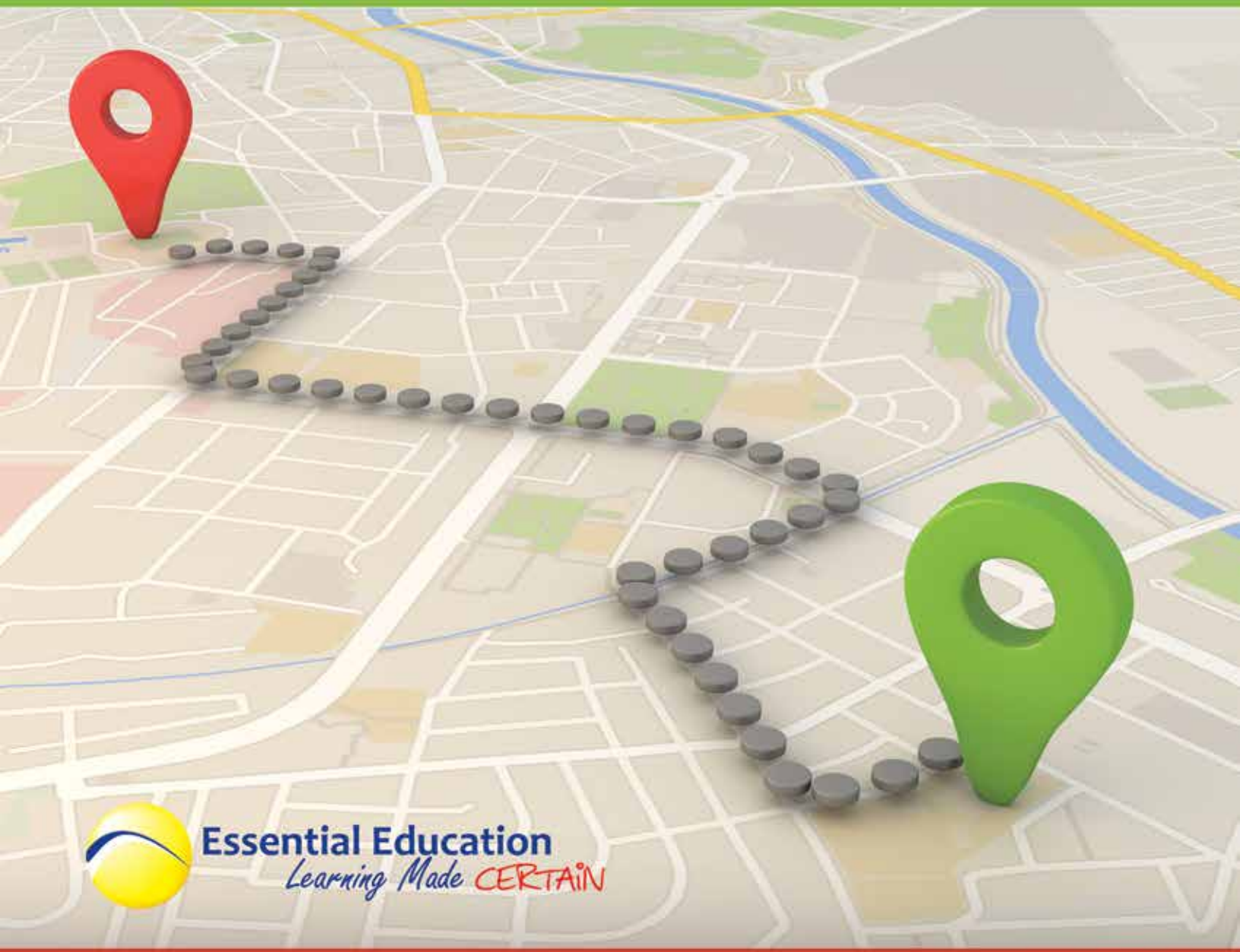
CCR Roadmap

Teaching with the Career and College Readiness Standards in the Adult Ed Classroom



Essential Education
Learning Made CERTAIN

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What Are the CCR Standards?

Adult students need to catch up on basic education, so the standards for adult ed need to reflect what's being taught in K–12. Adults also need standards that prepare them for careers or for college. With this in mind, the CCR Standards were developed by examining and evaluating the Common Core State Standards for K–12. What are the priorities for adult ed students? What are the most critical skills? What will best prepare adults for their future, in a manageable adult ed curriculum? The CCR Standards distill the Common Core down to essential skills for work, life, and post-secondary education.

Adult education classrooms face unique challenges. The students have widely different backgrounds, knowledge levels, and goals. The CCR Standards outline a curriculum in fundamental skills to be adapted to these diverse students. The goal of this curriculum is one that is manageable in the classroom, while still focused on truly important skills.

The CCR Standards cover literacy and mathematics skills, the foundations of education. The literacy standards cover five areas:

- Reading
- Writing
- Speaking and listening
- Language
- Reading foundational skills

Mathematics are also broken down into specific categories covering elements of broader areas such as geometry or algebra. However, to provide an overview, the standards cover these basic areas:

- Numbers and number systems
- Operations
- Expressions and equations
- Ratios and proportional relationships
- Algebra
- Functions
- Geometry
- Measurement and data
- Statistics and probability

Taken together, these standards describe a foundation of skills that prepare students for the breadth of future challenges in life. The CCR Standards are just that: a description of skills that students should have. It's a yardstick to measure adult learning. The standards aren't prescriptions for classroom activities or specific lessons. They are outcomes for students. The challenge for adult educators is to find effective ways to help students achieve these outcomes.

This roadmap includes details about what's in the CCR standards, how these standards relate to adult education testing, and ways to teach the CCR standards.

College and Career Readiness for Adult Students

The Big Picture

Adult education is filled with complex situations. One student urgently needs an HSE diploma because her job of the last ten years now requires one. Another student dropped out of high school and now feels trapped in low-paying positions. A third can't find a job at all and urgently wants a better resume.

College and career readiness standards may seem like they add an extra burden to the adult ed classroom. But ultimately, the goal of these standards is to increase skills.

By aiming higher in the classroom, all students benefit. Instruction becomes more effective. Students gain more skills in less time. Students desperate for jobs become better qualified. The trick? Teaching is the key.

Why is college and career readiness important to adult students? Some adults want to go on to post-secondary education and training. Others are interested in pursuing new careers. Teachers often see students who are looking at overwhelming, immediate problems. Every student has a story.

- "Because of a new requirement, I need a high school diploma to keep my current job. I don't need anything extra."
- "I want a specific technical education. A high school diploma is a first step—but I won't need a lot of the math and writing."
- "I need a better job right now. It has to be as soon as possible, because I've got bills to pay, and I just can't compete without that piece of paper."

All of these perspectives are looking at a high school diploma as a piece of paper that provides an entryway to something else. They see certain skills as extraneous and unnecessary. When students are

in tough immediate circumstances, it can be difficult to see the benefits of new standards that reach higher and ask students to develop new kinds of skills. Why do I need to understand the distributive property if I can just memorize the FOIL method to get through an algebra question? Why do I need to think about purpose and audience if I can just memorize the five-paragraph essay to get through a writing assessment?

The benefits of higher standards are three-fold. First, when teachers expect more from students, students achieve more. One of the strongest predictions of success is the expectation of success. Sometimes it's difficult to expect everyone to succeed; it doesn't seem realistic. But students who struggle with writing will achieve more if they are given big goals. They may not fully achieve all of the goals, but they'll get farther. Expectations are a predeterminer of achievement, for students and teachers alike.

Second, by teaching the skills students need immediately in the context of high standards, students learn more important workplace, life, and academic skills in the process of meeting their goals. Adult education does students a disservice by focusing only on the immediate need. Life has a way of changing, and even a student who wants "just a piece of paper" is likely to soon face another challenging problem—or opportunity—that requires expanded skills. The goal is for students to leave adult education with more significant abilities that will serve them well in life, career, and education.

Third, higher standards maintain the relevance of adult education. What happens as K-12 education changes, if adult education remains the same? If a high school equivalency diploma is no longer equivalent to a high school diploma, employers will value it less and less. It will become irrelevant, and there is nothing to replace it.

Student Goal: HSE for a Specific Job or Entrance Requirement

When a student is looking to get or keep a specific job or meet an entrance requirement, the emphasis immediately shifts from learning to credential-getting. The student often wants an official piece of paper, not an education. After all, that's the requirement: a piece of paper. CCR standards may seem to make the task harder without a purpose.

The student who comes to the adult education classroom to meet a high school diploma requirement needs help getting that diploma. That may seem like an impossibly obvious statement. The implication, though, is that the student needs help because *that student does not have the skills to earn a high school equivalency diploma without help*. That's what the adult education system is for: to help adults acquire skills that they've missed.

Jobs and programs require high school diplomas, not because they want a piece of paper to file in someone's employment records, but because they want a worker or student who has high-school level skills: communication skills, analysis skills, critical thinking skills, application skills. The CCR standards are intended to define those skills.

- Reading standards emphasize the ability to closely read and interpret complex texts. Instead of focusing only on literature, the standards include informational texts, historical/social studies texts, and scientific and technical texts. The complexity of text is key. Students must deal with many types of texts in the real world, and if they can understand complex texts, then they can achieve more.
- Writing standards include evaluating and revising writing as well as using technology to write. They encompass research and using sources in writing tasks. Students who can research and write complex works have an advantage.
- Math standards emphasize deeper understanding of mathematical principles and the ability to apply math to real-world situations. Students who internalize math principles can perform a wider variety of tasks required across careers.

Even if a student doesn't need these skills right away, the more progress that student can make toward mastering real-world skills, the better off that student will be in

the future. While a particular student may not need to master every single CCR standard to succeed at his or her present and future goals, centering a curriculum around advanced standards will increase students' skills.

For students headed into the workplace, emphasize the core job skills and real-world connections that are inherent in the CCR standards. Adult students are often in education programs for a limited amount of time. The more your classroom focuses on critical, high-level skills, the better off your students will be.

Students don't necessarily need longer preparation time. They need better preparation. By teaching to higher level standards with strong teaching methods, students understand quicker and have a stronger grasp of materials. Students build skills that they can use in their career and daily lives. If students later want to move on to higher education, they have a head start.

How do you teach to higher level standards and use strong teaching methods?

- Use complex texts. Even if students need to start with texts with a lower reading level, tackle texts that address complex ideas, real-world events, and scientific topics. The content of texts should encourage thought and learning.
- Teach for understanding instead of memorization. Don't teach a formula for solving a math problem. Teach why that formula works. Don't ask students what happened in a passage. Ask why it happened, why it's significant, or what the results might be. Have students to think through the reasons why.
- Ask students to defend their opinions and conclusions. Why is their answer correct? What support do they have?
- Have students work together. Explaining concepts to another student, collaborating to find solutions, and communicating in a small group all improve performance.

Student Goal: College

It's easier to see how students who want to move on to college-level courses can benefit from CCR standards. They are, after all, the Career and College Readiness standards. Success in college depends on solid foundational skills measured by the CCR standards. Students who are bound for college want to earn a high school equivalency diploma, and they want to succeed at college placement exams. Mastering fundamental skills will help students move forward without remedial courses. In addition, college-bound students may need to prepare for college entrance exams and prepare for their particular field.

The CCR standards give educators a picture of the skills students should master for college readiness. It's a large and detailed picture, but it's one that can be mastered in the adult ed classroom. A curriculum based on the CCR standards can meet all the needs of a college-bound student more effectively and efficiently.

Earning a Diploma

As college-bound students prepare for their high school equivalency diplomas, they should be simultaneously preparing for other requirements of college. When students learn techniques for comprehension, they should be exposed to quality texts that introduce science, social studies, and critical thinking concepts. When students learn math fundamentals, they should be preparing for algebra and higher level math. Teaching with the CCR standards will help your students earn their diploma while bringing them closer to their other goals.

College Placement Exams

College placement exams including ACCUPLACER® and ACT® Compass® determine students' need for remedial courses. Teaching with the CCR standards will prepare students for these tests.

For example, the ACT Compass test in math includes application—applying math to complex and novel situations—and analysis—demonstrating conceptual understanding of math principles. The CCR standards focus on building these capabilities by teaching for understanding principles. Why do you choose a particular type

of formula for a certain circumstance? Why does a math strategy work? Similarly, the ACT Compass writing test gives students real-world writing tasks that require critical analysis and persuasion. The reading test includes reading in the social sciences and natural sciences as well as fiction, practical reading, and humanities. Not surprisingly, CCR skills are reflected clearly in college placement tests.

For more information about ACT Compass and ACCUPLACER, see pages 59–66.

College Entrance Exams

Students who plan to take the ACT® or SAT® college entrance exams are in a similar circumstance. The SAT essay asks a student to develop and support a point of view. Reading questions will deal with college level texts and vocabulary.

The ACT has its own ACT Career and College Readiness Standards which serve as test targets. These standards cover similar skills to the CCR standards. Examples include determining whether an essay has met a goal, determining relevance of plausible but potentially irrelevant material, solving multi-step problems involving planning, and drawing logical conclusions from challenging passages. Using the CCR standards in the classroom will give students an advantage in preparing for these standardized tests.

Why do colleges want students who can achieve high scores on the ACT or SAT? It's the same as the reason why employers want their new hires to have a diploma. A score represents skills. As a society, we often debate how accurate standardized tests are in measuring skills and representing students' capabilities. This debate reflects the fact that the tests are never the goal. The goal of teaching and of learning is to develop skills and abilities. As students prepare for standardized tests, and as you implement standards in the classroom, never lose sight of the skills students are developing. Doing well on tests will be a side effect of developing skills.

Preparing for a Particular Field

Adult students who are college-bound are likely to have particular careers in mind. If a student is headed for a technical college, they may want to focus in more depth on math and science. If a student is interested in social work, social sciences and reading may be of special interest. Allowing students to pursue subjects of interest and relevance to them will help them build skills and prepare for the future. Fundamental skills in reading, writing, and math are applicable to many careers. Use texts from relevant fields that your students are interested in, and ask your students to find texts in their field.

Student Goal: Life Improvements and Fulfillment

The student who is pursuing education for fulfillment and life improvement may seem least in need of career and college readiness standards. However, the CCR standards are also a useful tool for developing life skills.

- Financial health is benefited by critical thinking skills, conceptual understanding of mathematic principles, and application of math to novel problems. A retired adult student might improve her ability to manage her retirement account. A younger student might manage student loans or budget his money to afford a house. Navigating credit and loans, saving for emergencies, and starting a small business are all personal goals. Mastering the skills in the CCR standards will give students the tools to achieve these goals and more.
- Life involves making choices. A student who can evaluate complex texts, analyze information, and develop well-supported opinions can make good choices about careers, housing, hobbies, family, and all the details of life.
- Everyone has pursuits in life, whether they are work-centered or recreational. Thinking about rich texts can inspire an amateur artist or community activist. Understanding mathematical principles can help an amateur carpenter tackle more complex projects or help a gardener plan his perfect backyard.
- Civic life involves critical thinking and evaluation skills. When an adult votes for a local proposition or a national candidate, she is making decisions based on information. Reading complex texts, analyzing visual information, and evaluating information all play a role.
- Reading complex texts about real-world topics, from technology to sociology to politics, can be fulfilling. Thinking about new perspectives, forming opinions, and analyzing positions are intellectually stimulating pursuits.

Students who seek life improvements and fulfillment are diverse, as are students seeking high school credentials and college degrees. However, the CCR standards are designed to be broadly applicable. Because they are foundational standards, they are useful for activities at home as well as in the workplace.

Students who want to feel fulfilled and improve their lives will benefit most from learning critical thinking skills and evaluating real-world ideas and problems. Because colleges and careers demand these abilities, they are integral to the CCR standards. Exposing students to complex materials beyond their current scope of knowledge will encourage growth.

Real-world applications of knowledge are not only useful for students seeking life improvements and fulfillment. Real-world texts and problems create interest, activate background knowledge, and increase understanding.

As diverse as adult ed students may be, they benefit from common skills:

- Critical thinking
- Evaluation
- Comprehending math practices
- Working with complex, rich texts
- Building arguments and supporting opinions
- Expressing ideas well

Not surprisingly, these are the skills emphasized by the CCR standards.

How Do the CCR Standards Affect the Classroom?

The Big Picture

In the classroom, the emphasis is on teaching and learning. Standards aren't a prescription for how you run your classroom. Instead, they are a definition of the skills that students need to master.

The CCR standards, however, can inform your teaching methods. Classroom activities should emphasize comprehending rich texts, evaluating reasons and evidence, and building a breadth of knowledge. In mathematics, students should understand fundamental skills deeply. Focusing on understanding math concepts and applying math to real-world problems will develop student skills.

This section will give you an overview of important concepts in the CCR standards and ways to incorporate these concepts into your teaching.

The CCR standards identify three significant shifts in instruction in language arts and literacy and three key shifts in mathematics. The focus in language arts becomes examining complex, rich texts. This shift increases breadth of knowledge and builds critical thinking and analysis skills.

- **The first shift is complexity.** The research underlying the CCR standards shows that success is tied to the ability to comprehend and interact with complex texts. At the same time, research shows that secondary texts are much simpler than typical college and career texts. Because of this, the CCR standards emphasize the need to build students' skills with complex texts.
- **The second shift is evidence.** Students must be able to identify textual evidence. This is a crucial critical thinking skill, demanding that students support ideas. If a student states that a character is timid, that student should point to evidence of the character's actions. If a student states that an argument is flawed, that student should point to evidence of the flaw. If a

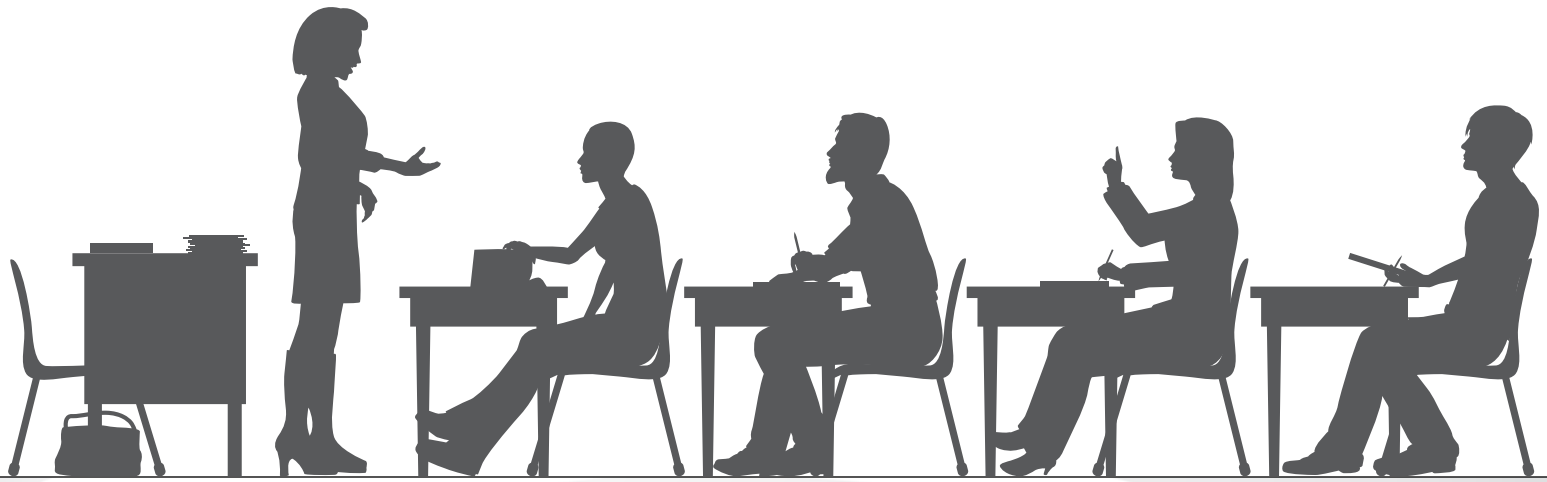
student states an author's main idea, that student should point to evidence that shows what the author is trying to say. A statement without evidence isn't convincing.

- **The third shift is knowledge.** Reading is a skill that's foundational to humanities, sciences, social sciences, careers, and personal pursuits. The CCR standards ask students to read in science, social studies, and technical subjects, emphasizing informational texts. Reading a broad range of informational texts will increase subject matter knowledge as well as reading skills and vocabulary.

The three key shifts in mathematics instruction focus on understanding mathematical principles. Students should understand mathematical thinking and apply mathematical ideas, not merely memorize formulas.

- **The first shift is focus.** The CCR standards encourage math instruction that is narrower and deeper. Time is always in short supply in adult ed classrooms. Focus on teaching the most important math topics fully and well. Get at the foundational reasons behind these math topics. Teach "why," not just "how." The CCR standards for math define priority topics to narrow the focus of math instruction and build foundational math understanding.
- **The second shift is coherence.** This means building new math on previous learning. Make the connections between what you're teaching and the foundational math. Higher level standards build on the lower-level ones, so that a student is developing one idea over time instead of constantly facing a new and unrelated math topic in the next lesson.
- **The third shift is rigor.** The CCR standards for math ask students to understand key concepts, master procedures, and apply math to real-world contexts. Understanding the conceptual underpinnings of math and applying math build strong knowledge.

This section will look at how to apply these shifts in language arts and mathematics to your classroom.



Teaching ELA/Literacy for Complexity, Evidence, and Knowledge

Teaching for complexity, evidence, and knowledge means tackling more complex texts. Even when students need to begin with texts at a lower reading level, choose those with rich and relevant information that builds knowledge. Assure that students identify evidence in the text to back up their ideas and responses. This section will give you classroom activities and techniques to teach for complexity, evidence, and knowledge.

Supporting the Main Idea

Instructions: Locate a substantial and appropriate text (from a magazine, newspaper, or online source) about a new technology. Break students up into groups. Have each group:

1. Read the text.
2. Identify the main idea of the text and state it in their own words.
3. Identify three pieces of evidence in the article that support their statement of the main idea. What proof is there that this is the main idea?
4. Write down why each piece of evidence supports the main idea.

After students are finished with this activity, have each group share their main idea and support with the class. If two groups have different main ideas, even if they're only slightly different, ask students to judge the evidence. Which main idea is stated best, based on the evidence?

Complexity: Choose a complex real-world text for students' reading level. Having students read and discuss in groups will help build comprehension. Provide a physical and/or online dictionary and other resources to help students build vocabulary as they read.

Evidence: Students work to identify evidence to support an idea. It is just as important to have students explain why the evidence supports their idea. Expressing the connection between the main idea and the evidence is essential to success in writing evidence-based works. In discussion, students will evaluate evidence. Help students determine what is good or bad evidential support.

Knowledge: Students also build knowledge through a real-world text relating to technology. This activity can be modified for use with historical texts, scientific texts, workplace texts, texts on civic issues, or other content-rich material.

Developing an Advertisement

Instructions: Have each student identify a political or community issue that they support. Should the community have an after-school program? Should the local government reduce sales tax? Should the town undertake a river clean-up project? Have each student:

1. Find and bring to class at least three good sources of information about this issue.
2. Write a main idea that the student wants to promote. For example, "The local government should lower the sales tax by 0.5 cents."
3. In each information source, identify and document evidence to support their idea.
4. Create a one-page magazine ad to promote the idea. The ad should contain persuasive evidence supporting the idea.

After students are finished creating their ads, have students break up into groups and share advertisements. Other students in the group should critique the ads, explaining why it is persuasive or not persuasive. The ad creators can respond, providing additional evidence from their sources.

Complexity: Real-world sources with support for an issue will provide complexity of text. Since students are seeking information about an idea that is important to them, they will have background knowledge (and interest) to aid with comprehension.

Evidence: Students must source and identify support for their idea and then develop their own persuasive arguments. In the groups, students will evaluate support and judge persuasiveness.

Knowledge: Students will build knowledge about issues that they care about as well as issues that their classmates care about. Community and political issues will build social studies knowledge.

Classroom Debate

Instructions: Have students work in two, four, or six groups. Assign each group a "pro" or "con" position on a debate topic.

1. Have each group research the assigned topic and identify sources of information to use in developing arguments supporting the group's position.
2. Groups should collect evidence from their sources and document the relationship between the evidence and the group's position.
3. Have each student prepare a brief verbal argument supporting the group's position.
4. Hold classroom debates between the "pro" and "con" groups where each student presents the verbal argument. Students in neither group may vote for the winner—the group or student with the most persuasive argument.

Classroom discussion after the debate can be valuable. Evaluate the support and discuss what makes an argument persuasive.

Complexity: Researching support for an argument involves complexity of texts. Encourage students to find more detailed, complex sources.

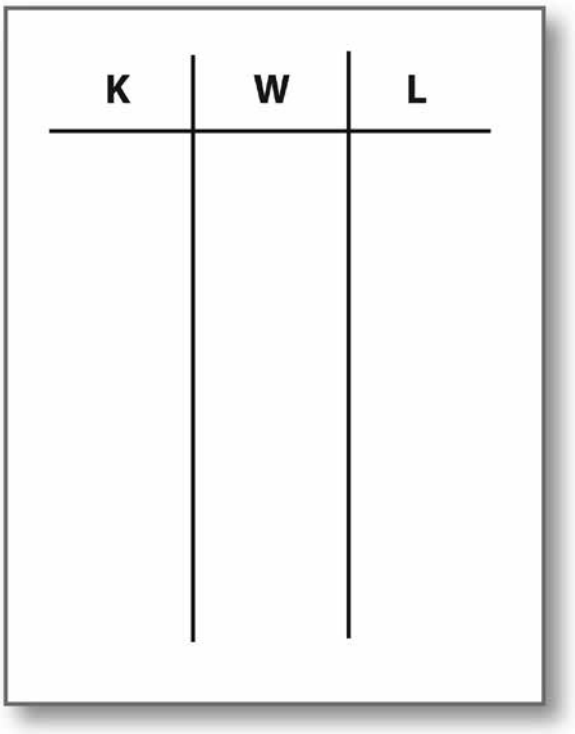
Evidence: Students must identify the most persuasive evidence and make connections with a position. They must judge whether their classmates' evidence is persuasive and relevant.

Knowledge: Students will build knowledge about the debate topics. Topics can cover science, social studies, civic issues, or other rich content.

K-W-L in Context

Instructions: Find a magazine article or in-depth text about a historic event or a modern development in the field of history. Distribute this text to students along with a K-W-L chart. Explain that students will outline a research project based on this article. Have each student:

1. Use the K-W-L chart while reading the text. In the "K" column, students will write what they know about the topic before reading. In the "W" column, students will write what they want to know. In the "L" column, students will write what they learned from reading. Have students identify specific passages in the text that exemplify their learning.
2. After reading, have students use their K-W-L chart to ask questions about the historic topic. Based on the questions, have students develop a topic for a research paper.
3. Ask students to research sources of information for their research topics. What sources are available? Based on the available sources, does the student need to revise the research topic? Have students revise the topics as needed.



The research projects can be completed over a longer period, or the exercise can end with the development of a topic and identification of sources.

Complexity: This exercise uses a K-W-L chart to help students tackle a complex text. Students will also deal with real-world texts as they review and select sources of information, although they may not read these sources in depth.

Evidence: Having students identify passages in the text that illustrate what they've learned helps students develop the ability to distinguish evidence.

Knowledge: Students will build social studies knowledge by reading about and developing a research topic related to history.

Literary Evidence

Instructions: Choose a short story that includes character development. Distribute the story to students. Have each student:

1. Identify a passage in the text that tells something significant about a specific character.
2. Write down the passage and write an explanation of what the passage reveals about the specific character.
3. Share with the class the passage and explanation.

Have the class discuss each passage and explanation. Which passages are most significant? What is the author's purpose in developing the character in this way?

Complexity: Choose a story with a complex text. If students are at a lower reading level, have them work in groups to read and discuss the story. During class discussion, talk about any misunderstandings students had in reading the text. Look at specific evidence in the passage. What words or phrases or sentences caused confusion? Why?

Evidence: This exercise builds students' ability to identify character traits through evidence. Students start with the evidence to build an idea.

Knowledge: While this is an exercise with literary text, students can still build knowledge. Look for literary texts that relate to important issues, scientific ideas, or other rich content.

Fluency Pairs

Instructions: Choose a text that is rich in content, such as a science or social studies text, and that is at a slightly high reading level for your students.

Break students up into pairs and give each pair a copy of the text.

1. Have one student read the passage aloud to the other student.
2. Have each student read the passage silently.
3. Have the pair discuss words they did not understand. Provide resources for the students to research and define new vocabulary words.
4. Have the students document words that were difficult. For each difficult word, have the pair identify and document context clues in the text that support or explain the definition of the word.
5. After the students have discussed the text, have the second student read the passage aloud to the first student.

After this fluency exercise, the class can discuss the topic of the text.

Complexity: This exercise builds the students' ability to read content-rich text and develops fluency. Although the text difficulty may vary with students' reading level, it increases the student's ability to tackle more complex texts in the future.

Evidence: Having the students identify context clues in the text supports the student's ability to identify evidence while building vocabulary skills.

Knowledge: Choosing content-rich text builds the student's knowledge in the field. Texts with academic or subject-specific vocabulary will help students build the ability to read and gain knowledge in academic subjects.

Facts and Opinions

Instructions: Choose two texts that present opposing positions on an issue. These could be two newspaper editorials or magazine articles or two position statements in a voter information pamphlet, for example. Distribute the texts to the class.

1. Discuss with the class the role of facts and opinions in building an argument. What do facts add to an argument? What do opinions add to an argument?
2. Have each student read the passages and underline all the facts in each passage.
3. Have each student read the passages a second time and highlight all the opinions in each passage.
4. Make a classroom chart of facts for each passage and a second chart of opinions for each passage. Discuss the identified facts or opinions. If there is disagreement or misidentifications of fact versus opinions, discuss why.

5. As a class, discuss the charts. How do the facts contribute to and support each argument? How do opinions contribute to and support each argument? Is an argument based only on opinion valid or convincing?

Complexity: By using real-world persuasive texts, students learn about facts and opinions in a context that defines why this topic is important and relevant. It primes students to critically analyze arguments. Texts should be complex for your students' reading level so that students build reading skills while learning about facts and opinions.

Evidence: By identifying specific examples of facts and opinions in the text, students build their skills in identifying evidence. Students analyze the role of these facts and opinions within the text, which helps build the students' ability to use textual evidence.

Knowledge: By examining both sides of an issue, students are developing deeper knowledge. Choose a relevant issue that builds knowledge.

Comparing Positions

Instructions: Choose two texts that present opposing positions on an issue. These could be two newspaper editorials or magazine articles or two position statements in a voter information pamphlet, for example.

This exercise could use the same texts as the texts for the Facts and Opinions exercise. Distribute the texts to the class.

1. Ask each student to identify quotation that gives a strong argument in one passage.
2. Have each student write down the quotation from the passage, a paraphrase of the quotation, and an explanation of why it is a strong argument.
3. Have each student present his or her argument to the class. Discuss each argument. Do other students agree that it's strong? How well did the student state why the argument is strong?
4. After reviewing all of the students arguments, hold a classroom discussion to determine which passage has an overall stronger argument. Why?

After this classroom exercise, you may have students write a response comparing the two passages and explaining why one presents stronger arguments than the other.

Complexity: Presenting opposing texts gives the students a reason to read closely and analyze the texts. Choose texts that are complex for your students' reading level, so that students continue to build their reading skills by tackling more and more difficult texts.

Evidence: Students identify evidence in the text and evaluate that evidence.

Knowledge: By examining both sides of an issue, students are developing deeper knowledge. Choose a relevant issue that builds knowledge.

Questioning a Text with Graphic Elements

Instructions: Choose a complex text dealing with a science, social studies, or workplace topic. The text should include heads/subheads, bulleted or numbered lists, photos or illustrations, and/or charts or graphs. Distribute this text to students. Have each student:

1. Preview the text by examining the graphical elements of the text and by skimming the text.
2. Based on the preview of the text, write questions about the text.
3. Read the text. During reading, the students should write additional questions about the text. What do they wonder or want to know as they read?
4. After reading, review each question. Did the text answer the question? If the student has found an answer, she should identify the appropriate passage in the text and explain how that passage answers the question.

Students can present their questions and answers to the class for discussion. Some students may have found answers to others' unanswered questions.

Complexity: This activity helps students approach complex texts by previewing and questioning. Students will learn to use graphic elements to gain information from a text.

Evidence: The student identifies specific evidence in the text to answer questions.

Knowledge: The activity builds knowledge in the subject area of the text. Science, social studies, and workplace texts commonly use graphical elements and are well-adapted to this activity.

Prediction

Instructions: Choose a literary text with a complexity slightly higher than students' reading levels. Identify a good stopping place where students can predict what will happen next.

Before the lesson, ask students to think of times when they predicted what would happen in the next episode or season of a favorite television show. Why did they speculate about what would happen? What did they base this speculation on?

Distribute the text to each student. Explain that the students will practice prediction with this text. Prediction builds students' comprehension and ability to make inferences.

1. Break students up into groups. Have the groups read the first part of the story.
2. Have each group make a prediction about something that will happen in the later part of the story. The group must agree on one prediction.
3. Have each group identify evidence supporting the group's prediction in the text. Each group should document the evidence and the reasons why that evidence supports the prediction.
4. Ask each group to share their predictions and evidence with the class. Discuss each prediction and evidence.
5. Read the rest of the story as a class and discuss which predictions were correct and incorrect. Why were groups with incorrect predictions mislead? What led groups with correct predictions to their responses?

Complexity: This exercise helps students read a complex text through examining the text closely and working in groups.

Evidence: Students must identify evidence that supports their predictions and make connections between the evidence and predictions.

Knowledge: While this exercise uses a literary text, students can still build knowledge. Choose literary texts that deal with science, history, culture, or other rich topics.

Teaching Mathematics for Focus, Coherence, and Rigor

The CCR standards for math represent a narrow approach that teaches more deeply. Students should master underlying concepts, procedures, and application of math to real-world problems. Math lessons should be coherent as students develop skills, building on previous knowledge. The goal of coherence is not only about a single lesson or activity. It involves the movement through math in a logical manner, so that what has been taught is then utilized in current lessons.

In addition, the CCR standards identify math practices that students should acquire throughout the scope of their mathematical learning. These practices support understanding math concepts more deeply and learning math more rigorously. For more information about math practices, see page 28. The following extended example lessons will help you teach math for focus, coherence, and rigor, as well as incorporating math practices in your teaching.

Word Problems with Fractional Answers

Target Standard: Level C, Apply and extend previous understanding of multiplication and division to multiply and divide fractions.

Objective: Student will demonstrate understanding of a fraction as division of the numerator by the denominator by solving word problems with fractional answers.

Activate Background Knowledge in Multiplication and Division

1. Ask students what it means to multiply. What is multiplication? Introduce an object to reinforce this concept. If I have one pen, what does multiplying that pen by 10 or 15 mean? If one pen costs 50 cents, how do I find the cost for 10 pens? Why do I use multiplication?
2. Ask students what it means to divide. What is division? Use examples of real-world objects. If there are a dozen pencils, how could they be divided by three? If there is one pencil, how could it be divided? A student might answer that you would divide a pencil by breaking it or cutting it into pieces. If not, suggest this answer.

Instruction

1. Introduce the concept that a fraction is a division of the numerator by the denominator. When you divide one whole by two, you get one half. Demonstrate fractions with shapes on the board or with manipulatives, and show the same fractions written as fractions and as simple whole-number division.
2. Demonstrate that because one whole divided by two is one half, one half multiplied by two equals one. Demonstrate this mathematical concept with several fractions.
3. Demonstrate that when three wholes are shared among five people, each person has ⅗ of an object. When four *x* are shared among nine, *y* each *y* has ⅘ of an *x*. Use real objects as examples. If five people order three pizzas, how much of a pizza will each person have?

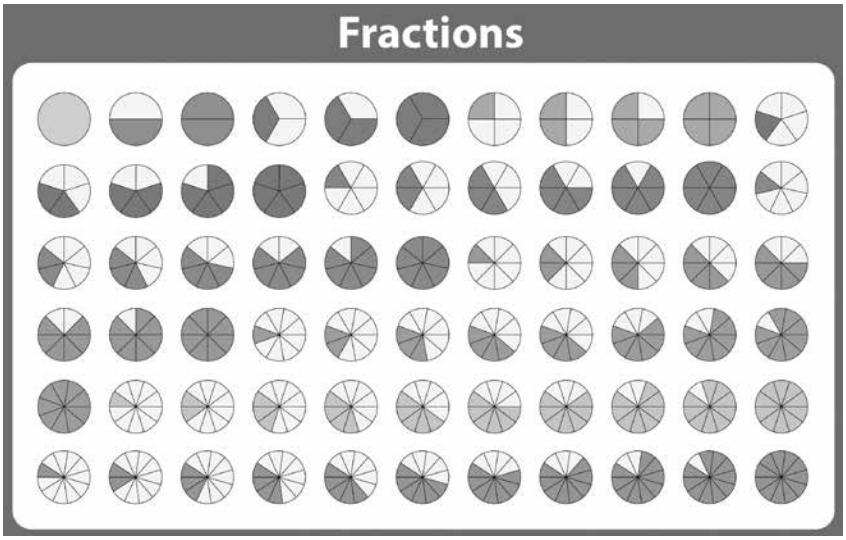
Guided Practice

1. Present the class with a word problem that involves dividing whole numbers with a fractional result. For example: For a party, Josh makes 20 servings of his famous lasagna. However, 16 people come to the party, and all of them want as much lasagna as they can get. To distribute the lasagna equally, how many servings should each person get?
2. Ask the class what operation they would use to solve this problem? The problem is to distribute a quantity equally in a number of parts. If no one suggests division, explain that division is the correct process.
3. Ask a student to write the division problem on the board: 20 ÷ 16
4. Ask the students to solve this division problem, keeping in mind that a fraction is division.
5. Call on students to give their answers and their reasoning in solving this division problem. Discuss errors in division and differences in answers. For example, why did one student get 1⅛ while another student got 1¼? Allow students to discuss the thought process behind their answers.

Independent Practice

1. Divide students into small groups and give them word problems to solve. Ask each group to provide a numeric answer; show what two whole numbers the answer lies between; and explain the reasoning that led them to that answer.
2. Give each individual student a group of word problems to solve. Ask each individual student to provide the same responses: a numeric answer, its location between two whole numbers, and the reasoning behind it.

Focus: Focus means designing the curriculum around core math concepts. The standards define the scope of that focus. Multiplication and division of fractions is a core concept that is used in real-world contexts. In algebra and geometry, understanding fractions deeply will be critical. This lesson focuses on the first part of the standard: interpreting a fraction as division of the numerator by the denominator and solving word problems involving division of whole numbers that lead to fractions.



Coherence: This activity builds on students' prior knowledge of multiplication and division. Connecting new material to students'

prior knowledge should be overt. The math standards are presented in levels to show the progression of ideas.

Rigor: This activity focuses on comprehending underlying mathematical concepts and applying those concepts to problems to build understanding. The student understands the relationship between a numerator and denominator and how this applies to a number of examples. Discussing problems and differences in solving equations, working in groups, and explaining the reasoning behind results all build conceptual understanding.

Math Practices: Explaining reasoning and discussing differences in solutions helps students make sense of problems and persevere in solving them (MP.1). In these activities, students also construct viable arguments and critique the reasoning of others (MP.3).

Understanding Ratios

Target Standard: Level C, Understand ratio concepts and use ratio reasoning to solve problems.

Objective: Student will understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

Activate Background Knowledge in Ratio Relationships

1. Present students with an example of a ratio relationship without describing it as a ratio. For example, you have a recipe that requires four cups of flour and two cups of milk.
2. Ask students what the relationship is between the numbers. If you are making a quarter batch of the recipe, how does that affect the numbers? If you are doubling it, how does that affect the numbers? What is the relationship between the amount of flour and the amount of milk?

Instruction

1. Explain that the relationship introduced is a ratio relationship. A ratio shows the relationship between two quantities.
2. Demonstrate different ways to write a ratio, including *a:b*, *a* to *b*, and $\frac{a}{b}$.
3. Ask students to generate examples of ratio relationships, such as the ratio of democrats and republicans who vote in an election or the ratio of teachers to students in a school. Prompt students with examples if they have difficulty coming up with their own.
4. Write down example ratios for some of the examples the students contribute. For example, a ratio of democrats to republicans voting in an election might be 2:3. Ask the students to describe the relationship based on the example ratio. What if the numbers were reversed? What if you wanted to know the ratio of democrats to all voters? What does this 2:3 ratio mean if there are 100 voters?

5. Make example figures for the rest of the student examples. For example, you might tell students that a school has 308 students and 22 teachers. What is the student-to-teacher ratio? Have students suggest a way to find and write this. What is the reasoning? Why might you want to look at numbers this way? Use ratio language, such as "14 to 1 ratio" and "14 students for every teacher."

Guided Practice

1. Present students with an example of a ratio relationship. For example, the dimensions of a computer monitor are often expressed a ratio (called an aspect ratio). One monitor measures 20 inches wide and 11.25 inches high. Ask students to write down the information as a ratio.
2. Give students another example with the same ratio. For example, another monitor has a width of 18 inches and a height of 10.125 inches. Ask students to write down this information as a ratio as well.
3. Ask students to describe the ratios. What do they mean? How do they compare to each other? How are they useful? Would other ratio relationships be useful in looking at this example?
4. Explain to the class that you want to examine these ratios to determine whether the monitors have the same aspect ratio. Are these relationships equivalent? Ask students to generate ideas about how to approach this problem. Write student ideas on the board.
5. Discuss each idea with the class. Set up potential equations or expressions based on the ideas. Which ideas will work? Why? Which ideas won't? Why not? How do the ideas reflect what a ratio means? Which ideas will be easier or harder to execute?
6. Have the class choose one of the approaches to the problem. Set up an equation, and call on students to solve each step. Provide assistance as it is needed.

Independent Practice

1. Provide each student with a number of examples of ratio relationships.
2. Have students write numeric ratios based on the examples. Students may need to find multiple relationships for one example situation.
3. Have students write explanations describing the ratio relationships.

Save student responses. These practice exercises can be used later in higher level ratio lessons.

Focus: This lesson focuses on the first portion of the Level C ratios and proportions standard: "Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities." Building this understanding will be useful in algebra and geometry as the student progresses through math.

Coherence: The concept of ratios and proportions is introduced in Level C, but it does build on students' existing knowledge of values and basic operations. This lesson will become a reference to build further knowledge of ratios. The same independent practice examples can be carried through to later lessons to build continuity of knowledge.

Rigor: This standard is based on building comprehension of underlying mathematical concepts. Students are building their understanding of numbers and using numbers to increase understanding of relationships. Having students compare and choose methods of problem-solving builds student understanding of math and flexibility in approaching math problems.

Math Practices: In using ratios to describe relationships, students are beginning to model with mathematics (MP.4). Students are learning when ratios are relevant math to model real-world problems. Students are also making sense of problems in this lesson (MP.1).

Writing Expressions

Target Standard: Level C, Reason about and solve one-variable equations and inequalities.

Objective: Student will write expressions including a variable for both real-world and mathematical problems.

Activate Background Knowledge in Variables

1. Remind students that a variable represents a number or, in some circumstances, a number in a particular set.
2. Ask students to brainstorm reasons why variables are useful in math. Write students' suggestions on the board. When it is appropriate, ask for clarification and elaboration from students.

Instruction

1. Review with students how to write an expression or equation that reflects a real-world situation or word problem. Math expresses relationships in real life. A sentence such as, "Karla deposited her $350 paycheck and a $54 check from her aunt" can be converted into an equation that shows how much Karla deposited:

   The deposit is paycheck and aunt's check.
   (Deposit) is (Paycheck) and (Check)
   (Deposit) = (Paycheck) + (Check)
   (Deposit) = 350 + 54

2. Ask the students how a variable would be used in this example. What would you use a variable to represent? If students suggest that the deposit is the variable, ask them to explain their reasoning. If students don't suggest the deposit, remind them that a variable represents a number that's not known. Which number in the problem is unknown before it's solved? Place the variable in the equation.

   $$x = 350 + 54$$

3. Show students an example scenario. For example, a grocery co-op distributes profits equally to all its members at the end of the year. The profits for last year were $18,340. How much does each member receive?

4. Explain that, even though you don't know how many members there are in the co-op, you can represent the amount each member receives with a variable. To find the amount each member receives, you would divide the profits by the number of members. If you represent the number of members as the variable *m*, then you can write an *expression* to show the amount each receives. Discuss showing division in an expression:

   $$\frac{18{,}340}{m}$$

5. Ask students to explain what an expression is. Discuss the term *expression* and how expressions are used in math.

Guided Practice

1. Present students with a verbal representation of an expression: four times a number, decreased by three.

2. Ask the students what they would do first to convert this into a mathematical expression. Students may suggest writing the text out with mathematical operators or replacing "number" with a variable. Discuss the students' suggestions. If a suggestion is a reasonable

first step, implement it. If not, ask the student what the goal of this idea is. Prompt students to discuss why it won't work.

3. Continue prompting students for the next step as you work out the expression as a class.
4. When it comes time to represent multiplication with a variable, explain how multiplication is expressed with a variable and what 4*x* means. Explain that 1*x* isn't used in algebraic expressions. Ask students why not, based on what they know about multiplication. What does 1*x* mean? Compare students' responses, and prompt students to elaborate promising explanations.

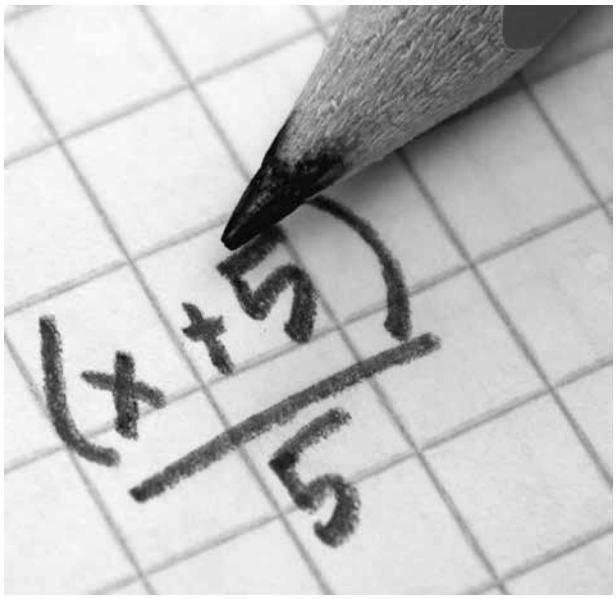
Independent Practice

1. Give each student a series of examples, including word problem examples and verbal representations of expression.
2. Have students write an expression for each example.
3. As a class, go over students' expressions. Find examples where two students came up with a different expression. Compare these expressions. Is one better? Is one incorrect? What do the differences mean?

Focus: This lesson focuses on building a deeper understanding of variables and expressions, a concept fundamental to algebra.

Coherence: The lesson builds on existing knowledge of variables and word problems, including converting word problems or real-world examples into mathematical language. This lesson prepares the student to use algebra to solve word problems and to manipulate algebraic equations. Understanding algebraic representations is a cornerstone of higher math.

Rigor: Understanding mathematical representation is the purpose of this lesson. By comparing students' responses and evaluating different ways to represent an algebraic expression, students are better able to interpret and manipulate expressions.



Math Practices: This lesson moves from real-world representations to abstract representations, building the ability to reason abstractly and quantitatively (MP.2). It also asks students to model with mathematics (MP.4). When students suggest ways to proceed with a problem or compare different representations of an expression, they participate in constructing viable arguments and critiquing the reasoning of others (MP.3)

Incorporating Math Practices in the Classroom

Make sense of problems and persevere in solving them. (MP.1)

To implement this practice in the classroom, have students analyze the meaning of problems, compare approaches, suggest multiple approaches, and connect math procedures with real-world problems.

Reason abstractly and quantitatively. (MP.2)

Start with real-world focused problems and help students make the connections between these problems and abstract representations. Then, move toward abstract problems.

Construct viable arguments and critique the reasoning of others. (MP.3)

Have students defend their responses and explain why they chose a problem-solving technique. Ask students to make and compare alternative suggestions.

Model with mathematics. (MP.4)

Bring in real-world problems for students to model mathematically. Encourage students to find mathematical problems outside of the classroom. How is math used in city planning? In technology?

Use appropriate tools strategically. (MP.5)

Introduce mathematical tools into the classroom, including calculators, math programs, simulators, spreadsheets, rulers and protractors, graph paper, and manipulatives. Discuss and compare the use of mathematical tools.

Attend to precision. (MP.6)

Prompt students to clarify their explanations and answers. Identify problems with precision in creating and solving mathematical equations. Go over solutions to math problems as a class to identify and correct errors.

Look for and make use of structure. (MP.7)

Design lessons around identifying patterns in math, and look for examples of patterns in your lessons as you teach. Make a point of asking students what the pattern is. How is that pattern useful? Why is there a pattern?

Look for and express regularity in repeated reasoning. (MP.8)

Point out repeated calculations or reasoning at appropriate times. Lead students through a division problem that creates a repeating decimal and wait for students to point out that you're repeating the same work over and over. Talk about why multiplication is used in math instead of repeated addition. Ask students why exponents are used in math.

Essential Education and the CCR Standards

Essential Education's courses are designed to prepare students for career and college readiness. By promoting conceptual understanding and critical thinking, Essential Education courses reinforce CCR standards-based instruction.

Essential Education and the ELA/Literacy Standards

The literacy standards for career and college readiness go beyond merely rotely learning a pattern for essay-writing or reiterating a fact from a simplistic text, so Essential Education courses do, too. Below are a few examples of core CCR literacy standards and how Essential Education addresses them in adult education coursework.

> ***Reading CCR Anchor 1:*** Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Essential Education Academies | While this anchor standard is primarily covered in reading, related skills regarding reading text closely, making inferences, and citing evidence are reinforced across the curriculum in reading, writing, social studies, and science. This overarching anchor is broken up into teachable skills and covered in multiple ways, building and reinforcing students' abilities.

Computer Essentials | Computer Essentials builds students' reading skills through lessons that apply close attention to practical uses such as learning to navigate an unfamiliar website or finding and evaluating information.

Essential Skills Workbooks | The *Essential Reading Skills* and *Essential Writing & Language Skills* workbooks teach strategies to build students' close reading skills and ability to cite specific evidence.

Example Lessons

Lesson	Source	Description
Bartlby, The Scrivener: Understanding Description	Essential Education Academies—Reading	Asks students to make an inference about a character based on a description in a passage from "Bartleby, the Scrivener" by Herman Melville
Barn Burning: Comprehending a Detail	Essential Education Academies—Reading	Asks students to identify a specific evidence in a passage from "Barn Burning" by William Faulkner to support an idea

Lesson	Source	Description
Slavery Compromise?	Essential Education Academies—Social Studies	Examines a passage about slavery to determine a conclusion
Citing Evidence and Connecting with Claims	*Essential Writing & Language Skills*	Introduces a strategy to define and cite evidence from a source text in order to support a claim
Navigating Using Links and Buttons	Computer Essentials	Teaches how to navigate websites using links and buttons; asks students to predict where links will lead them based on reading the link text and surrounding text

Reading CCR Anchor 8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Essential Education Academies | In Essential Education Academies, students evaluate evidence across the curriculum in reading, writing, science, and social studies. Each subject area reinforces critical thinking and reading skills.

Computer Essentials | In addition to basic computer skills, Computer Essentials teaches students to find and evaluate information, reinforcing their ability to evaluate evidence.

Essential Skills Workbooks | The *Essential Reading Skills* and *Essential Writing & Language Skills* workbooks teach students to evaluate texts as they read, including evaluating claims and evidence in argumentative texts.

Example Lessons

Lesson	Source	Description
Affirmative Action: Evaluating Evidence	Essential Education Academies—Reading	Asks students to identify evidence that weakens an author's argument in an argumentative writing about affirmative action
Evaluating Arguments	Essential Education Academies—Writing	Leads students through the process of evaluating claims and evidence in two competing arguments

Lesson	Source	Description
Building an Argument	Essential Education Academies—Writing	Defines elements of an argument, including the claim, types of evidence, and the warrant connecting the evidence to the claim
Developing Strong Support	*Essential Writing & Language Skills*	Introduces a strategy for evaluating whether evidence in an argument is specific, timely, accurate, and relevant
Evaluating Information	Computer Essentials	Teaches how to determine the source of information, its currency, relevance, accuracy and completeness, and its purpose, including evaluating bias

Writing CCR Anchor 1: Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Essential Education Academies | The Essential Education Academies writing course provides a wide range of real-world and academic writing tasks but gives special focus to writing arguments to support claims. This focus is supported by lessons about support in reading, science, and social studies.

Essential Skills Workbooks | The *Essential Writing & Language Skills* workbook builds students' ability to writing arguments in support of claims.

Example Lessons

Lesson	Source	Description
Persuasive Writing	Essential Education Academies—Writing	Teaches students how to write a persuasive work, including responding to claims and making counterclaims
Essay Writing	Essential Education Academies—Writing	Gives an overview of planning, organizing, and writing an essay
Essay Prompt Lessons	Essential Education Academies—Writing	Multiple essay prompt lessons ask students to respond to essay prompts and then evaluate and revise their writing, including focusing on and developing the main idea.
Developing a Thesis Statement	*Essential Writing & Language Skills*	Provides a strategy for writing a thesis statement to focus a student's arguments

Lesson	Source	Description
Drawing Conclusions	*Essential Writing & Language Skills*	Asks students to identify evidence, make inferences and comparisons, and draw a conclusion to state in their writing

Writing CCR Anchor 6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Computer Essentials | Computer Essentials provides comprehensive instruction, starting with the basics of technology and continuing to address interacting using technology and producing written works in various ways.

Essential Education Academies | Writing lessons regularly ask students to write responses to prompts in a computer interface. Students gain familiarity with technology through responding to a wide variety of technology-enhanced questions across the curriculum, including drop-down items, drag-and-drop items, and short responses.

Essential Skills Workbooks | Essential Skills workbooks encourage students to use technology in their work. Students should use computers whenever available to complete writing exercises.

Example Lessons

Lesson	Source	Description
Computer Activity Skills	Computer Essentials	Gives students an overview of how to use basic computer interactions, including using scroll bars and windows
Participating in Internet Communities	Computer Essentials	Provides an introduction to Internet communities and ways to interact in those communities
Social Interaction on the Internet	Computer Essentials	Teaches how people relate to each other differently using technology and how communication is affected by technology
Organizing Written Information	Computer Essentials	Instructs students on using a word processor to write, organize, and format documents, focusing on clear communication
Presenting Information	Computer Essentials	Trains students in using presentation software to communicate information, including organizing information onto slides and presenting information effectively

Writing CCR Anchor 9: Draw evidence from literary or informational texts to support analysis, reflection, and research. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Essential Education Academies | This anchor standard for writing incorporates reading standards and focuses on core aspects of the CCR standards. Reading, writing, social studies, and science lessons ask students to identify evidence in texts, and the writing program emphasizes drawing evidence.

Essential Skills Workbooks | The *Essential Writing & Language Skills* workbook incorporates information, research, and reading. Real-world and academic tasks both depend upon referencing information from multiple sources. Students become familiar with integrating texts into their writing. Similarly, in *Essential Reading Skills*, students have many opportunities to write about what they read. Students are asked to analyze and evaluate literary and informational texts.

Example Lessons

Lesson	Source	Description
Comparing Arguments	Essential Education Academies—Writing	Asks students to compare two arguments to evaluate which argument is stronger, focusing on textual details in each argument
Reading and Thinking for Writing	*Essential Writing & Language Skills*	Provides a strategy for reading for a writing purpose, including developing ideas based on a text
Practice in Everyday Writing	*Essential Writing & Language Skills*	Includes practice in responding to written works, such as letters and articles
Practice in Social Studies Writing	*Essential Writing & Language Skills*	Includes practice in drawing comparisons between and writing about social studies texts, including primary source texts
Comparing Fiction	*Essential Reading Skills*	Teaches students to make comparisons between literary texts, including written responses based on graphic organizers

Language CCR Anchor 1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Essential Education Academies | Essential Education Academies' language lessons and writing lessons cover grammar and usage in the context of real-world writing tasks. Students learn about purpose and audience in writing while studying standard English skills.

Essential Skills Workbooks | The *Essential Writing & Language Skills* workbook provides strategies for editing and proofreading written works.

Example Lessons

Lesson	Source	Description
Prepositional Phrases	Essential Education Academy—Language	Dwayne writes confusing directions, and students evaluate sentence structure to clarify the writing by identifying prepositional phrases.
Cliches and Awkwardness	Essential Education Academy—Language	Students evaluate and improve the language in a letter written by Elizabeth, removing cliches and awkward sentence structure.
Peer Editing	Essential Education Academy—Writing	Students are introduced to a rubric to evaluate their peers' writing. The characters evaluate a brochure written by Curtis.
Obstructions to Communication	*Essential Writing & Language Skills*	This lesson provides a strategy to check for errors that interfere with communication, including dangling modifiers, wordiness, and awkward or illogical word order.

Essential Education and the Mathematics Standards

The CCR standards for math build knowledge from fundamental math skills. The students' foundational understanding of math concepts allows them to build more complex math knowledge. Essential Education strives to develop understanding of math concepts and develop that understanding into mastery of higher level math.

The following outline of the CCR standards in math is broken down into domains and provides an overview of how Essential Education products handle each domain.

Number and Operations

Essential Education Academies | Essential Education math courses begin with basic numeracy, reinforcing both student fluency and comprehension of the principles underlying operations.

Essential Skills Workbooks | The *Essential Math Skills* workbook presents numeracy and operations in real-world contexts, focusing on application of skills.

Example Lessons

Lesson	Source	Description
Adding and Subtracting Whole Numbers	Essential Education Academies—Mathematics	Instructs in principles of addition and subtraction to help students understand mathematical concepts
Introduction to Fractions	Essential Education Academies—Mathematics	Teaches students basics of fractions, focusing on understanding what fractions represent in real-world terms
Decimals and Place Value	Essential Education Academies—Mathematics	Gives an overview of place value and the application of place value to the number system
Estimation and Mental Math	*Essential Math Skills*	Provides instruction in estimation and using mental math to increase basic numeracy
Personal Finance and Money	*Essential Math Skills*	Teaches strategies for real-world math problems involving basic operations in personal finance and money

The Number System

Essential Education Academies | Math lessons in Essential Education Academies fluidly connect numbers and operations standards with number system standards, which are closely related. As students study fractions, they will apply their knowledge to division of fractions as well. Because adult students are often on limited time frames, Essential Education Academies moves students quickly through levels of math knowledge. Students use rational numbers in context.

Essential Skills Workbooks | The *Essential Math Skills* workbook incorporates rational numbers and other number system instruction into real-world problems. Students understand basic math concepts underlying the number system.

Example Lessons

Lesson	Source	Description
Dividing Fractions	Essential Education Academies—Mathematics	Applies knowledge of fraction and operations to dividing fractions
Integers	*Essential Math Skills*	Provides practice with integers in both abstract and real-world problems
Math in the Workplace	*Essential Math Skills*	Teaches negative numbers in workplace concepts, including number line representations of negative and positive values

Number and Quantity

Essential Education Academies and Essential Skills Workbooks | Number and quantity skills include using rational exponents and applying understandings of units and quantities to problems. Essential Education Academies and the *Essential Math Skills* workbook integrate these skills into learning on exponents, real-world problems, and measurement.

Example Lessons

Lesson	Source	Description
Radicals	Essential Education Academies—Mathematics	Incorporates simplifying numeric expressions with rational exponents into lessons on radicals

Lesson	Source	Description
Using Units of Measure	*Essential Math Skills*	Applies understanding of measurement and units to real-world problems
Review Exponents	*Essential Math Skills*	Includes review of negative exponents

Operations and Algebraic Thinking

Essential Education Academies | Operations and algebraic thinking standards often reinforce and relate closely to numbers and operations standards. In Essential Education Academies, these skills are often taught in related lessons.

Essential Skills Workbooks | The *Essential Math Skills* workbook takes care to present basic number operations in the context of algebraic thinking.

Example Lessons

Lesson	Source	Description
Solving Word Problems I and II	Essential Education Academies—Mathematics	Two lessons that provide strategies for approaching word problems to apply understanding of operations to real-world problems
Multiplying and Dividing Whole Numbers	Essential Education Academies—Mathematics	Reinforces students' knowledge of multiplication and division, emphasizing comprehension of basic math concepts
Concrete and Abstract Problem Solving	*Essential Math Skills*	Teaches strategies for approaching concrete or real-world math problems as well as abstract math problems
Reasoning in Math	*Essential Math Skills*	Provides students with practice in using reasoning to solve math problems and in evaluating and understanding their reasoning process

Ratios and Proportional Relationships

Essential Education Academies and Essential Skills Workbooks | Essential Education math courses introduce ratios and proportions with introductory algebra. Ratio and proportion problems also appear in many real-world or word problems. *Essential Math Skills* focuses on ratio and proportion problems in real-world applications.

Example Lessons

Lesson	Source	Description
Ratios and Proportions	Essential Education Academies—Mathematics	Introduces concepts of ratios and proportions and asks students to apply ratio thinking to examples
Applications of Ratios and Proportions	*Essential Math Skills*	Examines ratio and proportion situations including converting measurements and dealing with speeds

Expressions and Equations

Essential Education Academies | Expressions and equations standards deal with fundamental algebraic concepts. Essential Education Academies teach these standards in early algebra lessons.

Essential Skills Workbooks | The *Essential Math Skills* workbook develops students' algebraic ability throughout the content. Expressions and equations standards are taught as students develop early algebra skills.

Example Lessons

Lesson	Source	Description
Word Problems with Two Unknowns	Essential Education Academies—Mathematics	Teaches students to use algebraic thinking to tackle more complex word problems involving multiple unknown numbers
Introduction to Algebra	Essential Education Academies—Mathematics	Introduces students to algebraic expressions and equations and asks students to write algebraic expressions and equations
Simplifying Expressions	Essential Education Academies—Mathematics	Asks students to evaluate algebraic expressions, focusing on understanding underlying math concepts
Algebra in Practical Application	*Essential Math Skills*	Provides practice with real-world examples of algebraic problems and helps students convert word problems to expressions and equations
Reasoning with Algebraic Equations	*Essential Math Skills*	Introduces students to manipulation of algebraic equations and helps students solve for unknown numbers

Lesson	Source	Description
Linear Equations with One Variable	*Essential Math Skills*	Introduces students to lines and linear equations in algebra

Algebra

Essential Education Academies and Essential Skills Workbooks | Essential Education Academies teach algebra in increasing complexity, as does the *Essential Math Skills* workbook. Students will have practice with polynomials, equations, and inequalities.

Example Lessons

Lesson	Source	Description
Multiplying Binomials Lesson	Essential Education Academies—Mathematics	Building on students' algebraic knowledge, introduces students to multiplication of binomial expressions
Quadratic Equations Lesson	Essential Education Academies—Mathematics	Provides instruction on understanding and solving quadratic equations
Factoring Expressions	Essential Education Academies—Mathematics	Teaches students to factor quadratic expressions
Systems of Equations	*Essential Math Skills*	Gives students strategies to solve systems of equations with multiple variables
Introduction to Polynomials	*Essential Math Skills*	Provides an introduction to polynomials, including adding, subtracting, and multiplying polynomials

Functions

Essential Education Academies and Essential Skills Workbooks | Essential Education Academy lessons and the *Essential Math Skills* workbook introduce students to coordinate plane graphing. They develop students' knowledge to understand and evaluate functions.

Example Lessons

Lesson	Source	Description
The Slope-Intercept Equation of a Line Lesson	Essential Education Academies—Mathematics	Introduces student to the slope-intercept equation of a line and provides understanding of graphing linear equations
The Point-Slope Equation of a Line Lesson	Essential Education Academies—Mathematics	Gives students practice with the point-slope equation of a line
Functions	*Essential Math Skills*	Provides strategies for students to evaluate and compare functions, using representations in graphs, tables, and equations

Geometry

Essential Education Academies | Essential Education math courses cover two-dimensional and three-dimensional geometry, introducing students to basic concepts and expanding students' ability to think geometrically and evaluate challenging geometry problems.

Essential Skills Workbooks | The *Essential Math Skills* workbook provides geometric reasoning strategies for real-world geometry problems.

Example Lessons

Lesson	Source	Description
Similar and Congruent Figures	Essential Education Academies—Mathematics	Develops students' geometric skills by examining similar and congruent figures
The Pythagorean Formula	Essential Education Academies—Mathematics	Provides conceptual understanding of right triangles and applies students' knowledge of algebra to the Pythagorean formula
Circles	Essential Education Academies—Mathematics	Introduces geometry related to circles and develops students' understanding of circumference and area of circles
Irregular Objects	Essential Education Academies—Mathematics	Teaches students to think flexibly about geometric figures by finding volume and surface area of irregular objects

Lesson	Source	Description
Thinking about Shape and Form	*Essential Math Skills*	Applies concepts of similarity and congruence to solving complex geometric problems, focusing on real-world examples
Applications of Three-Dimensional Geometry	*Essential Math Skills*	Applies understanding of surface area and volume to real-world problems

Measurement and Data

Essential Education Academies and Essential Skills Workbooks | Measurement and data standards prepare students for geometry, statistics, and probability. Students focus on basics of measuring and representing data. In Essential Education Academies math and science and the *Essential Math Skills* workbooks, students will work with measurement and data in many contexts, often overlapping with geometry, data, and statistics as well as word problem and real-world applications.

Computer Essentials | Computer Essentials lessons introduce students to using spreadsheets and presenting data in charts and graphs.

Example Lessons

Lesson	Source	Description
Lines and Angles	Essential Education Academies—Mathematics	Introduces students to concepts of lines and angles through discussion of mathematical terms, such as parallel and congruent
Operations with Measurements	Essential Education Academies—Mathematics	Teaches how to perform operations and solving problems involving measurements
Data in Tables	Essential Education Academies—Mathematics	Teaches how data is presented in tables and prepares students to use tables to understand and present data
Graphs and Charts	Essential Education Academies—Mathematics	Introduces students to charts and graphs and provides practice with understanding graphical representations of data
Calculators and Technology	*Essential Math Skills*	Provides strategies for using technology in math, including using spreadsheets to represent and interpret data
Spreadsheet Organization	Computer Essentials	Introduces students to spreadsheets and how to use and organize them

Statistics and Probability

Essential Education Academies and Essential Skills Workbooks | Math and science courses introduce students to statistics and probability concepts and real-world examples. The *Essential Math Skills* workbook covers applications of data and statistics in science and social studies as well as other practical applications.

Example Lessons

Lesson	Source	Description
Mean, Median, and Mode	Essential Education Academies—Mathematics	Introduces students to concepts of central tendency and how they are used in comparing and evaluating data
Dependent Probability	Essential Education Academies—Mathematics	Provides instruction in calculating dependent probability, focusing on building understanding of probability concepts
Practical Applications of Statistics	*Essential Math Skills*	Provides practice with evaluating statistics in real-world contexts
Applications in Science	*Essential Math Skills*	Teaches about applications of statistics in science, including drawing conclusions from data
Applications in Politics and Public Policy	*Essential Math Skills*	Introduces students to uses of data in social studies and evaluating data in public policy contexts

Integrating Essential Education into the Classroom

Essential Education products can increase the effectiveness of classroom instruction through blended learning. A blended learning classroom can provide the best of both computer instruction and face-to-face teaching.

Station Blended Learning

A station model of blended learning can be effective in the adult education classroom. In this model, the classroom is divided into stations. One station might be a computer station with Essential Education lessons. Another station might be a project station, where students can work on specific, relevant projects. A third station could be an instruction station where the teacher can work with a smaller group. The class would be divided into groups, and each group would work at one station during part of the class time. Groups rotate through the stations during the class. This gives students a chance to interact and work independently while allowing the teacher to provide more focused instructions to smaller group.

Student Learning Pairs or Groups

In this model, pair higher achieving students with students who need more focused instruction. Have student pairs or groups work together on Essential Education instruction. The higher achieving students will take a lead role, modeling their thought process for the other students. The teacher can spend this time working individually with students who need additional instruction.

Independent Study outside the Classroom

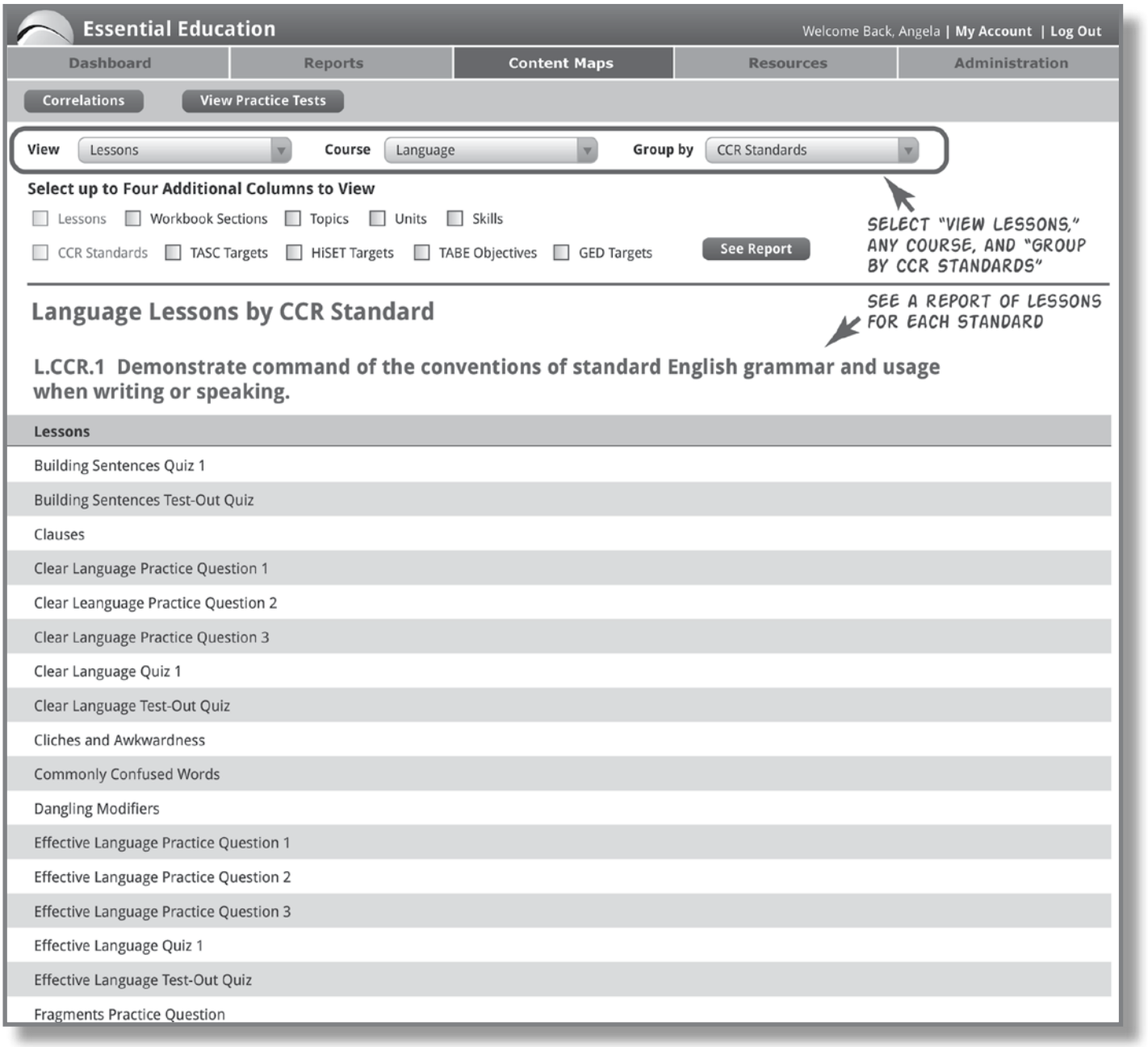
Students can study using Essential Education products outside the classroom. Tailor assignments to individual students' needs or let students self-direct their study at their own pace. The administrative dashboard will provide feedback on students' progress and needs. In the classroom, instruction can focus on the learning students need most.

Independent Study in the Classroom

In this model, class time is used for independent study with computer-assisted learning. Based on data about student performance, the teacher can meet with students individually and in small groups to provide additional instruction and help. The students get the benefit of one-on-one instruction while progressing at their own pace through materials. This approach works well in a highly differentiated classroom with widely varying needs

CCR Standard Correlations

The LMS for Essential Education products includes content mapping that allows you to generate custom correlation reports to suit your needs. Select view lessons by CCR Standards for any course, and you will see a report that shows all lesson content that directly teaches each standard.



Online content maps are regularly updated with any new content. Content maps for Essential Education lessons for the CCR standards are available at http://www.EssentialEd.com/correlations.

How Do the CCR Standards Affect Assessment?

The Big Picture

The majority of states have adopted CCSS standards for K through 12. Adult education assessment is moving towards these standards as well, since they define the skills taught in a high school education. The GED®, TASC—Test Assessing Secondary Completion™, and HiSET® high school equivalency exams and other adult assessments have adopted CCR and CCSS standards to judge high school equivalency and college readiness.

The CCR standards will prepare students well for adult assessments. They focus on high-level reading skills, critical thinking, comprehension of concepts, and application to real-world situations. The ultimate goal of building these skills is increased competency in real-world tasks, but in addition, acquiring these skills will prepare students for a wide range of standardized tests.

The CCR standards are the best definition of and measure for "career and college readiness." Does an adult student have the skills to be successful in a training program? A non-remedial college course?

Of course, the standards are a general measurement, and students may need a specific balance of (or level of achievement in) these skills for a specific goal. However, standardized tests are also general measurements. Adult standardized tests have designed their tests to reflect the CCR standards in various ways.

Different standardized tests emphasize different aspects of the CCR standards and different CCSS standards that fall under ELA/literacy anchor standards or mathematics domains. Some tests use additional standards, such as the Next Generation Science Standards (NGSS) or national standards

relating to particular fields of social studies. However, the literacy and math skills covered under the CCR standards will be valuable preparation for tests in every subject area.

The ELA/literacy CCR standards particularly provide important skills for all areas of testing. Without literacy skills in reading scientific or technical tests, understanding visual information, and interpreting data, students will be unsuccessful in science. Without literacy skills in reading texts from historical contexts or understanding complex processes found in economics or government, students will be unsuccessful in social studies.

The following sections give details about how the CCR standards are covered in five common adult education tests:

- The GED® Test
- The TASC—Test Assessing Secondary Completion™
- The HiSET® Exam
- ACCUPLACER®
- ACT® Compass®

The GED® Test

The 2014 GED® test is designed to align with the CCR standards. Most of the changes in the test are driven by the need for career and college readiness. The test focuses on critical thinking skills and understanding of concepts.

Reasoning through Language Arts

The Reasoning through Language Arts test encompasses the ELA/literacy standards, focusing on three groups of skills: reading closely, writing clearly, and editing and understanding the use of standard written English in context.

The texts include academic and workplace texts of varying complexity up to the career and college readiness level. Approximately 75% of texts are nonfiction (including informational, science, and social studies texts), reflecting the focus of the CCR standards on complex nonfiction texts.

The change from separate language arts tests for reading and writing to a single language arts test focusing on reasoning reflects the goals of the CCR standards. One of the major changes in the Reasoning through Language Arts test is the Extended Response. The RLA Extended Response asks students to read passages and analyze them, using evidence from the texts to support their response. The ER is designed to reflect the CCR standards for reading and writing, including the core skill of identifying and using textual evidence. This test asks the student to both analyze arguments in texts and write their own well-organized and well-supported arguments. Since the test is computer-based, students use technology to write their responses.

Students' language skills are tested in the context of their writing, as well as in technology-enhanced items on the non-Extended Response portion of the test. In the rest of the RLA test, students will use reading skills. They will analyze structure, assess point of view, show comprehension of literary and informational texts, and draw evidence from those texts.

The GED® assessment targets for reading, writing, and language align with the following CCR anchor standards:

- Reading CCR anchor standards 1, 5, 6, 8, and 10
- Language CCR anchor standards 1, 2, and 4
- Writing CCR anchor standards 1, 6, and 9

Mathematical Reasoning

The Mathematical Reasoning test focuses on quantitative and algebraic problem solving. It tests conceptual understanding, fluency, and application of math in academic and workforce contexts, reflecting the focus of the CCR standards. The math reporting categories are:

- Quantitative problem solving with rational numbers (25%)
- Quantitative problem solving in measurement (20%)
- Algebraic problem solving with expressions and equations (30%)
- Algebraic problem solving with graphs and functions (25%)

The content of the test reflects the CCR standards' focus on building algebraic thinking. The GED® Mathematical Reasoning test reflects the CCR standards in math content but also focuses on math practices. This means that students must reason about math and comprehend the logic of mathematical procedures. They must apply math concepts to real-world problems.

About 30% of math items are aligned to a math practice in addition to a content area. The GED® test defines five math practices that align with the CCR math practices:

- **MP.1 Building Solution Pathways |** This GED® math practice describes developing problem-solving skills. It aligns with the first CCR math practice, making sense of problems and persevering in solving them. Because it also demands logical thinking about problems, it aligns with the third CCR math practice, to construct arguments and critique reasoning. Additionally, this practice aligns with modeling mathematics and using mathematical tools, which both provide avenues for problem solving.
- **MP.2 Abstracting Problems |** This GED® math practice aligns with reasoning abstractly and quantitatively and modeling with mathematics. Both of these CCR math practices describe using abstract thinking to approach problems.
- **MP.3 Furthering Lines of Reasoning |** Focusing on math reasoning skills, this math practice for the GED® test aligns with the third CCR math practice, constructing viable arguments and critiquing reasoning. Students who develop math reasoning skills and the ability to explain the logic behind their math will fulfill this math practice.
- **MP.4 Mathematical Fluency |** Math fluency aligns with the second, fourth, and sixth CCR math practices. Students must reason abstractly and quantitatively, model with mathematics, and attend to precision in order to achieve fluency.
- **MP.5 Evaluating Reasoning and Solution Pathways |** This GED® math practice describes the need for students to evaluate choices in problem solving and choose the best reasoning to solve a problem. It aligns with the third CCR math practice, constructing viable arguments and critiquing the reasoning of others.

Social Studies

The GED® Social Studies test incorporates CCR standards for reading as well as data and statistics. Although the focus is on application to social studies texts, many of the literacy standards are the same as those on the RLA test. When students learn reading skills, they should use a broad range of subject matter texts so that they can apply these skills to social studies as well as literary or informational texts.

The GED® Social Studies test content is approximately 50% civics and government, 20% U.S. history, 15% economics, and 15% geography and the world. Students will be asked to write an extended response relating to a social studies text, demonstrating their ability to read and write in a social studies context. Every item is associated with a GED® social studies practice. These social studies practices align with CCR standards in ELA/literacy and mathematics.

- **SSP.1 Drawing Conclusions and Making Inferences |** This practice correlates to reading CCR anchor 1, which includes reading closely and making inferences.
- **SSP.2 Determining Central Ideas, Hypotheses and Conclusions |** Reading CCR anchor 2, determining and analyzing central themes, correlates to this practice.
- **SSP.3 Analyzing Events and Ideas |** This practice is closely related to the reading CCR anchor 3, analyzing development and interaction of individuals, events, and ideas.
- **SSP.4 Interpreting Meaning of Symbols, Words and Phrases |** Reading CCR anchor 4 also addresses interpreting words and phrases in a text.
- **SSP.5 Analyzing Purpose and Point of View |** This practice correlates to reading CCR anchor 6, assessing the effects of the author's point of view and purpose.
- **SSP.6 Integrating Content Presented in Different Ways |** Reading CCR anchor 7 is directly related to this social studies practice. This anchor standard covers integrating and evaluating content in varying formats.
- **SSP.7 Evaluating Reasoning and Evidence |** This social studies practice is related to CCR anchor 8, which covers evaluating arguments and claims in a text.
- **SSP.8 Analyzing Relationships between Texts |** Reading CCR anchor 9, analyzing how multiple texts address a theme or topic, is correlated to this social studies practice.
- **SSP.9 Writing Analytic Response to Source Texts |** This practice relates to writing CCR anchor 1, argumentative writing, and writing CCR anchor 9, drawing evidence from texts.
- **SSP.10 Reading and Interpreting Graphs, Charts, and Other Data Representation |** In addition to CCR anchor 7, this standard is related to the CCR mathematics standards for data (in Data and Measurement) and statistics (in Statistics and Probability).
- **SSP.11 Measuring the Center of a Statistical Dataset |** This social studies practice relates to Statistics and Probability standards in mathematics.

Science

The GED® Science test focuses on literacy in science, referencing the CCR standards. It also draws from the Next Generation Science Standards for content areas. Similarly to social studies and math, the GED® Science test identifies science practices.

- **SP.1 Comprehending Scientific Presentations |** Students should understand and explain scientific presentations in different forms, textual and visual. Reading anchor standards 1, 3, and 7 are relevant to this practice.
- **SP.2 Investigation Design (Experimental and Observational) |** Students should understand, design, and critique experiments and studies. Math Data and Measurement and Statistics and Probability standards related to gathering and interpreting data will be useful for this practice.
- **SP.3 Reasoning from Data |** Students should use textual evidence to support a conclusion and use sampling techniques to answer questions. They should also draw conclusions and make predictions from data. This practice relates to Statistics and Probability standards in math, as well as CCR standards that emphasize textual evidence, including writing CCR 9.
- **SP.4 Evaluating Conclusions with Evidence |** Students should use evidence to evaluate a conclusion or theory. Does the evidence support or contradict the conclusion? CCR standards relating to evidence are relevant, including writing CCR 8 and reading CCR 8.
- **SP.5 Working with Findings |** Students should be able to reconcile multiple findings, conclusions, or theories. Reading CCR anchor 9 is relevant to this standard.
- **SP.6 Expressing Scientific Information |** Students should express scientific information visually, numerically, symbolically, and verbally. Math standards in Data and Measurement as well as Statistics and Probability are relevant, as are reading CCR standard 4, which includes application of this standard to scientific and technical texts that incorporate symbols.
- **SP.7 Scientific Theories |** Students should be able to understand and apply scientific theories, models, and formulas. This practice relates to math standards in Algebra and Expressions and Equations that will help students understand formulas and also the math practice for modeling mathematically. Reading CCR standards 1, 3, 4, and 7 also develop the skills needed for this standard.
- **SP.8 Probability & Statistics |** Students should be able to describe a data set and use statistics and probability to solve math problems. This science practice relates to Statistics and Probability mathematics CCR standards.

The TASC—Test Assessing Secondary Completion™

The TASC—Test Assessing Secondary Completion™ measures career and college readiness based on the CCR standards. The TASC Test was developed to gradually transition to fully assess the Common Core State Standards. For 2015, the test includes increased coverage of the Common Core State Standards. For each subject area, the TASC Test includes test targets that are high-, medium-, and low-emphasis.

Reading

The following CCSS standards are high-emphasis for reading.

- **CCSS.ELA-Literacy.RI.11-12.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. | This standard is a level E CCSS specific standard under reading CCR anchor 1.
- **CCSS.ELA-Literacy.RI.9-10.2** Determine a central idea of a text and analyze its development over the course of the text, including how it emerges and is shaped and refined by specific details; provide an objective summary of the text. | This standard is a level E CCSS specific standard under reading CCR anchor 2.
- **CCSS.ELA-Literacy.RI.11-12.2** Determine two or more central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to provide a complex analysis; provide an objective summary of the text. | This standard is also closely related to reading CCR anchor 2, which requires determining central ideas, analyzing development, and providing an objective summary.
- **CCSS.ELA-Literacy.RI.9-10.3** Analyze how the author unfolds an analysis or series of ideas or events, including the order in which the points are made, how they are introduced and developed, and the connections that are drawn between them. | This standard is related to reading CCR anchor 5, which asks students to analyze the structure of texts.
- **CCSS.ELA-Literacy.RI.11-12.3** Analyze a complex set of ideas or sequence of events and explain how specific individuals, ideas, or events interact and develop over the course of the text. | This standard is a level E CCSS specific standard under reading CCR anchor 3.

Writing

The TASC Writing Test identifies specific high-emphasis CCSS standards that relate to language anchor standards.

- Under language CCR anchor 1, command of grammar and usage, the TASC Test emphasizes focusing on understanding and using phrases and clauses, forming sentences, correcting misplaced or dangling modifiers, understanding verbals, forming and using verbs, recognizing inappropriate shifts in verb voice and mood, using parallel structure, understanding changes in usage over time, and resolving issues of contested usage.
- Under language CCR anchor 2, conventions of capitalization, punctuation, and spelling, the TASC Test emphasizes commas separating coordinate adjectives, punctuation to indicate pauses, ellipses to indicate omissions, semicolons, colons, hyphenation, and correct spelling.
- Under language CCR anchor 3, understanding how language functions in different contexts, the TASC Test emphasizes choosing precise and concise language, using verbs in well-chosen voices and moods, writing and editing appropriate to a discipline, and varying syntax for effect.

The TASC essay focuses on the following standards:

- **Writing CCR Anchor 1** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. | Students will be asked to write an argumentative essay in response to texts.
- **Writing CCR Anchor 2** Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content. | Students will be asked to write an informative or explanatory essay.

When students respond to the essay prompt, their practical application of language and writing skills will be assessed. The language anchor standards as well as writing anchor standards 4 (clear and coherent writing) and 5 (develop and strengthen writing by planning, revising, editing, and rewriting) will improve students' performance on any essay writing task.

Mathematics

In math, the TASC Test emphasizes specific CCSS standards related to domains covered in the CCR standards.

- **Algebra: Arithmetic with Polynomials and Rational Expressions |** The TASC Test emphasizes understanding and performing operations on polynomials. Students should also be able to identify zeros of polynomials and construct graphs based on those zeros.

- **Algebra: Reasoning with Equations and Inequalities |** Students should be able to explain the rationale for solving a simple equation, solve linear and quadratic equations with one variable, understand graphs of two-variable equations, and graph solutions to linear inequalities and systems of inequalities in two variables.
- **Algebra: Creating Equations |** Students should create and solve equations, inequalities, and systems of equations with one and two variables. Students should use equations to model and solve problems. They should also be able to rearrange formulas to highlight a specific quantity or variable.
- **Algebra: Seeing Structure in Expressions |** Students should be able to interpret expressions, relating them to real-world contexts, and manipulate expressions to reveal properties of the quantity represented.
- **Functions: Interpreting Functions |** Students should understand the definition of a function, use function notations, and interpret key features of function graphs, tables, and equations. Students should understand domain and rate of change. They should be able to graph, write, and compare functions.
- **Functions: Linear, Quadratic, and Exponential Models |** Students should understand what situations can be modeled with linear and with exponential functions. Students should be able to construct linear and exponential functions and should recognize graphs that increase linearly or quadratically. Students should be able to relate qualities of functions to their real-world context.
- **Geometry: Geometric Measurement with Dimension |** Students should solve volume problems using formulas for cylinders, pyramids, cones, and spheres. They should identify shapes of cross-sections of three-dimensional figures and identify three-dimensional objects generated from two-dimensional objects.
- **Geometry: Modeling with Geometry |** Students should apply the concepts of density based on area and volume.
- **Number and Quantity: The Real Number System |** Students should be able to rewrite expressions involving radicals and rational exponents. They should explain why the sum or product of rational numbers is rational. They should understand that the sum of a rational and irrational number or the product of a nonzero rational number and an irrational number is rational.

Social Studies

The TASC Social Studies Test focuses on standards specific to the domain areas it covers: U.S. history, world history, civics and government, and economics. While the social studies test is not designed to reflect the CCR standards, reading and writing standards are particularly related to civics and government targets. For example, the test expects students to explain, take, and defend positions on law, public opinion, and the media. Writing CCR anchor 1, argumentative writing, will prepare students for these tasks.

The TASC Social Studies Test also asks students to describe purposes, organization, and functions of government, as well as the roles of political parties, campaigns, and elections. In economics, students will need to make predictions based on economic changes and explain or describe aspects of economics. Reading CCR standard 3, which asks students to describe and analyze complex ideas and events, will prepare students for these tasks.

Science

The TASC Science Test is based on the Next Generation Science Standards (NGSS). In the area of life sciences, students are tested on living structures and processes, ecosystems, heredity, and biological evolution. In earth science, students are tested on Earth's place in the universe, earth's systems, and earth and human activity. In physical science, students are tested on matter and its interactions, forces and interactions, energy, and waves.

Introducing science texts into literacy instruction will expose students to science concepts. Using reading and writing techniques will help students comprehend and retain science materials.

The HiSET® Exam

The HiSET® Exam measures whether test-takers have equivalent skills to a high school graduate. HiSET® Exam scores can also indicate career and college readiness. The HiSET® Exam incorporates high-school (level E) CCR standards in its design specifications.

Language Arts—Reading

The HiSET® Exam addresses the focus of the CCR standards on complexity, evidence, and knowledge. Texts are selected for appropriate complexity, and students are required to draw evidence from texts. The reading test will also include science and history texts; however, it covers many CCSS standards associated particularly with literature. The Language Arts—Reading test measures specific CCSS standards in ELA and aligns to the CCR anchor standards in reading. All ten of the anchor standards are represented on the test. The following list gives the specific CCSS standards measured by the HiSET® Reading test and their relationship to the CCR standards.

- **CCSS.ELA-Literacy.RL.11-12.1** Cite strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, including determining where the text leaves matters uncertain. | This reflects the level E standards associated with reading CCR anchor 1.
- **CCSS.ELA-Literacy.RL.11-12.2** Determine two or more themes or central ideas of a text and analyze their development over the course of the text, including how they interact and build on one another to produce a complex account; provide an objective summary of the text. | This is related to reading CCR anchor 2, determining themes and their development.
- **CCSS.ELA-Literacy.RL.11-12.3** Analyze the impact of the author's choices regarding how to develop and relate elements of a story or drama (e.g., where a story is set, how the action is ordered, how the characters are introduced and developed). | This standard is specific to literary texts. It relates to, but is not directly covered in, reading CCR anchors 2, 3, and 5.
- **CCSS.ELA-Literacy.RL.11-12.4** Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone, including words with multiple meanings or language that is particularly fresh, engaging, or beautiful. (Include Shakespeare as well as other authors.) | This reflects the level E standards associated with reading CCR anchor 4.
- **CCSS.ELA-Literacy.RL.11-12.5** Analyze how an author's choices concerning how to structure specific parts of a text (e.g., the choice of where to begin or end a story, the choice to provide a comedic or tragic resolution) contribute to its overall structure and meaning as well as its aesthetic impact. | This is related to reading CCR anchor 5, analyzing structure of texts.

- **CCSS.ELA-Literacy.RL.11-12.6** Analyze a case in which grasping a point of view requires distinguishing what is directly stated in a text from what is really meant (e.g., satire, sarcasm, irony, or understatement). | This is a level E standard under reading CCR anchor 6.
- **CCSS.ELA-Literacy.RL.11-12.7** Analyze multiple interpretations of a story, drama, or poem (e.g., recorded or live production of a play or recorded novel or poetry), evaluating how each version interprets the source text. (Include at least one play by Shakespeare and one play by an American dramatist.) | This is not directly covered under CCR standards, but skills in the reading standards will build this ability.
- **CCSS.ELA-Literacy.RL.11-12.9** Demonstrate knowledge of eighteenth-, nineteenth- and early twentieth-century foundational works of American literature, including how two or more texts from the same period treat similar themes or topics. | This is a level E standard under reading CCR anchor 9.
- **CCSS.ELA-Literacy.RL.11-12.10** By the end of grade 11, read and comprehend literature, including stories, dramas, and poems, in the grades 11–CCR text complexity band proficiently, with scaffolding as needed at the high end of the range. | This standard reflects level E of reading CCR anchor 10.

Language Arts—Writing

The Language Arts—Writing test covers language and writing standards. Part 2 of the writing test is an essay response. The test directly covers language anchor standards 1–6 and writing anchor standards 1–5 through the following CCSS standards.

- **CCSS.ELA-Literacy.L.11-12.1** Demonstrate command of the conventions of standard English grammar and usage when writing or speaking. | This reflects language CCR anchor 1.
- **CCSS.ELA-Literacy.L.11-12.2** Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening. | This reflects language CCR anchor 3.
- **CCSS.ELA-Literacy.L.11-12.3** Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grades 11–12 reading and content, choosing flexibly from a range of strategies. | This reflects level E of language CCR anchor 4.
- **CCSS.ELA-Literacy.L.11-12.4** Demonstrate understanding of figurative language, word relationships, and nuances in word meanings. | This reflects language CCR anchor 5.
- **CCSS.ELA-Literacy.L.11-12.5** Acquire and use accurately general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college-and career-readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression. | This reflects language CCR anchor 6.

- **CCSS.ELA-Literacy.W.11-12.1** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence. | This reflects writing CCR anchor 1.
- **CCSS.ELA-Literacy.W.11-12.2** Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content. | This reflects writing CCR anchor 2.
- **CCSS.ELA-Literacy.W.11-12.3** Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences. | This reflects writing CCR anchor 3.
- **CCSS.ELA-Literacy.W.11-12.4** Produce clear and coherent writing in which the development, organization,and style are appropriate to task, purpose, and audience. | This reflects writing CCR anchor 4.
- **CCSS.ELA-Literacy.W.11-12.5** Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience. | This reflects writing CCR anchor 5.

Mathematics

The math test reflects the requirements of focus and rigor in the CCR standards, including application of math to real-world contexts. The focus on coherence applies to the development of skills; the HiSET® Exam reflects the culmination of that learning. The HiSET® Mathematics test correlates to the following areas in the CCR mathematics standards.

- **Number and Quantity: The Real Number System |** In this area, the math test covers rational exponents and properties of rational and irrational numbers.
- **Number and Quantity: Quantities |** The math test covers reasoning quantitatively and using units to solve problems.
- **Number and Quantity: The Complex Number System |** Students should be able to perform operations with complex numbers, represent complex numbers and operations, and use complex numbers in polynomials.
- **Algebra: Seeing Structure in Expressions |** Students should interpret the structure of expressions and write equivalent expressions to solve problems.
- **Algebra: Arithmetic with Polynomials and Rational Functions |** The HiSET® Mathematics test covers performing operations on polynomials and rewriting rational expressions.
- **Algebra: Creating Equations |** Students should be able to create equations to describe numbers and relationships.

- **Algebra: Reasoning with Equations and Inequalities |** Students should explain the reasoning behind solving equations and solve one-variable equations and systems of equations. Students should use graphs to reflect and solve equations and inequalities.
- **Functions: Interpreting Functions |** The test will cover functions and function notation, including relating functions to context and representing functions in various ways.
- **Functions: Building Functions |** Students should be able to build a function to model a relationship between two quantities.
- **Functions: Linear, Quadratic, and Exponential Models |** The test will include constructing and comparing linear, quadratic, and exponential models and relating function expressions to situations that they model.
- **Geometry: Congruence |** Students should understand transformations in the plane.
- **Geometry: Similarity, Right Triangles, and Trigonometry |** Students should prove theorems involving similarity.
- **Geometry: Geometric Measurement and Dimension |** Students should explain volume formulas and use them to solve problems.
- **Geometry: Modeling with Geometry |** The text will include applying geometric concepts in modeling situations.
- **Statistics and Probability: Interpreting Categorical and Quantitative Data |** In this area, students should be able to summarize, represent, and interpret data with one or two variables. Students should also be able to interpret linear models.

Social Studies and Science

Social studies and science incorporate the math standards for interpreting categorical and quantitative data in the Statistics and Probability domain. Students should understand linear models and data with one or two variables. Social studies and science texts also reflect the CCR standards in ELA/literacy for comprehending and using subject-area texts.

Science covers ELA/literacy standards including synthesizing information from a variety of sources and reading science and technical texts proficiently. Social studies covers the full range of ELA/literacy standards for CCR, including applying reading CCR anchor standards 1 through 10 to social studies and historical texts.

ACCUPLACER®

The ACCUPLACER test is used to place students in college courses and identify needed remediation. Because the CCR standards prepare students for college-level study, students who have acquired the skills reflected in the CCR standards will do well on ACCUPLACER tests and avoid remediation. The following is an overview of ACCUPLACER tests.

Arithmetic

The ACCUPLACER Arithmetic test covers operations with whole numbers and fractions, operations with decimals and percents, and applications and problem solving. The topics covered on this test relate to the following disciplines in the CCR math standards:

- **Numbers and Operations: Base Ten |** Students should perform operations with multi-digit whole numbers and decimals.
- **Numbers and Operations: Fractions |** Students should understand fraction equivalence and ordering, perform operations with fractions, and compare decimals with fractions.
- **The Number System |** Students should be fluent with factors and multiples and should be able to divide fractions.
- **Operations and Algebraic Thinking |** Students should be fluent in operations and use them to solve problems.
- **Ratios and Proportional Relationships |** Students should be able to solve rate and percent problems.
- **Geometry |** Students should solve simple geometry problems reflected in Geometry levels A through D.
- **Measurement and Data |** Students should acquire the geometric measurement skills in Measurement and Data.

College-Level Math

The ACCUPLACER College-Level Math test covers algebraic operations, solutions of equations and inequalities, coordinate geometry, applications and other algebra topics, and functions and trigonometry. Students should have a solid foundation in the lower-level CCR math standards. The topics covered on this test fully cover to the following disciplines in the CCR math standards. Students should master all of the following areas.

- **Expressions and Equations**
- **Algebra: Seeing Structure in Expressions**
- **Algebra: Arithmetic with Polynomials and Rational Expressions**

- **Algebra: Creating Equations**
- **Algebra: Reasoning with Equations and Inequalities**
- **Functions**
- **Functions: Interpreting Functions**
- **Functions: Building Functions**
- **Functions: Linear, Quadratic, and Exponential Models**

Elementary Algebra

The Elementary Algebra test covers operations with integers and rational numbers, operations with algebraic expressions, and solutions of equations, inequalities, and word problems. The topics covered on this test relate to the following disciplines in the CCR math standards:

- **The Number System |** Students should understand and be able to use operations with rational numbers, including understanding absolute value.
- **Expressions and Equations**
- **Algebra: Seeing Structure in Expressions**
- **Algebra: Arithmetic with Polynomials and Rational Expressions**
- **Algebra: Creating Equations**
- **Algebra: Reasoning with Equations and Inequalities**

Reading Comprehension

The Reading Comprehension test includes long and short reading passages, with questions involving identifying the main idea, supporting ideas, application, and inference. It also includes questions that ask test-takers to identify the relationship between two sentences.

Reading CCR anchor standards 1 and 2 are particularly relevant to the Reading Comprehension test. Students should be able to read closely, determine what the text says explicitly, and make logical inferences from the text. They should also be able to identify central ideas and the development of those ideas, which includes supporting ideas. Reading CCR standards 4 and 5, which focus on interpreting words and phrases and analyzing structure, will help build students' comprehension.

Reading CCR anchor standard 8, evaluating arguments and specific claims, will help students identify specific relationships between sentences, particularly when a sentence supports or contradicts another sentence. Reading CCR standard 3 will also help students understand relationships between sentences, including cause and effect.

Sentence Skills

The Sentence Skills test covers CCR standards in language. The test includes questions to correct sentence structure and questions involving rewriting the sentence in a new way.

Students should master language CCR anchor standard 1, which covers grammar and usage. A thorough mastery of this standard, especially verb usage and sentence construction, will prepare students for the Sentence Skills test.

WritePlacer (Written Essay)

The WritePlacer exam is a written essay exam. It is evaluated in five dimensions: focus, organization, development and support, sentence structure, and mechanical conventions.

Prompts may provide a real-world situation that includes a purpose and audience. Students may need to take and defend a position on a particular issue defined in the prompt. The following CCR standards in language and writing are applicable to the WritePlacer test.

- **Language CCR Anchor 1 |** Students who master this standard will be able to write with strong and appropriate sentence structure.
- **Language CCR Anchor 2 |** Students who master this standard will write with a strong grasp of mechanical conventions.
- **Language CCR Anchor 3 |** This standard will help students write effectively for the purpose and audience, with appropriate word choice.
- **Language CCR Anchor 6 |** This standard develops student vocabulary, which will improve written works.
- **Writing CCR Anchor 1 |** This standard develops student ability to write argumentative works with strong structure and development that supports valid arguments and reasoning. This standard will improve focus, organization, and development and support.
- **Writing CCR Anchor 4 |** Students who master this standard will communicate clearly and coherently with good organization.
- **Writing CCR Anchor 5 |** This standard develops students' ability to use a writing process to plan, revise, and editing their work.

ESL—Language Use, Listening, Reading Skills, and Sentence Meaning

The ACCUPLACER exam includes four ESL tests which measure basic language skills. The ELA/literacy anchor standards at levels A through D will prepare students for these tests.

- **Language Use |** This test covers grammar. Language CCR anchor standard 1, which covers grammar and usage, is helpful in preparing for this test.
- **Listening |** This test covers basic conversational skills in English. Speaking and listening CCR anchor standards 1 and 6 will help prepare students for this test.
- **Reading Skills |** This test covers reading comprehension. Reading CCR anchor standards 1 and 2 will help prepare students for this test.
- **Sentence Meaning |** This test covers language skills and word usage as well as sentence-level comprehension. Language CCR anchor standard 1 will help students choose appropriate words. Vocabulary-building standards, language CCR anchor standards 4, 5, and 6, will also help students be successful on this test. Reading CCR standard 1 addresses the reading comprehension skills on this test.

ACT® Compass®

ACT Compass tests incoming college students to evaluate their proficiency in fundamental skills. It is used to identify needed remediation and to place students in appropriate courses. There are five ACT Compass tests.

Math

ACT Compass includes items that test students' basic skills, application in novel contexts or complex situations, and analysis/conceptual understanding of math. The test assesses students' basic math skills in up to five subject areas:

Numerical Skills/Pre-Algebra

This assessment will include operations with integers, fractions, and decimals; positive integer exponents, square roots, and scientific notation; ratios and proportions; percentages; and measures of central tendency (mean, median, and mode). The mathematics CCR standards for levels A through D will prepare students for this assessment. Students will benefit from the following standards:

- Numbers and Operations: Base Ten
- Numbers and Operation: Fractions
- The Number System
- Operations and Algebraic Thinking
- Ratios and Proportional Relationships
- Quantitative measures of center in Statistics and Probability

Algebra

The algebra assessment covers elementary algebra, coordinate algebra, and intermediate geometry. The following standards will prepare students for this assessment.

- Expressions and Equations
- Algebra: Seeing Structure in Expressions
- Algebra: Arithmetic with Polynomials and Rational Expressions
- Algebra: Creating Equations
- Algebra: Reasoning with Equations and Inequalities

College Algebra

The majority of items in the test for placement in college algebra cover functions, exponents, complex numbers, arithmetic and geometric sequences and series, and matrices. In additions to Expressions and Equations and Algebra standards, students should study the following CCR and CCSS standards.

- CCR standards for Functions for all levels, including the specific areas of Functions in level E.
- CCR standards for Number and Quantity: The Real Number System
- CCSS standards for The Complex Number System (N.CN.3–9) and Vector and Matrix Quantities (N.VM.1–12)

Geometry

The Geometry Placement Test covers triangles, circles, angles, rectangles, three-dimensional concepts, and hybrid shapes. The CCR standards in Geometry and geometric measurement in the domain of Measurement and Data will prepare students for this assessment.

Trigonometry

The Trigonometry Placement Test covers trigonometric functions and identities, right-triangle trigonometry, trigonometric equations and inequalities, graphs of trigonometric functions, and special angles. Students will need additional preparation in trigonometry for this assessment. The CCSS standards in Similarity, Right Triangles, and Trigonometry including G.SRT.9–11 will help prepare students.

Reading

The Reading Placement Test covers comprehension of practical reading, prose fiction, humanities, social sciences, and natural sciences texts. The assessment covers comprehension of explicit statements in the text. It also includes items that test making inferences, developing critical understanding, and determining the meaning of words in context. The following reading CCR anchor standards are applicable to this test:

- **Reading CCR anchor 1 |** This standard will build students' comprehension of explicit statements as well as their ability to make inferences and critically understand the text.
- **Reading CCR anchor 2 |** This standard focuses on determining central ideas and their development and will assist students in critically understanding the text.

- **Reading CCR anchor 4 |** This standard will build students' skills in determining the meaning of words in context.
- **Reading CCR anchor 5 |** Developing an understanding of structure and its meaning builds students' ability to critically understand complex texts.
- **Reading CCR anchor 6 |** Assessing point of view and purpose will assist students in critically understanding the text.
- **Reading CCR anchor 8 |** Evaluating arguments and evidence will develop students' critical understanding of texts.

Writing Skills

The Writing Skills Placement Test covers language and writing skills: grammar and usage, mechanics, strategy, organization, and style. The following CCR anchor standards are relevant to this test.

- **Language CCR anchor 1 |** This standard covers grammar and usage.
- **Language CCR anchor 2 |** This standard covers English mechanics: capitalization, spelling, and punctuation.
- **Language CCR anchor 3 |** This standard will help students evaluate effective language choices for meaning and style.
- **Writing CCR anchor 4 |** This standard addresses issues of strategy, organization, and style for a specific purpose and audience.

E-Write

The ACT Compass e-Write test is an essay test. The writing prompt asks students to take and defend a position on an issue described in the prompt. The essay test can be scored on a scale of 2 to 8 or a scale of 2 to 12. Results include subscores in five areas: focus, content, organization, style, and conventions. The following standards will help prepare students for the e-Write test.

- **Language CCR Anchor 1 |** This standard covers usage and grammar and will help students develop appropriate style as well as follow conventions.
- **Language CCR Anchor 2 |** This standard covers spelling, punctuation, and capitalization, which are evaluated as English conventions.
- **Language CCR Anchor 3 |** The effectiveness of students' language will be evaluated as part of style. Students should relate language to purpose and audience.
- **Language CCR Anchor 6 |** This vocabulary standard will improve clarity and word choice.

- **Writing CCR Anchor 1 |** This standard covers argumentative writing. When a student chooses and defends a position, that student will use the skills in this standard. Focus, content, and organization are covered by this standard.
- **Writing CCR Anchor 4 |** This standard is relevant to focus, content, and organization. It will help students write clearly and coherently.
- **Writing CCR Anchor 5 |** Learning to use a writing process to plan, revise, and edit will improve students' performance on an essay assessment.

English as a Second Language

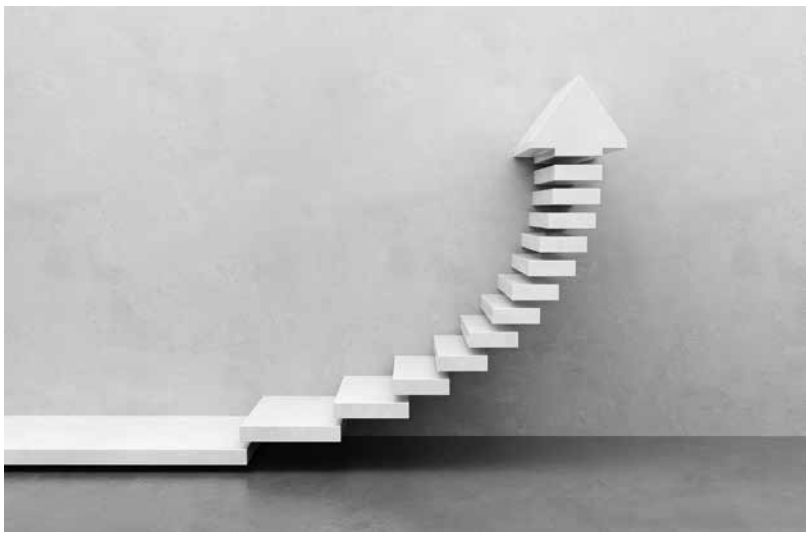
The ACT Compass includes four ESL tests: Listening, Reading, Grammar/Usage, and ESL e-Write. The ELA/literacy anchor standards at levels A through D will prepare students for these tests.

- **Listening |** The Listening test covers comprehension, from beginning-level conversations through longer spoken stimuli where students can take notes. Speaking and listening CCR anchor standards 1 and 6 will help students develop their listening skills for this test.
- **Reading |** The Reading test covers explicitly stated meaning as well as inferences. Reading CCR anchor standard 1 will prepare students for understanding explicit meaning and making inferences from texts. Reading CCR anchor standard 2, which focuses on central ideas and their support and development, can also help increase comprehension.
- **Grammar/Usage |** The Grammar/Usage test covers the functions of words in sentences, grammar and usage, and mechanics. Language CCR anchor standards 1 and 2 cover the topics on this test.
- **ESL e-Write |** The ESL e-Write is an essay test. Students are scored on development, language use, organization, focus, and mechanics. Language CCR anchor standards 1, 2, 3, and 6 will help prepare students for the areas of language use and mechanics. Writing CCR anchor standards 1, 4, and 5 will prepare students for good development, organization, and focus.

CCR Standards Overview

The CCR standards define the real-world skills that are most critical for a promising future. ELA/literacy focuses on reading and critically evaluating complex texts and ideas, while mathematics focuses on comprehending fundamental math concepts and applying them to real-world problems. It can be easy to lose sight of these overarching goals when reviewing the standards in detail. The details, however, are also critical.

A career and college-ready skillset is built on a foundation of many abilities built up over years. Adult education covers a 13-year curriculum because adult students are so diverse in their backgrounds. However, no adult comes to the classroom devoid of skills. Every adult brings with them myriad learning and life experiences, and also many gaps in their knowledge and capabilities. The adult classroom must be prepared to fill in these gaps where they exist and where they interfere with the student's ability to move forward toward a goal. The CCR standards seek to define the scope of skills that, when missing, need to be taught, because they are skills that, when absent, will prevent students from reaching goals in education and in the workforce.



This section goes into more details about the specifics of the CCR standards and provides an easy-to-use reference to clarify their content and organization. You can use it along with the full CCR standards document as you design your curriculum and plan your lessons.

The ELA/literacy standards are organized into anchor standards in reading, writing, speaking and listening, language, and reading foundational skills. This section will provide each anchor standard and explain its scope, giving an overview of what is required to master the anchor standards.

The mathematics standards are organized first in levels, and within each level, in domains. Each domain contains a number of standards and the specific Common Core State Standards underlying it. These Common Core standards provide specific objectives and examples that can guide curriculum development and lesson planning.

The organization of the mathematics standards promotes the coherence of math instruction. Each level builds upon knowledge taught in the previous level. In order to clarify the threads of knowledge that run through the mathematics standards from level to level, this section will organize math standards into generalized domains. It will provide an overview of the scope of standards in a domain at each level where it is taught. It will emphasize connections between standards that provide coherence in a math curriculum.

As you review the CCR standards, keep in mind both the overarching goals of the standards and the details that implement them. You will see that literacy standards are applied to complex (for the student's level) and content-rich texts. The theme of text-based evidence runs throughout. In math, standards will refer to applying previous knowledge to maintain coherence. They will promote rigor through understanding and application of math concepts. Maintaining these themes in your classroom teaching will help students achieve increased mastery of college and career level skills.

ELA/Literacy Standards Overview

The Big Picture

The CCR ELA/literacy standards include reading, writing, speaking and listening, language, and foundational reading skills. The content of these standards will look familiar to ELA instructors: identifying central ideas, mastering standard English language, analyzing structure, writing with clarity, and evaluating information—among other familiar skills. The changes are in the depth and scope of applying these skills.

Students will expand their literacy skills to diverse and complex texts, including social studies, science, and workplace texts. They will also rely on textual evidence to support their ideas.

The reading standards are particularly critical, since tackling complex texts across disciplines is the core of the ELA/literacy standards.

The ELA/literacy standards provide anchor standards that summarize the core skills for each level. The full standards also include detailed subordinate standards from the Common Core State Standards. These standards are organized by grade level to correspond to typical adult education learning levels. The levels used in the CCR standards are:

- Level A (Grades K–1)
- Level B (Grades 2–3)
- Level C (Grades 4–5)
- Level D (Grades 6–8)
- Level E (Grades 9–12)

The Common Core State Standards for each anchor standard were selected as the most important content for adult learners. These standards will help you identify specific skills that, together, form the building blocks of the anchor standards. As students develop skills across the learning levels, they apply them to more complex texts, building the literacy levels needed for college and careers.

The anchor standards support the need for a higher level of literacy in career and college-level texts. As you review the ELA/literacy standards, keep in mind the fundamental shifts that underlie them:

- Developing fluency with complex texts at the career and college level
- Evaluating texts for specific evidence in support of ideas
- Acquiring knowledge through content-rich subject matter texts

The complexity of texts should increase as students move forward through grade-level skills. Students should acquire vocabulary, fluency with structure and style, and tools to analyze and evaluate content at every level. As students progress, they will apply these to a variety of rich texts with relevant subject matter and increasing complexity.

This overview will broadly describe each of the anchor standards and the skill level that students should achieve. The goal of this section is to clarify the anchor standards so that they can be implemented in classroom instruction.

Reading Standards

The reading standards comprise ten anchor standards that describe deep comprehension of a variety of complex texts. Students who have achieved mastery of these standards will be able to understand, evaluate, and use career and college texts.

> ***CCR Anchor 1:*** Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

This standard is about comprehension and inference, but it is also about citing evidence. At the high-school level, students should be able to make analytical statements about informational, historical, and scientific texts, and support those statements with evidence from the text that is clearly and logically tied to the analysis.

> ***CCR Anchor 2:*** Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Students should apply this standard to literary, informational, and scientific texts. The central idea should be connected to evidence in the text through analyzing its development. How does the author present and support the central idea? How are complex details tied together in one main theme or idea? Students should be able to summarize complex ideas and processes.

> ***CCR Anchor 3:*** Analyze how and why individuals, events, and ideas develop and interact over the course of a text. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

This standard applies to informational, historic, and scientific texts. Students must understand and evaluate cause and effect as well as complex procedures or processes. This standard looks at relationships between elements of a text. How do the steps of a complex natural process relate to each other? How are historical events connected? How are parts of a procedure connected? Students should identify evidence supporting their analysis of texts.

CCR Anchor 4: Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Students should develop deep understanding of word meanings and contexts. How is a word used in a particular context in a scientific, technical, or historic text? What technical terms and symbols does a text involve? What are the connotations of a word? How do those connotations relate to the usage in the text? Why did the author choose that word? How do the words affect tone and meaning? How do they relate to the author's purpose?

CCR Anchor 5: Analyze the structure of texts, including how specific sentences, paragraphs, and larger portions of the text (e.g., a section, chapter, scene, or stanza) relate to each other and the whole. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Analyzing structure involves looking at the parts and seeing how they form the whole of a text. How are arguments built by the text? How do parts of the text support the whole? How effective is the structure of the text in supporting its ideas? Students should apply these concepts to informational as well as literary texts.

CCR Anchor 6: Assess how point of view or purpose shapes the content and style of a text. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Purpose and point of view shape historic texts, informational texts, scientific texts, and literary texts. What rhetoric is used in a text? What is the author's culture and context? How does that context shape the author's choices? How does it shape the author's meaning? The student should be able to analyze satire or irony, texts from different times or cultures, and persuasive texts shaped by a point of view.

CCR Anchor 7: Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words. (Apply this standard to texts of appropriate complexity as outline by Standard 10.)

When reading across the curriculum, students need to evaluate many types of media. Students should understand tables, charts, graphs, and diagrams and be able to use or restate information presented in many different ways, including quantitative information along with text. Students should evaluate visual information in photographs and illustrations.

CCR Anchor 8: Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

By evaluating arguments and evidence, including fallacies or false statements, sufficient or insufficient evidence, valid or invalid logic, and relevant or irrelevant evidence, students will build their understanding of argumentation. Students should be able to apply their knowledge of arguments to complex and real-world texts.

CCR Anchor 9: Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Comparing texts expands students' ability to understand techniques that literary and informational authors use. Students should compare and analyze historic and literary documents, including foundational civic documents such as the Declaration of Independence and the Bill of Rights. Students should be able to compare technical and scientific documents, including comparing experimental results with other scientific sources.

CCR Anchor 10: Read and comprehend complex literary and informational texts independently and proficiently.

The complexity of texts will develop as students move across reading levels. The CCR standards identify six quantitative measures of text for each level from B to E. The chart below shows the measures for two common systems, Flesch-Kincaid and The Lexile Framework®.

Level	Flesch-Kincaid	The Lexile Framework®
Level B (Grades 2–3)	1.98–5.34	420–820
Level C (Grades 4–5)	4.51–7.73	740–1010
Level D (Grades 6–8)	6.51–10.34	925–1185
Level E (Grades 9–10)	8.32–12.12	1050–1335
Level E (Grades 11–CCR)	10.34–14.2	1185–1385

Writing Standards

Students' writing should focus on writing that is appropriate to a task, purpose, and audience. As students move into college and careers, they will be faced with a wide variety of writing tasks, and the purpose and audience will govern the appropriateness of the response. The CCR standards for writing include responding to written sources, using research for writing, and using technology in writing. The standards focus students on a variety of tasks, including argumentation, informational writing, and narrative writing. The central focus is informational and argumentative writing.

> ***CCR Anchor 1:*** Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Students should be able to write about relevant, real-world topics, choosing a position, stating this position as a specific and well-defined claim, and supporting this claim with clear and appropriate evidence and reasoning. Students who have mastered this standard will address opposing claims, evaluate opposing evidence, and clarify relationships between claims and counterclaims. Their evidence will be fair and complete, acknowledging strengths and weakness. Their writing will be clear and coherent, with a style appropriate to the purpose and audience. This standard is related to reading CCR anchor 8. Students should develop both skills in evaluating others' arguments and creating their own.

> ***CCR Anchor 2:*** Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Informative and explanatory texts should tackle complex ideas clearly and effectively. Students need to write about history, science, and technical subjects accurately and with strong organization and analysis. Students should use techniques of good organization as well as formatting and graphic elements (when appropriate) to support their work and organize complex ideas clearly. They should develop topics in detail and use precise language, including technical language specific to a topic. Style and tone should be appropriate to the purpose and audience.

> ***CCR Anchor 3:*** Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details and well-structured event sequences.

Narrative writing is not a central focus of the CCR standards, but students should develop their ability to write a well-organized, complete narrative, including appropriate elaborating details. As students write and respond to more complex texts, their narrative writing should develop as well.

CCR Anchor 4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

This standard underlies the previous three standards; without clear and coherent writing, a student cannot make an argument, present complex information, or write a narrative. Students must develop an idea with specific details and appropriate logic. They must organize writing with a clear and appropriate beginning, middle, and ending. They must respond to the task, purpose, and audience with appropriate choices.

CCR Anchor 5: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

CCR anchor 5 for writing also is foundational to the first three standards. Process-driven writing will allow the student to develop complex informational and argumentative writing appropriate to the purpose and audience. Students will plan, draft, evaluate, and revise their work with a particular purpose and audience in mind. The first three language standards are foundational to students' mastery of editing.

CCR Anchor 6: Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

Students should build competency with technology for both writing and research. Internet- and technology-based writing tools include blogs, web sites, email, social networking sites, forums, and Internet-based word processing programs. Students should collaborate, research, and utilize the special features of particular technologies for writing, including creating links. Students should take advantage of technology that allows them to display information dynamically and update information.

CCR Anchor 7: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

Research projects should become more complex and sustained as students advance. Students should be able to generate research questions and narrow, expand, or redefine the scope of the research as needed. They should locate and evaluate sources and present information or solutions to problems. Research can include scientific investigations, as well as research from multiple written sources. Students should demonstrate their understanding of the problem or question being researched.

CCR Anchor 8: Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

This standard connects reading and writing in the context of real-world tasks. Workers and students (and human beings) will need to evaluate information from many types of sources, print and digital, across diverse mediums. Students will need to make comprehensive and sometimes complex searches for information, evaluate the usefulness and appropriateness of sources, and integrate information from multiple sources into their text to support their work. This standard also includes avoiding plagiarism and following standard citation formats.

CCR Anchor 9: Draw evidence from literary or informational texts to support analysis, reflection, and research. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

This standard reiterates the reading standards in a writing context. Using the reading standards for literary and informational texts, students should read complex texts and use these texts to support their own writing.

Speaking and Listening Standards

The speaking and listening standards will prepare students to interact in college and career environments. These skills focus on students' ability to communicate orally and work collaboratively. Students should be able to listen closely and evaluate many types of auditory and visual mediums. While speaking and listening skills are not tested in most standardized tests, they are essential for success in real-world tasks.

CCR Anchor 1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

Students should participate actively in discussions, generating and responding to ideas with articulate, reasoned ideas. They should prepare for collaborative discussion and refer to text or research. They should create rules for discussion and decision-making, working in groups. They should set goals, deadlines, and roles for projects. Collaborative discussions should develop ideas. Students should challenge others, while remaining productive. They should respond to diverse points of view, negotiate disagreements, and generate new ideas through discussion.

CCR Anchor 2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

This standard asks students to evaluate information from multiple sources, presented in multiple formats. It reflects both reading and writing standards for evaluating and using information. Students should be able to integrate complex information from multiple sources into their oral presentations and conversations.

CCR Anchor 3: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

Just as in reading and writing, in speaking and listening, the ability to evaluate arguments and interpret a speaker's point of view (and its influence) is essential. Students should be able to transfer their skills in evaluating information, arguments, and perspective to speaking and listening. Students should be able to identify rhetorical devices, fallacies or false information, and effective persuasive arguments. Students should evaluate a speaker's purpose and the ways that purpose influences the speaker's oration.

CCR Anchor 4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

This standard applies principles of clarity and organization to speaking. This standard is related to writing CCR Anchor 4, which calls for clarity, coherence, development, organization, and an appropriate style. Students should recognize the similarities and differences between writing and speaking and the importance of each in the workplace and college.

This standard also calls for supporting evidence. Students develop their skills in evaluating and presenting evidence in both reading and writing. This skill is applied to oral presentations in this standard. Students' oral presentations do not need to be formal speeches. Most oral communications in the workplace and college take place in meetings and classroom discussions. The adult education classroom should reflect these contexts for communication with small and large group discussions and informal class-wide presentations.

CCR Anchor 5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Digital media and visual data are critical for understanding complex ideas and technical materials. Students will learn better in a media-rich environment, and they will be more prepared to deal with diverse media in real-world contexts. Students should use visual materials in their own work to clarify and enhance communication.

CCR Anchor 6: Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

Students should use correct and appropriate speech for their purpose and audience. Mastery of this standard requires mastery of language CCR anchor standards 1–3.

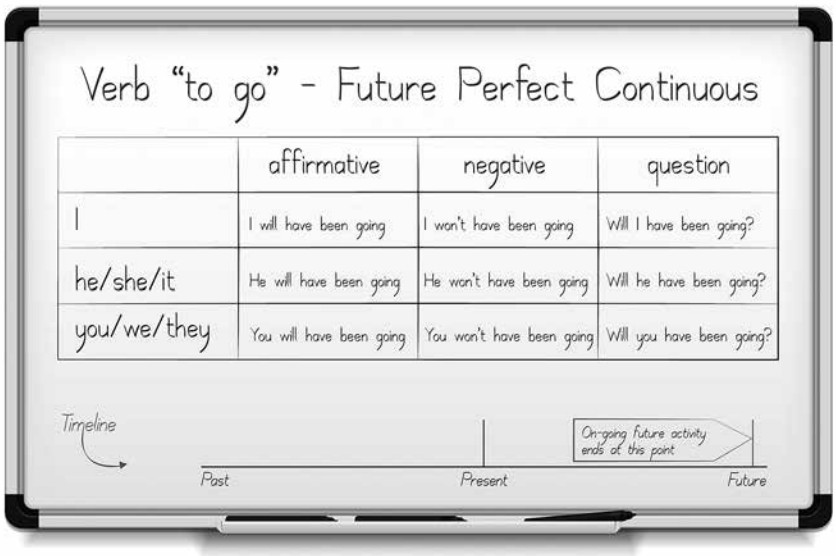
Language Standards

The language standards go beyond command of standard written and spoken English. They incorporate word choice and effective language in the context of the purpose and audience. Students should understand nuances of language and utilize that knowledge in their work. Students' mastery of the language standards will be reflected in their mastery of writing and speaking standards. Their mastery of vocabulary will enhance their performance in reading.

CCR Anchor 1: Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

Command of standard English grammar and usage is a broad category of language. Students should master a growing number of topics as their skills develop. The topics covered under this standard include:

- Correctly using words in all parts of speech
- Using verbs and verb phrases correctly in all forms and contexts
- Correctly using and manipulating different types of sentence structure, including avoiding common errors such as fragments and run-ons
- Understanding and explaining parts of speech and sentence structures
- Ensuring subject-verb and pronoun-antecedent agreement in all contexts
- Correctly using frequently confused words
- Avoiding dangling modifiers, unclear pronouns, or other formulations that can interfere with communication
- Using language that is appropriate to its purpose and audience, including recognizing non-standard English
- Using phrases and clauses for specific purposes and effects
- Using parallel structure



CCR Anchor 2: Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Capitalization, punctuation, and spelling are straightforward and familiar requirements. Students will use more complex vocabulary as they progress to more complex texts. Their spelling should encompass subject-specific vocabulary in a wide range of disciplines. Students should master:

- Capitalization
- End-of-sentence punctuation
- Comma usage
- Use of apostrophes in possessives and contractions
- Spelling, including commonly confused words and specialized vocabulary
- Punctuation of quotations and titles
- Use of ellipses, semicolons, colons, and dashes

CCR Anchor 3: Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

Students should choose words effectively and precisely, recognize language differences in difference contexts, and adapt their language to their purpose and audience. They should develop writing style, including varied sentence structure and consistent tone. Student writing should be concise, eliminating wordiness and redundancy.

CCR Anchor 4: Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Building vocabulary is essential to success in reading and writing. Students should use multiple strategies to find and clarify the meaning of words.

- Use context to determine meaning.
- Identify patterns of words in different parts of speech and use those patterns to identify the meanings of words.
- Consult print and digital references to determine precise meaning.
- Verify meaning by checking sources.

CCR Anchor 5: Demonstrate understanding of figurative language, word relationships, and nuances in word meanings.

Students' understanding of word nuance, including figurative language and relationships between words, will inform their word choice. This standard requires students to distinguish literal and non-literal meaning, interpret figurative language, understand word nuances, and recognize idioms. Students should make connections between words and their use and use the relationships between words to better understand their meanings.

CCR Anchor 6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering a word or phrase important to comprehension or expression.

Vocabulary development is critical for student success. Students need academic vocabulary to read texts in social science, science, and the humanities. They need workplace vocabulary to comprehend career texts. Students should develop strategies for acquiring academic and domain-specific vocabulary and expand their knowledge of words including those expressing precise meanings, those fundamental to a variety of topics, and those that indicate logical relationships.

Reading Standards: Foundational Skills K–5

The foundational reading skills support students' ability to read at a higher level. These skills are included as the fundamental skills underlying reading and encompass levels A though C.

RF.2. Demonstrate understanding of spoken words, syllables, and sounds (phonemes). (Phonological Awareness)

This standard only includes level A materials and covers the fundamental parts of words. It includes understanding and using rhymes, long and short vowel sounds, phonemes, syllables, and single-syllable words.

RF.3. Know and apply grade-level phonics and word analysis skills in decoding words. (Phonics and Word Recognition)

Students should:

- Understand the correspondence between letters and sounds, including the various vowel sounds and digraphs.
- Recognize spellings of long vowels, including spellings with a final *-e*.
- Decode words and distinguish similarly spelled words based on sound.
- Understand the role of a vowel in a syllable.
- Read grade-appropriate words.
- Use knowledge of letter sounds, syllabication, roots, and affixes to read unfamiliar words.

RF.4 Read with sufficient accuracy and fluency to support comprehension. (Fluency)

Students should have purpose in reading grade-level texts and comprehend those texts. This standard includes reading grade-level prose and poetry orally with accuracy, at an appropriate rate, and with expression. Students should use context to confirm or correct word recognition and understanding.

Mathematics Standards Overview

The Big Picture

The CCR standards for mathematics cover essential math concepts organized by skill level. The standards are selected and organized to focus students on essential concepts and build towards higher-level math with a sense of continuity.

Underlying the CCR standards for math are a set of math practices. These practices should become intregral to the math classroom. In every lesson and experience, students should be developing rigorous knowledge and flexible thinking about math.

The math practices define what skills and abilities students should be continuously developing in math. The math standards define the specific math content where students should apply these math practices.

Applying the CCR standards in math to the adult ed classroom can seem challenging. Students are starting at many different levels, with different gaps in their knowlege. Start by making basic changes in approaching math instruction. Focus on understanding concepts, building coherent knowledge from topic to topic, and applying math in different ways. Students will learn more successfully and advance faster. Use this section as a guide to the CCR standards for math and how they advance through learning levels.

Math Practices

Make sense of problems and persevere in solving them. (MP.1)

The focus of this math practice is comprehension and rigor. Students need to understand a problem before they can solve it, and they need to feel empowered to solve problems, even if the solutions aren't obvious.

Reason abstractly and quantitatively. (MP.2)

The more deeply students understand math concepts, the more easily they will apply those concepts to abstract problems. Part of the challenge of math is abstract reasoning. Encourage students to discuss their thinking and reasoning as they improve their math skills.

Construct viable arguments and critique the reasoning of others. (MP.3)

Comprehending math concepts means understanding the reasoning and logic in math. Students should be able to explain why a solution is correct or identify where a solution went off track.

Model with mathematics. (MP.4)

Mathematical modeling is applying math concepts to real-world problems to understand those problems better. Students should connect math to life.

Use appropriate tools strategically. (MP.5)

Students should have access to mathematical tools in the classroom. Using spreadsheets, calculators, and math programs will enhance students' understanding of math and how it is applied in real-world situations.

Attend to precision. (MP.6)

Precision is key to success in math. Students should pay attention to detail in working through problems and finding solutions. Focusing on details is a skill that will benefit students in the workplace and in higher education.

Look for and make use of structure. (MP.7)

Finding structure and pattern in math builds students' knowledge of mathematical concepts.

Look for and express regularity in repeated reasoning. (MP.8)

Repeated reasoning occurs in many aspects of math. Students should identify and understand repeated reasoning.

Number and Operations

Number and operations domains create a foundation for later math. Students' number and operations knowledge develops in levels A through C. Adult education students will likely have a foundation in many of these skills, but often need to develop rigorous knowledge and fill in gaps.

Number and Operations: Base Ten (Levels A–C)

- Understand place value. (Levels A–B)
- Use place value understanding and properties of operations to add and subtract. (Levels A–B)
- Use place value understanding and properties of operations to perform multi-digit arithmetic. (Levels B–C)
- Generalize place value understanding for multi-digit whole numbers. (Level C)
- Understand the place value system. (Level C)
- Perform operations with multi-digit whole numbers and with decimals to hundredths. (Level C)

Students begin by understanding the basics of place value. They should recognize how a two-digit number is composed, and when students learn operations, they should make the connection between place value and methods for operations. Why do methods for addition and subtraction work? What's the connection with place value? The "why" is critical here. Students aren't simply learning a procedure. They should understand the reasoning behind basic operations with base ten numbers.

As students develop this understanding, they apply it to more complex math, extending the understanding of place value to larger numbers. Students should learn to round numbers and perform operations on multi-digit numbers comfortably.

Students will also apply their knowledge of place values to decimals. If students comprehend place value with whole numbers, that knowledge is easily transferred to decimals. Students should be able to explain, compare, and perform operations with decimals using an understanding of place values.

Represent numbers in multiple ways, using greater than and less than symbols, introducing symbols for unknown values

(such as a question mark or box), and using number lines. Apply students' learning to both abstract and real-world problems.

Number and Operations: Fractions (Levels B–C)

- Develop understanding of fractions as numbers. (Level B)
- Extend understanding of fraction equivalence and ordering. (Level C)
- Build fractions from unit fractions by applying and extending previous understanding of operations on whole numbers. (Level C)
- Understand decimal notation for fractions, and compare decimal fractions. (Level C)
- Use equivalent fractions as strategy to add and subtract fractions. (Level C)
- Apply and extend previous understanding of multiplication and division to multiply and divide fractions. (Level C)

Students' ability to use operations with fractions successfully depends on their understanding of fractions as numbers. Once students understand fractions, they should extend their understanding of numbers and operations to manipulate and perform operations with fractions. Since fractions are a stumbling block for many students, it's worthwhile taking the time to teach comprehension of fractions. How does the value of the numerator or denominator affect the value of the fraction? What does it mean if a fraction has a larger denominator? Where do fractions fall on a number line? What fractions are equivalent? Why? Why is a/b equivalent to na/nb?

Always bring the "why" into discussions of fractions and operations with fractions. Why do you use equivalent fractions to add or subtract? Why is one fraction equivalent to another? Reinforcing students' understanding of *what a fraction is* at each point in teaching math with fractions will build their comprehension. Comprehension will build lasting knowledge that's applicable to later math.

The Number System

The standards for the number system extend numbers and operations standards. Students will build deeper knowledge of numbers at a higher learning level. At the same time, they will develop foundational skills for later learning, including algebra.

The Number System (Levels C–D)

- Compute fluently with multi-digit numbers and find common factors and multiples. (Level C)
- Apply and extend previous understandings of multiplication and division to divide fractions by fractions. (Level C)
- Apply and extend previous understandings of numbers to the system of rational numbers. (Level D)
- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. (Level D)
- Know that there are numbers that are not rational, and approximate them by rational numbers. (Level D)

Students develop their rigorous knowledge of numbers and the ability to reason and compute mathematically. As students develop capacity with the base ten system, they should develop fluency with multi-digit numbers. In addition to performing basic operations, students should find the greatest common factor and be able to use the distributive property. These skills build foundational knowledge for algebra.

Dividing fractions builds on students' understanding of fractions and basic operations. Again, students should understand why, instead of learning rotely a routine for dividing fractions. This standard develops students' conceptual understanding of fractions. Students should be able to build visual models of fractions and solve word problems involving fractions.

A large number of these standards involve rational numbers. Students should develop an understanding of positive and negative numbers (and their real-world applications) and absolute value. They should find positive and negative

numbers and ordered pairs on number lines and coordinate planes. Include real-world problems in students' learning.

Students should also develop an understanding of adding, subtracting, multiplying, and dividing with positive and negative numbers. Again, instead of learning a rule, students should learn why adding a negative number is equivalent to subtracting a positive number, or why multiplying two negative numbers produces a positive number.

Students should be introduced to irrational numbers, compare the size of rational numbers, and estimate the value of rational numbers.

Number and Quantity

At the high school level, students will expand their understanding of the number system and quantities. As mathematical problems become more complex, students should be able to link their learning to earlier, foundational understanding of numbers.

Number and Quantity: The Real Number System (Level E)

- Extend the properties of exponents to rational exponents. (Level E)

This standard builds on two prior domains: real numbers and expressions and equations. Students should build knowledge of exponents and radicals at level D, while they are learning about expressions and equations. At level E, students will expand that knowledge to manipulate and rewrite expressions involving radicals and rational exponents. Make connections with students' existing knowledge of rational numbers as well as their understanding of exponents.

Number and Quantity: Quantities (Level E)

- Reason quantitatively and use units to solve problems. (Level E)

Students should apply their knowledge of units to help them understand and solve multi-step problems. Students should use units consistently and have awareness of potential problems with converting units or dealing with measurement. Students should be aware of limitations of measurement and report quantities with an appropriate level of accuracy. Measurement should be applied to real-world problems, including science. In graphs and other visual representations, students should understand scale and origin.

Operations and Algebraic Thinking

Operations and algebraic thinking starts at the lowest level of math to build foundational math knowledge which will be used throughout higher math. Algebraic thinking begins at the earliest level. Algebra should not seem like a complete departure from previous math, as it does to many students who struggle. Level by level, students should build understanding of math principles that underlie algebra, beginning with basic operations.

Operations and Algebraic Thinking (Levels A–C)

- Represent and solve problems involving addition and subtraction. (Levels A–B)
- Understand and apply properties of operations and the relationship between addition and subtraction. (Level A)
- Add and subtract within 20. (Levels A–B)
- Work with addition and subtraction. (Level A)
- Represent and solve problems involving multiplication and division. (Level B)
- Understand properties of multiplication and the relationship between multiplication and division. (Level B)
- Multiply and divide within 100. (Level B)
- Solve problems involving the four operations, and identify and explain patterns in arithmetic. (Level B)
- Use the four operations to solve problems. (Level C)
- Gain familiarity with factors and multiples. (Level C)
- Generate and analyze patterns. (Level C)
- Write and interpret numerical expressions. (Level C)

Students should be introduced to word problems at the most basic level of operations and use objects, drawings, and equations to solve problems. Use symbols, including variables, question marks, and boxes, to indicate unknown values in even basic equations. Use multi-step word problems as students develop their skills with operations. Students should be able to identify the appropriate operations and represent the problem in different ways, including using a variable for an unknown number. Students should be able to explain mathematical answers in real-world terms, including explaining the meaning of a remainder or fractional answer.

Emphasize the "why" in math. Why is 2 + 5 the same as 5 + 2? What can the learner say about addition based on this truth? How is counting related to addition and subtraction? What is the relationship

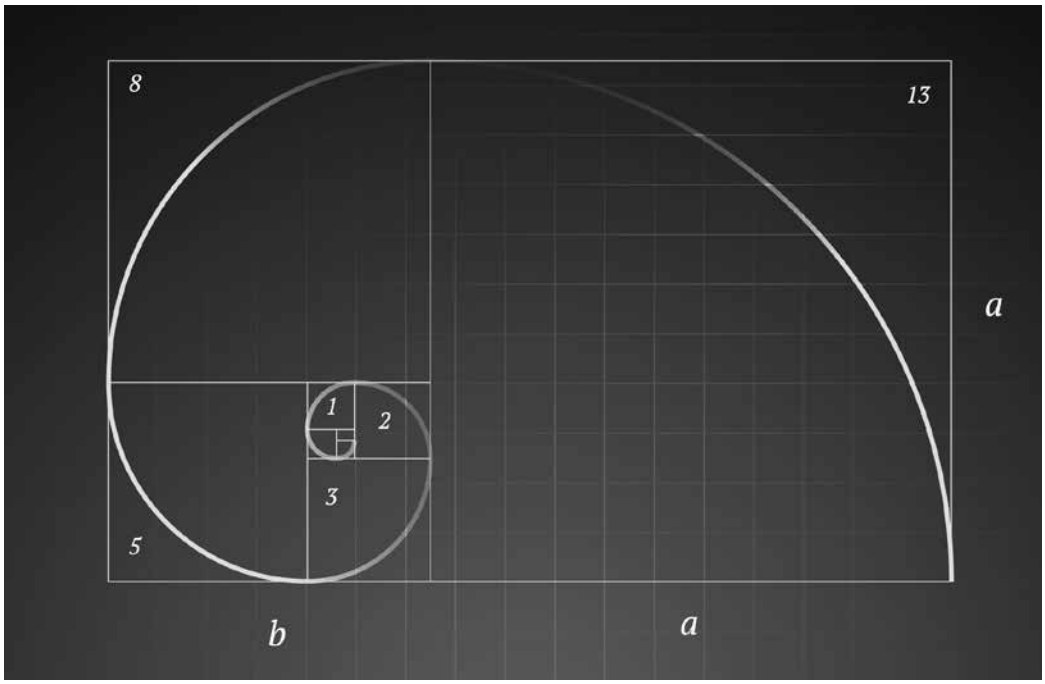
between addition and subtraction? What is the relationship between multiplication and division? How can simple equations and expressions be written in different ways, i.e., 5 + 2, 4 + 3, or 7?

Students should become fluent in simple mathematical operations, and they should also comprehend them well and be flexible in representing and interpreting simple equations and expressions. Deeper comprehension of operations builds algebraic skills.

Part of rigor is building math facts. Students should be able to add, subtract, multiply, and divide using mental strategies and know math facts by memory. Students should also learn and apply the distributive property to understand multiplication and division.

Students should look for patterns in math. What patterns exist in multiplication, division, addition, and subtraction? Why do those patterns exist? Why is every multiple of 4 (or 6 or 8) an even number? How can this be explained mathematically? This fluency in pattern should develop so that students can generate numbers or shapes that follow a given rule and identify features of patterns.

As students progress, they should become familiar with factors and multiples and write more complex expressions, including parentheses, brackets, or braces.



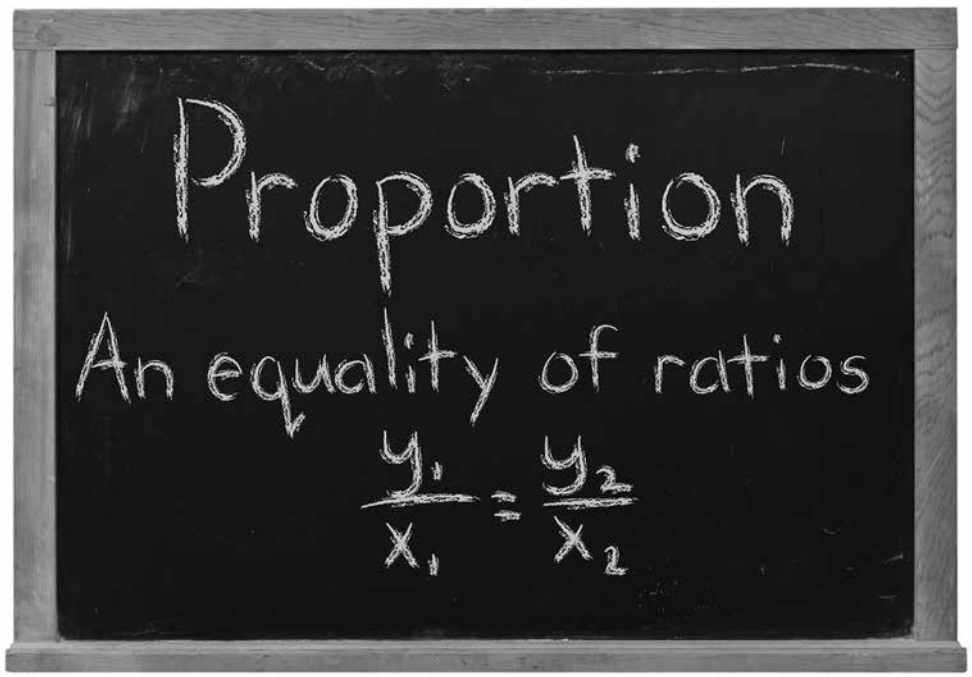
Ratios and Proportional Relationships

The standards for ratios and proportional relationships build on standards in numbers and operations. Students will build foundational skills for algebra and geometry.

Ratios and Proportional Relationships (Levels C–D)

- Understand ratio concepts and use ratio reasoning to solve problems. (Levels C–D)
- Analyze proportional relationships and use them to solve real-world and mathematical problems. (Level D)

Students should understand the concept of a ratio and be able to represent ratios in various ways, using the language of ratios and rates to describe situations. In further developing an understanding of ratios, students should use tools such as tables and coordinate planes to represent ratios. They should apply ratios to real-world problems, including unit-rate problems, measurement conversion, percent problems, and proportional relationships. Students should be able to identify a proportional relationship (and relationships that are not proportional). Comprehension of ratios and proportions will be a valuable skill as students progress.



Expressions and Equations

The standards for expressions and equations build on those for operations and algebraic thinking. An understanding of ratios and proportions will also help students as they transform real-world problems into mathematical expressions and equations. These level C and D standards will prepare students for high-school level algebra.

Expressions and Equations (Levels C–D)

- Apply and extend previous understandings of arithmetic to algebraic expressions. (Level C)
- Reason about and solve one-variable equations and inequalities. (Level C)
- Represent and analyze quantitative relationships between dependent and independent variables. (Level C)
- Use properties of operations to generate equivalent expressions. (Level D)
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations. (Level D)
- Work with radicals and integer exponents. (Level D)
- Understand the connections between proportional relationships, lines, and linear equations. (Level D)
- Analyze and solve linear equations and pairs of simultaneous linear equations. (Level D)

Students should learn about variables and exponents and write and evaluate expressions with exponents and variables. They should learn common mathematical terms including sum, term, product, factor, quotient, and coefficient. Students should represent real-world problems as algebraic expressions or equations.

Applying their understanding of operations and their flexible math thinking, students should solve one-variable equations and inequalities. Students should be able to write, manipulate, and solve simple equations. Students should understand inequalities, represent them on number lines, apply them to real-world problems, and solve them.

Students should be introduced to dependent and independent variables and represent real-world problems as an equation including an independent variable and a dependent variable. Use graphs and tables to represent two-variable equations. Students should be able to analyze and graph a relationship between two variables.

Students should graph and solve systems of two linear equations. They should be able to represent and solve real-world problems using equations and expressions.

Algebra

Algebra is often a stumbling block for adult students. The organization of the standards introduces algebra sooner and develops algebraic skills as students learn basic numeracy. Reinforcing students' number skills as you introduce pre-algebra skills will build the foundation for success in algebra, which begins at the high school level but extends its roots to the basics of everyday math.

Algebra: Seeing Structure in Expressions (Level E)

- Interpret the structure of expressions. (Level E)
- Write expressions in equivalent forms to solve problems. (Level E)

Standards in algebraic thinking, expressions, and equations have built students' knowledge of the fundamental concepts behind algebra. Students should be able to master algebraic equations at a high school level, understanding what an expression represents and recognizing the parts of an expression.

Students should be able to manipulate expressions, rewriting them in multiple ways that show understanding of the expression's meaning. Students should understand that different forms of an expression or equation can be helpful in solving problems and should choose forms to suit their purposes.

Algebra: Arithmetic with Polynomials and Rational Expressions (Level E)

- Perform arithmetic operations on polynomials. (Level E)
- Rewrite rational expressions. (Level E)

Students should apply their knowledge of numbers and exponents to simple polynomials. Relate polynomials to integers, building on students' existing knowledge of numbers. Polynomials can be added, subtracted, multiplied, or divided.

Students should master the ability to perform basic operations with polynomials and apply their knowledge of operations. Polynomials don't need to be complex. Students should master basic skills involving variables with exponents before moving on to more complicated expressions and equations.

Students should be able to rewrite expressions that include polynomials, applying their knowledge of manipulating and restating simple algebraic expressions. As students develop skills with polynomials, they can advance to more complex polynomial expressions and equations.

Algebra: Creating Equations (Level E)

- Create equations that describe numbers or relationships. (Level E)

Students should be able to apply algebra to real-world problems. Beginning with one-variable equations, students should develop the ability to create equations and use them to solve problems. Students should create equations with multiple variables, graph equations, create inequalities, and create systems of equations to model problems mathematically. They should also rearrange formulas for specific purposes.

Algebra: Reasoning with Equations and Inequalities (Level E)

- Understand solving equations as a process of reasoning and explain the reasoning. (Level E)
- Solve equations and inequalities in one variable. (Level E)
- Solve systems of equations. (Level E)
- Represent and solve equations and inequalities graphically. (Level E)

Don't forget the "why" behind algebra. Students should maintain a connection between solving algebraic equations and their foundational math knowledge (as well as a connection between algebra and real-world problems).

Students should be able to explain the reasoning behind the manipulation of an algebraic expression in order to solve a problem. They should follow a train of logic as they use algebra. As students solve one-variable equations and inequalities and systems of equations, they should rigorously understand why their solutions are successful (or why they fail).

Students should also be able to graph equations and inequalities and use a graph (of a line or curve) to solve a problem.

Functions

As with algebra, students begin familiarity with functions at a basic level and develop their knowledge as they advance. Functions build on students' understanding of numbers and algebraic concepts, including the representation of numbers in graphs. Students begin formally studying functions at Level D and continue with functions at the high school level.

Functions (Level D)

- Define, evaluate, and compare functions. (Level D)
- Use functions to model relationships between quantities. (Level D)

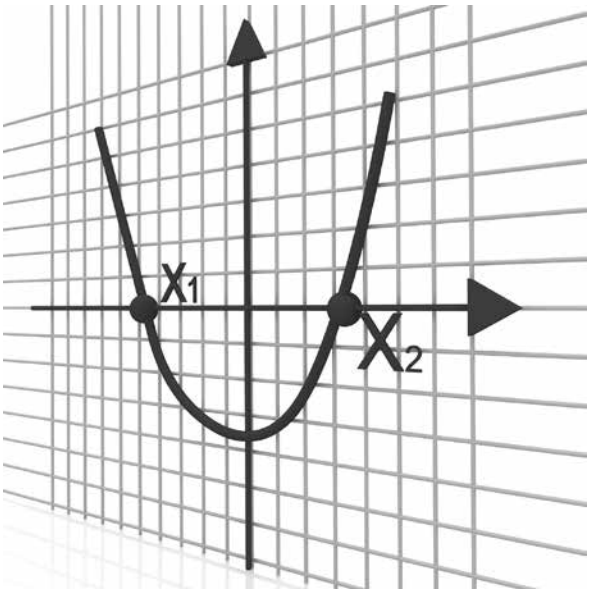
At level D, students will understand what a function is and review the graph of a function. Students should recognize linear functions ($y = mx + b$) and understand that a graph of a linear function is a straight line. They should be able to construct a model of a linear relationship and determine rate of change and initial value.

Students should be able to create and review graphs and tables of value to gather information about a relationship. Students should also be able to give examples of non-linear functions.

Functions: Interpreting Functions (Level E)

- Understand the concept of a function and use function notation. (Level E)
- Interpret functions that arise in applications in terms of the context. (Level E)
- Analyze functions using different representations. (Level E)

Students should develop understanding of terms and symbols used to represent functions. Introduce words such as domain and range, and represent functions as graphs. Represent functions algebraically, using *f(x)*.



Connect functions with both real-world problems and mathematical representations. What does a graph or expression mean? Why is it useful to define functions and use them in different ways?

Students should be able to interpret graphs and tables of functions, draw graphs, and discuss the features of graphs. Students should understand and compare various representations of functions.

Functions: Building Functions (Level E)

- Build a function that models a relationship between two quantities. (Level E)

Students should be able to write a function based on a relationship. Use real-world problems. Students should develop the ability to describe a relationship and represent it mathematically.

Functions: Linear, Quadratic, and Exponential Models (Level E)

- Construct and compare linear, quadratic, and exponential models and solve problems. (Level E)
- Interpret expressions for functions in terms of the situation they model. (Level E)

Students should understand the difference between linear relationships and exponential ones. They should be able to recognize situations that require linear versus exponential relationships and create models to represent both. Use real-world relationship to model linear and exponential functions. Students should relate functions to real-world problems and interpret graphs or models in terms of the situations they represent.

Geometry

Geometry standards begin at level A and continue through high school. Students should build their ability to apply math to shapes and figures as they develop their numeracy skills. Geometry should not be something separate and disconnected from the rest of math. It should be integrated with students' growing understanding of numbers and algebraic reasoning. Geometry introduces coordinate planes and uses algebra to describe shapes. The more that you can make connections between areas of math, the better your students will comprehend fundamental principles.

Geometry (Levels A–D)

- Analyze, compare, create, compose shapes. (Level A)
- Reason with shapes and their attributes. (Levels A–B)
- Draw and identify lines and angles, and classify shapes by properties of their lines and angles. (Level C)
- Graph points on the coordinate plane to solve real-world and mathematical problems. (Level C)
- Classify two-dimensional figures into categories based on their properties. (Level C)
- Solve real-world and mathematical problems involving area, surface area, and volume. (Level C)
- Draw, construct, and describe geometrical figures and describe the relationships between them. (Level D)
- Solve real-life and mathematical problems involving angle, measure, area, surface area, and volume. (Level D)
- Understand congruence and similarity using physical models, transparencies, or geometry software. (Level D)
- Understand and apply the Pythagorean Theorem. (Level D)

Students should begin geometry at the earliest levels, becoming familiar with the attributes of shapes, comparing them, and creating them. Teach the names of shapes and their attributes, including categories of shapes (such as quadrilaterals) that have subcategories (such as squares, rectangles, and parallelograms). Students should learn to partition shapes and identify equal partitions, identifying partitions with the appropriate fractions.

As students progress, they should be able to draw and discuss points, lines, line segments, rays, and angles, using geometric terminology. Students should use coordinate planes to graph points and solve problems. Using their understanding of geometric principles, students should solve basic problems

of angle, measure, area, surface area, and volume. Include real-world problems involving two-dimensional and three-dimensional objects formed from geometric figures, as well as scale drawings of geometric figures. Students should be able to reproduce a geometric drawing at a different scale.

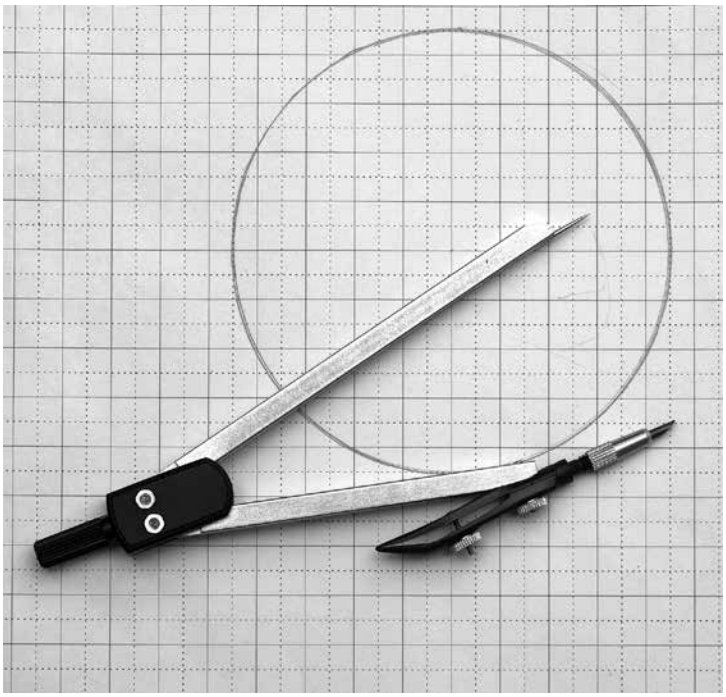
Students should understand congruence and similarity and be able to rotate and transform geometric figures. Manipulatives and computer programs can be valuable in teaching these skills. Have students support statements that shapes are similar or congruent by explaining the transformations that show similarity or congruence.

Introduce the Pythagorean Theorem. Students should be able to solve problems involving right triangles. Students should also be able to find the distance between two points on a coordinate grid using the Pythagorean Theorem. Using their knowledge of angles, students should be able to understand facts about triangles, including the sum of angles in a triangle.

Geometry: Congruence (Level E)

- Experiment with transformations in the plane. (Level E)

Solidify students' understanding of congruence. Students should know precise definitions of geometric terms, including angle, circle, perpendicular line, parallel line, and line segment.



Geometry: Similarity, Right Triangles, and Trigonometry (Level E)

- Prove theorems involving similarity. (Level E)

Students should solve problems based on congruence and similarity of triangles.

Geometry: Geometric Measurement and Dimension (Level E)

- Explain volume formulas and use them to solve problems. (Level E)

Students should solve volume problems involving cylinders, pyramids, cones, and spheres. Focus on understanding the formulas for volume, not merely memorizing or referencing them.

Geometry: Modeling with Geometry (Level E)

- Apply geometric concepts in modeling situations. (Level E)

Incorporate density into geometric discussion. Students should solve problems of density based on area and volume.

Measurement and Data

Measurement and data builds on students' basic numeracy skills. Starting at level A, students will build skills in measurement as well as data. These foundational skills develop into skills in geometry, statistics and probability, and algebra.

Measurement and Data (Levels A–C)

- Measure lengths indirectly and by iterating length units. (Level A)
- Represent and interpret data. (Levels A–C)
- Measure and estimate lengths in standard units. (Level B)
- Relate addition and subtraction to length. (Level B)
- Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. (Level B)
- Represent and interpret data. (Level B)
- Geometric measurement: understand concepts of area and relate to operations of multiplication and addition. (Level B)
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures. (Level B)
- Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit. (Level C)
- Geometric measurement: understand concepts of angle and measure angles. (Level C)
- Convert like measurement units within a given measurement system. (Level C)
- Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition. (Level C)

Measurement | Students should begin measurement and data by measuring lengths and expressing lengths in whole numbers. Focus on understanding the concept of a unit and of measurement. Compare lengths in different units as well as lengths of different objects. Estimate lengths using standard measurements. Relate measurement to addition and subtraction and compare measurements of lengths to number lines to build understanding of concepts of measure.

Students should solve measurement problems involving time, volume, and mass, using basic operations and real-world problems. As students progress, they should solve more complex measurement problems, including converting units, money, and simple fractions or decimals. Students should represent measurement in different ways, including using a number line.

Data | Students should be able to organize, represent, and interpret data, even at the lowest learning levels. Introduce simple tables and graphs. Have students ask and answer questions about data and compare quantities.

As students progress, they should draw and interpret more complex charts and graphs and solve more complex mathematical problems based on graphs. Students should be able to measure lengths on graphs and create accurate representations of data. They should use more types of graphs, such as line graphs, and plot fractional data.

Geometric Measurement | Students should develop a concept of area and measure area. They should understand "a square unit" and use a square unit for measurement. Students should understand the relationship between area and multiplication and use multiplication to solve area problem. Show how the distributive property works with area. In a rectangle with a height a and a length $b + c$, you can apply the distributive property to finding the area. Demonstrate this visually using a divided geometric figure as well as mathematically to reinforce the concept of the distributive property. Students should solve real-world problems of perimeter and area using measurement.

As students progress, they should begin to measure, add, and subtract angles. Introduce the concept of volume. Students should relate volume to multiplication and addition. Build on students' knowledge of area, and introduce a "unit cube" or "cubic unit" to measure volume. Students should be able to find volume and solve volume problems. They should recognize that the volumes of two figures can be added to find a combined volume or subtracted to find a difference in volume.

Statistics and Probability

Beginning at level C, students will study statistics and probability. Statistics and probability build on students' understanding of measurement and data. Students will look at larger data sets and representations of data distribution. They should understand central tendency and range, as well as data samples from populations.

Statistics and Probability (Levels C–D)

- Develop understanding of statistical variability. (Level C)
- Summarize and describe distributions. (Levels C–D)
- Use random sampling to draw inferences about a population. (Level D)
- Draw informal comparative inferences about two populations. (Level D)
- Investigate chance processes and develop, use, and evaluate probability models. (Level D)
- Investigate patterns of association in bivariate data. (Level D)

Statistics | Students should recognize statistical questions and understand the difference between statistical data and specific data, i.e., "How heavy is this cat?" versus "How much do cats weigh?" Introduce the idea of distribution of data and describe and demonstrate distribution curves. Display statistical data in various ways: dot plots, histograms, and box plots. How is data collected and represented to answer statistical questions?

Students should be able to summarize statistical data, describing the data set and how it was measured. They should be able to describe the mean or median and range of data. Students should identify patterns or anomalies in the data. Introduce the idea of sampling data. Students should be able to use data from a random sample to draw inferences about a population. They should compare two populations by looking at representations of data samples and measurements of center and variability.

Represent data with two variables on a scatter plot and describe patterns in the data. Identify straight lines to model relationships between two variables and fit straight lines to scatter plot data. Apply students' understanding of slope and intercept to lines fitted to scatter plots. Students should understand the relationship between scatter plots and the real-world problems they represent. Represent similar data in two-way tables to see patterns in data.

Probability | Students should understand the representation of probability as a number between 0 and 1 and comprehend what a low, high, or middle probability means. Students should be able to calculate probability from data and observation and compare probabilities. Introduce probability of compound events and represent data for compound events in lists, tables, and diagrams.

Statistics and Probability: Interpreting Categorical and Quantitative Data (Level E)

- Summarize, represent, and interpret data on a single count or measurable variable. (Level E)
- Summarize, represent, and interpret data on two categorical and quantitative variables. (Level E)
- Interpret linear models. (Level E)

At the high school level, students should be able to represent data in dot plots, histograms, or box plots. They should interpret differences in data sets based on shape, center, and spread. Students should be familiar with the concept of outliers and account for outliers in their interpretation of data.

Students should create two-way frequency tables and compare data, recognizing possible trends. Students should also interpret the slope, or rate of change, and intercept in linear models of data, relating the representation of the data to the real-world problem.

Teach the distinction between correlation and causation. Students should be able to identify correlations as well as possible causal links. They should understand that correlation does not necessarily imply causation and different types of causal relationships.

Applying the CCR Standards to Other Subjects

The CCR standards focus on two central areas: literacy and mathematics. Throughout the standards, though, there is a clear awareness of applying these core skills to specific subjects. ELA/literacy standards reference informational texts, historical/social studies texts, and scientific and technical texts for reading and writing. Mathematics standards also apply to social studies and science. Both literacy and math are key skills for the workplace, and the standards focus on real-world applications.

As you teach literacy and math skills, students will benefit from connections to science, social studies, and the workplace. Integrating these subjects with math and language arts connects learning to students' lives and interests. At the same time, it introduces students to vocabulary and concepts in those subject areas.

You can connect students to other subject areas in several ways throughout your teaching.

- Use a variety of texts in relevant subject areas. Introduce social studies, science, and workplace texts throughout your teaching. Incorporate students' interests and goals in your choices of texts. If you have students who want to pursue nursing, include texts that are related to medicine. If you have students from Central America, include texts about the history of that area. Be sure your texts cover a broad range of subject matter, including primary source texts and technical texts.
- Collect examples of real-world applications of learning material. At the physical therapist, maybe you notice how the therapists measure and compare angles to show range of motion. In a magazine, maybe you read about a proposed bill that's hotly contested. Make notes of these examples to use in your teaching. Collect a wide variety of examples and integrate them into your lessons and practice questions.

- Make real-world connections in every lesson, including academic, workplace, and everyday content. Use word problems and real-world scenarios in every math lesson. Use texts from magazines, newspapers, Internet publications, and books in reading and writing. Ask students to write for real-world tasks, including college applications, job applications, blogs, workplace documents, and articles for publication.
- Give students projects that relate to real-world subject matter. Have students work on larger, longer-term projects including science experiments, reports, presentations, and research papers. These projects will build students' communication skills as well as subject matter skills.

By incorporating social studies, science, and workplace materials into language arts and mathematics on a regular basis, you will build students' knowledge and abilities. The following pages provide more specific connections between the CCR standards and science and social studies.

Science

Both ELA/literacy standards and math standards provide valuable skills for science. Students should be comfortable reading scientific texts and understanding charts, graphs, and diagrams. Statistics and probability are important math skills to apply to science, but students will use many types of math in science and engineering tasks.

The CCR standards identify an additional 54 CCSS math standards for STEM (science, technology, engineering, and mathematics) fields. Students interested in a career in STEM fields will need additional study with these standards, which include additional standards in The Complex Number System; Vector and Matrix Quantities; Arithmetic with Polynomials and Rational Expressions; Reasoning with Equations and Inequalities; Interpreting Functions; Building Functions; Trigonometric Functions; Similarity, Right Triangles, and Trigonometry; Circles; Expressing Geometric Properties with Equations; Geometric Measurement and Dimension; Conditional Probability and the Rules of Probability; and Using Probability to Make Decisions.

ELA/Literacy Standards

The following specific CCSS standards under reading anchor standards apply specifically to science learning. Several writing anchor standards also apply specifically to science.

Within Reading CCR Anchor 1 | *Application*: cite specific textual evidence to support analysis of science and technical texts. (RST.6-8.1) *Application:* cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions. (RST.9-10.1)

Introduce scientific or technical texts, and ask students to analyze or evaluate the information, citing specific evidence in the text to support their conclusions. Students should be able to quote or paraphrase appropriately and explain the connection between the textual evidence and the main idea. You might ask students to identify evidence supporting a conclusion based on a study. You might ask students to draw a conclusion from evidence and identify the supporting evidence. You might ask students to identify problems with a study, experiment, or method of data collection.

Within Reading CCR Anchor 2 | *Application:* determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions. (RST.6-8.2) Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. (RST.11-12.2)

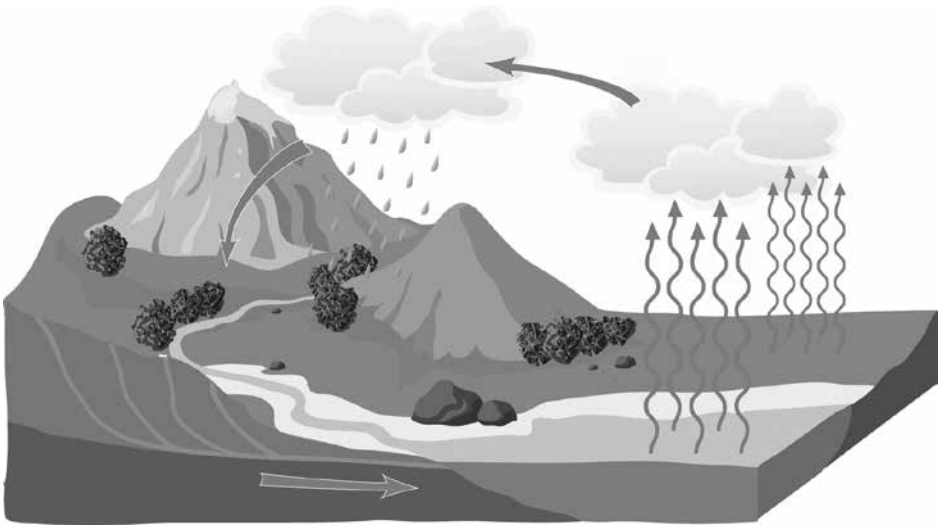
Use scientific and technical texts when identifying central ideas and conclusions or writing summaries. Students should be able to make accurate summaries of scientific texts describing natural processes or systems, scientific experiments or studies, scientific theories, and other complex ideas.

Within Reading CCR Anchor 3 | Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks. (RST.6-8.3) Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. (RST.9-10.3)

Reading isn't necessarily passive. People read in order to bake cookies or sign up for services. In science, students should be able to read and follow complex procedures. Use this opportunity to teach hands-on science while increasing literacy skills.

Within Reading CCR Anchor 4 | *Application:* determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context. (RST.9-10.4)

Incorporate scientific and technical terms in reading. Students will need to understand, not only science vocabulary, but symbols such as chemical symbols for atoms and molecules. Expand students' vocabulary-building tools to incorporate scientific symbols and notations.



Within Reading CCR Anchor 7 | Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table). (RST.6-8.7) Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words. (RST.9-10.7)

Students should be able to understand and use information from scientific tables, charts, equations, and diagrams, integrating this information with scientific texts.

Writing CCR Anchor 1 | Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

At the high school level, students should be able to write thoughtful scientific arguments in support of claims. This can include examining scientific texts to draw conclusions about a scientific question; conducting experiments and writing a report with a central claim and supporting arguments; and writing critiques of study designs. Incorporate science writing in your lessons along with other types of argumentative writing.

Writing CCR Anchor 2 | Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

At level D and E, students should be able to write informative or explanatory texts on science topics. Having students write about science topics will reinforce learning and show students' comprehension. Students should write well-constructed texts with good organization, development, and fluency. Through informative and explanatory writing assignments, students will develop knowledge in both science and writing.

Writing CCR Anchor 4 | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Students should become familiar with style, development, and organization appropriate to scientific writing. As students write argumentative and explanatory science texts, address issues related to science writing.

Writing CCR Anchor 5 | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

Planning and revising scientific texts includes researching science information, performing experiments, and collecting data. Students should also be able to review their conclusions and take a new approach when research or experimental results conflict with earlier ideas. Students should be able to apply a writing process to a variety of science writing.

Writing CCR Anchor 7 | Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

Science research projects can include independent investigation and experimentation. Students should be able to generate research questions, complete background research including information from multiple sources, and design projects to solve problems and answer questions.

Writing CCR Anchor 8 | Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

Writing CCR Anchor 9 | Draw evidence from literary or informational texts to support analysis, reflection, and research. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Students should gather information and draw evidence from texts to support science writing. When students approach science writing, they should be able to find and evaluate technical and scientific source materials. This includes information in science journals, data from government agencies, and science books.

Mathematics

Many types of math are applicable to science. The following are some examples of specific CCSS standards within the CCR standards that you can apply to science content.

Solve problems involving measurement and estimation of intervals of time, liquid volumes, and masses of objects. | Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units, e.g., by using drawings (such as a beaker with a measurement scale) to represent the problem. (3.MD.2)

Measurement standards are easily adaptable to science. Students should be able to measure volumes and masses (among other values) in an experimental setting. They should understand accuracy in scientific measurement.

Understand ratio concepts and use ratio reasoning to solve problems. | Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."* (6.RP.1)

Ratios apply to many scientific topics. A water molecule has a ratio of 2:1 hydrogen atoms to oxygen atoms. A lightyear is the distance light travels in one year. Ratios can be used with data samples. Use scientific scenarios to illustrate ratios.

Represent and analyze quantitative relationships between dependent and independent variables. | Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. *For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.* (6.EE.9)

Science experiments include independent and dependent variables. Students can use experimental data to represent and analyze quantitative relationships. What is the relationship between temperature and time under a light source? What is the relationship between time and plant growth in specific conditions?

Graph points on the coordinate plane to solve real-world and mathematical problems. | Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. (5.G.2)

Coordinate plane grids can be used to plot scientific data. Students can gather information based on slope and intercept. They can interpret and compare values based on coordinate plane graphs.

Summarize and describe distributions. | Display numerical data in plots on a number line, including dot plots, histograms, and box plots. (6.SP.4)

Data distribution is particularly relevant for science. Choose data from scientific investigations to display in dot plots, histograms, and box plots.

Apply and extend previous understandings of numbers to the system of rational numbers. | Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. (6.NS.5)

Scientific data often includes negative numbers. Temperature, elevation, and electric charge are all real-world scientific contexts. Use science to explain and manipulate negative numbers.

Work with radicals and integer exponents. | Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology. (8.EE.4)

Students should be familiar with scientific notation and be able to manipulate and compare numbers presented in scientific notation. Science deals with both very small numbers (the sizes of atoms and molecules) and very large numbers (distances between stars). Provides students with scientific contexts to use and understand scientific notation.

Social Studies

Students benefit from strong literacy skills in social studies. In most areas of social studies, including geography, economics, and sociology, math skills are also critical. The following literacy and math standards can be easily applied to social studies in the classroom.

ELA/Literacy Standards

Social studies topics in the ELA/literacy standards reference historical as well as social studies texts. Students should be able to tackle primary source documents from history, recognizing change in language over time. The following standards in reading and writing are specifically applicable to social studies content.

Within Reading CCR Anchor 1 | *Application:* cite specific textual evidence to support analysis of primary and secondary sources. (RH.6-8.1) *Application*: cite specific textual evidence to support analysis of primary and secondary sources, attending to such features as the date and origin of the information. (RH.9-10.1)

Introduce primary and secondary source material to reading lessons. Students should be able to identify textual evidence to support inferences and analysis. Ask students to relate Supreme Court decisions to the text of the constitution. Have students identify how presidents use rhetorical devices in speeches. Analyze texts from diverse historical periods and locations.

Within Reading CCR Anchor 3 | *Application*: identify key steps in a text's description of a process related to history/social studies (e.g., how a bill becomes law, how interest rates are raised or lowered). (RH.6-8.3) Analyze in detail a series of events described in a text; determine whether earlier events caused later ones or simply preceded them. (RH.9-10.3)

In addition to processes of government, you can introduce economic systems and sociological phenomena to describe processes. Cause-and-effect relationships can be found in history, geography, and economics. Take examples from a wide variety of social studies fields.

Within Reading CCR Anchor 6 | Identify aspects of a text that reveal an author's point of view or purpose (e.g., loaded language, inclusion or avoidance of particular facts). (RH.6-8.6) Compare the point of view of two or more authors for how they treat the same or similar topics, including which details they include and emphasize in their respective accounts. (RH.9-10.6)

Point of view and purpose are particularly relevant in historical texts and in argumentative texts, including issues involving civics and government.

Within Reading CCR Anchor 7 | Integrate quantitative or technical analysis (e.g., charts, research data) with qualitative analysis in print or digital text. (RH.9-10.7)

Incorporate data from demographics or census data, linguistics, economics, political science (including polls), and human geography. Interpreting quantitative data and incorporating it with text will help students understand critical areas of social studies.

Within Reading CCR Anchor 9 | *Application:* compare and contrast treatments of the same topic in several primary and secondary sources. (RH.9-10.9)

Primary and secondary sources from different cultures and time periods provide excellent materials for comparing and contrasting different treatments of the same topic. Compare primary sources with later analysis of the time period. Compare writings about similar topics from diverse cultures.

Writing CCR Anchor 1 | Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Argumentative writing is well suited for civics topics and can provide a connection with topics important to your students. Students can also write argumentative works about issues in history, economics, or sociology. Integrate this topic with reading by having students read and respond to social studies texts.

Writing CCR Anchor 2 | Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

Students can write informative or explanatory texts about any social studies topics. Writing about history or government will cement students' knowledge and give you a valuable way to assess students' comprehension.

Writing CCR Anchor 4 | Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Task, purpose, and audience are important in the context of social studies. Is the student writing a persuasive argument meant for voters? An analysis of census data for academic purposes? Define specific tasks and contexts for student writing, and develop students' awareness of purpose and audience in their work.

Writing CCR Anchor 5 | Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

Planning for social studies writing can include reading, research, analysis, and investigation. Students can gather and present data to include with their writing, as well as researching from primary and secondary sources. Students should complete substantive projects where they can plan, revise, and rewrite, as well as shorter writing projects where they implement a writing process.

Writing CCR Anchor 7 | Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

Research projects in social studies can cover any topic. Students may research local historical events and find their own primary sources. They can identify historical events that their parents or grandparents witnessed. Students may study local census records, graveyards, political processes, or economic data.

Writing CCR Anchor 8 | Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

Writing CCR Anchor 9 | Draw evidence from literary or informational texts to support analysis, reflection, and research. (Apply this standard to texts of appropriate complexity as outlined by Standard 10.)

Social studies texts are rich and varied. Students should encounter a wide range of primary and secondary source material. They should identify sources of information and draw evidence from both provided sources and their own sources of information.

Mathematics

Real-world applications of math can be found in any discipline. Economics is notable for math applications. Civics, sociology, and human geography (as well as economics) include many applications of data and statistics. Students should be familiar with social studies data and be able to interpret representations of data in tables, charts, and graphs. The following are a few data and statistics standards that can be used with social studies data.

Represent and interpret data. | Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another. (1.MD.4)

Even at a low level of math with simple charts, students can use real-world data related to social studies disciplines. Data from historical events can be graphed on simple charts. Comparisons can be made between presidential race results, voting rates, or populations.

Develop understanding of statistical variability. | Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. *For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.* (6.SP.1)

Statistical variability is an important concept underlying data. Use statistical data from geography, sociology, or civics to illustrate statistical variability.

Draw informal comparative inferences about two populations. | Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in one chapter of a science book are generally longer or shorter than the words in another chapter of a lower level science book.* (7.SP.4)

Students might compare data from two countries or two time periods to make inferences about two populations. Find examples of data from multiple social studies disciplines to familiarize students with how data is used.