the student should concentrate on the first five lines of the poem and write their own version, describing their environment, school, or city. This poem also must be at least five lines long.
    c. It is optional to have copies of the poem for the students to take outside with them.
7. Take the students outside to the Outdoor Classroom/Learning Garden. Tell the students they will use their surroundings to help them create their poems. If time (and weather) allows, you may have students share some of their "poems" outside.
8. Further, if time allows, have students exchange poems with a partner and have each partner complete another row or two on their "Identifying Figurative Language" Chart using their partner's poem.

Closure (Reflection)

Ask students to continue to look for the literary devices used in the readings they will do the rest of the year.

Assessment

Multiple options exist for informal and formal assessment:

- Create a quiz for students on the terms related to poetry and literary devices
- In addition to the poetry students write, have them get into groups, choose one person's poem they like best, and create a short video or skit dramatizing it
- Have students take the poem they created and, as if found on a page in a poetry book, complete it with illustrations
- Host a poetry slam or poetry reading where everyone shares their own work for a participation grade
- Ask students to turn their Charts/Venn Diagrams in for a classwork grade

Adaptations (for students with learning disabilities)

Make sure to integrate a hands-on approach to keep students more interested in the concept. For example, have them create the video or even a diorama in class depicting their poem. Assign students to work in groups rather than individually. More time can be allotted for activities.

*It could also be possible to integrate this lesson with a trip to Carl Sandburg's home.

Extensions (for gifted students)

Ask students to research Carl Sandburg; possibly have him or his work as the topic of a Research Paper assigned in class. Have students adapt a poem to dramatic format and perform it for the class. Attention to costume, dialogue, and props will be key. The performances can even be done outside at the outdoor classroom.

Possible connections to other subjects: Art, Drama, and Social Studies

SAMPLE CHART

Identifying Figurative Language in Poetry

Figurative Language Example	Simile	Metaphor	Personification	Synecdoche
1 The fog comes **2 on little cat feet**			More like felinification ☺ ✓	

CARL SANDBURG POEMS

Fog

by Carl Sandburg

The fog comes
on little cat feet.

It sits looking
over harbor and city
on silent haunches
and then moves on.

Chicago

by Carl Sandburg

Hog Butcher for the World,
Tool maker, Stacker of Wheat,
Player with Railroads and the Nation's Freight Handler;
Stormy, husky, brawling,
City of the Big Shoulders:

They tell me you are wicked and I believe them, for I have seen your painted women under the gas lamps luring the farm boys.
And they tell me you are crooked and I answer: yes, it is true I have seen the gunman kill and go free to kill again.
And they tell me you are brutal and my reply is: On the faces of women and children I have seen the marks of wanton hunger.
And having answered so I turn once more to those who sneer at this my city, and I give them back the sneer and say to them:
Come and show me another city with lifted head singing so proud to be alive and coarse and strong and cunning.
Flinging magnetic curses amid the toil of piling job on job, here is a tall bold slugger set vivid against the little soft cities;
Fierce as a dog with tongue lapping for action, cunning as a savage pitted against the wilderness,
Bareheaded,
Shoveling,
Wrecking,
Planning,
Building, breaking, rebuilding,
Under the smoke, dust all over his mouth, laughing with white teeth,
Under the terrible burden of destiny laughing as a young man laughs,
Laughing even as an ignorant fighter laughs who has never lost a battle,
Bragging and laughing that under his wrist is the pulse, and under his ribs the heart of the people,
Laughing!
Laughing the stormy, husky, brawling laughter of Youth, half-naked, sweating, proud to be Hog Butcher, Tool Maker, Stacker of Wheat, Player with Railroads and Freight Handler to the Nation.

Math

Effectively Using the Outdoor Classroom
Middle School Curriculum for Interdisciplinary Studies

MATH

6th Grade

"Plant Study: Identifying Population Characteristics by Studying a Sample"

UNIT: Data and Probability
Unit Essential Question: How can a population's characteristics be identified and predicted through studying a sample?

LESSON: Plant study: Data Analysis
Lesson Essential Question: How can data from a plant growth study be used to make a prediction for a larger population?

STANDARDS ADDRESSED
National
Common Core Standards:
Students should be able to draw inferences about populations based on samples

South Carolina
Standard 6-6: The student will demonstrate through the mathematical processes an understanding of the relationships within one population or sample.
Indicator 6-6.1: Predict the characteristics of one population based on the analysis of sample data.

Guiding Questions
1. How does a sample reflect a population?
2. What predictions can be made for a whole population from the data of a sample population?

Background Information
Students should be able to understand and identify that in many arenas, a sampling of a population must be done in order to gather data since it is nearly impossible many times to gather data from an entire population. We see this in examples such as:
- A researcher might study the success rate of a new 'quit smoking' program on a test group of 100 patients, in order to predict the effects of the program if it were made available nationwide
- A scientist may want to know the effect of pollution on tropical coral reefs, so she studies a sample population rather than all the tropical coral reefs worldwide

Lesson Objective(s)
The student will use data collection, problem solving, reasoning, and communication to:
- Identify the growth rate of two sample populations
- Make a prediction of a whole population based on the sample populations

Materials/Resources

Plant seeds or seedlings of two different types of plants (suggested: Native & Non-native)
Raised bed or area in or near outdoor classroom
Gardening supplies (soil, hand shovels, water hoses or buckets, etc.)
Graph paper
Planting worksheet; Data Table and questions (provided)

Activating Strategy/Preparation

Begin by asking students to write down their own ideas of why it is important to get information from sample populations, rather than entire populations. If needed, give the students a scenario to think about (such as the ones mentioned in the Background section). Give students the opportunity to write their ideas down and discuss with a partner. Finally ask them to share their ideas with the entire class and, as a class, have other students discuss each other's answers and scenarios while you guide them to the purpose of the lesson.

Procedure

1. Take students to the outdoor classroom and divide them into groups of 3-5.
2. Tell students you are going to do a science experiment in which they will test whether or not native plants will thrive better than non-native plants in a garden if given the same resources (sunlight, water, etc.) to survive. They will then take the data, represent it graphically, and analyze it as it pertains to a larger population.
3. Give each group the exact same supplies. A sample supply list would include: 2 packets of seeds or groups of seedlings (1 native plant & one non-native plant), hand shovel, and water bucket.
4. Tell each group that they will plant the two different species and over the next two weeks, they will visit the garden/beds and record the growth of the plants to date.
5. Over the next two weeks, have students use rulers to record the each individual plant's growth, as well as an average for each group, in a data table similar to the one supplied.
6. Remind students to nurture their plants – treating them each the same so that the only experimental variable is the types of species being tested.
7. Once the two weeks are complete, have students take collected data, graph it, and analyze it. Have students answer questions pertaining to the relationship of the data, including an analysis of how their data would be representative of a larger population.

Closure (Reflection)

Have students reflect on their experiment and what they learned in a journal entry, class presentation, and/or essay response on the next formal assessment.

Assessment

Give students a project grade for the planting, maintenance of plants, record of data, and final report of analysis and conclusions. Partner with a science teacher to help students use their work to write a formal lab report.

Adaptations (for students with learning disabilities)

Spend more in-class time with students on the project itself. Another option is to have students work in selected partner pairs rather than larger groups to help ensure greater participation and more involvement.

Extensions (for gifted students)

Ask students to create a presentation on their project or photograph their work through the experiment to showcase at the end of the assignment.

Possible connections to other subjects: Science

STUDY of PLANTS

Purpose:

Hypothesis:

Materials:

Procedure:

Data Table:

DAY NUMBER	Plant one growth (cm)	Plant two growth (cm)
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		

Take the data from the 1st and 2nd column and the 1st and 3rd column and on graph paper, create two graphs showing growth.

1. What is the independent variable in this situation?

2. What is the dependent variable in this situation? Why?

3. Using your graphs, find an estimate of plant growth for Day 12 for both plants.

4. Using your graphs, predict the day that the growth for each plant could triple in size.

5. Did both of your species of plants represent linear relationships? Explain.

6. Compare your results to other groups in your class, were they quite similar? Much different? Explain.

7. Back to the original purpose of the experiment, did the native species thrive better outdoors than the Non-native species? Why do you think?

8. Also, from this activity, what can you predict about the two species populations as a whole and how they would grow/thrive in this environment?

Effectively Using the Outdoor Classroom
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MATH

7th Grade

"Constructing Architectural Scale Drawings"

UNIT: Geometry
Unit Essential Question: How can one construct an accurate scale drawing using geometric shapes and appropriate measurements?

LESSON: Constructing a Scale Drawing of an Outdoor Classroom
Lesson Essential Question: How can one measure and convert measurements to create a scale drawing of an outdoor classroom or garden space?

STANDARDS ADDRESSED
National
Common Core Standards:

Geometry 7.G - Draw, construct, and describe geometrical figures and describe the relationships between them.

1. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

South Carolina

Standard 7-5: The student will demonstrate through the mathematical processes an understanding of how to use ratio and proportion to solve problems involving scale factors and rates and how to use one-step unit analysis to convert between and within the U.S. Customary System and the metric system.

Indicator 7-5.1 Use ratio and proportion to solve problems involving scale factors and rates.

Indicator 7-5.2 Apply strategies and formulas to determine the surface area and volume of the three-dimensional shapes prism, pyramid, and cylinder.

Indicator 7-5.3 Generate strategies to determine the perimeters and areas of trapezoids.

Indicator 7-5.4 Recall equivalencies associated with length, mass and weight, and liquid volume:
1 square yard = 9 square feet, 1 cubic meter = 1 million cubic centimeters, 1 kilometer = 5/8 mile, 1 inch = 2.54 centimeters; 1 kilogram = 2.2 pounds; and 1.06 quarts = 1 liter.

Indicator 7-5.5 Use one-step unit analysis to convert between and within the U.S. Customary System and the metric system.

Guiding Questions

1. How is a scale drawing created?
2. Why is measurement important in a scale drawing?
3. How are ratios and proportions used in a scale drawing?

Background Information

During this lesson students practice measuring and converting to scaled measurements. Students measure various places in the outdoor learning environment. They place their findings in a spreadsheet and/or report. After converting measurements to a scaled version, students draw a scaled model of the space with a possible extension to build a physical model.

Lesson Objective(s)

The student will use data collection, problem solving, reasoning, and communication to:

- Measure a space within the outdoor learning environment
- Convert measurements to scale
- Used scaled measurements to create a scaled drawing of the space
- With time, use scaled drawing to build a scaled model

Materials/Resources

Measuring tape, ruler, & meter stick (1 of each per group)
Art or Poster Paper
Computer with access to printer
Measurement Review worksheet (provided)

Activating Strategy/Preparation

Students should have proper measuring techniques when using measuring equipment and solving proportions. Therefore, start this unit by having students review each of these techniques with the attached worksheet provided.

Procedure

1. Begin the lesson by asking students to explain what they know about measuring and solving proportions. Then use the attached worksheets to review measuring.
2. Demonstrate how to apply proportions to convert from actual measurements to scale drawings. Let students examine how different keys can be used.
3. Assign students to groups and give each student a spreadsheet and each group a measuring tape. Assign students a room in the school of which they will make a scale drawing. (The teacher should make any needed arrangements in advance for students to visit the room briefly and make the measurements.) They should carefully measure the length and width of the room, the door's length and width, and how far the door is from the nearest corner. This will enable students to make an accurate drawing. Students should enter their information on the spreadsheets as they measure.
4. Once students complete their measuring, they should return to the classroom and work in their groups to decide what they want their key to be and to convert all actual measurements to scaled measurements.
5. Have students within the groups compare their answers for accuracy. Once the conversion procedure has been completed, instruct students to use a ruler and art paper to draw their scale models. Allow groups to share their scaled drawings with the class.

Closure (Reflection)

Have students reflect on their experiment and what they learned in a journal entry, class presentation, and/or essay response on the next formal assessment.

Assessment

Give students a project grade for the planting, maintenance of plants, record of data, and final report of analysis and conclusions. Partner with a science teacher to help students use their work to write a formal lab report.

Adaptations (for students with learning disabilities)

Spend more in-class time with students on the project itself. Another option is to have students work in selected partner pairs rather than larger groups to help ensure greater participation and more involvement.

Extensions (for gifted students)

Ask students to create a presentation on their project or photograph their work through the experiment to showcase at the end of the assignment.

Possible connections to other subjects: Science

Measurement Review

Name _____

Use a ruler to measure the following lines in centimeters. Use decimals if necessary.

1.

2.

3.

4.

Use a ruler to measure each side of the following shapes in centimeters. Use decimals if necessary.

5.

6.

7.

Effectively Using the Outdoor Classroom
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MATH

8th Grade

"Science of Shadows"

UNIT: Numbers and Operations
Unit Essential Question: How can one apply ratios and proportions to real-world situations?

LESSON: Determining height without physical measurement
Lesson Essential Question: How can one determine the height of a tree or a telephone pole without climbing to the top?

STANDARDS ADDRESSED
National
Common Core Standards:

Geometry 7.G - Draw, construct, and describe geometrical figures and describe the relationships between them.

2. Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

South Carolina

Standard 8-2: The student will demonstrate through the mathematical processes an understanding of operations with integers, the effects of multiplying and dividing with rational numbers, the comparative magnitude of rational and irrational numbers, the approximation of cube and square roots, and the application of proportional reasoning.

Indicator: 8-2.7 Apply ratios, rates, and proportions.

Guiding Questions

1. How is a scale drawing created?
2. Why is measurement important in a scale drawing?
3. How are ratios and proportions used in a scale drawing?

Background Information

During this lesson students practice measuring and converting to scaled measurements. Students measure various places in the outdoor learning environment. They place their findings in a spreadsheet and/or report. After converting measurements to a scaled version, students draw a scaled model of the space with a possible extension to build a physical model.

Lesson Objective(s)

The student will use data collection, problem solving, reasoning, and communication to:

- Measure a space within the outdoor learning environment
- Convert measurements to scale
- Used scaled measurements to create a scaled drawing of the space
- With time, use scaled drawing to build a scaled model

Materials/Resources

Measuring tape, ruler, & meter stick (1 of each per group)/ Art or Poster Paper
Computer with access to printer
Measurement Review worksheet (provided)

Activating Strategy/Preparation

Students should have proper measuring techniques when using measuring equipment and solving proportions. Therefore, start this unit by having students review each of these techniques with the attached worksheet provided.

Procedure

1. Begin the lesson by asking students to explain what they know about measuring and solving proportions. Then use the attached worksheets to review measuring.
2. Demonstrate how to apply proportions to convert from actual measurements to scale drawings. Let students examine how different keys can be used.
3. Assign students to groups and give each student a spreadsheet and each group a measuring tape. Assign students a room in the school of which they will make a scale drawing. (The teacher should make any needed arrangements in advance for students to visit the room briefly and make the measurements.) They should carefully measure the length and width of the room, the door's length and width, and how far the door is from the nearest corner. This will enable students to make an accurate drawing. Students should enter their information on the spreadsheets as they measure.
4. Once students complete their measuring, they should return to the classroom and work in their groups to decide what they want their key to be and to convert all actual measurements to scaled measurements.
5. Have students within the groups compare their answers for accuracy. Once the conversion procedure has been completed, instruct students to use a ruler and art paper to draw their scale models. Allow groups to share their scaled drawings with the class.

Closure (Reflection)

Have students reflect on their experiment and what they learned in a journal entry, class presentation, and/or essay response on the next formal assessment.

Assessment

Give students a project grade for the planting, maintenance of plants, record of data, and final report of analysis and conclusions. Partner with a science teacher to help students use their work to write a formal lab report.

Adaptations (for students with learning disabilities)

Spend more in-class time with students on the project itself. Another option is to have students work in selected partner pairs rather than larger groups to help ensure greater participation and more involvement.

Extensions (for gifted students)

Ask students to create a presentation on their project or photograph their work through the experiment to showcase at the end of the assignment.

Possible connections to other subjects: Science

Science

Effectively Using the Outdoor Classroom
Middle School Curriculum for Interdisciplinary Studies

SCIENCE

6th Grade

"Energy from the Sun"

UNIT: Physical Science
Unit Essential Question: How can heat energy be transferred?

LESSON: Examining Heat Energy through Radiation
Lesson Essential Question: How does the sun transfer energy through radiation? How do surfaces absorb heat (the sun's) energy differently?

STANDARDS ADDRESSED
National Science Education Standards

- Physical Science, Earth Science, Grades 5 to 8, pg.155, Item #3: "Light interacts with matter by transmission (including refraction), absorption, or scattering (including reflection). To see an object, light from that object - emitted or scattered from it - must enter the eye."
- Physical Science, Earth Science, Grades 5 to 8, pg.155, Item #6: "The sun is a major source of energy for changes on the earth's surface. The sun loses energy by emitting light. A tiny fraction of the light reaches the earth, transferring energy from the sun to the earth. The sun's energy arrives as light with a range of wavelengths, consisting of visible light, infrared, and ultraviolet radiation."

Benchmarks for Science Literacy, Project 2061, AAAS

- The Physical Setting, Energy Transformations, Grades 6 to 8, pg. 85, Item #3: "Heat can be transferred through materials by the collisions of atoms or across space by radiation. If the material is fluid, currents will be set up in it that aid the transfer of heat."
- The Physical Setting, The Earth, Grades 9 to 12, pg. 70, Item #2: "Weather (in the short run) and climate (in the long run) involve the transfer of energy in and out of the atmosphere. Solar radiation heats the landmasses, oceans, and air. Transfer of heat energy at the boundaries between the atmosphere, the landmasses, and the oceans results in layers of different temperatures and densities in both the ocean and atmosphere. The action of gravitational force on regions of different densities causes them to rise or fall - and such circulation, influenced by the rotation of the earth, produces winds and ocean currents."

South Carolina

Standard 6-5: The student will demonstrate an understanding of the law of conservation of energy and the properties of energy and work. (Physical Science)

Indicator: 6-5.5 Illustrate the directional transfer of heat energy through convection, radiation, and conduction.

Guiding Questions

1. How is energy transferred through radiation?
2. How do different surfaces absorb heat energy?
3. How is the sun's light and heat an example of radiation energy transfer?

Background Information

Practically all of the energy that reaches the earth comes from the sun. Intercepted first by the atmosphere, a small part is directly absorbed, particularly by certain gases such as ozone and water vapor. Some energy is reflected back to space by clouds and the earth's surface. Most of the radiation, however, is absorbed by the surface. Energy is transferred between the earth's surface and the atmosphere in a variety of ways, including radiation, conduction, and convection.

Radiation is the transfer of heat energy by electromagnetic wave motion. The transfer of energy from the sun across nearly empty space is accomplished primarily by radiation. Radiation occurs without the involvement of a physical substance as the medium.

The amount of energy absorbed by an object depends upon the following:

- The object's absorptivity, which, in the visible range of wavelengths, is a function of its color
- The intensity of the radiation striking the object

Darker-colored objects absorb more visible radiation, whereas lighter-colored objects reflect more visible radiation. That's why we usually choose light-colored clothing on really hot days.
Every surface on earth absorbs and reflects energy at varying degrees, based on its color and texture.

Lesson Objective(s)

The student will use data collection, problem solving, reasoning, and communication to:

1. Understand that the physical characteristics of a surface have a powerful effect on the way that surface absorbs and releases heat from the sun.
2. Understand that radiation of heat occurs without the involvement of a physical object.

Materials/Resources (for each group of students)

- Three pie pans
- Dark potting soil
- Light-colored sand or perlite
- Water
- Three thermometers
- Graph paper
- Watch with a second hand or Stopwatch

Activating Strategy/Preparation

*This lesson/activity must be done on a day with full sun.
Explain to students that you will be conducting an experiment to investigate radiation and test its' effects on various surfaces. At this point, it may be good to review all three types of heat transfer (if this is a reinforcement activity) or, if you are just introducing radiation and heat transfer – to get students brainstorming about how heat can be transferred from one object to another. Conduct whole-group brainstorming and discussion (possibly through a Socratic seminar) or have students pair up.

Procedure

1. Have students make data tables to record the time and temperature of the three experimental pie pans. Examples:

Heating Cycle											
Surface material	Start time	Start temp.	Temperature each minute									
			1	2	3	4	5	6	7	8	9	10

Cooling Cycle											
Surface material	Start time	Start temp.	Temperature each minute									
			1	2	3	4	5	6	7	8	9	10

2. Next, have students/groups fill the pie pans to the same level, one with dark soil, one with light sand, and one with water.
3. Place the pie pans on a table, bench, or flat surface outside (in school garden or outdoor classroom).
4. Place a thermometer into each pie pan, securing it so it measures the temperature just under the surface of the substance in the pan.
5. Record the starting temperatures on the data table.
6. Have students record the temperature of each substance every minute for ten minutes. (If you are doing instruction outside and can spend more time outdoors, have students record the temperature every five minutes for fifty minutes – 10 times – as they work on another assignment or listen to direct instruction.)

Note: Feel free to vary the materials in the pie pans. Use different colored soils, dry and wet soils, grass, green or dry leaves, or different types of coverings such as plastic or aluminum foil. Encourage students to use their imaginations. You may wish to assign students to design and conduct their own research into the influence of surfaces on temperature.

Observations and Questions (Once students are done, have them answer the following or discuss as a class):

1. Using the data tables, graph the heating and cooling cycles to compare the rates at which the various substances heated and cooled.
2. Which material absorbed more heat in the first ten minutes?
3. Which material lost the most heat in the last ten minutes?
4. Imagine that it's summer and that the sun is shining on the ocean and on a stretch of land. Which will heat up more during the day? Which will cool more slowly at night? Explain.

5. Imagine three cities in the desert, all at about the same altitude and latitude.
    - One city (A) is surrounded by a dark-colored rocky surface.
    - Another city (B) is surrounded by a light-colored sandy surface.
    - The third city (C) is built on the edge of a large man-made desert lake.
    - Which city would likely have the highest average summer air temperature and why?
6. The earth's surface tends to lose heat in winter. Which of the above cities would have the warmest average winter temperature? Why?
7. Since the sun is approximately 93 million miles from the earth and space has no temperature, how do we get heat from the sun?
8. How would the uneven energy absorption by different surfaces on earth (water, soil, snow, trees, sand, etc.) affect the atmosphere?

Closure (Reflection)

Have students reflect on their experiment and what they learned in a journal entry, exit slip, and/or essay response on the next formal assessment.

Assessment

After some exploratory work and class discussion about these phenomena, show other surfaces and ask students to predict the heating and cooling curves and justify their predictions.

Adaptations (for students with learning disabilities)

Do an oral assessment for students with limited reading and writing skills.

Extensions (for gifted students)

Ask students to create a presentation or glogster on their project to showcase at the end of the assignment.

Possible connections to other subjects: Math

Effectively Using the Outdoor Classroom
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SCIENCE

7th Grade

"Food Webs: The Creatures Among Us"

UNIT: Ecology
Unit Essential Question: How do organisms interact in their environment?

LESSON: Food Webs
Lesson Essential Question: What is a food web and what are examples from our local/regional environment?

STANDARDS ADDRESSED

National Science Education Standards

> Life Science, Grades 5 to 8: Populations and Ecosystems, pg.157: "Populations of organisms can be categorized by the function they serve in an ecosystem. Plants and some microorganisms are producers—they make their own food. All animals, including humans, are consumers, which obtain food by eating other organisms. Decomposers, primarily bacteria and fungi, are consumers that use waste materials and dead organisms for food. Food webs identify the relationships among producers, consumers, and decomposers in an ecosystem."
>
> Life Science, Grades 5 to 8, Populations and Ecosystems, pg.158: "For ecosystems, the major source of energy is sunlight. Energy entering ecosystems as sunlight is transferred by producers into chemical energy through photosynthesis. That energy then passes from organism to organism in food webs."

South Carolina

> Standard 7-4: The student will demonstrate an understanding of how organisms interact with and respond to the biotic and abiotic components of their environment. (Earth Science, Life Science)
>
> Indicator 7-4.2 Illustrate energy flow in food chains, food webs, and energy pyramids

Guiding Questions

1. How is energy transferred through food chains and food webs?
2. What are examples of a local food chain/web?
3. What are the major roles organisms play in a food chain/web and how do they contribute to energy flow in the environment?

Background Information

> Food chains are the simplest arrangement of who eats whom assuming that each organism only eats one thing. Of course, in real life this is not the case. Still, it is useful to consider food webs as tangled food chains; therefore, understanding food chains is an essential prerequisite.

The roles that organisms play within a food chain are very well defined. Producers make their own food through photosynthesis. Consumers eat producers or other consumers and may be divided into 4 major categories: herbivores which eat producers, carnivores which eat herbivores or other carnivores, dentritivores (also called decomposers) which recycle the energy from dead organisms to make nutrients available for producers, and omnivores which eat producers and consumers.

Although it is tempting to emphasize that every food chain begins with the sun as the source of energy on which photosynthesis depends, in fact, not all food chains begin with the sun. Organisms near hydrothermal vents at the bottom of the ocean depend on sulfur as the initial energy source. These bacteria use a process called chemosynthesis, taking hydrogen sulfide and oxidizing it, thereby releasing energy. (This is typically far more advanced than middle school classrooms although you may wish to allude to the existence of food chains that do not rely on the sun as the initial energy source. For further information, an excellent resource about life at hydrothermal vents can be found on the Office of Naval Research website: http://www.onr.navy.mil/focus/ocean/habitats/vents2.htm)

The concept of a food pyramid adds a level of complexity to the concept of food chains. A producer uses energy from sunlight to grow, reproduce, and survive. Only a small fraction of that energy can be used by a herbivore that eats that producer. Similarly, that herbivore needs to use energy to grow, reproduce, and survive. A carnivore that eats that herbivore does get some energy from that herbivore but only a small percentage. Another way to think of it is to consider how many seeds a plant produces in its lifetime, how many seeds a chicken consumes in its lifetime, and how many chickens a human will consume in its lifetime. Clearly, energy is used and lost at each level of the food chain. Using a food pyramid to illustrate this concept helps students see this visually.

Lesson Objective(s)

The student will be able to:

1. define and construct a food chain
2. identify the role of organisms within a food chain
3. Identify organisms from their local environment into their roles in a food chain/web
4. build a food pyramid and explain how it functions in terms of energy transfer at each level.

Materials/Resources

- Field Guides (for students to share)
- Colored Pencils/Markers (for each individual or group of students)
- Digital camera (optional)

Activating Strategy/Preparation

*This lesson/activity must be done on a day with full sun.

Explain to students that you will be conducting an experiment to investigate radiation and test its' effects on various surfaces. At this point, it may be good to review all three types of heat transfer (if this is a reinforcement activity) or, if you are just introducing radiation and heat transfer – to get students brainstorming about how heat can be transferred from one object to another. Conduct whole-group brainstorming and discussion (possibly through a Socratic seminar) or have students pair up.

Procedure

1. Begin the lesson with the question: “What did you eat for dinner last night?" Break responses down into individual ingredients (separate lasagna into pasta, beef, tomatoes, and cheese) and write them on the board.
2. Once you have a broad sampling, begin categorizing the ingredients into producers, and consumers. Use questions such as:
    - Which of these foods come from plants?
    - Which of these foods don't come from plants? (If mushrooms are on the board, remember that technically mushrooms are fungi not plants!)

    *At this point, introduce the idea of producers as plants, or more scientifically, as organisms that make their own food through photosynthesis. Introduce the idea of consumers as animals, or more scientifically, as organisms that eat producers or other consumers.
3. Break down the consumer category further into herbivore, carnivore, omnivore, and dentritivore (or decomposer). Use questions such as:
    - Of the consumers, which are animals that eat plants?
    - Which are animals that eat other animals?
    - Which eat both?
    - Are there any decomposers? (Mushrooms, crab, shrimp, and lobster are likely to be the only decomposers.)

    Introduce the vocabulary words herbivore, carnivore, omnivore, and dentritivore at this point and give the formal definitions.
4. Ask students to describe a food chain. As part of this discussion, try to follow one or more of the foods on the board through the food chain.
    For example, sun → corn → cow → people. All the food chains we will be dealing with in this class have the sun as the initial energy source although you may want to briefly mention the existence of other food chains that do not depend on the sun (see notes in Teacher Background section).
5. Introduce today's activity. Students will be going outside to make a record, through words or pictures, (this could also be a neat opportunity to incorporate a digital camera and maybe students can take pictures) of all the local organisms they can find a specific area by school (tree garden or outside classroom). Encourage students to look for evidence of animals they may not be able to actually see – songs from a bird, scat from an animal, insect evidence on leaves/ground.
6. When students have had time to complete their list, they will use these local organisms to create a food web/chain. This can be done outside while still being inspired by their environment or back indoors. Also, students could just list and write their examples or they could draw them, get together with other students to create one chain between multiple individuals or as a whole class.
7. It may be great at this point to have local fiend guides so students can also indentify the organisms they are making a record of.
8. Once the students have had chance to create their food chains, have them present to the class. Also, as class finishes, ask the students to discuss the transfer of energy from one level of the food chain to the next, focusing on how any one organism can't transfer the energy it gets from its food directly to the next organism in the food chain because it needs to use some of that energy itself to grow, reproduce and survive. Along with that,

discuss why there are more plants in a community than squirrels, or why there are more squirrels than bobcats, for example.

Closure (Reflection)

Have students put their constructed food chains into a giant food web in partners, small groups, or as an entire class. Review what was learned in class.

Assessment

Have students pick an ingredient from their lunch today and construct a food chain. Make sure to remind them to start with the sun and include themselves. They should identify the role of each organism also (producer, herbivore, omnivore, etc.).

Adaptations (for students with learning disabilities)

Do an oral assessment for students with limited reading and writing skills.

Extensions (for gifted students)

1. Discuss food chains that do not use the sun as its energy source – have students do research and report back or write a short essay.
2. Take the activity to the next level by ordering and dissecting owl pellets, using these biological artifacts as evidence of food chains/webs.
3. Bring a rotten log back to the classroom to explore the food chains and mini-ecosystems within.

Possible connections to other subjects: Art and English

Effectively Using the Outdoor Classroom
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SCIENCE

8th Grade

"Adapt to Survive"

UNIT: Earth's Biological History
Unit Essential Question: How has biological diversity changed over history?

LESSON: Biological adaptations
Lesson Essential Question: How do organisms change due to their environment in order to survive?

STANDARDS ADDRESSED
National Science Education Standards

- Life Science, Grades 5 to 8: Diversity and Adaptations to Organisms, pg.158: "Biological evolution accounts for the diversity of species developed through gradual processes over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology that enhance survival and reproductive success in a particular environment."

- Life Science, Grades 5 to 8, Diversity and Adaptations to Organisms, pg.158: "Extinction of a species occurs when the environment changes and the adaptive characteristics of a species are insufficient to allow its survival. Fossils indicate that many organisms that lived long ago are extinct. Extinction of species is common; most of the species that have lived on the earth no longer exist."

South Carolina

Standard 8-2: The student will demonstrate an understanding of Earth's biological diversity over time. (Life Science, Earth Science)

Indicator 8-2.1 Explain how biological adaptations of populations enhance their survival in a particular environment.

Guiding Questions

1. How have organisms changed over time?
2. What are examples of biological adaptations?
3. How do adaptations help organisms better survive within their environment?

Background Information

(Provided by Oracle ThinkQuest Education Foundation)

Going to Grandma's House
You know when you go to grandma's house and you eat lots of goodies and you watch lots of television. Would these same behaviors fly at your mom's house? Probably not, right? So you change your behavior to fit where you are or who you are with. The same is true of plants and

animals. Animals, including humans, and plants change their structures, behaviors and physiology to fit where they are.

What are Biological Adaptations?
Plants and animals change over time in order to adapt to their environment. This change allows them to survive and to reproduce. The change can be fast, as in a chameleon changing colors (structural) to hide from predators, or it can be very slow (evolution).

Why Adapt?
In order for plants and animals to survive, they must have structures, behaviors and physiology that meet the requirements of their environment. For example, in order for plants to survive on the land, they must have ways to get water and other important nutrients from their surroundings. Adaptations such as shiny, waterproof cuticles slow down evaporation of rainwater--thus, giving the plant more time to absorb the water.

Similarities and Differences
Some species of animals may look and behave quite differently depending on their location. When Charles Darwin visited Galapagos Island, he noted some interesting differences between the animals of the island to their counterparts on the mainland. For example, the iguanas on the islands had large claws, which allowed them to hold onto the slippery rocks where they dined on seaweed. Iguanas on the mainland, however, had smaller claws which permitted them to climb trees to eat leaves.

Lesson Objective(s)

The student will be able to:

1. Define biological adaptation
2. Illustrate examples of biological adaptation for organism survival
3. Explain how adaptation aids organisms in competition and survival

Materials/Resources

- Field Guides (for students to share)
- Colored Pencils/Markers (for each individual or group of students)
- Digital camera (optional)

Activating Strategy/Preparation

Ask students to consider their own growth and development. If they were the same age they are now, but still had the same abilities that they had as an infant, how likely would it be that they survived until this point? Now ask them to consider life if the entire human race grew in that manner. Explain that humans do not only grow, but they develop as they grow. Ask them to consider the examples below.

- *Growth and Development*
    - The soft spot on our heads solidifies and protects us from the environment.
    - Hormones develop so that we are able to procreate and guarantee the existence of the species.
    - Muscles develop so that we are able to sit up, walk and move around.
    - Our bones become stronger and more stable to better deal with the environment.
    - Our teeth develop and grow so that we may take in suitable nourishment to sustain out growth and development.

Adaptations develop in different ways for different species. All organisms originate from a single cell organism and have simply adapted to the environment in different ways through a process called evolution. Each species has their own process of evolution. These adaptations are based on the resources that a species uses. The more they adapt, the more resources they able to use. Review some of the examples below to teach students about adaptation.

- *Adaptation*
    - Loss of excess hair in humans.
    - Wings on birds.
    - Sharp claws on hawks.

Evolution is a lengthy process of adaptations that changes as the environment changes and resources become either easier or more difficult to access. It is a means to ensure the survival of the species using methods that are demanded by the environment. Ask students if they can come up with their own examples of adaptations and evolution.

Procedure

1. Take students outside to the tree garden or outdoor learning center/classroom.
2. Tell students they have 10 minutes to find and then using a field guide, identify a plant or animal (animals whose evidence as been left behind can be used. For example, if a nest is found in a tree, a student may choose a local bird) found in the environment.
3. Once the students have chosen their organism, have them both draw and describe it in its environment. Be sure to have them include characteristics they can see or possibly touch that help make the organism unique (for example, the big bushy tail of an Eastern gray squirrel).This portion may take a good part or the whole period if students are really getting into examining their organism, drawing it, and writing about its features.
4. Before leaving the outdoor environment, ask the students to keep in mind what they see and the characteristics they notice and then have them write about the adaptations of the organism that is specific to the environment. For example, in keeping with the squirrel example from earlier – if a characteristic is the big bushy tail, the adaptation is that the tail distracts its predators, helps to keep the animal warm in cold winters, and acts as a rudder in long jumps. Students should be looking for adaptations in their specific region/biome.
5. When students have had time to complete their assignment, extend it the following day by telling them that they are now going to use the information they collected the previous day and extend their learning. Using their observations as an introduction, they will now write a research essay on their organism. They also have a choice on their extended assignment:
    - CHOICE ONE: Write an essay describing the adaptations of the species and then, how the environment may have changed in such a way as to force the species to adapt. This essay should include the earliest known version of this species and at least five ways that it has evolved to adapt to its environment.
    - CHOICE TWO: Research and write a paper that describes how the adaptations of their selected species may affect other species in the same environment.
    - CHOICE THREE: Create a scenario that includes a drastic change in the environment. Describe how their particular species might adapt to that change and why they would adapt in that way. For instance, if there was another ice age, how might their organism adapt to this new environment?
6. It may be nice when students complete their work to have them share or present in class.

Closure (Reflection)

Review with the class the importance and significance of biological adaptation over the history of the planet and even in current times. As a whole class extension, it may be neat at this point to have a Socratic seminar on how students believe humans will continue to adapt and evolve as our world changes. Ask, what will humans look and behave like 1000 years from now? Or 10,000 years? Any changes?

Assessment

Assess the written research paper and include information from the lesson on the next formative assessment.

Adaptations (for students with learning disabilities)

Do an oral assessment for students with limited reading and writing skills or have them work in pairs or small groups for greater success.

Extensions (for gifted students)

1. Give students an interesting and unique physical environment that you have created and then have them design and create their own organism that would be adapted to your environment.
2. Take the activity to the next level by developing a presentation from their research essay.

Possible connections to other subjects: Art and English

Social Studies

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SOCIAL STUDIES

6th Grade

"John Doe"

UNIT: Early Cultures
Unit Essential Question: How did civilizations develop as they moved from nomadic culture to settled life?

LESSON: Hunter-Gatherer Groups
Lesson Essential Question: How did Hunter-Gatherer groups live in concert with their environment?

STANDARDS ADDRESSED
National Standards for Social Studies Teachers

Thematic Standards: Culture and Cultural Diversity
Learner Expectations: "Human beings, learn, modify, and adapt to their cultures. Their culture helps them comprehend and make sense of themselves as individuals and members of various groups. Cultures predispose individuals to develop perspectives, make assumptions, create ideas, and behave in particular ways. Cultures are similar in how they influence individuals but they differ in the specifics of their influence. All cultures have systems of knowledge, values, traditions, and beliefs; yet the specifics of each may vary widely. Each cultural system is also unique. Cultures and systems within cultures are dynamic, ever-changing, and highly influential on the thoughts and actions of those who belong to them."

Thematic Standards: Time, Continuity, and Change
Learner Expectations: "The study of time, continuity, and change and how historians study the
past allows learners to understand their historical roots and to locate themselves in time. Learning how to read and reconstruct the past allows them to develop a historical perspective and to answer questions such as: Who am I? What happened in the past? How can I make my understanding of the past more accurate? How has the world changed and how might it change in the future?

South Carolina

Standard 6-1: The student will demonstrate an understanding of the development of the cradles of civilization as people moved from a nomadic existence to a settled life.

Indicator 6-1.1 Explain the characteristics of Hunter-gatherer groups and their relationship to the natural environment.

Guiding Questions

1. How have human civilizations changed over time?
2. What are characteristics of Hunter-gatherer groups?
3. How did Hunter-gatherer groups relate to their environment?

Background Information

Hunter-gatherer societies were marked by the use of tools and fire, basic hunting weapons, beads and other jewelry. These societies also had a basic form of social organization, a concept that applies to all human societies throughout time. Students need to understand how different groups organized themselves to sustain their lives

Lesson Objective(s)

The student will be able to:

1. Define and provide characteristics of Hunter-gatherer groups
2. Explain how Hunter-gatherer groups related to their environment in order to ensure survival

Materials/Resources

- Textbooks or Computer access for internet research
- White Paper, Colored Pencils/Markers (for each individual or group of students)
- Digital camera (optional)
- Research worksheet, provided (optional)

Activating Strategy/Preparation

Have students spend a day in class researching, discussing, and writing about Hunter-gatherer cultures. Let them know they have one class period to become experts on what these societies were like – how they survived and how they used the land for their culture and well-being. Students should do this part individually. They can research with use of textbooks or print books from the Library or with the use of internet. Students should take notes on their own or you can give them the research worksheet to help get them started.

Procedure

1. Take students outside to the tree garden or outdoor learning center/classroom. Break the students into small groups and give each group a piece of poster board or several pieces of paper that can form a booklet and colored pencils or markers.
2. Explain to students that they have now traveled back in time. The school building they see next to or behind them has disappeared – along with the parking lot, cars, and other modern-day materials that you would not find 10,000 years ago. Then, announce to them that they are about to encounter a group of Hunter-gatherers – men, women, and children. The problem is a tragic accident has occurred and the entire society is suffering from amnesia.
3. The students' job is to use their new knowledge on Hunter-gatherer societies and using the outdoor natural environment as their inspiration, create a survival guide for this group of people.
4. Before leaving the outdoor environment, they must develop a plan and put it into a booklet form or on the poster board, teaching this group how to do things that include, but are not limited to:
    - Finding food
    - Making clothing
    - Constructing and maintaining homes
    - Interacting with each other

5. It is important students understand that the group is suffering from total memory loss and so they must explain briefly, but in its entirety, the nature of this prehistoric society so that they may continue to survive.
6. Students can take pictures of items outside to include in their guide to help explain techniques or they may simply draw and illustrate in addition to writing. Remind students that their focus also needs to be on survival in the environment they are in (for example, in Upstate South Carolina, it would be a temperate Deciduous forest) since that is the environment they are living in.

Closure (Reflection)

Ask students to present their survival guides to class. This should also serve as a review of the content for any upcoming formative assessments.

Assessment

Assess the survival guides and include information from the lesson on the next formative assessment. If students create a poster as their survival guide, reference the appendix for a rubric on grading Poster Board assignments.

Adaptations (for students with learning disabilities)

Do an oral assessment for students with limited reading and writing skills or have them work in pairs or small groups for greater success.

Extensions (for gifted students)

1. Have students create a tool that the Hunter-gatherer society would have used and include that as a separate assignment or part of their survival guide
2. Ask students to read each other's survival guides and give peer feedback or react to presentations their peers have done on a blog you have set up as the teacher

Possible connections to other subjects: Art, English, and Science

Hunter-Gatherers Adapt to Environments

Research Worksheet

Name: Date:

Questions to get you started in your research… Put your answers in paragraph style below:

1. How did early humans interact with their environment?
    - Think about how they got food, shelter, how they lived
2. Why did Hunter-gatherers move often?
3. What were some of the tools created by early humans?
4. How did early humans use fire?
5. What kinds of culture did early humans create?
    - Think about religion, art, and language
6. What were the main elements of prehistoric culture (summation)?

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SOCIAL STUDIES

7th Grade

"Population Explosion"

UNIT: Contemporary Cultures
Unit Essential Question: How are our current civilizations experiencing significant change?

LESSON: Population Growth
Lesson Essential Question: How is worldwide population growth affecting the natural environment?

STANDARDS ADDRESSED
National Standards for Social Studies Teachers

Thematic Standards: Culture and Cultural Diversity
Learner Expectations: "Human beings, learn, modify, and adapt to their cultures. Their culture helps them comprehend and make sense of themselves as individuals and members of various groups. Cultures predispose individuals to develop perspectives, make assumptions, create ideas, and behave in particular ways. Cultures are similar in how they influence individuals but they differ in the specifics of their influence. All cultures have systems of knowledge, values, traditions, and beliefs; yet the specifics of each may vary widely. Each cultural system is also unique. Cultures and systems within cultures are dynamic, ever-changing, and highly influential on the thoughts and actions of those who belong to them."

Thematic Standards: Time, Continuity, and Change
Learner Expectations: "The study of time, continuity, and change and how historians study the
past allows learners to understand their historical roots and to locate themselves in time. Learning how to read and reconstruct the past allows them to develop a historical perspective and to answer questions such as: Who am I? What happened in the past? How can I make my understanding of the past more accurate? How has the world changed and how might it change in the future?

South Carolina

Standard 7-6: The student will demonstrate an understanding of the significant political, economic, geographic, scientific, technological, and cultural changes as well as the advancements that have taken place throughout the world from the fall of the Berlin Wall in 1989 to the present day.

Indicator 7-6.6 Summarize the dangers to the natural environment that are posed by population growth, urbanization, and industrialization, including global influences on the environment and the efforts by citizens and governments to protect the natural environment.

Guiding Questions

1. How has the increase in population growth affected the natural environment?
2. What are solutions to the issue of population growth?
3. How is population growth an effect of increased urbanization and industrialization?

Background Information

In the year 2000, some crowded cities had over 10 million inhabitants and our planet had approximately 6 billion people living on it. Many people predict that by the year 2050, the world population will reach 9 billion. The number of people on Earth, where they live and how they live, will have a tremendous impact on the environment. In this lesson students will investigate the problems that are associated with high population growth rates. Students will also explore what people are doing to cope with overpopulation.

Lesson Objective(s)

The student will be able to:

- Describe the impact of population growth on the environment.
- Describe how cities affect their surrounding environment.
- Explain how cities are handling growth and its resulting effect on the quality of life.

Materials/Resources

- Internet connection
- World map
- From U.S. Census Bureau: U.S. and World Population Clocks —POPClocks
- From the Earthday Network: Ecological Footprint Quiz
- CIAWorld FactbookWebsite at www.cia.gov/cia/publications/factbook/geos/ke.html

Activating Strategy/Preparation

Take students to the outdoor classroom/tree garden asking them to bring along a notebook to journal in. Once outside, explain to the students that you are beginning a lesson that will examine population growth issues. To kick off, you are going to give them ten minutes outside to use the natural surroundings around them as an inspiration to free-write about the following question: "What impact do you think human population has on the environment and the availability of natural resources?"

Procedure

1. Once students have completed their free-write, ask if anyone would like to share a few sentences. See if at least three or four students will share their work.
2. Next, conduct a Socratic Seminar on the topic, probing students with questions such as:
    - What would happen if everyone in the world had a lifestyle similar to that of the students in the class?
    - How do you think the United States compares to other countries when it comes to population growth and its effects?
    - What are possible solutions to some of the challenges we face?
3. Either on day two (depending on how successful the seminar went and how long the discussion took) or, once back inside, explain to students that they are going to take a quiz. This quiz will not be graded but it will be one in which they assess their "footprint"

on the planet. This would be a good time to explain what that means to students who do not already know. Using the Ecological Footprint Quiz provided by the Earthday Network, have a student volunteer answers where the whole class can see the questions and watch for the results projected on a Board. Or, in a computer lab setting with laptops for students, have each take the quiz individually.

4. Once complete, hold another discussion and revisit the question from the Socratic Seminar: "What would happen if everyone in the world had a lifestyle similar to that of the students in the class?"
5. Follow with more probing questions, such as:
    - How do humans impact the environment?
    - Do you think the United States impacts the environment more or less than other countries?
6. Use a projection device to show students the World Population and the U.S. Population clocks that are available from the U.S. Census Bureau. Continue to facilitate a discussion.
7. Finally, introduce students to their culminating activity: Break students into small groups and assign each group a country to research and develop a population presentation on. A great resource for them to use is the CIA World Factbook online. Each group should record the following information about their assigned country:
    - Climate
    - Terrain
    - Natural Resources
    - Land Use
    - Irrigated Land
    - Environment: Current Issues
    - Population Growth/Population Pyramid
    - Major Infectious Diseases

    Each group should carefully examine the data, look for connections to population issues, and speculate how an increasing population could impact the country. Countries to consider studying: Kenya, India, Greece, Nepal, United States
    *Finally, a significant piece to their project should be an original idea the group comes up with as a solution to one of the challenges the country faces due to population growth
8. Once students have completed their research project, ask them to present in class.

Closure (Reflection)

Ask students to partner up and discuss what they have learned and then reflect in an exit slip or in an essay portion of the unit's formative assessment.

Assessment

Assess the research projects as a major grade. You can also check for deep understanding of the concepts by assigning students to write an essay on the following topic:

> Explain the relationships between Earth's natural resources, its systems, and its human population. What are some demographic trends that are likely to have an impact on the environment?

Adaptations (for students with learning disabilities)

Do an oral assessment for students with limited reading and writing skills or have them work in pairs or small groups for greater success.

Extensions (for gifted students)

Ask students to interview someone from the local Extension Service office and find out the average amount of land it takes for various species to survive (e.g., human beings, cattle, horses, goats). Ask students to use the data to make comparisons and projections about land use in the future.

Possible connections to other subjects: Art, English, Math, and Science

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SOCIAL STUDIES

8th Grade

"Plantations of the South"

UNIT: South Carolina History
Unit Essential Question: How was the structure of the economy in antebellum South Carolina?

LESSON: Plantation Systems
Lesson Essential Question: How were plantation systems set up in the 18th and 19th centuries and how did they support the South Carolina economy?

STANDARDS ADDRESSED
National Standards for Social Studies Teachers

Thematic Standards: Culture and Cultural Diversity
Learner Expectations: "Human beings, learn, modify, and adapt to their cultures. Their culture helps them comprehend and make sense of themselves as individuals and members of various groups. Cultures predispose individuals to develop perspectives, make assumptions, create ideas, and behave in particular ways. Cultures are similar in how they influence individuals but they differ in the specifics of their influence. All cultures have systems of knowledge, values, traditions, and beliefs; yet the specifics of each may vary widely. Each cultural system is also unique. Cultures and systems within cultures are dynamic, ever-changing, and highly influential on the thoughts and actions of those who belong to them."

Thematic Standards: Time, Continuity, and Change
Learner Expectations: "The study of time, continuity, and change and how historians study the
past allows learners to understand their historical roots and to locate themselves in time. Learning how to read and reconstruct the past allows them to develop a historical perspective and to answer questions such as: Who am I? What happened in the past? How can I make my understanding of the past more accurate? How has the world changed and how might it change in the future?

South Carolina

Standard 8-4: The student will demonstrate an understanding of the multiple events that led to the Civil War.

Indicator 8-4.1 Explain the importance of agriculture in antebellum South Carolina, including the plantation system and the impact of the cotton gin on all social classes.

Guiding Questions

1. How did the system of agriculture work in the 18th and 19th centuries in the South?
2. What are characteristics of plantation systems?
3. What are the steps to rice cultivation?

4. What do historic plantation sites tell us about colonial life in that era?

Background Information

The introduction and successful cultivation of rice was the most significant development in colonial South Carolina. South Carolina rice commanded an excellent price and was exported in great quantities by the 1730s. From the 1750s to the late 19th century, South Carolina was the nation's leading rice producer. Rice cultivation, which required intensive labor, provided the basis for a flourishing slave-worked plantation economy. Although the production of cotton eventually surpassed that of rice in South Carolina in the first half of the 19th century, rice culture had a significant impact on the landscape, economy, and society up to the Civil War.

Textbooks tend to examine this period in connection with the rise of cotton culture. It is important, however, for students to understand that before "cotton was king," the plantation system had already been producing crops such as rice, indigo, and tobacco.

Lesson Objective(s)

The student will be able to:

1. Describe the complexity of large-scale, slave-worked agricultural enterprises.
2. Examine the origins of rice production and the role it played in the economy of the antebellum South.
3. Explain the steps involved in rice cultivation.
4. Analyze historic plantation sites for what they tell us about daily life in a particular era.
5. Discover the relationship of the economic and cultural origins of their own community.

Materials/Resources

- Hand shovels (optional)
- Reading passage ("Rice Cultivation in Georgetown County") with questions, provided

Activating Strategy/Preparation

Take students outside to get a feel for the natural environment typical in the South. They are in this environment all of the time but have them sit, take 4-5 minutes, look around, and really notice their environment – feel the temperature, the humidity, observe the trees and natural vegetation. Ask them to imagine what it must have been like to live in the colonial South.

Procedure

DAY ONE

1. Pass out the reading passage and ask everyone to be silent for at least ten minutes while everyone reads the passage. Once everyone is done reading, ask students to pair up and answer the questions.
2. Using the questions as a guide, conduct a discussion centered on rice cultivation on plantation systems in the south. Be sure to get students' reactions on their own thoughts of what it was like at the time.
3. Finally, before the end of the class period, pass out hand shovels or have the students use their hands, find a bare spot of native soil in the garden, and ask students to take a few minutes to try and dig at least a 2-3 inch hole where a seed could be planted.

DAY TWO

4. On the second day, remind students of what they learned yesterday – review the discussion about the article, their feelings of being outside, and what is was like to dig in native South Carolina soil.
5. Next, introduce the interview activity. Divide the students into groups of three. Ask one member of each group to pretend to be a newspaper reporter from a northern city who has come to interview people living on a plantation in antebellum South Carolina. The other two students should pretend to be children their own age living on the plantation--either a child of the owner or of a slave. The reporter interviews the two about their daily lives and records their responses.
6. Finally, hold a class discussion to see if the students came up with similar kinds of details.

Closure (Reflection)

Ask students to reflect on what they learned and brainstorm how the plantation system was reflective of life in the colonial era at the time.

Assessment

Assess the interview as a formal writing assignment and include information learned in the next formative assessment.

Adaptations (for students with learning disabilities)

Do an oral assessment for students with limited reading and writing skills or have them work in pairs or small groups for greater success.

Extensions (for gifted students)

Researching Your Community's Economic Origins

Have the students work in groups to research the economic base of their own community when it was established. Was the economy based on a single agricultural product? An early industry? In short, why did people settle in the region? In most communities, local historians have put together pamphlets or books describing the genesis of the town or city. State histories can also be useful. Newspapers often put out anniversary issues that tell much about the early history of a town or region. Local and state libraries and archives also contain useful sources. Finally have them consider what the economic base of their community is today and explain how and why it has changed or stayed the same. Groups could present their research in short written or oral reports or create displays to share with the rest of the class.

Possible connections to other subjects: English, Science

Reading Passage: Rice Cultivation in Georgetown County

(Several words used to describe rice cultivation may be unfamiliar. Use a dictionary to look up words that you cannot define from their context.)

The intricate steps involved in planting, cultivating, harvesting, and preparing rice required an immense labor force. Planters stated that African slaves were particularly suited to provide that labor force for two reasons: 1) rice was grown in some areas of Africa and there was evidence that some slaves were familiar with the methods of cultivation practiced there, and 2) it was thought that the slaves, by virtue of their racial characteristics, were better able than white laborers to withstand the extreme heat and humidity of the tidal swamps and therefore would be more productive workers. Rice cultivation resulted in a dramatic increase in the numbers of slaves owned by South Carolinians before the American Revolution. In 1680, four-fifths of South Carolina's population was white. However, black slaves outnumbered white residents two to one in 1720, and by 1740, slaves constituted nearly 90% of the population. Much of the growing slave population came from the West Coast of Africa, a region that had gained notoriety by exporting its large rice surpluses.

While there is no consensus on how rice first reached the American coast, there is much debate over the contribution of African-born slaves to its successful cultivation. New research demonstrates that the European planters lacked prior knowledge of rice farming, while uncovering the long history of skilled rice cultivation in West Africa. Furthermore, Islamic, Portuguese, and Dutch traders all encountered and documented extensive rice cultivation in Africa before South Carolina was even settled. At first rice was treated like other crops, it was planted in fields and watered by rains. By the mid-18th century, planters used inland swamps to grow rice by accumulating water in a reservoir, then releasing the stored water as needed during the growing season for weeding and watering. Similarly, prior records detail Africans controlling springs and run off with earthen embankments for the same purposes of weeding and watering. Soon after this method emerged, a second evolution occurred, this time to tidewater production, a technique that had already been perfected by West African farmers. Instead of depending upon a reservoir of water, this technique required skilled manipulation of tidal flows and saline-freshwater interactions to attain high levels of productivity in the floodplains of rivers and streams. Changing from inland swamp cultivation to tidal production created higher expectations from plantation owners. Slaves became responsible for five acres of rice, three more than had been possible previously. Because of this new evidence coming to light, some historians contend that African-born slaves provided critical expertise in the cultivation of rice in South Carolina. The detailed and extensive rice cultivating systems increased demand for slave imports in South Carolina, doubling the slave population between 1750 and 1770. These slaves faced long days of backbreaking work and difficult tasks.

A slave's daily work on an antebellum rice plantation was divided into tasks. Each field hand was given a task--usually nine or ten hours' hard work--or a fraction of a task to complete each day according to his or her ability. The tasks were assigned by the driver, a slave appointed to supervise the daily work of the field hands. The driver held the most important position in the slave hierarchy on the rice plantation. His job was second only to the overseer in terms of responsibility.

The driver's job was particularly important because each step of the planting, growing, and harvesting process was crucial to the success or failure of the year's crop. In the spring, the land

was harrowed and plowed in preparation for planting. Around the first of April rice seed was sown by hand using a small hoe. The first flooding of the field, the *sprout flow*, barely covered the seed and lasted only until the grain sprouted. The water was then drained to keep the delicate sprout from floating away, and the rice was allowed to grow for approximately three weeks. Around the first of May any grass growing among the sprouts was weeded by hoe and the field was flooded by the *point flow* to cover just the tops of the plants. After a few days the water was gradually drained until it half covered the plants. It remained at this level--the *long flow*--until the rice was strong enough to stand. More weeding followed and then the water was slowly drained completely off the field. The ground around the plants was hoed to encourage the growth and extension of the roots. After about three weeks, the field was hoed and weeded again, at which time--around mid-June or the first of July--the *lay-by flow* was added and gradually increased until the plants were completely submerged. This flow was kept on the field for about two months with fresh water periodically introduced and stagnant water run off by the tidal flow through small floodgates called trunks.

Rice planted in the first week of April was usually ready for harvesting by the first week of September. After the lay-by flow was withdrawn, just before the grain was fully ripe, the rice was cut with large sickles known as rice hooks and laid on the ground on the stubble. After it had dried overnight, the cut rice was tied into sheaves and taken by flatboat to the threshing yard. In the colonial period, threshing was most often done by beating the stalks with flails. This process was simple but time consuming. If the rice was to be sold rough, it was then shipped to the agent; otherwise, it was husked and cleaned--again, usually by hand. By the mid-19th century most of the larger plantations operated pounding and/or threshing mills which were driven by steam engines. After the rice had been prepared, it was packed in barrels, or tierces, and shipped to the market at Georgetown or Charleston. In 1850 a rice plantation in the Georgetown County area produced an average yield of 300,000 pounds of rice. The yield had increased to 500,000 pounds by 1860.

Questions for Reading

1. Why did planters believe that slaves were particularly suited to rice cultivation? How was that belief reflected in the population statistics of South Carolina in the first half of the 18th century?
2. What is the evidence that slaves' contributed knowledge as well as manual labor to the cultivation of rice? Do you think most planters probably did, or did not know, that the slaves had already conceived many of these agricultural "advances"? Do you think that planters who knew this would have more or less respect for the slaves? Would they be more or less likely to support slavery? Why or why not?
3. What role did a "driver" play on a rice plantation and why was that role important?
4. What are the steps involved in rice cultivation, beginning with the preparation of the fields through the packing of rice in barrels for shipment to market?

Reading 1 was compiled from J. Tracy Power and Sherry Piland, "Georgetown County Rice Culture, c. 1750-c. 1910" (Georgetown County, South Carolina) National Register of Historic Places Multiple Property Documentation Form, Washington, D.C.: U.S. Department of the Interior, National Park Service, 1987; and Judith Carney, "Rice, Slaves, and Landscapes of Cultural Memory," Places of Cultural Memory: African Reflections on the American Landscape, *Washington, D.C.: U.S. Department of the Interior, National Park Service, 2001.*

All About Trees

The following pages contain specific lesson plans which support TreesGreenville's emphasis: tree planting and conservation. These lessons do not necessarily support state and national standards and so those components are not included in any of the following lessons.

These lessons, however, are specific to middle grades and they do include:

- Background information
- Objectives
- Materials
- Procedures
- Assessment
- Ideas for adaptation (for students with learning disabilities)
- Ideas for extension (for gifted students)

Just as those lessons provided for core content areas, these lessons are intended to assist and encourage teachers to use any outdoor space they have on school grounds in the goal to support classroom learning.

"*Leaf Collection*"

Background Information

This activity should be done in the fall. The reasoning behind that is:

- First, the leaves are nearly ready to fall from the trees and, therefore, will not adversely affect the tree's photosynthetic production.
- Second, the leaves tend to be drier in the fall and will not be as likely to mold in the binders.

The first and last class periods may be inside or outside, however the remainder of the work will be done outside.

Lesson Objective(s)

The student will be able to:

1. Increase their observation and inquiry skills assessing the world around them.
2. Recognize and identify trees commonly found in their neighborhoods and in the forests of South Carolina (or their home state).
3. Become familiar and confident in their abilities to use identification techniques and resources.

Materials/Resources

- Various tree identification field guides
- Dichotomous key for common trees in South Carolina (or home state)
- Three-ring binder or other similar storage medium
- Handouts, provided (Leaf Collection Requirements, Leaf Collection Grade Sheet, and Leaf Collection Appearance Rubric)

Procedure

*This lesson can be used as a stand-alone activity or in coordination with a unit on trees, forest ecosystems, or even the history of the state.

1. Students are briefly introduced to the process of identifying trees by leaf type (simple or compound), leaf arrangement (alternate or opposite), and leaf shape (margin, entire, toothed, lobed).
2. Students will then compile a collection of leaves from 12 to 15 species of trees common to South Carolina (or their home state).
3. Students are given handouts that cover leaf collection requirements, the leaf collection grade sheet and table, and the leaf collection appearance rubric. These leaves are displayed in a binder or similar package.
4. Only one tree should be represented on each page. More than a single page may be used for a given species. The common name, scientific name, and leaf type (simple or compound) must be supplied for each tree exhibited.

5. Student leaf collections will be shared with the class on the final day of the project. Students will vote (by private ballot) for awards to be given to the best collections in previously identified areas such as most creative display, best organized, or others that can be identified by the students on the first day of the project.

Assessment

Students receive points based on the accuracy of identification, leaf arrangement, scientific name, and neatness/organization. Examples of previous collections could be made available after the first year of implementing this project.

Twelve different tree species must be represented to be able to earn full credit. The extra three species can be used as extra credit.

Adaptations (for students with learning disabilities)

To help students who may seem overwhelmed by finding leaves on their own, this activity could also be done by providing a list of trees common to your area and instructing students to collect only specimens from those species. Students can also work with a partner to help stay on track or to keep from being overwhelmed doing the project alone.

Extensions (for gifted students)

One extension of this activity could include examining leaf structure for stoma or pigments. A second extension could involve drawings of the leaves and the trees on which they are found as an art activity.

Possible connections to subjects: Art, English, Science

Leaf Collection Requirements

1. Collect at least twelve species - one species per page. At least one entire leaf should be used, but at times you may wish to use as many as three or four per page.

2. On each page include all of the following in this order:
   A. Common name B. Scientific name C. Simple or compound leaves
   An example: A. Red Maple B. Acer rubrum C. Simple leaf

3. **All tree species must be native to South Carolina.** Ornamental leaves, species of shrubs and fruit trees should be avoided.

4. Broad leaf trees should be used, do not use "pine" (coniferous) trees.

5. Up to three "extra credit" leaves may be used. These leaves should be placed at the end of your collection. The same information must be supplied for these leaves as for those required. The first 12 leaves will be graded as required.

Suggestions

1. Make your collection as neat and attractive as possible.

2. A photo album may be used to hold your collection.

3. Pick leaves of "common" trees.

Grading

This project is worth 100 points. Grades will be determined as follows:

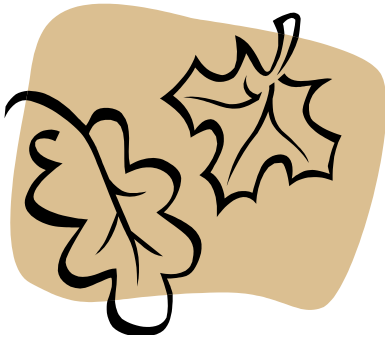
1. 24 points for the correct identification of common names. (2 points per leaf)

2. 48 points for the correct information for your answers to B and C from above (2 points for the scientific name and 2 points for the leaf type).

3. 20 points for the general appearance of your collection.

4. The grading sheet **must** be included as the first page in your collection. (8 points)

5. Each extra credit leaf will be worth 1/2 as much as each required leaf. (A total of 3 points per leaf.)



Name:
Period:
Date:

LEAF COLLECTION GRADE SHEET

Common Name Scientific Name	/24
Leaf Type Appearance	/48
Appearance of Collection	/20
Grade Sheet	/8
Extra Credit	/0
Total Points	/100

You must complete the chart on the bottom of this sheet. A check will be placed in the appropriate location if points were missed for that leaf. This form **MUST** be placed in your collection.

Common Name	Scientific Name	Simple or Compound Leaves
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
EC 1		
EC 2		
EC 3		

LEAF COLLECTION

Appearance Rubric

By reading below and following these guidelines, you can assure yourself the full 20 points given for the appearance of your leaf collection:

20 points Leaves are neatly displayed and are flat on the page. All leaves are whole with no pieces missing. Labels are written neatly or typed clearly and the entire collection is arranged in a neat and creative manner.

17 points Leaves are neatly displayed and with most flat on the page. Most leaves are whole with few pieces missing. Labels are written neatly or typed clearly and the entire collection is organized well.

14 points Leaves are somewhat neatly displayed, only some are flat on page. Some leaves have pieces missing. Not all labels are written neatly or typed clearly. There is effort toward organization and creativity but it is not consistent.

11 points Leaves are not neatly displayed. Most are not flat on the page. Most leaves are torn and have pieces missing. Collection mostly lacks organization and creativity.

8 points Leaves are not neatly displayed. No leaves are flat on the page. All leaves are torn and have pieces missing. Collection lacks effort, organization, and creativity.

Effectively Using the Outdoor Classroom

Middle School Curriculum for Interdisciplinary Studies

"Thinking Like a Scientist"

Background Information

What makes scientists different from other people? It is the way they look at the world. Scientists observe the world around them. Then they ask questions about what they see. Why do things happen? How do they happen? Scientists use a systematic method to find answers to their questions. In this lesson, students will use the outdoor classroom setting to do the same.

In small groups, students will use a digital camera to record visual observations, helping to teach students to make very careful observations and to ask careful questions. Teaching them to observe in this very careful and systematic manner will help them in the future as they identify trees, plants, and animals and proceed with this skill in many of their subject areas.

Depending on students' or the class's prior experiences, you may want to set aside time prior to this lesson to:

- demonstrate how to use the digital camera
- demonstrate how to upload photos from the camera to the computer
- demonstrate how to use the photos in a software program (such as inserting them into a presentation

Lesson Objective(s)

The student will be able to:

1. Develop an understanding of science and what scientists do.
2. Begin to look at the world as a scientist (i.e. Scientists question what they see).
3. Practice making careful observations using a variety of senses, noticing how careful observations can lead to good scientific questions.
4. Begin to gain an interest in the South Carolina environment and forests and a general awareness of the importance of forests and trees

Materials/Resources

- Set of digital cameras (at least one camera per every group)
- Clipboard / notepaper for each student
- Assorted resources (either print or online) to assist in tree, leaf, plant, and/or animal identification, depending on what students choose to observe.

Procedure

**(This would be a great lesson to utilize parent volunteers and/or interns/ student teachers.)*

1.Let students know that today you are going to be going outside to look at the world as a scientist does.

2. Take students to the outdoor classroom and group students equally so that each group has a camera to share.

3. Provide each student with a clipboard and a sheet upon which to record observations when outside. Remind students to make observations using all senses (except taste in most cases) and to be very specific. Remind them that it is very important that they are detailed with touch, smell, and sound observations, as they will not be able to use the pictures to help with these types of observations.

4. Instruct each student to find something specific and natural (i.e. not a piece of litter) in the outdoor area of which to observe and photograph. Students should choose something interesting to them. Examples can include leaves, branches with leaves, tree bark, plants, something on the forest floor, wildlife, etc. (Students can all be making observations concurrently, and they can pass the camera around the group)

5. Students should take five to seven close-up photographs of their specific item, using different angles and various zooms.

6. Once all kids in a group are done photographing, and once the first kid is done with photographing and outdoor observations, he/she should be able to take the camera in to upload his/her photos to the computer. If this is not possible, students can find other things in the forest to observe closely without photographs, or they can ask more questions about the observations they've already made.

7. Once inside, have students upload photos to the computer. As a group, or individually, ask students to create a presentation (using Microsoft PowerPoint, Prezi, or other tool) about their selected item, their observations, and questions from their observations.

8. For example, have students select and type in a title for their observation photos along with their name. Next, with their photos (adding text boxes or using a format where they can type in text), have them type at least 10 detailed observations about what they photographed. Remind them to remember to use all of their senses and notes from their field observations. Next, have them type at least one question (more than a one word answer) that comes to mind when looking at their object (for example, if they took a picture of a big leaf toward the bottom of a tree: Why are leaves on a tree bigger at the bottom than at the top?). Have them think of a possible explanation and write it in complete sentences on the slide/page/etc.

9. When students are completely done and have proofread their work, have them turn in their presentation and/or present in class.

Assessment

Students can share their finished products with the class through a projector. There is no need to print all of these projects, as it would be cost-prohibitive with the color ink. An alternate way to share would be to post the projects on a teacher or class web page or blog.

Projects can be evaluated using a simple rubric, such as:
(10) Clever Title
(50) At least ten detailed observations using a variety of senses
(20) Strong question / wondering derived from observations
(20) Possible explanation / hypothesis to question / wondering (written in complete sentences)

Adaptations (for students with learning disabilities)

Students can also work with a partner to help stay on track or to keep from being overwhelmed doing the project alone.

Extensions (for gifted students)

This activity could be used to introduce any activity in a subject class where the skill of inquiry is a necessity. Therefore, an extension could be the next subject-related lesson. For example, in an English class where there needs to be a skill of inquiry of asking probing questions related to a novel, the theme, the author's intent, etc. – this could be a perfect introduction to get students into that mindset.

Possible connections to subjects: Art, English, Math, Science, Social Studies

"The Doctor is in: A Tree Assessment"

Background Information

Tell students: "You have learned that all living organisms need certain conditions in order to survive. But not all living things prefer the same conditions in order to thrive. You will identify five trees, investigate the conditions that those trees need, and study those particular trees to see if their preferred conditions are being met."

Lesson Objective(s)

The student will be able to:

1. Use a dichotomous chart to identify five trees.
2. Identify the environment in which each tree is growing, the climate for their area, and conditions needed for success for their five trees.
3. Analyze information to decide if the trees are placed appropriately.
4. Write an analytical summary for each tree related to their findings

Materials/Resources

- Dichotomous tree identification charts or field guides for identification
- Internet access or data for local climate and tree information
- Table to record information

Procedure

1. Take students to the outdoor classroom/tree garden. Using a dichotomous chart (or field guide), have students identify three different trees, trying to identify trees from a variety of growing conditions. Students note the growing conditions of each tree on a chart, with respect to:
   a. location (city park, city street, park, backyard, along stream, orchard, etc.)
   b. water supply (precipitation only, irrigation, nearby body of water, surrounded by concrete)
   c. purpose (supply shade, supply food, aesthetic)
   d. special problems (insects, dying, lots of traffic, behind first base, lawn mower chips at base, etc.)
2. For homework, and in order to assess a variety of trees in different environments, students should additionally identify two trees at home (in their neighborhood, in a nearby location, etc.) to give them a total of five trees for their study. For these two trees, they should also note the same conditions as they did for the ones at the outdoor classroom.
3. Students use the Internet (or library sources) to identify the climate for the area (maximum and minimum temperatures, annual precipitation), for example, using United States Climate Page or World Climate. Then they look up and record the preferred growing conditions for their five trees, using the Internet or print material.

4. For each tree, students analyze whether their five trees are placed appropriately. In a paragraph for each tree, students should review the environment in which the tree is found, the preferred environment for the tree, whether those preferred conditions are met, and how any unfavorable conditions could be remedied.
5. A class discussion can then be had on why certain trees may have planted where they were, what solutions can be for any challenges they found, and the advantage of native tree populations.

Assessment

Collect student work and check for accuracy and consistency. Have students discuss their findings in class. Possibly have students turn their findings into a presentation or post them on a blog.

Adaptations (for students with learning disabilities)

Students can also work with a partner to help stay on track or to keep from being overwhelmed doing the project alone.

Extensions (for gifted students)

1. Assign the students the position of community arborist with the task of deciding what trees should be planted in particular environments.
2. Collect the information and compile it in a binder describing trees that are appropriate for local environments.
3. Write to the community arborist about trees the students have identified that are not in their preferred conditions.

Possible connections to subjects: Art, English, Math, Science, Social Studies

Appendices

APPENDIX A

Flyer or Poster Rubric

	Exceeds Expectations	Meets Expectations	Does Not Meet Expectations	Score
Points Earned	**3**	**2**	**1 or 0**	**/30**
Colors and Patterns	Enhance readability	Support readability	Detract from readability	
Layout	Creatively enhances information	Balanced, uncluttered, adequate white space	unbalanced, cluttered, insufficient white space	
Graphics/ Photos	All graphics are engaging, enhance text	Graphics enhance text	Graphics do not enhance text	
Titles And Subtitles	All titles and subtitles are clear, readable	Most titles and subtitles are clear, readable	Few or no titles or subtitles to clarify text	
Text Size And Color	All text is clear and readable; size and color enhance understanding	Text is clear; changes in size and color enhance understanding	Some text is clear; frequent changes do not enhance understanding	
Writing	Well written and organized, clear, easy to follow	Adequately written and organized, reasonably easy to follow	Poorly written and organized, unclear, hard to follow	
Quality of Information	The content description is clear, complete, concise	Content description is mostly clear, could be more concise	Content description is not clear, incomplete, not concise	
Grammar and Spelling	No grammar or spelling errors	One grammar or spelling error	Many grammar and spelling errors	
References	Listed in proper format	Listed with no format	Not listed	
Name	Name on project on back	Name on project on front	No name on project	

Additional Comments: **Total Points: ____/30**

APPENDIX B

Photographic Presentation Rubric

CRITERIA	0 poor	1 moderate	2 good	3 excellent
TECHNICAL QUALITIES	Poorly executed, little regard for print quality	Technique may be erratic with little sense of challenge	Most technical aspects are successful; materials generally well handled	Excellent print quality; well-executed
COMPOSITION & LAYOUT	Composition is poor, little consideration – little to no regard for layout	In contrast to work that receives a score of 1, there is at least some sense of decision making and purpose	Composition/Presentation is generally with purpose	Excellent. Composition is purposeful
CONTENT	Subject material tends to be trite/unoriginal/unimaginative	Shows a sense of effort and some decision making in the subject of the photograph	The level of work may be somewhat inconsistent, but the work is strong enough to offset it's weaknesses and it has aspects of creativity and originality in content	Shows a sense of inventiveness or imagination, a sense of style or engagement with the subject of the photos
COMMUNICATIVE PROPERTIES	There is little, if any, evidence of thinking and communicating the photographer's subject material with his/her audience	Work shows a real sense of effort, but problems with fully communicating themes and subject are not successfully resolved	There is successful engagement with some aspects of project with audience – the theme, thoughts, and subject of the photographer is relatively clear	Shows obvious evidence of thinking, it may address fairly complex visual or conceptual ideas, the image/theme is presented in an effective way to communicate

Additional Comments: **Total Points: ____x5 =____/60 pts**

APPENDIX C

Rubric for Writing a Persuasive Letter

CATEGORY	5 Points	4 Points	3 Points	2 Point
Audience	In addition to 3 - Anticipates reader's questions and provides thorough answers appropriate for that audience.	Demonstrates a general understanding of the potential reader and uses vocabulary and arguments appropriate for that audience.	Demonstrates some understanding of the potential reader and uses arguments appropriate for that audience.	It is not clear who the author is writing for.
Goal or Thesis Statement	The goal or thesis provides a clear and strong statement of the author's position on the topic.	The goal or thesis provides a clear statement of the author's position on the topic.	A goal or thesis is present, but does not make the author's position clear.	There is no goal or thesis.
Reasons Supporting Goal or Thesis Statement	In addition to 3 - The writer anticipates the reader's concerns, biases or arguments. and has provided at least 1 counter-argument.	Includes 3 or more reasons (facts, statistics, examples, real-life experiences) that support the goal or thesis statement.	Includes 2 reasons (facts, statistics, examples, real-life experiences) that support the goal or thesis statement.	Includes 1 or fewer reasons (facts, statistics, examples, real-life experiences).
Facts and Examples	All of the facts and examples are specific and relevant, and explanations are given that show how each piece of evidence supports the author's position.	Most of the facts and examples are specific and relevant, and explanations are given that show how each piece of evidence supports the author's position.	At least one of the facts and examples is relevant and has an explanation that shows how that piece of evidence supports the author's position.	Facts and examples are not relevant and/or are not explained.
Sequencing	Arguments and support are provided in a logical order that makes it easy and interesting to follow the author	Arguments and support are provided in a fairly logical order that makes it reasonably easy to follow the author	Support details or arguments are not in a logical order, distracting the reader, making the letter seem confusing.	Many details or arguments are not in an expected or logical order, distracting the reader; letter is very confusing.
Letter Format	Complies with all the requirements for a business letter.	Complies with almost all the requirements for a business letter.	Complies with several of the requirements for a business letter.	Complies with fewer than 75% of the requirements for a business letter.

Additional Comments: **Point Total: ____/30 x 3.3 = ____/99 SCORE**

APPENDIX D

Rubric for Presentation

PRESENTATION STYLE

Length of Presentation	Between 5-7 slides *3 points*	More than 7 slides *2 points*	Between 3-4 slides *1 point*	Less than 3 slides *0 points*
Organization & Preparation	Very *3 points*	Mostly *2 points*	Somewhat *1 point*	Not organized *0 points*
Relevance of Information	Very *3 points*	Mostly *2 points*	Somewhat *1 point*	Not relevant *0 points*
Volume & Presence	Loud and Clear *3 points*	Quiet and Clear *2 points*	Loud and unclear *1 point*	Quiet and unclear *0 points*
Creativity & Level of Interest	Very *3 points*	Mostly *2 points*	Somewhat *1 point*	Not *0 points*
Sources	At least 3 sources *3 points*	Only 2 sources *2 points*	Only 1 source *1 point*	No sources listed *0 points*

INFORMATION PROVIDED

Information on topic	Extensive & detailed *3 points*	General information *2 points*	Very little & not focused *1 point*	No information *0 points*
Photos/Graphics	Detailed/Relevant *3 points*	General/Relevant *2 points*	General/unrelated *1 point*	Few-no photos *0 points*
Questions answered	All; *3 points*	Most ; *2 points*	Some; *1 point*	None; *0 points*
Able to answer audience questions	Yes, in detail *3 points*	Yes, in general *2 points*	Somewhat *1 point*	No *0 points*

Additional Comments:

Point Total: ____/30 x 3.3 = ____/99 SCORE
(+1 if student introduces themselves) = _____

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ADDITIONAL RESOURCES

Arbor Day Foundation, "What tree is that?":
http://www.arborday.org/trees/whattree/?TrackingID=908

Project Learning Tree, Secondary Modules: http://www.plt.org/cms/pages/26_29_9.html

SC Forestry Commission, "What tree is this?": http://www.state.sc.us/forest/reftree.htm

TreesGreenville Nonprofit Organization: www.treesgreenville.org