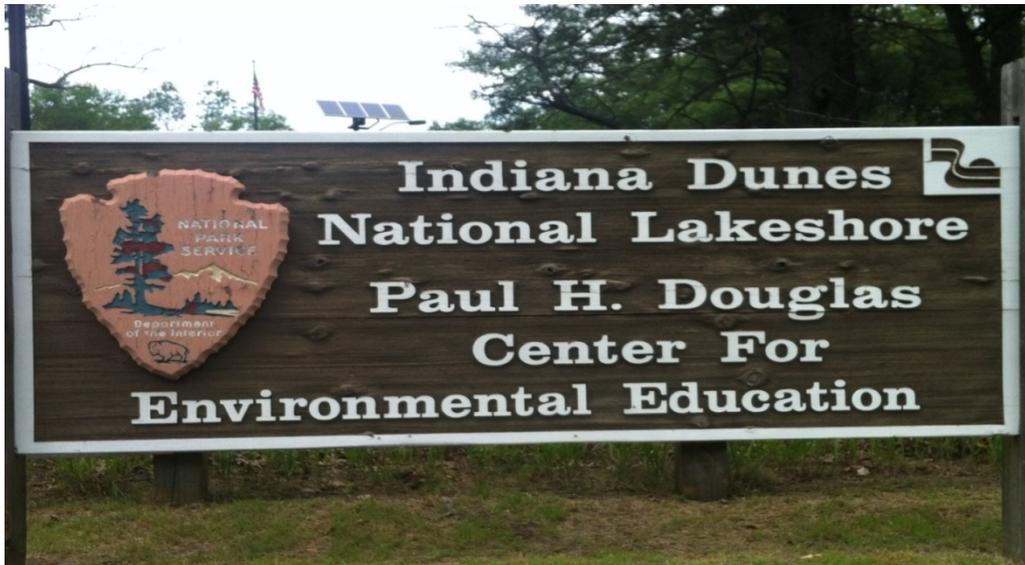


Indiana Dunes Education

National Park Service
U.S. Department of the Interior
Indiana Dunes National
Lakeshore



Paul H. Douglas Environmental Education Center

Address: 100 N Lake Street, Gary, IN 46403

219-395-1821

Latitude: 041.36.22N

Longitude: 087.16.02W

In case of emergency or to report a crime, call 1-800-PARK-TIP.

Environmental Education Center Information

- Open daily, 9 a.m.- 5 p.m. Memorial Day through Labor Day.
- Winter hours, 9 a.m. - 4 p.m. Monday through Saturday (closed Sundays)
- Miller Woods Trail opens daily at 7 a.m. and closes 30 minutes past sunset. Park in the west or gravel parking lot if you plan to be on the trail before the Douglas Center opens or closes. The paved parking lot hours are the same as the Douglas Center.
- Picnic Areas
- Restroom Facilities



MILLER WOODS

Miller woods hiking trails are located next to the Paul H. Douglas Center in the Miller section of Gary IN. There are three interconnecting trails that wind through the beautiful Black Oak Savannah. Trail loop 1 is .16 miles, trail loop 2 is .30 miles, trail loop 3 is .77 miles. In all, the trails reach a length of 1.25 miles. Miller Woods is home to the endangered Karner blue butterfly, and the wild lupine plant that is food for the caterpillar. Please stay on the marked trails and leave everything as you found it so others can have the enjoyment that you had on your visit.

Background/History:

Miller Woods is a trail system in the far western part of the Indiana Dunes National Lakeshore Park, in the lakefront community of Miller Beach, Indiana. Miller Woods is home to the federally endangered Karner Blue butterfly and the federally threatened Pitcher's thistle. Miller Woods is also the only part of the National Lakeshore that also adjoins the Grand Calumet River.

Miller Woods was acquired by US Steel for industrial use, and a number of railroads and spur lines were laid through the area. This had an unintended beneficial impact for the local oak savanna ecology; the sparks thrown off by passing trains maintained the fire cycle that was suppressed in most other parts of the Indiana Dunes during the 20th century. The area was acquired by the National Park Service through an expansion bill passed in 1976. The bill was passed in honor of Senator Paul Douglas, and the Douglas name was applied to the large center that now stands at the entrance to Miller Woods.

Miller Woods Self-Guided Program

Description:

Using simple field equipment, students will take a close look at a natural, outdoor area to find evidence of or actual objects that represent basic ecologic concepts and relationships. These activities allow students to demonstrate understanding of those concepts in both concrete and abstract ways.

Summary: Explore the diverse ecosystem that makes up Miller Woods. Discovering what types of life a fire-dependent oak savannah holds, listening to, and observing the plants and animals that inhabit this fragile wetland area

Objectives:

Students will try to identify up to twelve plant species

Students will understand the difference of native and non-native plants

Students will see how a rare wilderness cohabitates with industry

Students will use their sense of sound as well as sight

Students will use their mind's eye to imagine what type of life is in the woods they cannot see

Setting: Douglas Center/Miller Woods Nature Trail/ Nature Fun Zone (NFZ)

Grade Level: 2-8

Ratio of students to a chaperone: 10-1

Safety issues: Inclement weather, poison ivy, ticks

Subject Areas: Science, language arts, art, social studies, math

Materials:

• Clip boards, pencils, student data sheet, journal, hand lenses, water, trail map, binoculars, hat

• (optional) Digital cameras/Smartphones, bug spray, sunscreen, snacks, sunglasses, first aid kit, compass, watch

Activities for Discovering

Remember that you don't need to be a scientist, naturalist or expert in outdoor skills to take children on a nature hike. Just take a look around:

- If you see an animal, let the children try and figure out how the animal's size or shape or color helps it.
- Challenge the children to use their senses. Look for colors, textures and smells. Take a piece of paper and a crayon and do rubbings on different tree bark. Remember that you cannot remove objects from state or national parks.
- Ask the children if they believe Miller Woods would look the same or different in other seasons
- Observe how things outdoors such as plants, animals, rocks are either same or different. You don't need to be a scientist and know fancy names for things. Just let the children discover how things can be the same or different. The first scientists got started this way, trying to organize the natural world into something they could understand. Let the children discover this for themselves.
- Ask them if they can find places where animals hide or live.
- Try to discover how plants, animals, people and natural resources are all part of one system. What happens to one part of the system can affect the other. Was there a big rain recently or a drought? How were things outdoors affected? Can you find animal tracks on the trail(s)?
- Have the children draw or write about their discoveries in their own journal,

Prerequisite Classroom Activities:

Students will look up the traits of the twelve species of plants they will be asked to identify:

Sassafras- has leaves that are polymorphic (an organism having more than one adult form). Most common are leaves that are single, mitten-shaped, or trilobed, dark green leaves that are spicy in fragrance when rubbed or crushed.

Arrowhead -identified by its rosettes of arrowhead-shaped leaves.

Box Elder-The compound leaves have three to five notched or lobed leaflets, 2 to 4 inches long and 1 to 2 inches wide. They are dark green above and lighter green below.

Switchgrass- is easily identified by a small nest of hair where the blades attach to the sheath

Bracken fern-Bracken fronds are shaped like triangles each frond usually has three leaflets

Pricklypear-has many pads (called cladodes) with tufts of needle-like spines

Poison Ivy-“Leaflets three—let them be!” Characteristics: the leaves alternate, with three leaflets sitting on a long stem. The leaflets are broad and the two lateral (side) leaflets are smaller than the terminal (end or middle) leaf. The plant can cause a severe skin reaction in allergic individuals and should be avoided.

Black Oak-Black oak leaves are alternate, simple, 5 to 9 inches long and have 5 to 7 irregular bristle tipped lobes. The lobes extend $\frac{2}{3}$ to $\frac{7}{8}$ of the way to the midrib of the leaf and have broad U-shaped or circular sinus

Showy Tick Trefoil-The leaves of the Showy Tick Trefoil are split into three leaflets. Leaflets are usually dark green and slender, growing up to three inches long

Indian Grass-Three to four feet in height, bunching prairie grass with blue-green blades and a plume-like golden-brown head

Solomon’s Seal-Widely found flowering plant, the roots of which can be used to make a starchy bread flour

Activities

Have the students learn how to use a compass

Have the students sit in the classroom with their eyes closed and listen to everything around them. Have them write in their journal every noise they heard.

Have students find definitions for vocabulary words

Remind students that they are to take nothing from the park

Vocabulary:

Ecosystem, wetland, species, community, diversity, native, sensory, habitat, Savanna Oak, flora, fauna, poison ivy

Activity #1 Flora Find Grades 2-8

Purpose of activity: Learning to identify common plants in the Miller Woods area.

Description of activity: Children will learn to identify up to twelve different types of plants before coming to the Douglas Center. Every student group will receive a "flora sheet" (handout 1) and a Miller Woods map (handout 2). When they hike on the trails they will be asked to identify as many of the twelve leaves as they can. Grades 2-4 will receive sheets with the name and picture of the leaf, when they spot a leaf on the sheet they will place an "X" through the box. Grades 5-8 will receive sheets with just the picture of the leaves, when they spot a leaf they will write the name of the leaf down and place an "X" through the box. Students will be arranged in groups of 4 or 5. One person will lead the group, 1 person will write down the number of steps the group takes per trail and any interesting sights the group sees, 1 person will hold the clipboard with the flora sheet, 1 person will examine the plant that any of the group discovers for their flora find.

Trial loop 1 is for all groups. It is suggested that grades 2 and 3 use only trail loop 1. This suggestion is left to the teacher to decide if they want to hike the longer trails.

Keep a journal of all the things you have seen.

Trail loop 1: .16 miles



Trail loop 2: .30 miles



Trail loop 3: .77 miles



Setting: Miller Woods

Target age group: 7-14 years

Time allowance: 40-45 minutes.

Materials needed: Flora sheets, clip boards, pencils, Miller Woods map, journal.

Activity #2 Follow-up on Flora Find Grades 2-8

Directions:

1. Involve students in a conversation about the word "sleuth" and what it means. Compare a scientist with an investigator of a crime in that both are asking questions and looking for clues to help them answer those questions. Explain that wildlife biologists and rangers from Indiana Parks and Wildlife Department have a basic knowledge of how nature works and an ability to observe and measure natural phenomena. They ask questions and use clues in nature to help them solve mysteries about wildlife, about the environment and about how wildlife and the environment interact. Based on this knowledge, they also make recommendations for hunting and fishing regulations and for other important environmental issues.
2. Divide the students into investigative groups of from 2 to 4, giving a specific job to each student on the team (data recorder, equipment manager, reporter, etc.). Explain that they will be looking in a specific area outdoors for examples of the items listed on the data sheet. With time constraints, you may reduce the number or assign specific items to each group. Ask students to take a measurement of the objects they find if possible. Give students a specific time and specific boundaries for looking.
3. Discuss what should or should not be taken as a sample (nothing may be taken at state or national parks), stressing any rules or safety concerns (poison ivy, etc.) for the investigation site.
4. In summary, ask student groups to answer the following questions:
 - a. What tools did your group use to examine the habitat to find the listed items? (Did students think of their own eyes and ears as investigative tools? Which tools were most helpful? What other tools would they like to have?)
 - b. How would doing the investigation at a different time of year or a different time of day have made it easier or harder?
 - c. What natural sight or sound did you see or hear today for the first time?

Objectives:

Students will be able to demonstrate they know what they can take and not take out of a national/state park

Students will be able to distinguish the difference among 12 different plant species

Activity #3 Do You Hear What I Hear? Make a Sound Map! Grades 2-8

What You Need:

- Map of Miller Woods
- Clipboard, tablet or something to write on
- Something to write with like a pencil or pen

Directions:

1. Find a comfortable spot to sit outdoors.
2. Mark an "X" on the Miller Woods map. This shows YOU on the map.
3. Close your eyes and listen for at least one minute. Listen for sounds from animals, birds, and other activities.
4. Open your eyes. Keep listening, but now draw pictures or symbols on the map representing all the sounds you hear, and where they are coming from.
5. At the top of your page, write down the date, time, and where you were.

What Did You Discover?

Did you hear something from each direction around you? Could you hear at least 10 different sounds? Could you identify all the sounds you heard? If you did this with a friend, compare your maps!

Stuff to Think About:

- What would happen if you sat somewhere else?
- What would be different at another time of day? Another season?

Objectives:

Students will be able to locate where they are on a map

Students will be able to name a species of animal they hear

Students will be able to classify certain species of animal they hear

Activity #4 Reflective Essay Grades 4-8:

Write an essay that reflects on what you have learned today. What did you experience in your group or individually. Is there anything new that you saw, anything interesting, or something you chose not to share with the other students. Think about what you already knew about nature and what you learned. Were you surprised with anything or was it what you expected? (rubric hand out #4)

Objectives:

Students will be able to compose an essay describing where they have been and what they have seen

Students will be able to assess their thoughts and feelings in an essay

Students will be able to describe what they experienced on their hike

Science

- Identifying plant species
- Identifying all (if any) animals that were spotted
- Do a species survey. How many kinds of mammals, or plants can you find?
- What would happen if you removed or changed a part of this habitat? What would be affected? Animals? Insects? Plants?

Geography

- Where is this wetland area in relation to other wetlands? Do other states have similar ecoregions?
- A wetland surrounded by industry

Follow-up lessons for the classroom

English

Activity #5 Grades 2-8

- Create an adventure story that could take place in this scene.
Character

Setting
Plot

Activity #6 Grades 2-8

- Write a newspaper article about this ecosystem
Who
What
When
Why
How

Activity #7 Grades 4-8

- Create a travel brochure for this ecoregion.
What would people see?
What activities could they enjoy?
Will time of year affect what they see and do?
How will they feel when they get here?

Social Studies

Think about why some habitat areas are developed, some have only parts of the habitat modified, and why some areas are protected.

Math

What shapes can you find in nature—round leaves, triangular leaves, spherical flowers, umbrella trees? What shapes do we trim our bushes into—ovals, rectangles, squares?

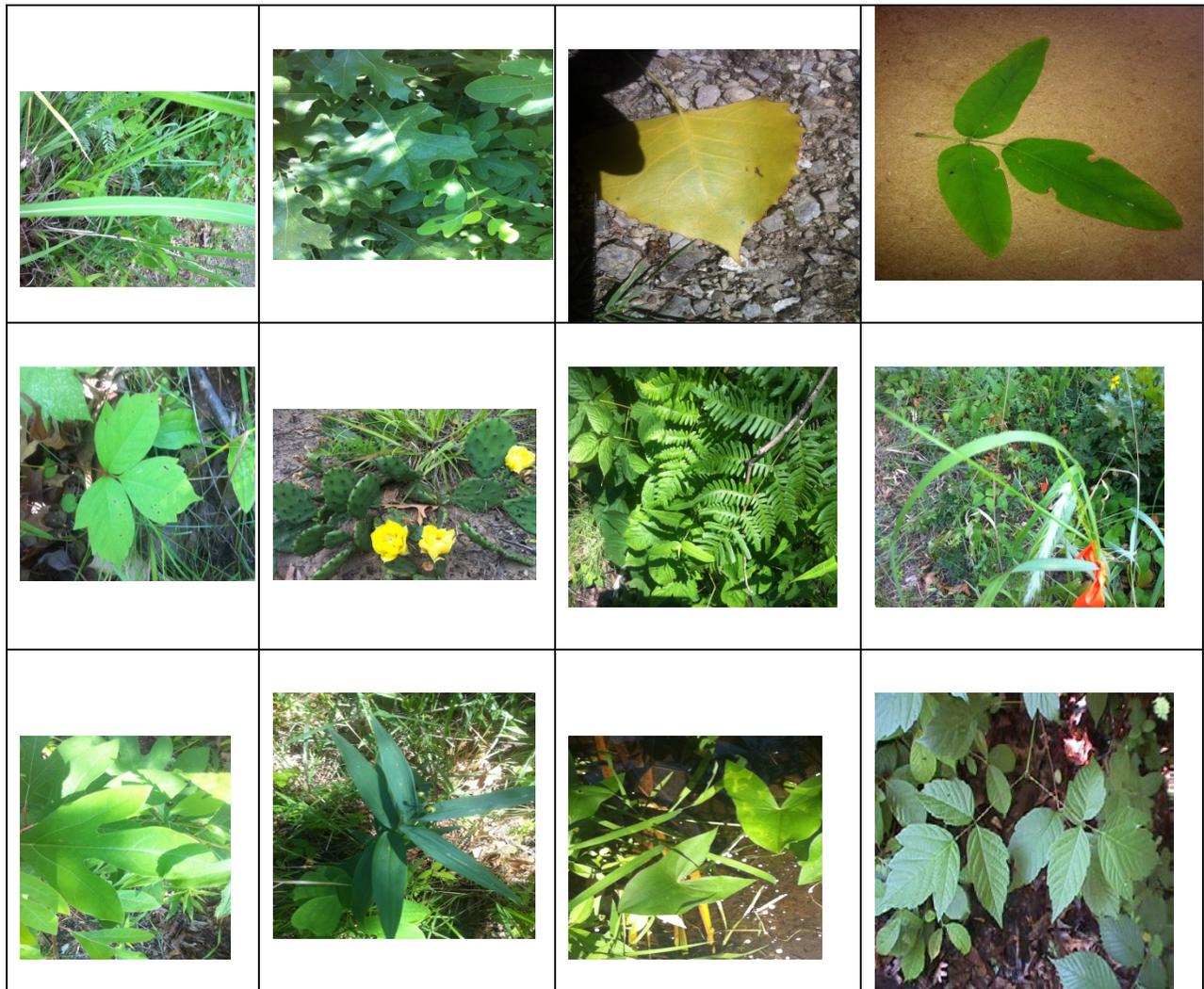
Physical Education

One person in the group will record how many steps they take to cover each trail.

Flora Find

Instructions: When you see one of the plants pictured; write down its name and place an "X" over the picture. Grades 4-8.

Hand out #1 (Grades 4-8)



Flora Find

Instructions: When you see one of the plants pictured; place an "X" over the picture. Grades 4-8.

Hand out #2 (Grades 2 & 3)

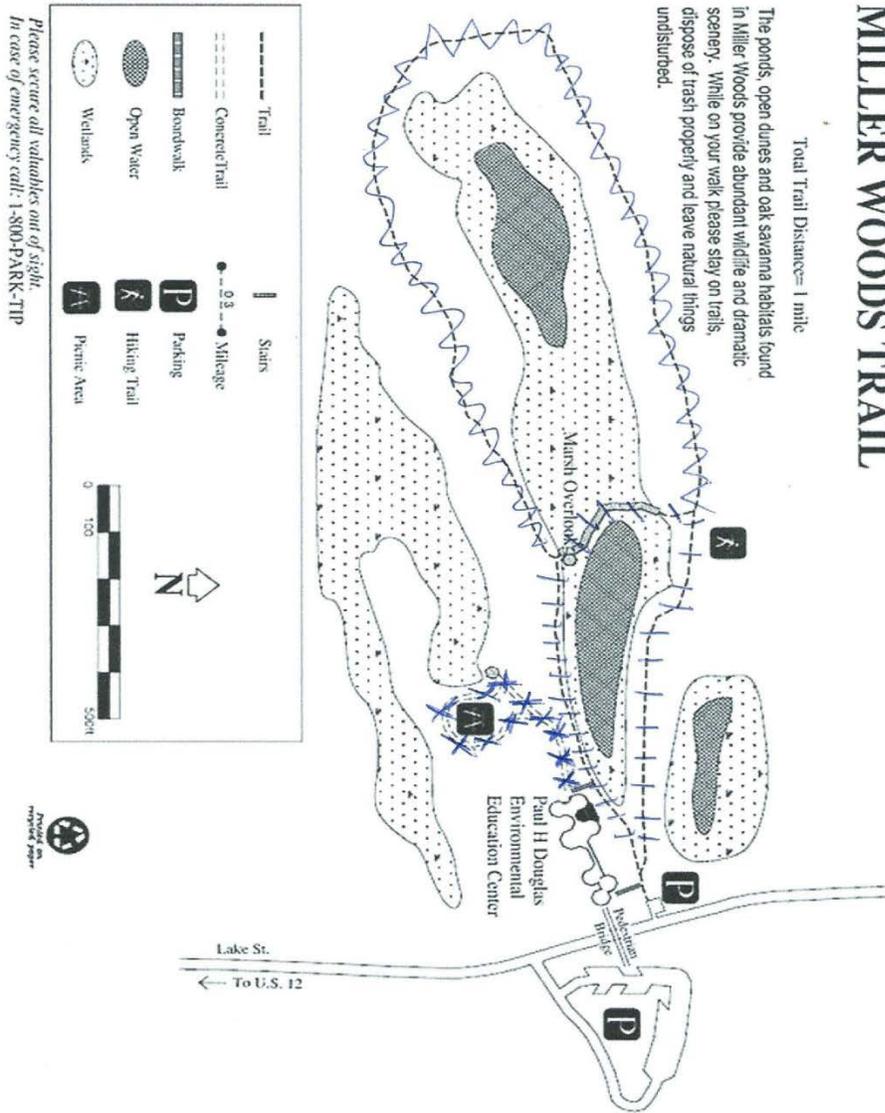
Indian Grass 	Blackoak 	Cottonwood 	Showy Tick Trefoil 
Poison Ivy 	Prickley Pear 	Bracken Fern 	Switch grass 
Sassafras 	Solomon's Seal 	Arrowhead 	Box Elder 

Hand out #3

MILLER WOODS TRAIL

Total Trail Distance= 1 mile

The ponds, open dunes and oak savanna habitats found in Miller Woods provide abundant wildlife and dramatic scenery. While on your walk, please stay on trails, dispose of trash properly and leave natural things undisturbed.



Trail 1 - X

Trail 2- Dashes

Trail 3 - Squiggly Line

*****Trail 3 also leads to West Beach, before taking this trail please make a ranger aware**

Hand out #4

Reflective Essay Rubric

	Unsatisfactory 1	Needs Improvement 2	Good 3	Excellent 4
Content	The writer simply restates facts rather than reflecting on his or her own experience. The writer's point of view is not evident.	Contains some interesting ideas, but the writer does not explore them thoroughly. Lacks detailed explanation or supporting examples.	Essay shows thoughtful reflection. Writer's point of view is apparent.	Demonstrates fresh, original thought and ideas. Point of view is thoroughly explored and clearly expressed.
Organization	No clear direction. Main ideas are vague and connections are confusing or incomplete.	Includes an organizational skeleton (intro, body, conclusion), but often strays from the main idea. Lacks transitions.	Organization is generally good, but there may be some extraneous details or unclear transitions.	Organization enhances the main ideas. Supporting information is presented logically, with no extraneous details. Transitions are smooth.
Sentence Fluency and Word Choice	Contains frequent grammar errors. Sentences are choppy, awkward, and hard to follow. Vocabulary is limited and words are used incorrectly.	Some errors in grammar and word choice. Sentences may be incomplete or rambling.	Generally applies standard English usage and appropriate word choices. Sentences are grammatical, but sometimes stiff or choppy.	The writing flows and shows a high level of sophistication. Strong and specific words are used to convey meaning.
Mechanics	Frequent spelling, punctuation, and typographical errors. No evidence of proofreading.	Some distracting errors. Needs more thorough proofreading.	Contains occasional spelling, punctuation, and typographical errors, but the errors are not overly distracting.	Proofreading is thorough. Correct spelling and punctuation throughout.

Miller woods standards

English-First Grade

READING: Word Recognition, Fluency, and Vocabulary Development

EL.1.1.15 2006

Read aloud smoothly and easily in familiar text

English-Second Grade

READING: Word Recognition, Fluency, and Vocabulary Development

EL.2.1.6 2006

Read aloud fluently and accurately with appropriate changes in voice and expression.

English-Third Grade

READING: Word Recognition, Fluency, and Vocabulary Development

EL.3.1.5 2006

Demonstrate knowledge of grade-level-appropriate words to speak specifically about different issues.

English-Sixth Grade

READING: Word Recognition, Fluency, and Vocabulary Development

EL.6.1.5 2006

Understand and explain slight differences in meaning in related words.

Science-Second Grade

Life Science

SCI.2.3.2 2010

Compare and contrast details of body plans and structures within the life cycles of plants and animals.

Third Grade-Science

Life Science

SCI.3.3.1 2010

Identify the common structures of a plant including its roots, stems, leaves, flowers, fruits and seeds. Describe their functions.

Organization and Focus:

Discuss ideas for writing, keep a list or notebook of ideas, and use graphic organizers to plan writing.

English-Seventh Grade

EL.7.1.3 2006

READING: Word Recognition, Fluency, and Vocabulary Development

Clarify word meanings through the use of definition, example, restatement, or through the use of contrast stated in the text.

EL.7.6.1 2006

Sentence Structure:

Properly place modifiers (words or phrases that describe, limit, or qualify another word) and use the active voice (sentences in which the subject is doing the action) when wishing to convey a livelier effect.

WRITING: English Language Conventions

English-Eighth Grade

READING: Word Recognition, Fluency, and Vocabulary Development

EL.8.1.3 2006

Verify the meaning of a word in its context, even when its meaning is not directly stated, through the use of definition, restatement, example, comparison, or contrast.

WRITING: Processes and Features

EL.8.4.1 2006

EL.8.4.10 2006

Research Application:

Write or deliver a research report that has been developed using a systematic research process (defines the topic, gathers information, determines credibility, reports findings) and that:

- uses information from a variety of sources (books, technology, multimedia) and documents sources independently by using a consistent format for citations.
- demonstrates that information that has been gathered has been summarized and that the topic has been refined through this process.
- demonstrates that sources have been evaluated for accuracy, bias, and credibility.
- organizes information by categorizing and sequencing, and demonstrates the distinction between one's own ideas from the ideas of others, and includes a bibliography (Works Cited).

Example: Research the topic of the benefits and drawbacks of public transportation. Conduct research to learn why some experts argue that we should use more public transportation. Survey parents and friends to find out how often they use public transportation for school, business, or pleasure travel. Summarize the findings and write a report on the pros and cons of public transportation.

WRITING: English Language ConventionsEL.8.6.1 2006

Sentence Structure:

Use correct and varied sentence types (simple, compound, complex, and compound-complex) and sentence openings to present a lively and effective personal style.

EL.8.6.4 2006

Grammar:

Edit written manuscripts to ensure that correct grammar is used.

EL.8.6.5 2006

Punctuation:

Use correct punctuation.

EL.8.6.6 2006

Capitalization:

Use correct capitalization.

EL.8.6.7 2006

Spelling:

Use correct spelling conventions.

Create an organizational structure that balances all aspects of the composition and uses effective transitions between sentences to unify important ideas.

EL.8.4.11 2006

Identify topics; ask and evaluate questions; and develop ideas leading to inquiry, investigation, and research.

EL.8.4.2 2006

Create compositions that have a clear message, a coherent thesis (a statement of position on the topic), and end with a clear and well-supported conclusion.

EL.8.4.3 2006

Support theses or conclusions with analogies (comparisons), paraphrases, quotations, opinions from experts, and similar devices.

EL.8.4.4 2006

Research Process and Technology:

Plan and conduct multiple-step information searches using computer networks.

EL.8.4.5 2006

Achieve an effective balance between researched information and original ideas.

EL.8.4.6 2006

Use a computer to create documents by using word-processing skills and publishing programs; develop simple databases and spreadsheets to manage information and prepare reports.

EL.8.4.7 2006

Evaluation and Revision:

Review, evaluate, and revise writing for meaning and clarity.

EL.8.4.8 2006

Edit and proofread one's own writing, as well as that of others, using an editing checklist or set of rules, with specific examples of corrections of frequent errors.

EL.8.4.9 2006

Revise writing for word choice; appropriate organization; consistent point of view; and transitions among paragraphs, passages, and ideas.

WRITING: Applications (Different Types of Writing and Their Characteristics)

EL.8.5.3 2006