DOCUMENT RESUME

ED 477 624 CS 512 261

TITLE	Indiana's Academic Standards: Grade 5 English/Language Arts, Mathematics, Science, Social Studies.
INSTITUTION	Indiana State Dept. of Education, Indianapolis.; Indiana State Dept. of Public Instruction, Indianapolis.; Indiana State Commission for Higher Education, Indianapolis.
PUB DATE	2002-08-00
NOTE	47p.; Adopted by the Indiana State Board of Education, 2000-2001.
AVAILABLE FROM	For full text: http://www.indianastandards.org/ .
PUB TYPE	Guides - Non-Classroom (055)
EDRS PRICE	EDRS Price MF01/PC02 Plus Postage.
DESCRIPTORS	*Academic Standards; Grade 5; Intermediate Grades; *Language Arts; *Mathematics; Parent Role; Reading Achievement; *Sciences; *Social Studies; *State Standards; Student Educational Objectives; Student Evaluation; Writing Achievement
IDENTIFIERS	*Indiana

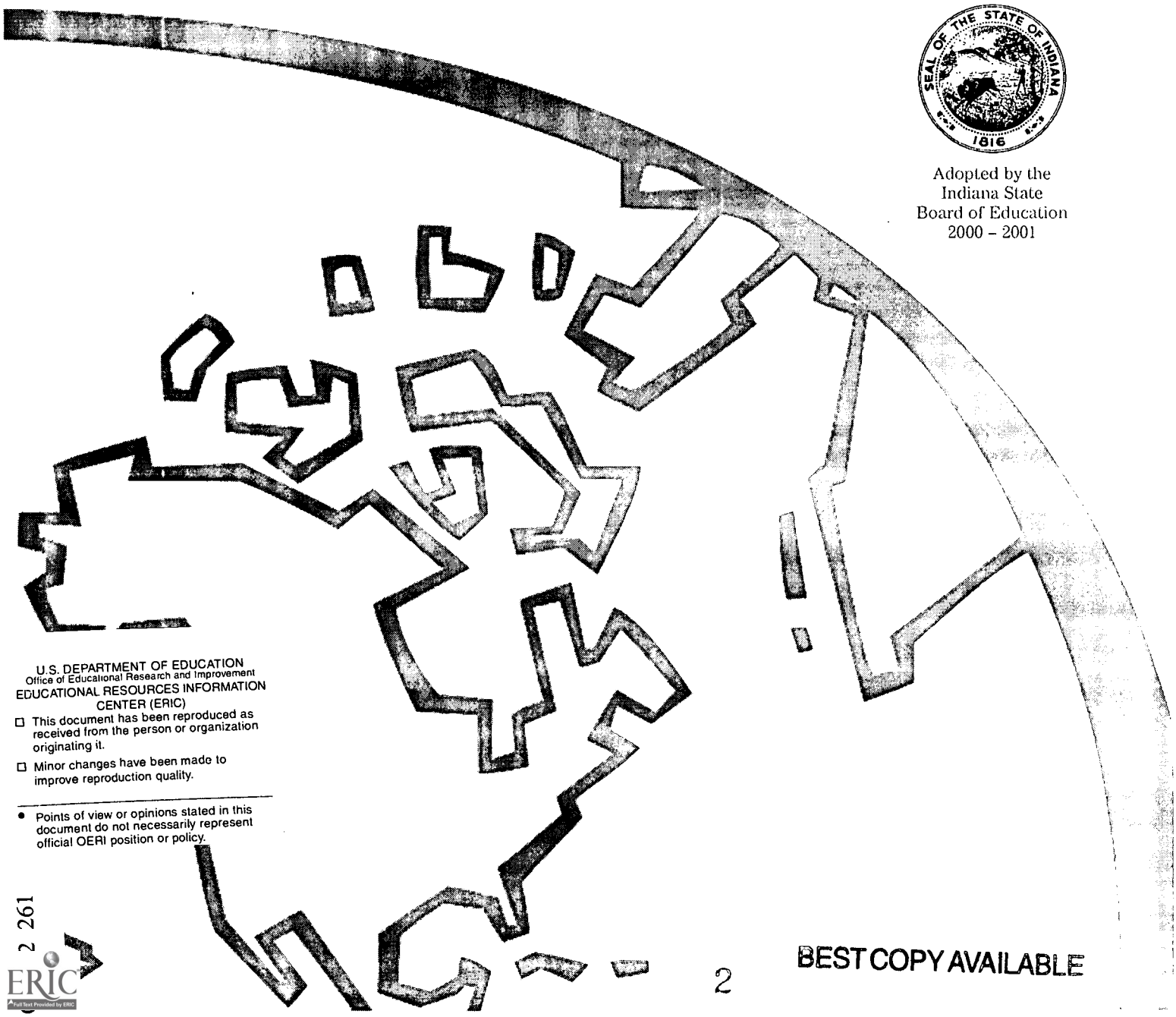
ABSTRACT

This guide to Indiana's academic standards in English/Language Arts, Mathematics, Science, and the Social Studies for Grade 5 students begins with a note to students and another note to parents. The guide spells out what students should know and be able to do in each subject, at each grade level. The guide also lists 10 things parents can do to help students succeed and includes information on assessments or measures of student learning. The guide cites the following seven standards for English/Language Arts: (1) Reading: Word Recognition, Fluency, and Vocabulary Development; (2) Reading: Comprehension (Focus on Informational Materials); (3) Reading: Literary Response and Analysis; (4) Writing: Process; (5) Writing: Applications (Different Types of Writing and Their Characteristics); (6) Writing: English Language Conventions; and (7) Listening and Speaking: Skills, Strategies, and Applications. It lists these seven standards for Mathematics: Number Sense, Computation, Algebra and Functions, Geometry, Measurement, Data Analysis and Probability, and Problem Solving. The guide enumerates the following six standards for Science: Nature of Science and Technology, Scientific Thinking, Physical Setting, Living Environment, Mathematical World, and Common Themes. It lists these five standards for the Social Studies: History; Civics and Government; Geography; Economics; and Individuals, Society, and Culture. Attached are sheets for notes. (NKA)

Grade 5

Indiana's Academic Standards

English/Language Arts
Mathematics
Science
Social Studies



Adopted by the
Indiana State
Board of Education
2000 – 2001

Dear Student,

The world is changing fast. In order for you to succeed in school, at work, and in the community, you will need more skills and knowledge than ever before.

Getting in shape academically is the single most important thing you can do to prepare for a successful future.

This booklet of Academic Standards clearly spells out what you should know and be able to do in each subject, at your grade level. Examples are given to help you understand what is required to meet the Standards. **Please review this guide with your teachers and share it with your parents and family.**

Whether you go on to be a surgeon, computer technician, teacher, or airplane mechanic, learning never stops. There will always be a more demanding computer application, a new invention, or a more complex project awaiting you.

To be ready for tomorrow — get in top academic shape today. Use this guide year round to check your progress.

Dear Parent,

The demand is greater than ever for people who can read, write, speak effectively, analyze problems and set priorities, learn new things quickly, take initiative, and work in teams. Technology has already transported us into a time where the next e-commerce opportunity is limited only by our imagination.

That's why Indiana has established new Academic Standards in English/language arts, mathematics, science, and social studies. These world-class Standards outline what your student should know and be able to do in each subject, at each grade level.

Indiana's new Academic Standards were recommended by Indiana's Education Roundtable and adopted by the State Board of Education. According to Achieve, Inc. and other respected education experts, these Standards are among the best in the nation.

Higher academic standards pose a challenge, but Indiana students have shown that they can measure up. Our students know that higher expectations lead to greater rewards — and they're prepared to work harder. We know that by setting specific goals, everyone wins. Teachers have clear targets, students know what's expected, and you have detailed information about your child's strengths and weaknesses.

How can you be sure that your student will be ready to meet these challenges? First, keep in mind that learning does not take place only in the classroom. Students spend far more time at home than they do in school. How they spend their time can make a real difference. That is where your help is the most important.

On the next page is a list of 10 things you can do to help your student get a good education. **Nothing will have a bigger impact on your student's success than your involvement in his or her education.** We hope you use this guide as a tool to help your child succeed today and in the future.

Sincerely,

Governor Frank O'Bannon

Dr. Suellen Reed,
Superintendent of Public Instruction

Stan Jones,
Commissioner for Higher Education

10 things parents can do to help students succeed

1. **Build relationships with your child's teachers.** Find out what each teacher expects of your child and how you can help your child prepare to meet those expectations.

2. **Read.** Reading is the foundation for all learning. Read to your young child, encourage your older child to read to you, or spend time together as a family reading. All this helps your child develop strong reading habits and skills from the beginning and reinforces these habits and skills as your child grows. Reading is one of the most important contributions you can make to your child's education.

3. **Practice writing at home.** Letters, journal entries, e-mail messages, and grocery lists are all writing opportunities. Show that writing is an effective form of communication and that you write for a variety of purposes.

4. **Make math part of everyday life.** Cooking, gardening, paying bills, and even shopping are all good ways to help your child understand and use mathematics skills. Show that there may be many ways to get to the right answer and encourage your child to explain his or her method.

5. **Ask your child to explain his or her thinking.** Ask lots of "why" questions. Children should be able to explain their reasoning, how they came up with the right answer, and why they chose one answer over another.

6. **Expect that homework will be done.** Keep track of your child's homework assignments and regularly look at his or her completed work. Some teachers now give parents a number to call for a recorded message of that day's homework assignments; others put the information on the Internet. If your school doesn't offer these features, talk to the teacher about how you can get this important information. Even if there aren't specific assignments, find out how you can stay informed about what your child is working on so that you can help at home.

7. **Use the community as a classroom.** Feed your child's curiosity about the world 365 days a year. Use the library to learn more about the history of your town. A visit to a farmer's market can help your child picture our state's rich agricultural tradition. Take your young child to zoos and parks and your older child to museums and workplaces to show how learning connects to the real world.

8. **Encourage group study.** Open your home to your child's friends for informal study sessions. Promote outside formal study groups through church or school organizations or other groups. Study groups will be especially important as your child becomes older and more independent. The study habits your child learns now will carry over into college and beyond.

9. **Help other parents understand academic expectations.** Use your school and employee newsletters, athletic associations, booster clubs, a PTA or PTO meeting, or just a casual conversation to help other parents understand what academic standards mean for them, their children, and their school and how they can help their children learn at home.

10. **Spend time at school.** The best way to know what goes on in your child's school is to spend time there. If you're a working parent, this isn't easy, and you may not be able to do it very often. But "once in awhile" is better than "never."

Remember: *You are the most important influence on your child. Indiana's Academic Standards give you an important tool to ensure that your child gets the best education possible.*

Measuring Student Learning

Children develop at different rates. Some take longer and need more help to learn certain skills. Assessments, like ISTEP+, help teachers understand how students are progressing and assist in identifying academic areas where students may need additional attention.

Assessments also provide a measure of school accountability – assisting schools in their efforts to align curriculum and instruction with the state's Academic Standards and reporting progress to parents and the public. Students in designated grades take ISTEP+ in the fall of each school year – with the assessment based on what the child should have learned and retained from the previous year.

Core 40 End-of-Course Assessments are given at the end of specific high school classes and are a cumulative assessment of what students should have learned during that course. End-of-Course Assessments also provide a means to ensure the quality and rigor of high school courses across the state. Voluntary for schools at this time, a selection of these assessments will be phased in over the next five years.

◗ Indicates mandatory ISTEP+ testing ♦ Indicates voluntary assessments

Kindergarten	Grade 1	Grade 2	Grade 3	Grade 4
	♦Reading	♦Reading	◗ English/Lang. Arts ◗ Mathematics	

What's the Goal? By Grade 4, have students moved beyond learning to read toward "reading to learn" other subjects? Can each student write a short, organized essay? Can each student use math skills to solve everyday, real-world problems?

Grade 5	Grade 6	Grade 7	Grade 8
◗ Science (begins 2003) ◗ Social Studies (begins 2004)	◗ English/Lang. Arts ◗ Mathematics	◗ Science (begins 2005) ◗ Social Studies (begins 2006)	◗ English/Lang. Arts ◗ Mathematics

What's the Goal? By Grades 7 and 8, have students developed strong enough study habits in English and math skills to be ready for high school?

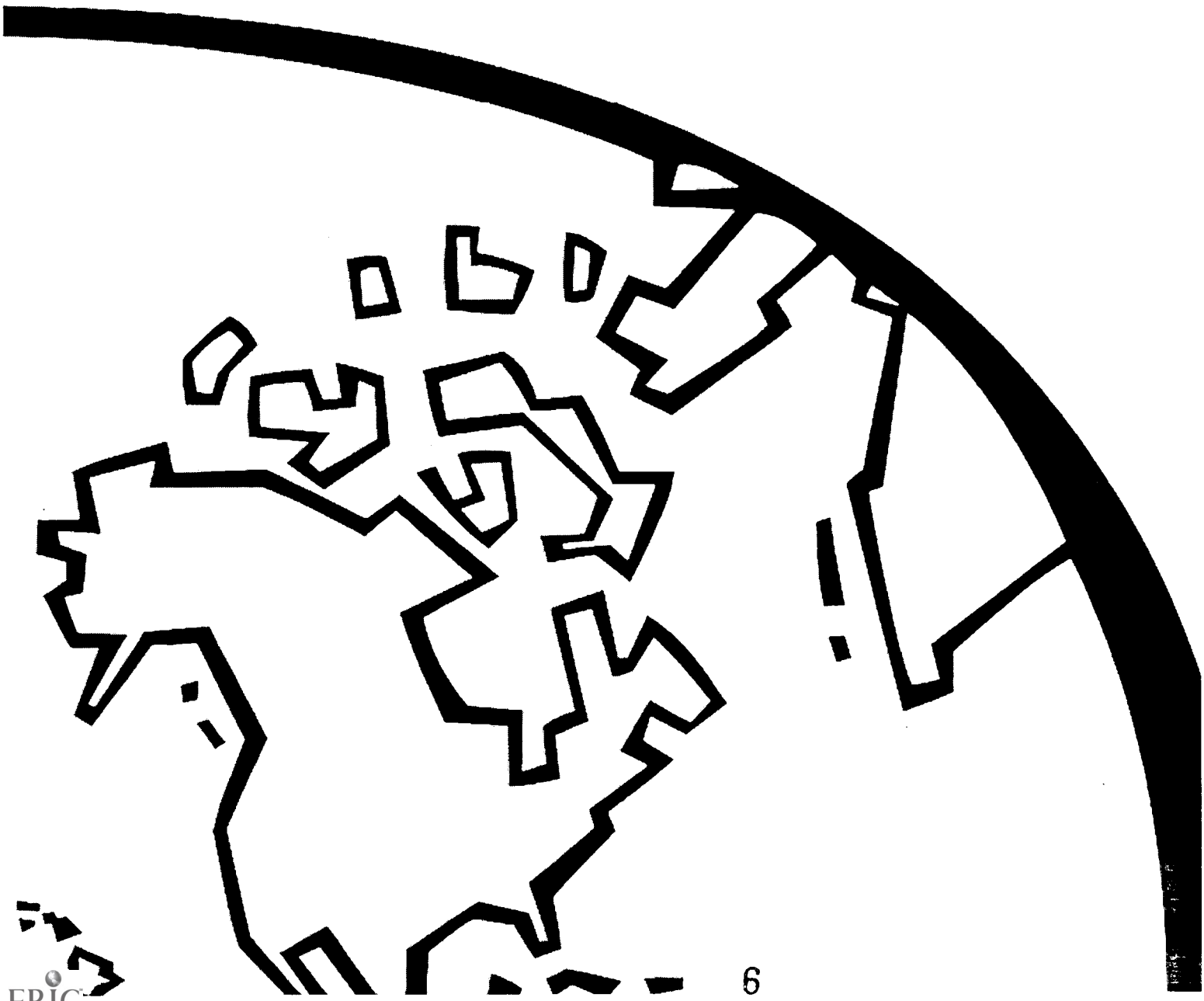
Grade 9	Grade 10 (GQE)	Grade 11	Grade 12	Graduation
◗ Science (begins 2007) ◗ Social Studies (begins 2008)	◗ English/Lang. Arts ◗ Mathematics	(two re-tests available for those who have not passed the GQE)	(two re-tests available for those who have not passed the GQE)	(or continued extra help)
♦Core 40 End-of-Course Assessments	♦Core 40 End-of-Course Assessments	♦Core 40 End-of-Course Assessments	♦Core 40 End-of-Course Assessments	

What's the Goal?
By Grade 12, can students read well enough to pass a driver's exam, understand an appliance manual, or compare two opposing newspaper editorials? Could students write an effective job application letter? By testing skills like these in Grade 10, teachers know whether – and in which skill area – students need more attention before it's time to graduate.

For more information visit www.doe.state.in.us/standards and click on Assessment or call 1-800-54-ISTEP (1-888-544-7837).

Grade 5

English/Language Arts



Standard 1

READING: Word Recognition, Fluency, and Vocabulary Development

Students use their knowledge of word parts and word relationships, as well as context clues (the meaning of the text around a word), to determine the meaning of specialized vocabulary and to understand the precise meaning of grade-level-appropriate words.

Decoding and Word Recognition

5.1.1 Read aloud grade-level-appropriate narrative text (stories) and expository text (information) fluently and accurately and with appropriate timing, changes in voice, and expression.

Vocabulary and Concept Development

5.1.2 Use word origins to determine the meaning of unknown words.

Example: After listening to a story of the myth of Hercules when it is read aloud, use the knowledge of the story to understand the phrase *Herculean task*.

5.1.3 Understand and explain frequently used synonyms (words with the same meaning), antonyms (words with opposite meanings), and homographs (words that are spelled the same but have different meanings).

5.1.4 Know less common roots (*graph = writing, logos = the study of*) and word parts (*auto = self, bio = life*) from Greek and Latin and use this knowledge to analyze the meaning of complex words (*autograph, autobiography, biography, biology*).

5.1.5 Understand and explain the figurative use of words in similes (comparisons that use *like* or *as: The stars were like a million diamonds in the sky.*) and metaphors (implied comparisons: *The stars were brilliant diamonds in the night sky.*).

Standard 2

READING: Comprehension

(Focus on Informational Materials)

Students read and understand grade-level-appropriate material. They describe and connect the essential ideas, arguments, and perspectives of the text by using their knowledge of text structure, organization, and purpose. The selections in the **Indiana Reading List** *(available online at www.doe.state.in.us/standards/readinglist.html) illustrate the quality and complexity of the materials to be read by students. At Grade 5, in addition to regular classroom reading, students read a variety of grade-level-appropriate narrative (story) and expository (informational and technical) text, including classic and contemporary literature, poetry, magazines, newspapers, reference materials, and online information.*

Structural Features of Informational and Technical Materials

5.2.1 Use the features of informational texts, such as formats, graphics, diagrams, illustrations, charts, maps, and organization, to find information and support understanding.

Example: Locate specific information in a social studies textbook by using its organization, sections on different world regions, and textual features, such as headers, maps, and charts.

5.2.2 Analyze text that is organized in sequential or chronological order.

Comprehension and Analysis of Grade-Level-Appropriate Text

5.2.3 Recognize main ideas presented in texts, identifying and assessing evidence that supports those ideas.

Example: After reading *The Life and Death of Crazy Horse* by Russell Freedman or *Eleanor Roosevelt, A Life of Discovery* by Russell Freedman, explain why each of these individuals is recognized as a great person in history. Identify details that support this idea.

5.2.4 Draw inferences, conclusions, or generalizations about text and support them with textual evidence and prior knowledge.

Example: After reading *Rosa Parks: My Story* by Rosa Parks, compare life today with life during the time of Rosa Parks' story, supporting the comparison with ideas from the text and from experience or other outside sources.

Expository (Informational) Critique

5.2.5 Distinguish among facts, supported inferences, and opinions in text.

Example: In reading an informational text, tell which is a fact and which is an opinion: *The color green can be made by mixing yellow and blue. Green is one of the most soothing colors, and makes one think of spring grass and new leaves.* Identify facts and opinions in a history book, such as the humorous *Lives of the Presidents: Fame, Shame (and What the Neighbors Thought)* by Kathleen Krull.

Standard 3

READING: Literary Response and Analysis

Students read and respond to grade-level-appropriate historically or culturally significant works of literature. They begin to find ways to clarify the ideas and make connections between literary works. The selections in the **Indiana Reading List** *(available online at www.doe.state.in.us/standards/readinglist.html) illustrate the quality and complexity of the materials to be read by students.*

Structural Features of Literature

5.3.1 Identify and analyze the characteristics of poetry, drama, fiction, and nonfiction and explain the appropriateness of the literary forms chosen by an author for a specific purpose.

Example: Analyze an author's purpose for writing, whether it is to inform, to teach, to entertain, or to elicit an emotional response, and tell how well that purpose is achieved by the type of writing the author has produced. After reading a nonfiction, instructional manual, such as *Computer Basics for Non-Techies: Course 1, Understanding the Basics*, use a graphic organizer to compare this to a humorous portrayal of the same subject, such as the humorous poem "A Dragon Is in My Computer" by Jack Prelutsky.

Narrative Analysis of Grade-Level-Appropriate Text

5.3.2 Identify the main problem or conflict of the plot and explain how it is resolved.

Example: Read a story with a central conflict, such as *The Pushcart War* by Jean Merrill. Tell how the conflict between the peddlers and the truckers is solved and describe what issues are raised in the conflict.

5.3.3 Contrast the actions, motives, and appearances of characters in a work of fiction and discuss the importance of the contrasts to the plot or theme.

Example: Read a book, such as *Mrs. Frisby and the Rats of NIMH* by Robert C. O'Brien, in which different characters are motivated in opposing ways, by innocent good, like the character of Mrs. Frisby, or by selfishness, like the characters of the Rats. Discuss how the contrast between innocence and worldly experience is important to the plot of the book.

5.3.4 Understand that *theme* refers to the central idea or meaning of a selection and recognize themes, whether they are implied or stated directly.

Example: Describe the themes in a fictional story, such as *A Wrinkle in Time* by Madeleine L'Engle, in which the themes of courage and perseverance are explored as the children in the story go on a dangerous mission in search of their scientist father.

5.3.5 Describe the function and effect of common literary devices, such as imagery, metaphor, and symbolism.

- Symbolism: the use of an object to represent something else; for example, a dove might symbolize peace.
- Imagery: the use of language to create vivid pictures in the reader's mind.
- Metaphor: an implied comparison in which a word or phrase is used in place of another, such as *He was drowning in money.*

Literary Criticism

5.3.6 Evaluate the meaning of patterns and symbols that are found in myth and tradition by using literature from different eras and cultures.

Example: Discuss the meaning of the walls in *The Secret Garden* by Frances Hogsdon Burnett.

5.3.7 Evaluate the author's use of various techniques to influence readers' perspectives.

Example: Tell how the details in the pictures support and add to the text in a picture book, such as *Bill and Pete Go Down the Nile* by Tomie DePaola. In the fictional picture book about Emily Dickinson, *Emily* by Michael Bedard, tell how the realistic illustrations and the writing style that imitates the style of Emily Dickinson's poetry make the story seem more realistic to the reader.

Standard 4

WRITING: Process

Students discuss and keep a list of ideas for writing. They use graphic organizers. Students write clear, coherent, and focused essays. Students progress through the stages of the writing process and proofread, edit, and revise writing.

Organization and Focus

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

5.4.2 Write stories with multiple paragraphs that develop a situation or plot, describe the setting, and include an ending.

5.4.3 Write informational pieces with multiple paragraphs that:
- present important ideas or events in sequence or in chronological order.
- provide details and transitions to link paragraphs.
- offer a concluding paragraph that summarizes important ideas and details.

Research and Technology

5.4.4 Use organizational features of printed text, such as citations, endnotes, and bibliographic references, to locate relevant information.

5.4.5 Use note-taking skills.

5.4.6 Create simple documents using a computer and employing organizational features, such as passwords, entry and pull-down menus, word searches, the thesaurus, and spell checks.

5.4.7 Use a thesaurus to identify alternative word choices and meanings.

Evaluation and Revision

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

5.4.9 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 specific errors.

5.4.10 Edit and revise writing to improve meaning and focus through adding, deleting, combining, clarifying, and rearranging words and sentences.

Standard 5

WRITING: Applications

(Different Types of Writing and Their Characteristics)

At Grade 5, students write narrative (story), expository (informational), persuasive, and descriptive texts of at least 500 words. Student writing demonstrates a command of Standard English and the research, organizational, and drafting strategies outlined in Standard 4 — Writing Process. Writing demonstrates an awareness of the audience (intended reader) and purpose for writing.

In addition to producing the different writing forms introduced in earlier grades, such as letters, Grade 5 students use the writing strategies outlined in Standard 4 — Writing Process to:

5.5.1 Write narratives (stories) that:
- establish a plot, point of view, setting, and conflict.
- show, rather than tell, the events of the story.

Example: Write a story, modeling the style of the story after a type of writing recently read in class, such as a folktale, myth, mystery, or science fiction story. Include an interesting beginning that establishes the central conflict of the story and an ending that resolves the problem.

5.5.2 Write responses to literature that:
- demonstrate an understanding of a literary work.
- support judgments through references to the text and to prior knowledge.
- develop interpretations that exhibit careful reading and understanding.

Example: Write an essay, telling how two authors are similar or different in terms of their writing styles, choices of topics, and the themes of their books. Support the opinion with specific examples from the authors' books. Write a personal reaction to books in which a character deals with a problem, such as *The Best Bad Thing* by Yoshiko Uchida or *Shiloh* by Phyllis Naylor. Use clear organization and careful word choices to show your reaction to the character and the problem.

5.5.3 Write research reports about important ideas, issues, or events by using the following guidelines:
- Frame questions that direct the investigation.
- Establish a main idea or topic.
- Develop the topic with simple facts, details, examples, and explanations.
- Use a variety of information sources, including firsthand interviews, reference materials, and electronic resources, to locate information for the report.

Example: After talking to local officials and conducting library research, write about the history of the different people and immigrant groups who settled in Indiana. Prepare a class book on *The History of Indiana* that includes information about where these groups came from, where they first lived in the state, and what work they did.

5.5.4 Write persuasive letters or compositions that:
- state a clear position in support of a proposal.
- support a position with relevant evidence and effective emotional appeals.
- follow a simple organizational pattern, with the most appealing statements first and the least powerful ones last.
- address reader concerns.

Example: Interview several students in lower grades and take notes regarding changes they would like to see made to the school's playground. Compile these opinions to write a persuasive article for the school newspaper.

5.5.5 Use varied word choices to make writing interesting.

Example: Write stories, reports, and letters showing a variety of word choices: use *inquired* or *requested* instead of *asked*.

5.5.6 Write for different purposes and to a specific audience or person, adjusting tone and style as appropriate.

Example: Write a skit or an episode of a puppet show to present at your class talent show. Use funny words and phrases to make the audience laugh.

Standard 6

WRITING: English Language Conventions

Students write using Standard English conventions appropriate to this grade level.

Sentence Structure

5.6.1 Identify and correctly use prepositional phrases (*for school* or *In the beginning*), appositives (*We played the Cougars, the team from Newport*), main clauses (words that express a complete thought), and subordinate clauses (clauses attached to the main clause in a sentence).
- *We began our canoe trip on the White River* (prepositional phrase) *when it stopped raining* (subordinate clause).
- *Although the weather, a violent snowstorm,* (appositive) *threatened our trip, we were never discouraged* (main clause).

5.6.2 Use transitions (*however, therefore, on the other hand*) and conjunctions (*and, or, but*) to connect ideas.

Grammar

5.6.3 Identify and correctly use appropriate tense (present, past, present participle, past participle) for verbs that are often misused (*lie/lay, sit/set, rise/raise*).

5.6.4 Identify and correctly use modifiers (words or phrases that describe, limit, or qualify another word) and pronouns (*he/his, she/her, they/their, it/its*).

- Correct: *On the walls there are many pictures of people who have visited the restaurant.*
- Incorrect: *There are many pictures of people who have visited the restaurant on the walls.*
- Correct: *Jenny and Kate finished their game.*
- Incorrect: *Jenny and Kate finished her game.*

Punctuation

5.6.5 Use a colon to separate hours and minutes (*12:20 a.m., 3:40 p.m.*) and to introduce a list (*Do the project in this order: cut, paste, fold.*); use quotation marks around the exact words of a speaker and titles of articles, poems, songs, short stories, and chapters in books; use semi-colons and commas for transitions (*Time is short; however, we will still get the job done.*)

Capitalization

5.6.6 Use correct capitalization.

Spelling

5.6.7 Spell roots or bases of words, prefixes (*understood/misunderstood, excused/unexcused*), suffixes (*final/finally, mean/meanness*), contractions (*will not/won't, it is/it's, they would/they'd*), and syllable constructions (*in•for•ma•tion, mol•e•cule*) correctly.

Standard 7

LISTENING AND SPEAKING: Skills, Strategies, and Applications

Students deliver focused, coherent presentations that convey ideas clearly and relate to the background and interests of the audience. They evaluate the content of oral communication. Students deliver well-organized formal presentations using traditional speech strategies, including narration, exposition, persuasion, and description. Students use the same Standard English conventions for oral speech that they use in their writing.

Comprehension

5.7.1 Ask questions that seek information not already discussed.

5.7.2 Interpret a speaker's verbal and nonverbal messages, purposes, and perspectives.

5.7.3 Make inferences or draw conclusions based on an oral report.

Organization and Delivery of Oral Communication

5.7.4 Select a focus, organizational structure, and point of view for an oral presentation.

5.7.5 Clarify and support spoken ideas with evidence and examples.

5.7.6 Use volume, phrasing, timing, and gestures appropriately to enhance meaning.

Analysis and Evaluation of Oral and Media Communications

5.7.7 Identify, analyze, and critique persuasive techniques, including promises, dares, flattery, and generalities; identify faulty reasoning used in oral presentations and media messages.

5.7.8 Analyze media as sources for information, entertainment, persuasion, interpretation of events, and transmission of culture.

Speaking Applications

5.7.9 Deliver narrative (story) presentations that:
- establish a situation, plot, point of view, and setting with descriptive words and phrases.
- show, rather than tell, the listener what happens.

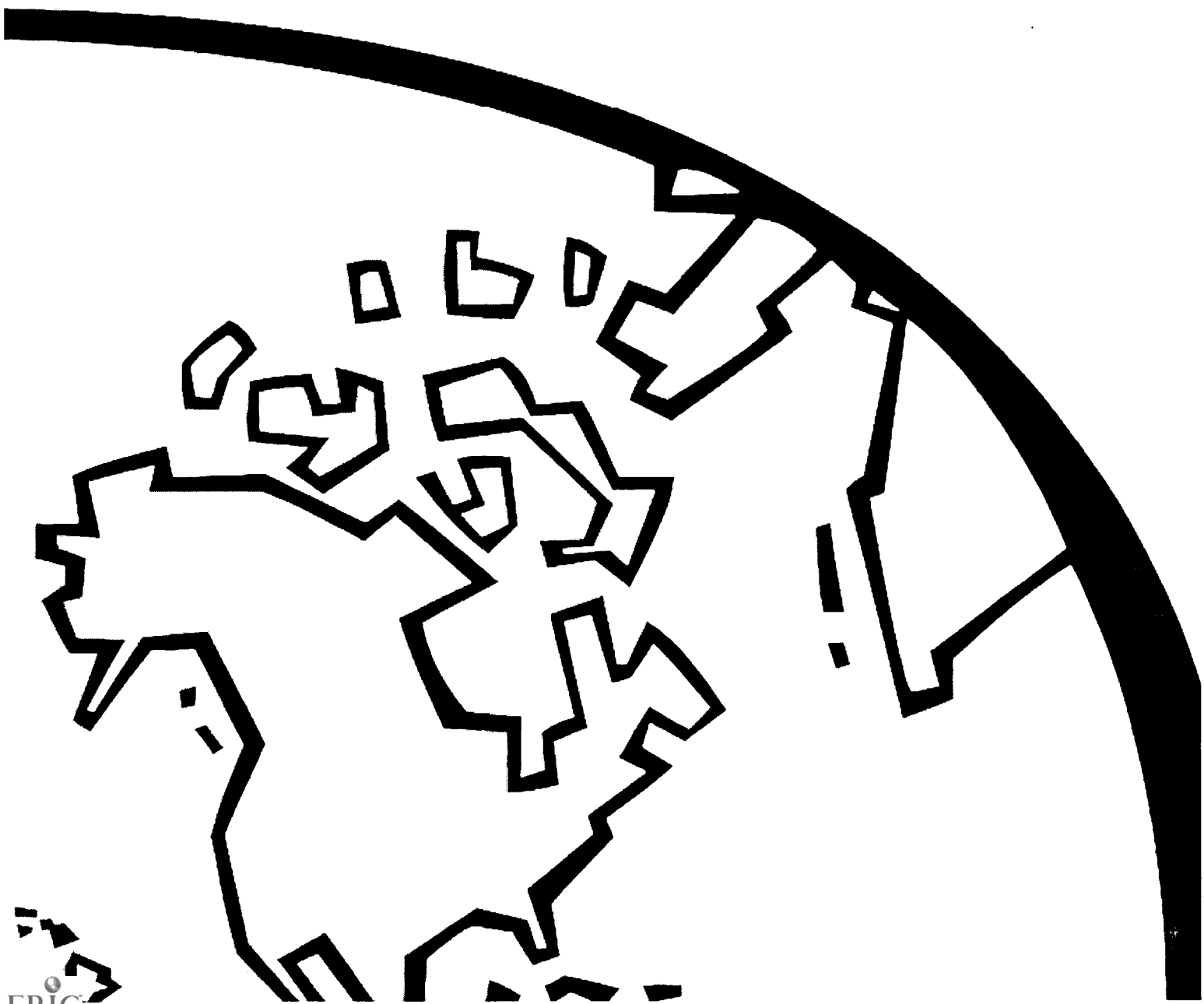
5.7.10 Deliver informative presentations about an important idea, issue, or event by the following means:
- frame questions to direct the investigation.
- establish a controlling idea or topic.
- develop the topic with simple facts, details, examples, and explanations.

5.7.11 Deliver oral responses to literature that:
- summarize important events and details.
- demonstrate an understanding of several ideas or images communicated by the literary work.
- use examples from the work to support conclusions.

NOTES

Grade 5

Mathematics



Mathematics

In this technological age, mathematics is more important than ever. When students leave school, they are more and more likely to use mathematics in their work and everyday lives — operating computer equipment, planning timelines and schedules, reading and interpreting data, comparing prices, managing personal finances, and completing other problem-solving tasks. What they learn in mathematics and how they learn it will provide an excellent preparation for a challenging and ever-changing future.

The state of Indiana has established the following mathematics Standards to make clear to teachers, students, and parents what knowledge, understanding, and skills students should acquire in Grade 5:

Standard 1 — Number Sense

Understanding the number system is the basis of mathematics. Students extend their understanding of the magnitudes of numbers to rounding whole numbers and decimals to any place value. They order and compare whole numbers and decimals using the correct symbols for greater than and less than. They develop the concept of percentage as parts of a hundred and compare different ways of looking at fractions. They identify whole numbers as prime or composite, and they compare fractions, decimals, and mixed numbers on a number line.

Standard 2 — Computation

Fluency in computation is essential. Students extend the standard methods for multiplying and dividing to larger numbers. They add and subtract more complex fractions and decimals, learning how these different representations of numbers can be manipulated. They also develop an understanding of how to multiply and divide fractions.

Standard 3 — Algebra and Functions

Algebra is a language of patterns, rules, and symbols. Students at this level develop further the fundamental concept of a variable — having a letter stand for all numbers of a certain kind. They use this to write simple algebraic expressions and to evaluate them. They begin to develop the idea of linking an algebraic equation to a graph, by finding ordered pairs that fit a linear equation, plotting these as points on a grid, and drawing the resulting straight line. They also interpret graphs to answer questions.

Standard 4 — Geometry

Students learn about geometric shapes and develop a sense of space. They draw angles, parallel and perpendicular lines, the radius and diameter of circles, and other geometric shapes, using ruler, compass, protractor, and computer drawing programs. They identify congruent triangles and explain their reasoning using specific geometrical terms, such as equilateral, isosceles, acute, and obtuse. They classify polygons with five or more sides. They develop an understanding of reflectional and rotational symmetry, and they construct prisms and pyramids, developing their ability to work in three dimensions.

Standard 5 — Measurement

The study of measurement is essential because of its uses in many aspects of everyday life. Students develop and use the formulas for calculating perimeters and areas of triangles, parallelograms, and trapezoids. They extend these ideas to finding the volume and surface area of rectangular solids. They understand and use additional units for measuring weight: ounce, gram, and ton. They also add and subtract with money in decimal notation.

Standard 6 — Data Analysis and Probability

Data are all around us — in newspapers and magazines, in television news and commercials, in quality control for manufacturing — and students need to learn how to understand data. At this level, they use the mean, median, mode, and range to describe data sets. They further develop the concept of probability, recording probabilities as fractions between 0 and 1 and linking these to levels of certainty about the events described.

Standard 7 — Problem Solving

In a general sense, mathematics is problem solving. In all of their mathematics, students use problem-solving skills: they choose how to approach a problem, they explain their reasoning, and they check their results. As they develop their skills with algebra, geometry, or measurement, for example, students move from simple to more complex ideas by taking logical steps that build a better understanding of mathematics.

As part of their instruction and assessment, students should also develop the following learning skills by Grade 12 that are woven throughout the mathematics Standards:

Communication

The ability to read, write, listen, ask questions, think, and communicate about math will develop and deepen students' understanding of mathematical concepts. Students should read text, data, tables, and graphs with comprehension and understanding. Their writing should be detailed and coherent, and they should use correct mathematical vocabulary. Students should write to explain answers, justify mathematical reasoning, and describe problem-solving strategies.

Reasoning and Proof

Mathematics is developed by using known ideas and concepts to develop others. Repeated addition becomes multiplication. Multiplication of numbers less than ten can be extended to numbers less than one hundred and then to the entire number system. Knowing how to find the area of a right triangle extends to all right triangles. Extending patterns, finding even numbers, developing formulas, and proving the Pythagorean Theorem are all examples of mathematical reasoning. Students should learn to observe, generalize, make assumptions from known information, and test their assumptions.

Representation

The language of mathematics is expressed in words, symbols, formulas, equations, graphs, and data displays. The concept of one-fourth may be described as a quarter, ¼, one divided by four, 0.25, ⅛ + ⅛, 25 percent, or an appropriately shaded portion of a pie graph. Higher-level mathematics involves the use of more powerful representations: exponents, logarithms, π, unknowns, statistical representation, algebraic and geometric expressions. Mathematical operations are expressed as representations: +, =, divide, square. Representations are dynamic tools for solving problems and communicating and expressing mathematical ideas and concepts.

Connections

Connecting mathematical concepts includes linking new ideas to related ideas learned previously, helping students to see mathematics as a unified body of knowledge whose concepts build upon each other. Major emphasis should be given to ideas and concepts across mathematical content areas that help students see that mathematics is a web of closely connected ideas (algebra, geometry, the entire number system). Mathematics is also the common language of many other disciplines (science, technology, finance, social science, geography) and students should learn mathematical concepts used in those disciplines. Finally, students should connect their mathematical learning to appropriate real-world contexts.

Standard 1

Number Sense

Students compute with whole numbers, decimals, and fractions and understand the relationship among decimals, fractions, and percents. They understand the relative magnitudes of numbers. They understand prime* and composite* numbers.*

5.1.1 Convert between numbers in words and numbers in figures, for numbers up to millions and decimals to thousandths.

Example: Write the number 198.536 in words.

5.1.2 Round whole numbers and decimals to any place value.

Example: Is 7,683,559 closer to 7,600,000 or 7,700,000? Explain your answer.

5.1.3 Arrange in numerical order and compare whole numbers or decimals to two decimal places by using the symbols for less than (<), equals (=), and greater than (>).

Example: Write from smallest to largest: 0.5, 0.26, 0.08.

5.1.4 Interpret percents as a part of a hundred. Find decimal and percent equivalents for common fractions and explain why they represent the same value.

Example: Shade a 100-square grid to show 30%. What fraction is this?

5.1.5 Explain different interpretations of fractions: as parts of a whole, parts of a set, and division of whole numbers by whole numbers.

Example: What fraction of a pizza will each person get when 3 pizzas are divided equally among 5 people?

5.1.6 Describe and identify prime and composite numbers.

Example: Which of the following numbers are prime: 3, 7, 12, 17, 18? Justify your choices.

5.1.7 Identify on a number line the relative position of simple positive fractions, positive mixed numbers, and positive decimals.

Example: Find the positions on a number line of 1¼ and 1.4.

* whole numbers: 0, 1, 2, 3, etc.

* prime number: number that can be evenly divided only by 1 and itself (e.g., 2, 3, 5, 7, 11)

* composite number: not a prime number (e.g., 4, 6, 8, 9, 10)

Standard 2

Computation

Students solve problems involving multiplication and division of whole numbers and solve problems involving addition, subtraction, and simple multiplication and division of fractions and decimals.

5.2.1 Solve problems involving multiplication and division of any whole numbers.

Example: 2,867 × 34 = ? Explain your method.

5.2.2 Add and subtract fractions (including mixed numbers) with different denominators.

Example: $3\frac{4}{5} - 2\frac{2}{3} = ?$

5.2.3 Use models to show an understanding of multiplication and division of fractions.

Example: Draw a rectangle 5 squares long and 3 squares wide. Shade $\frac{4}{5}$ of the rectangle, starting from the left. Shade $\frac{2}{3}$ of the rectangle, starting from the top. Look at the fraction of the squares that you have double-shaded and use that to show how to multiply $\frac{4}{5}$ by $\frac{2}{3}$.

5.2.4 Multiply and divide fractions to solve problems.

Example: You have $3\frac{1}{2}$ pizzas left over from a party. How many people can have $\frac{1}{4}$ of a pizza each?

5.2.5 Add and subtract decimals and verify the reasonableness of the results.

Example: Compute 39.46 − 20.89 and check the answer by estimating.

5.2.6 Use estimation to decide whether answers are reasonable in addition, subtraction, multiplication, and division problems.

Example: Your friend says that 2,867 × 34 = 20,069. Without solving, explain why you think the answer is wrong.

5.2.7 Use mental arithmetic to add or subtract simple decimals.

Example: Add 0.006 to 0.027 without using pencil and paper.

Standard 3

Algebra and Functions

Students use variables in simple expressions, compute the value of an expression for specific values of the variable, and plot and interpret the results. They use two-dimensional coordinate grids to represent points and graph lines.

5.3.1 Use a variable to represent an unknown number.

Example: When a certain number is multiplied by 3 and then 5 is added, the result is 29. Let x stand for the unknown number and write an equation for the relationship.

5.3.2 Write simple algebraic expressions in one or two variables and evaluate them by substitution.

Example: Find the value of $5x + 2$ when $x = 3$.

5.3.3 Use the distributive property* in numerical equations and expressions.

Example: Rewrite $3(16 - 11)$ by removing the parentheses.

5.3.4 Identify and graph ordered pairs of positive numbers.

Example: Plot the points (3, 1), (6, 2), and (9, 3). What do you notice?

5.3.5 Find ordered pairs (positive numbers only) that fit a linear equation, graph the ordered pairs, and draw the line they determine.

Example: For $x = 1$, 2, 3, and 4, find points that fit the equation $y = 2x + 1$. Plot those points on graph paper and join them with a straight line.

5.3.6 Understand that the length of a horizontal line segment on a coordinate plane equals the difference between the x-coordinates and that the length of a vertical line segment on a coordinate plane equals the difference between the y-coordinates.

Example: Find the distance between the points (2, 5) and (7, 5) and the distance between the points (2, 1) and (2, 5).

5.3.7 Use information taken from a graph or equation to answer questions about a problem situation.

Example: The speed (v feet per second) of a car t seconds after it starts is given by the formula $v = 12t$. Find the car's speed after 5 seconds.

* distributive property: e.g., $3 \times (5 + 2) = 3 \times 5 + 3 \times 2$

Standard 4

Geometry

Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.

5.4.1 Measure, identify, and draw angles, perpendicular and parallel lines, rectangles, triangles, and circles by using appropriate tools (e.g., ruler, compass, protractor, appropriate technology, media tools).

Example: Draw a rectangle with sides 5 in and 3 in.

5.4.2 Identify, describe, draw, and classify triangles as equilateral*, isosceles*, scalene*, right*, acute*, obtuse*, and equiangular*.

Example: Draw an isosceles right triangle.

5.4.3 Identify congruent* triangles and justify your decisions by referring to sides and angles.

Example: In a collection of triangles, pick out those that are the same shape and size and explain your decisions.

5.4.4 Identify, describe, draw, and classify polygons*, such as pentagons and hexagons.

Example: In a collection of polygons, pick out those with the same number of sides.

5.4.5 Identify and draw the radius and diameter of a circle and understand the relationship between the radius and diameter.

Example: On a circle, draw a radius and a diameter and describe the differences and similarities between the two.

5.4.6 Identify shapes that have reflectional and rotational symmetry*.

Example: What kinds of symmetries have the letters M, N, and O?

5.4.7 Understand that 90°, 180°, 270°, and 360° are associated with quarter, half, three-quarters, and full turns, respectively.

Example: Face the front of the room. Turn through four right angles. Which way are you now facing?

5.4.8 Construct prisms* and pyramids using appropriate materials.

Example: Make a square-based pyramid from construction paper.

5.4.9 Given a picture of a three-dimensional object, build the object with blocks.

Example: Given a picture of a house made of cubes and rectangular prisms, build the house.

* equilateral triangle: all sides are congruent

* isosceles triangle: at least two sides are congruent

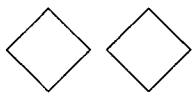
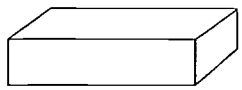
* scalene triangle: no sides are equal

* right triangle: one angle measures 90 degrees

* acute triangle: all angles are less than 90 degrees

* obtuse triangle: one angle is more than 90 degrees

* equiangular triangle: all angles are of equal measure

* congruent: two figures that are the same shape and size 
* polygon: two-dimensional shape with straight sides (e.g., triangle, rectangle, pentagon)
* reflectional and rotational symmetry: letter M has reflectional symmetry in a line down the middle; letter N has rotational symmetry around its center
* prism: solid shape with fixed cross-section (right prism is a solid shape with two parallel faces that are polygons and other faces that are rectangles) 

Standard 5

Measurement

Students understand and compute the areas and volumes of simple objects, as well as measuring weight, temperature, time, and money.

5.5.1 Understand and apply the formulas for the area of a triangle, parallelogram, and trapezoid.

Example: Find the area of a triangle with base 4 m and height 5 m.

5.5.2 Solve problems involving perimeters and areas of rectangles, triangles, parallelograms, and trapezoids, using appropriate units.

Example: A trapezoidal garden bed has parallel sides of lengths 14 m and 11 m and its width is 6 m. Find its area and the length of fencing needed to enclose it. Be sure to use correct units.

5.5.3 Use formulas for the areas of rectangles and triangles to find the area of complex shapes by dividing them into basic shapes.

Example: A square room of length 17 feet has a tiled fireplace area that is 6 feet long and 4 feet wide. You want to carpet the floor of the room, except the fireplace area. Find the area to be carpeted.

5.5.4 Find the surface area and volume of rectangular solids using appropriate units.

Example: Find the volume of a shoe box with length 30 cm, width 15 cm, and height 10 cm.

5.5.5 Understand and use the smaller and larger units for measuring weight (ounce, gram, and ton) and their relationship to pounds and kilograms.

Example: How many ounces are in a pound?

5.5.6 Compare temperatures in Celsius and Fahrenheit, knowing that the freezing point of water is 0°C and 32°F and that the boiling point is 100°C and 212°F.

Example: What is the Fahrenheit equivalent of 50°C? Explain your answer.

5.5.7 Add and subtract with money in decimal notation.

Example: You buy articles that cost $3.45, $6.99, and $7.95. How much change will you receive from $20?

Standard 6

Data Analysis and Probability

Students collect, display, analyze, compare, and interpret data sets. They use the results of probability experiments to predict future events.

5.6.1 Explain which types of displays are appropriate for various sets of data.

Example: Conduct a survey to find the favorite movies of the students in your class. Decide whether to use a bar, line, or picture graph to display the data. Explain your decision.

5.6.2 Find the mean*, median*, mode*, and range* of a set of data and describe what each does and does not tell about the data set.

Example: Find the mean, median, and mode of a set of test results and describe how well each represents the data.

5.6.3 Understand that probability can take any value between 0 and 1, events that are not going to occur have probability 0, events certain to occur have probability 1, and more likely events have a higher probability than less likely events.

Example: What is the probability of rolling a 7 with a number cube?

5.6.4 Express outcomes of experimental probability situations verbally and numerically (e.g., 3 out of 4, ¾).

Example: What is the probability of rolling an odd number with a number cube?

* mean: the average obtained by adding the values and dividing by the number of values

* median: the value that divides a set of data written in order of size into two equal parts

* mode: the most common value in a set of data

* range: the difference between the largest and the smallest values

Standard 7

Problem Solving

Students make decisions about how to approach problems and communicate their ideas.

5.7.1 Analyze problems by identifying relationships, telling relevant from irrelevant information, sequencing and prioritizing information, and observing patterns.

Example: Solve the problem: "When you flip a coin 3 times, you can get 3 heads, 3 tails, 2 heads and 1 tail, or 1 head and 2 tails. Find the probability of each of these combinations." Notice that the case of 3 heads and the case of 3 tails are similar. Notice that the case of 2 heads and 1 tail and the case of 1 head and 2 tails are similar.

5.7.2 Decide when and how to break a problem into simpler parts.

Example: In the first example, decide to look at the case of 3 heads and the case of 2 heads and 1 tail.

Mathematics

Students use strategies, skills, and concepts in finding and communicating solutions to problems.

5.7.3 Apply strategies and results from simpler problems to solve more complex problems.

Example: In the first example, begin with the situation where you flip the coin twice.

5.7.4 Express solutions clearly and logically by using the appropriate mathematical terms and notation. Support solutions with evidence in both verbal and symbolic work.

Example: In the first example, make a table or tree diagram to show another student what is happening.

5.7.5 Recognize the relative advantages of exact and approximate solutions to problems and give answers to a specified degree of accuracy.

Example: You are buying a piece of plastic to cover the floor of your bedroom before you paint the room. How accurate should you be: to the nearest inch, foot, or yard? Explain your answer.

5.7.6 Know and apply appropriate methods for estimating results of rational-number computations.

Example: Will 7×18 be smaller or larger than 100? Explain your answer.

5.7.7 Make precise calculations and check the validity of the results in the context of the problem.

Example: A recipe calls for $\frac{3}{8}$ of a cup of sugar. You plan to double the recipe for a party and you have only one cup of sugar in the house. Decide whether you have enough sugar and explain how you know.

Students determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.

5.7.8 Decide whether a solution is reasonable in the context of the original situation.

Example: In the first example about flipping a coin, check that your probabilities add to 1.

5.7.9 Note the method of finding the solution and show a conceptual understanding of the method by solving similar problems.

Example: Find the probability of each of the combinations when you flip a coin 4 times.

Grade 5

Science

The Indiana Academic Standards for science contain six Standards. Each Standard is described below. On the pages that follow, age-appropriate concepts are listed underneath each Standard. These ideas build a foundation for understanding the intent of each Standard.

Standard 1 — The Nature of Science and Technology

It is the union of science and technology that forms the scientific endeavor and that makes it so successful. Although each of these human enterprises has a character and history of its own, each is dependent on and reinforces the other. This first Standard draws portraits of science and technology that emphasize their roles in the scientific endeavor and reveal some of the similarities and connections between them. In order for students to truly understand the nature of science and technology, they must model the process of scientific investigation through inquiries, fieldwork, lab work, etc. Through these experiences, students will practice designing investigations and experiments, making observations, and formulating theories based on evidence.

Standard 2 — Scientific Thinking

There are certain thinking skills associated with science, mathematics, and technology that young people need to develop during their school years. These are mostly, but not exclusively, mathematical and logical skills that are essential tools for both formal and informal learning and for a lifetime of participation in society as a whole. Good communication is also essential in order to both receive and disseminate information and to understand others' ideas as well as have one's own ideas understood. Writing, in the form of journals, essays, lab reports, procedural summaries, etc., should be an integral component of students' experiences in science.

Standard 3 — The Physical Setting

One of the grand success stories of science is the unification of the physical universe. It turns out that all natural objects, events, and processes are connected to each other. This Standard contains recommendations for basic knowledge about the overall structure of the universe and the physical principles on which it seems to run, with emphasis on Earth and the solar system. This Standard focuses on two principle subjects: the structure of the universe and the major processes that have shaped planet Earth, and the concepts with which science describes the physical world in general – organized under the headings of *Matter and Energy* and *Forces of Nature*. In Grade 5, students continue to learn about changes to Earth and the sky. They learn about the properties of materials and how those properties can change.

Standard 4
The Living Environment

People have long been curious about living things – how many different species there are, what they are like, how they relate to each other, and how they behave. Living organisms are made of the same components as all other matter, involve the same kinds of transformations of energy, and move using the same basic kinds of forces. Thus, all of the physical principles discussed in Standard 3 – The Physical Setting, apply to life as well as to stars, raindrops, and television sets. This Standard offers recommendations on basic knowledge about how living things function and how they interact with one another and their environment. In Grade 5, students learn that organisms are composed of collections of similar cells and that these cells benefit from cooperating. They learn that characteristics of organisms, as well as their environment, affect survival.

Standard 5 — The Mathematical World

Mathematics is essentially a process of thinking that involves building and applying abstract, logically connected networks of ideas. These ideas often arise from the need to solve problems in science, technology, and everyday life — problems ranging from how to model certain aspects of a complex scientific problem to how to balance a checkbook.

Standard 6 — Common Themes

Some important themes pervade science, mathematics, and technology and appear over and over again, whether we are looking at ancient civilization, the human body, or a comet. These ideas transcend disciplinary boundaries and prove fruitful in explanation, in theory, in observation, and in design. A focus on *Constancy and Change* within this Standard provides students opportunities to engage in long-term and on-going laboratory and fieldwork, and thus understand the role of change over time in studying The Physical Setting and The Living Environment.

Standard 1

The Nature of Science and Technology

Students work collaboratively to carry out investigations. They observe and make accurate measurements, increase their use of tools and instruments, record data in journals, and communicate results through chart, graph, written, and verbal forms. Students repeat investigations, explain inconsistencies, and design projects.

The Scientific View of the World

5.1.1 Recognize and describe that results of similar scientific investigations may turn out differently because of inconsistencies in methods, materials, and observations*.

* observation: gaining information through the use of one or more of the senses, such as sight, smell, etc.

Scientific Inquiry

5.1.2 Begin to evaluate the validity of claims based on the amount and quality of the evidence cited.

The Scientific Enterprise

5.1.3 Explain that doing science involves many different kinds of work and engages men, women, and children of all ages and backgrounds.

Technology and Science

5.1.4 Give examples of technology, such as telescopes, microscopes, and cameras, that enable scientists and others to observe things that are too small or too far away to be seen without them and to study the motion of objects that are moving very rapidly or are hardly moving.

5.1.5 Explain that technology extends the ability of people to make positive and/or negative changes in the world.

5.1.6 Explain how the solution to one problem, such as the use of pesticides in agriculture or the use of dumps for waste disposal, may create other problems.

5.1.7 Give examples of materials not present in nature, such as cloth, plastic, and concrete, that have become available because of science and technology.

Standard 2

Scientific Thinking

Students use a variety of skills and techniques when attempting to answer questions and solve problems. Students describe their observations accurately and clearly using numbers, words, and sketches, and are able to communicate their thinking to others. They compare, contrast, explain, and justify both information and numerical functions.

Computation and Estimation

5.2.1 Multiply and divide whole numbers* mentally, on paper, and with a calculator.

5.2.2 Use appropriate fractions and decimals when solving problems.

* whole numbers: 0, 1, 2, 3, etc.

Manipulation and Observation

5.2.3 Choose appropriate common materials for making simple mechanical constructions and repairing things.

5.2.4 Keep a notebook to record observations and be able to distinguish inferences* from actual observations.

5.2.5 Use technology, such as calculators or spreadsheets, in determining area and volume from linear dimensions. Find area*, volume*, mass*, time, and cost, and find the difference between two quantities of anything.

* inference: a train of logic based on observations, leading to an explanation
* area: a measure of the size of a two-dimensional region
* volume: a measure of the size of a three-dimensional object
* mass: the amount of matter* in an object
* matter: anything that has mass and takes up space

Communication Skills

5.2.6 Write instructions that others can follow in carrying out a procedure.

5.2.7 Read and follow step-by-step instructions when learning new procedures.

Critical Response Skills

5.2.8 Recognize when and describe that comparisons might not be accurate because some of the conditions are not kept the same.

Standard 3

The Physical Setting

Students continue to investigate changes of Earth and the sky. They explore, describe, and classify materials, motion, and energy*.*

The Universe

5.3.1 Explain that telescopes are used to magnify distant objects in the sky, including the moon and the planets.

5.3.2 Observe and describe that stars are like the sun, some being smaller and some being larger, but they are so far away that they look like points of light.

5.3.3 Observe the stars and identify stars that are unusually bright and those that have unusual colors, such as reddish or bluish.

* motion: the change in position of an object in a certain amount of time

* energy: what is needed to do work

The Earth and the Processes That Shape It

5.3.4 Investigate that when liquid water disappears it turns into a gas* (vapor) mixed into the air and can reappear as a liquid* when cooled or as a solid* if cooled below the freezing point of water.

5.3.5 Observe and explain that clouds and fog are made of tiny droplets of water.

5.3.6 Demonstrate that things on or near Earth are pulled toward it by Earth's gravity*.

5.3.7 Describe that, like all planets and stars, Earth is approximately spherical in shape.

* gas: matter with no definite shape or volume

* liquid: matter with no definite shape but with a definite volume

* solid: matter with a definite shape and volume

* gravity: a force that pulls or attracts objects towards one another

Matter and Energy

5.3.8 Investigate, observe, and describe that heating and cooling cause changes in the properties of materials, such as water turning into steam by boiling and water turning into ice by freezing. Notice that many kinds of changes occur faster at higher temperatures*.

5.3.9 Investigate, observe, and describe that when warmer things are put with cooler ones, the warm ones lose heat* and the cool ones gain it until they are all at the same temperature. Demonstrate that a warmer object can warm a cooler one by contact or at a distance.

5.3.10 Investigate that some materials conduct* heat much better than others, and poor conductors can reduce heat loss.

* temperature: a measure of average heat energy that can be measured by using a thermometer

* heat: a form of energy
* conduction: the movement of heat through matter

Forces of Nature

5.3.11 Investigate and describe that changes in speed* or direction of motion of an object are caused by forces*. Understand that the greater the force, the greater the change in motion and the more massive an object, the less effect a given force will have.

5.3.12 Explain that objects move at different rates, with some moving very slowly and some moving too quickly for people to see them.

5.3.13 Demonstrate that Earth's gravity pulls any object toward it without touching it.

* speed: the rate per unit time at which an object moves
* force: a push or a pull that can cause a change in the motion of an object

Standard 4

The Living Environment

Students learn about an increasing variety of organisms – familiar, exotic, fossil, and microscopic. They use appropriate tools in identifying similarities and differences among these organisms. Students explore how organisms satisfy their needs in their environments.

Diversity of Life

5.4.1 Explain that for offspring to resemble their parents there must be a reliable way to transfer information from one generation to the next.

5.4.2 Observe and describe that some living things consist of a single cell that needs food, water, air, a way to dispose of waste, and an environment in which to live.

5.4.3 Observe and explain that some organisms are made of a collection of similar cells that benefit from cooperating. Explain that some organisms' cells, such as human nerve and muscle cells, vary greatly in appearance and perform very different roles in the organism.

Interdependence of Life and Evolution

5.4.4 Explain that in any particular environment, some kinds of plants and animals survive well, some do not survive as well, and some cannot survive at all.

5.4.5 Explain how changes in an organism's habitat are sometimes beneficial and sometimes harmful.

5.4.6 Recognize and explain that most microorganisms do not cause disease and many are beneficial.

5.4.7 Explain that living things, such as plants and animals, differ in their characteristics, and that sometimes these differences can give members of these groups (plants and animals) an advantage in surviving and reproducing.

5.4.8 Observe that and describe how fossils can be compared to one another and to living organisms according to their similarities and differences.

Human Identity

5.4.9 Explain that like other animals, human beings have body systems.

Standard 5

The Mathematical World

Students apply mathematics in scientific contexts. They make more precise and varied measurements in gathering data. Their geometric descriptions of objects are comprehensive, and their graphing demonstrates specific connections. They identify questions that can be answered by data distribution, e.g., "Where is the middle?" and their support of claims or answers with reasons and analogies becomes important.

Numbers

5.5.1 Make precise and varied measurements and specify the appropriate units.

Shapes and Symbolic Relationships

5.5.2 Show that mathematical statements using symbols may be true only when the symbols are replaced by certain numbers.

5.5.3 Classify objects in terms of simple figures and solids.

5.5.4 Compare shapes in terms of concepts, such as parallel and perpendicular, congruence*, and symmetry.

5.5.5 Demonstrate that areas of irregular shapes can be found by dividing them into squares and triangles.

5.5.6 Describe and use drawings to show shapes and compare locations of things very different in size.

* congruence: same size and shape

Reasoning and Uncertainty

5.5.7 Explain that predictions can be based on what is known about the past, assuming that conditions are similar.

5.5.8 Realize and explain that predictions may be more accurate if they are based on large collections of objects or events.

5.5.9 Show how spreading data out on a number line helps to see what the extremes are, where they pile up, and where the gaps are.

5.5.10 Explain the danger in using only a portion of the data collected to describe the whole.

Standard 6

Common Themes

Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result.

Systems

5.6.1 Recognize and describe that systems contain objects as well as processes that interact with each other.

Models and Scale

5.6.2 Demonstrate how geometric figures, number sequences, graphs, diagrams, sketches, number lines, maps, and stories can be used to represent objects, events, and processes in the real world, although such representation can never be exact in every detail.

5.6.3 Recognize and describe that almost anything has limits on how big or small it can be.

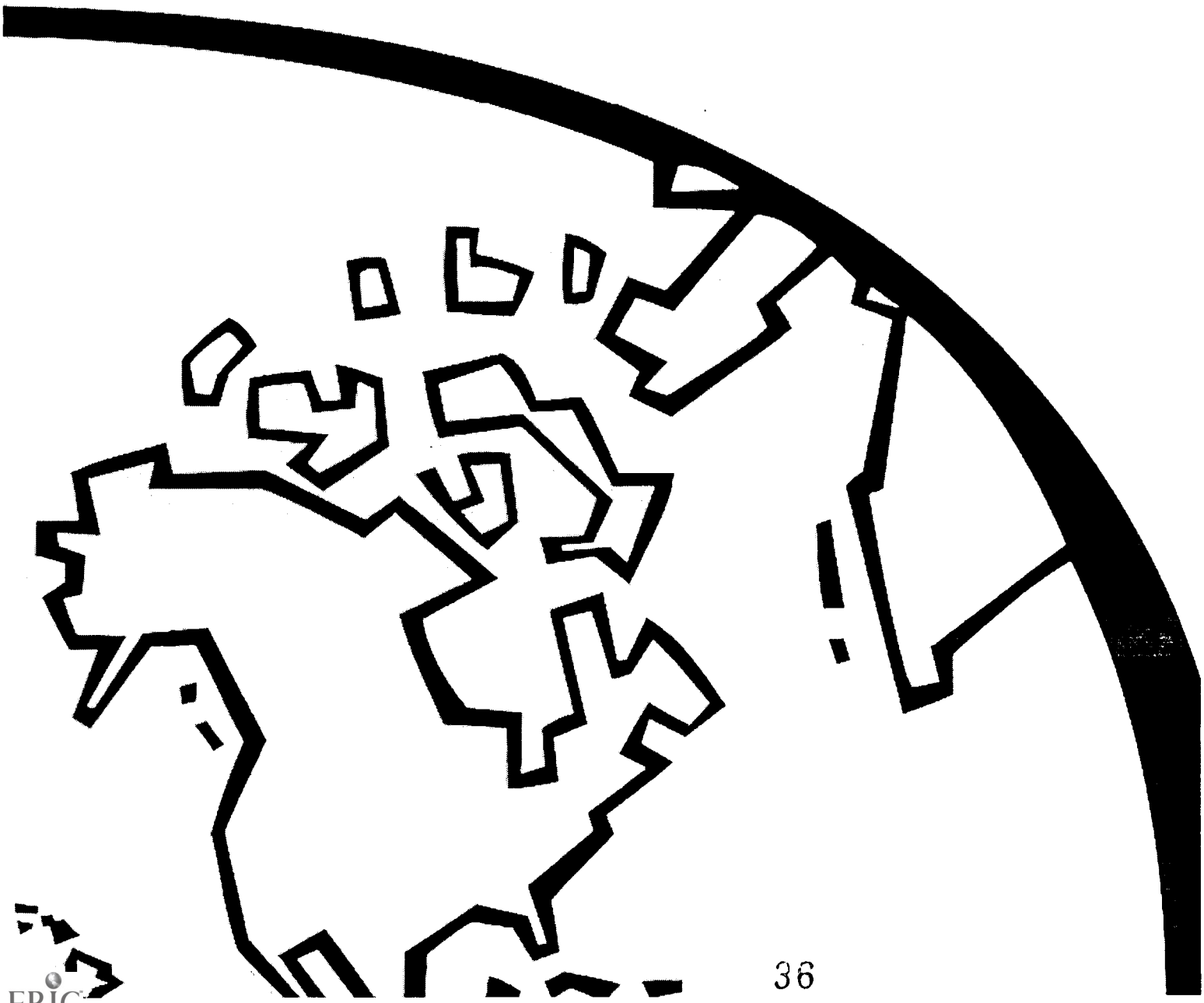
Constancy and Change

5.6.4 Investigate, observe, and describe that things change in steady, repetitive, or irregular ways, such as toy cars continuing in the same direction and air temperature reaching a high or low value. Note that the best way to tell which kinds of changes are happening is to make a table or a graph of measurements.

NOTES

Grade 5

Social Studies



The United States – The Founding of the Republic

Students in Grade 5 study the United States focusing on the influence of physical and cultural environments on national origins, growth, and development up to 1800. Emphasis should be placed upon study of American Indian cultures, European exploration, colonization, settlement, revolution against British rule, the founding of the republic, and the beginnings of the United States.

The K – 8 Indiana Academic Standards for social studies are organized around five content areas. The content area Standards and the types of learning experiences they provide to students in Grade 5 are described below. On the pages that follow, age-appropriate concepts are listed underneath each Standard. Skills for thinking, inquiry, and participation in a democratic society are integrated throughout. Specific terms are defined and examples are provided when necessary.

Standard 1 — History

Students will describe the historical movements that influenced the development of the United States from pre-Columbian times up to 1800 with an emphasis on the American Revolution and the founding of the United States.

Standard 2 — Civics and Government

Students will identify main components and characteristics of the United States government. They will identify and explain key ideas in government from the colonial and founding periods that continue to shape civic and political life.

Standard 3 — Geography

Students will describe Earth/sun relationships and the global grid system. They will identify major physical and cultural characteristics of the United States and its regions and name and locate the major physical features of each of the states and major cities of the United States. They will also explain the changing interaction of people with their environment in regions of the United States and show how the United States is related geographically to the rest of the world.

Standard 4 — Economics

Students will describe the productive resources and market relationships that influence the way people produce goods and services and earn a living in the United States in different historical periods.

Standard 5 — Individuals, Society, and Culture

Students will identify individuals and groups that have contributed to the development of the United States, investigate the way that individuals and groups cooperate to adapt to the environment and resolve conflicts, and examine the challenges faced and the contributions made by various cultural groups to American society.

Standard 1

History

Students will describe the historical movements that influenced the development of the United States from pre-Columbian times up to 1800 with an emphasis on the American Revolution and the founding of the United States.

Historical Knowledge

Ways of Life Before and After the Arrival of Europeans to 1610

5.1.1 Give examples of early cultures and settlements that existed in North America prior to contact with Europeans.

Example: Mississippian culture at Cahokia (600 – 1400 C.E.).

5.1.2 Examine accounts of early European explorations of North America, such as the Vikings' explorations and settlements in Greenland and North America, including accounts of interactions and conflicts between those early European explorers and Indians.

5.1.3 Identify and compare historic Indian groups of the West, Southwest, Northwest, Arctic and Sub-Arctic, Great Plains, and Eastern Woodlands regions at the beginning of European exploration in the late fifteenth and sixteenth centuries.

Example: Compare their styles of housing, settlement patterns, sources of food and clothing, customs and oral traditions, political and economic organization, and types and uses of technology.

5.1.4 Trace the major land and water routes of European explorers of the Caribbean region and North America, and examine their individual stories and reasons for exploration.

Example: Spanish expeditions by Christopher Columbus, Hernán Cortés, Hernando de Soto, and Francisco Vásquez de Coronado; expeditions by French explorers Jacques Cartier and Samuel de Champlain; and expeditions for England and Holland by explorers Henry Cabot, Henry Hudson, and John White.

5.1.5 Locate and compare early Spanish, French, and British settlements, such as St. Augustine, Roanoke Island, Quebec, Santa Fe, and Jamestown.

Colonization and Settlements: 1607 to 1763

5.1.6 Explain the religious, political, and economic reasons for movement of people from Europe to the Americas and describe the impact of exploration and settlement by Europeans on American Indians.

5.1.7 Identify and discuss instances of both cooperation and conflict between Indians and European settlers, such as agriculture, trade, cultural exchanges, and military alliances, as well as later broken treaties, massacres, and conflicts over control of the land.

Example: King Philip's War (1675 to 1676) in New England was extremely costly to both sides; the French and Indian War was a conflict between the British and French/American Indians to control territory in Northern America.

5.1.8 Locate the thirteen British colonies that became the United States and describe their political, social, and economic organization and structure.

5.1.9 Evaluate the contributions of political and religious leaders in colonial America.

Example: John Smith, William Bradford, Roger Williams, Anne Hutchinson, John Winthrop, Thomas Hooker, and William Penn.

5.1.10 Examine the causes and consequences of the establishment of slavery, and describe how slavery became an issue that began to divide the Northern and Southern colonies.

The American Revolution: 1763 to 1783

5.1.11 Analyze the causes of the Revolution, such as colonial resistance to British imperial policies, the denial of traditional rights of Englishmen to American colonists, and taxation without representation.

Example: The Stamp Act, Townsend Acts, taxes on tea, and the Coercive Acts.

5.1.12 Identify major British and American leaders and describe their roles in key events, such as the First and Second Continental Congresses, drafting and approval of the Declaration of Independence (1776), publication of *Common Sense*, and major battles of the Revolutionary War.

Example: King George III, Benjamin Franklin, Patrick Henry, Thomas Jefferson, John Adams, Thomas Paine, George Washington, and General Charles Cornwallis.

5.1.13 Assess the influence of other countries, such as France, Spain, Russia, Germany, Poland, and the Netherlands, in the American Revolution; identify individuals from other countries who assisted the American cause.

Example: The Marquis de Lafayette, Bernardo de Galvez, Thaddeus Kosciusko, and Friedrich Wilhelm Von Steuben.

5.1.14 Identify and evaluate contributions of women during the American Revolution, including Abigail Adams, Martha Washington, Mercy Otis Warren, and Molly Pitcher.

Example: Research on the Internet using women's history Web sites.

5.1.15 Explain consequences of the Revolution, including the drafting of state constitutions and the achievement of independence by the United States.

Making the United States Constitution and Establishing the Federal Republic: 1783 to 1800s

5.1.16 Explain why the United States Constitution was created in 1787 and how it established a stronger union among the original thirteen states. Identify people who were involved in its development.

Example: George Washington, James Madison, George Mason, Alexander Hamilton.

5.1.17 Describe the origins and drafting of the Bill of Rights, ratified in 1791.

5.1.18 Explain the development of the first American political parties and describe the presidential elections of 1792 (re-election of George Washington), 1796 (election of John Adams), and 1800 (election of Thomas Jefferson).

Chronological Thinking and Comprehension

5.1.19 Develop and interpret timelines showing major people, events, and developments in the early history of the United States from 1776-1801.

5.1.20 Read historical fiction and non-fiction about an event of the American Revolution and reconstruct the literal meaning of passages by identifying who was involved, what happened, where it happened, what events led to these developments, and what consequences or outcomes followed.

Example: The Boston Massacre, the Battle of Lexington Green.

5.1.21 Examine an historical narrative about an issue of the time and distinguish between statements of opinion and those that are factually grounded.

Example: Concerns about slavery, the controversy over the presidential election of 1800.

Research Capabilities

5.1.22 Identify and interpret primary source* and secondary source* materials that pertain to a problem confronting people during the founding period of the United States.

Example: Controversy and debate about the ratification of the United States Constitution.

* primary source: developed by people who experienced the events being studied (i.e., autobiographies, diaries, letters, government documents)

* secondary source: developed by people who have researched events but did not experience them directly (i.e., articles, biographies, internet resources, non-fiction books)

Standard 2

Civics and Government

Students will identify main components and characteristics of the United States government. They will identify and explain key ideas in government from the colonial and founding periods that continue to shape civic and political life.

Foundations of Government

5.2.1 Explain why people need government by considering what life would be like in the absence of government.

Example: The purposes of government include the protection of individual rights and the attainment of the common good.

5.2.2 Identify and explain ideas about limited government*, the rule of law, and individual rights in key colonial-era documents.

Example: The Mayflower Compact (1620), Fundamental Orders of Connecticut (1639), Massachusetts Body of Liberties (1641), and Pennsylvania Charter of Privileges (1701).

5.2.3 Give examples of how the British colonies developed forms of representative, self-government and democratic practices within the British imperial political system, including town meetings, colonial legislative bodies, and charters on individual freedoms and rights.

5.2.4 Identify and explain key ideas about government as noted in founding documents of the United States of America, such as the Declaration of Independence, Articles of Confederation, Northwest Ordinance, United States Constitution, and the Bill of Rights.

Example: Key ideas – union*, popular sovereignty*, republican government* (republicanism), constitutional government* (constitutionalism), federal government* (federalism), and individual rights*.

5.2.5 Summarize the principles and purposes of government in the Preamble to the Constitution of the United States.

Example: The purposes of government include the protection of individual rights to liberty and attainment of the common good or general welfare of society.

5.2.6 Identify and give examples of individual rights in the Bill of Rights.

Example: The right to associate with whomever one pleases; the right to practice the religion of one's choice; the right to vote, speak freely, and criticize the government; the right to own property.

* limited government: the powers of government are specified and limited, usually by a written constitution in order to protect individual rights
* union: an alliance of citizens, colonies, states, or other entities for mutual interest or benefit
* popular sovereignty: government by consent of the governed who are the source of all authority in their government
* republican government: type of government in which power is exercised by representatives chosen by the people
* constitutional government: powers of government are distributed according to provisions of a constitution or supreme law, which effectively limit or restrain the exercise of power
* federal government: type of government in which power is divided between a central (general or national) government and its states, such as the states of the United States
* individual rights: personal, political, and economic rights possessed equally by each person

Functions of Government

5.2.7 Describe various kinds of elections, such as primary elections, general elections, local, state, and national elections, including ones to select congressional and presidential office holders.

5.2.8 Describe the three branches of the United States government, their functions, and relationships.

Example: Separation of powers, shared powers, and checks and balances involving the legislative (law making), executive (law enforcing), and judicial (law interpreting) branches of government.

Roles of Citizens

5.2.9 Demonstrate civic responsibility in group and individual actions, including civic dispositions, such as civility, cooperation, respect, and responsible participation.

5.2.10 Examine ways by which citizens may effectively voice opinions, monitor government, and bring about change in government and the public agenda*, including voting and participation in the election process.

5.2.11 Use a variety of information resources* to identify and evaluate contemporary issues that involve civic responsibility, individual rights, and the common good.

* public agenda: what the public needs and wants with respect to government action

* information resources: print media, including books, magazines, and newspapers; electronic media, such as radio, television, Web sites, and databases; and community resources, such as individuals and organizations

Standard 3

Geography

Students will describe Earth/sun relationships and the global grid system. They will identify major physical and cultural characteristics of the United States and its regions and name and locate the major physical features of each of the states and major cities of the United States. They will also explain the changing interaction of people with their environment in regions of the United States and show how the United States is related geographically to the rest of the world.

The World in Spatial Terms

5.3.1 Demonstrate that lines of latitude and longitude are measured in degrees of a circle, that places can be precisely located where these lines intersect, and that location can be stated in terms of degrees north or south of the equator and east or west of the Prime Meridian.

Places and Regions

5.3.2 Name and locate states, major cities, major regions, major rivers and mountain ranges in the United States.

5.3.3 Compare the locations of cities today with American Indian and colonial settlements, and suggest reasons for the locations of these places, such as near bodies of water, on a lowland, along a transportation route, near natural resources or sources of power.

Example: Use geography software to show bodies of water and roads. Use Internet and other reference materials to locate early and modern cities.

Physical Systems

5.3.4 Locate the continental divide and the major drainage basins in the United States.

5.3.5 Map and describe the characteristics of climate regions of the United States.

Example: Distinguish between the moist eastern part of the United States and the drier western part. Explain how mountain ranges cut off moisture from specific regions.

Human Systems

5.3.6 Analyze how the location and natural environment of Spanish, French, and British colonies influenced their development.

5.3.7 Describe the major ways that land was used by American Indians and colonists in each region, and explain how land use changed in the past and continues to change.

5.3.8 Identify the major manufacturing and agricultural regions in colonial America, and cite ways that agriculture and manufacturing have changed in the past and continue to change.

5.3.9 Interpret historical maps and create maps of the United States in different historical periods using map elements, such as title, legend, directional indicator, scale, and projection.

Example: Use electronic sources, such as Geographic Information Systems (GIS)*, to find, interpret, and create maps.

* Geographic Information Systems (GIS): information technology systems used to store, analyze, manipulate, and display a wide range of geographic information

Environment and Society, Uses of Geography

5.3.10 Read fiction and non-fiction stories about how American Indians and European settlers lived in early America and find examples of the various ways people adapted to and changed the environment.

5.3.11 Give examples of how specific physical features influenced historical events and movements.

Standard 4

Economics

Students will describe the productive resources and market relationships that influence the way people produce goods and services and earn a living in the United States in different historical periods.

5.4.1 Describe the economic activities within and among American Indian cultures prior to contact with Europeans. Examine the economic factors that helped motivate European exploration and colonization.

5.4.2 Summarize a market economy, and give examples of how the colonial and early American economy exhibited these characteristics.

Example: Private ownership, markets, competition, rule of law, and consumer sovereignty.

5.4.3 Trace the development of technology and the impact of major inventions on business productivity during the early development of the United States.

5.4.4 Explain how education and training, specialization, and investment in capital resources* increase productivity*.

5.4.5 Use economic reasoning to explain why certain careers are more common in one region than in another, and how specialization results in more interdependence.

5.4.6 Predict the effect of changes in supply* and demand* on price.

5.4.7 Analyze how the causes and effects of changes in price of certain goods* and services* had significant influence on events in United States history.

Example: The price of cotton, the price of beaver pelts, and the price of gold all are related to specific events and movements in the development of the United States.

5.4.8 Identify the elements of a personal budget and explain why personal spending and saving decisions are important.

* capital resources: goods, such as tools, buildings, and equipment, used in production
* productivity: amount of goods and services produced in a period of time divided by the productive resources used
* supply: what producers are willing and able to sell at various price levels
* demand: what consumers are willing and able to buy at various price levels
* goods: objects, such as food or a toy, that can satisfy people's wants
* services: actions that someone does for someone else, such as dental care or trash removal

Standard 5

Individuals, Society, and Culture

Students will identify individuals and groups that have contributed to the development of the United States, investigate the way that individuals and groups cooperate to adapt to the environment and resolve conflicts, and examine the challenges faced and the contributions made by various cultural groups to American society.

5.5.1 Describe basic needs that individuals have in order to survive, such as the need for food, water, shelter, and safety, and give examples of how people in early America adapted* to meet basic needs.

Example: American Indian groups and early European settlers developed housing, clothing styles, and materials depending upon what was available in the local environment. Living and working in groups made it easier to build houses, hunt, and grow food for crops. People also live in groups today to meet basic and other needs.

5.5.2 Give examples of groups who made up communities* in early America, and compare the different ways that communities were organized.

Example: Communities in English colonies usually were made up of families as well as religious, military, business, school, and governmental groups. As the colonies grew, colleges and universities were established to provide higher education; militias were formed to provide for local defense; business groups were formed to carry out trade, and colonial assemblies were brought together to make laws. Less formal groups were formed to help meet social, civic, and recreational needs.

5.5.3 Read fiction and non-fiction stories about conflicts among and between groups of people at different stages in the formation of the United States, and give examples of how these conflicts were resolved.

Example: Different religious views within communities sometimes led to founding of new communities, such as Providence, Rhode Island, in 1644. During the revolutionary period, different political ideas led to conflicts between loyalists and patriots. During the development of the Constitution, the federalists and anti-federalists had differences of opinion about the role of government.

5.5.4 Compare significant examples of visual arts, crafts, music, architecture, and literature from early United States history, and illustrate how each reflects the times and cultural background of the historical period.

Example: The silver work and furniture of Paul Revere indicated an appreciation of both simplicity and elegance. The poetry of Phyllis Wheatley and popular songs, such as "Yankee Doodle," reflected the patriotic spirit of the time.

5.5.5 Analyze traditional arts, including folk tales and narratives that depict the experiences of ethnic, racial, and religious groups in different regions of the United States.

5.5.6 Read accounts of how scientific and technological innovations have affected the way people lived in the early United States, and make predictions about how future scientific and technological developments may change cultural life.

* adaptation: the way people change behavior to meet their needs in a changing environment

* community: a group of people (or groups of people) who often live close together and have similar interests or goals

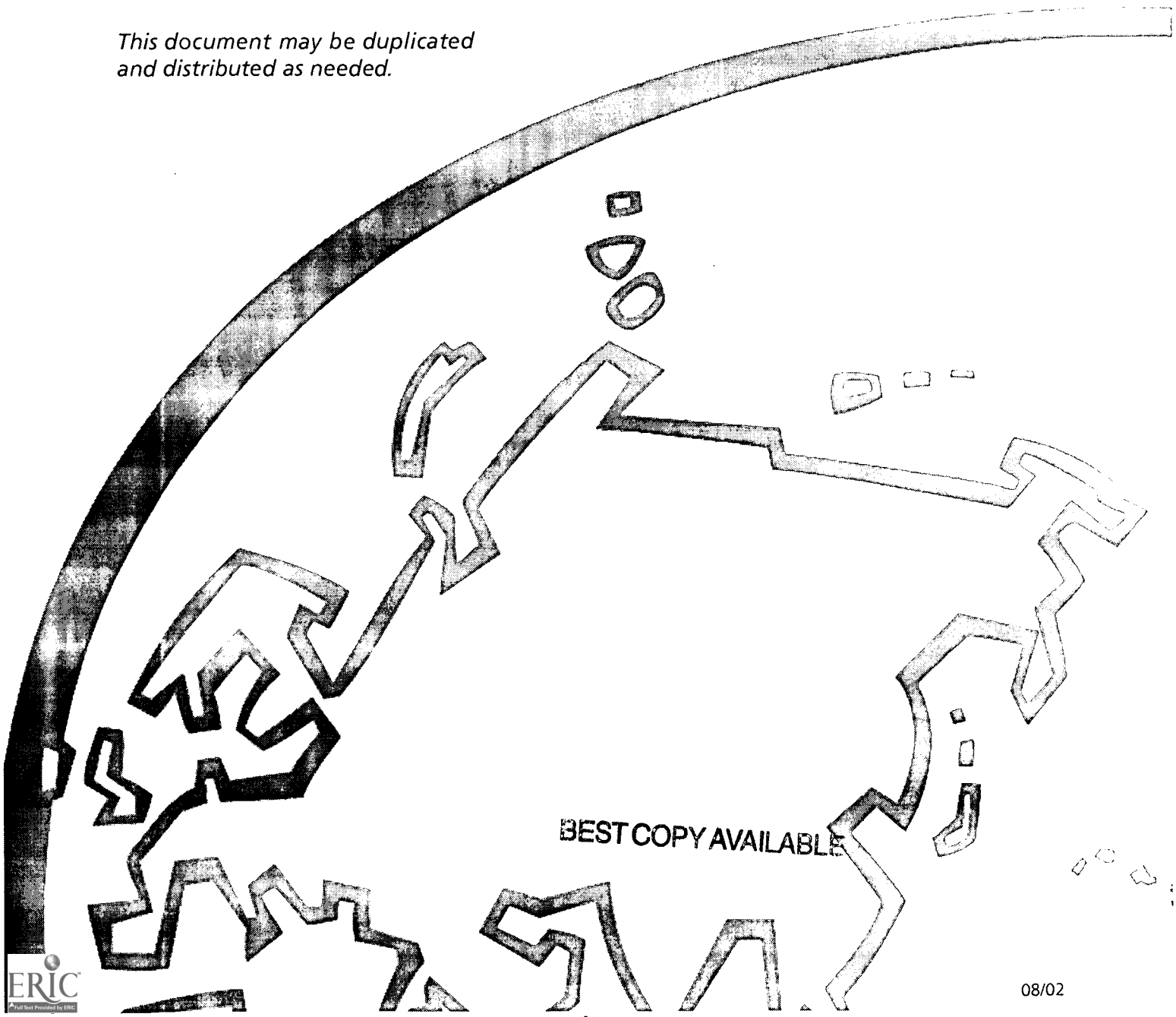
NOTES

Questions?

If you have contacted your child's school and still need additional information, call: **1.888.544.7837**.

www.doe.state.in.us/standards

This document may be duplicated and distributed as needed.



U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

	This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.
X	This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").