

# CCRS Standards Overview: Math

## Introduction

### *Welcome*

College and Career Readiness Standards Overview: Math  
INTRODUCTION

Pennsylvania  
Adult Education  
Resources

**College and Career Readiness Standards  
Overview: Math**

**WELCOME TO THE MODULE**  
Staff Induction Module Series

#### **Notes:**

Welcome to the College and Career Readiness Standards for Math Overview module. Throughout the module, the Math Standards will be referred to as the math CCRS. This online learning activity will take approximately one hour to complete; however, you can stop the module and log back in to view it again at any point. Be sure to use headphones or speakers and have a reliable internet connection as you work through this module.


Please click on Next to begin.

## Navigation Tips

College and Career Readiness Standards Overview: Math  
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### Navigating the Module



**Directions:** Click on each of the icons to learn how to navigate the module and access the resources.

### Notes:

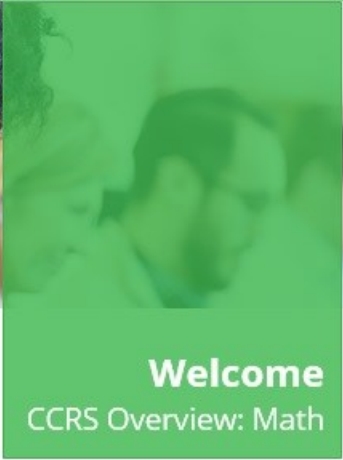

If this is your first time participating in a staff induction module, please click on each of the icons to learn how to navigate and access resources. When you are ready, please click Next to continue.

## Module Overview

College and Career Readiness Standards Overview: Math

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**Module Overview**

- **Section 1:** Why Use the CCRS?
- **Section 2:** Understanding the Standards
- **Section 3:** The CCRS and Math Instruction
- **Section 4:** Aligning Instruction to the CCRS

### Notes:

There are four sections to this module. Please read over the upcoming sections and click Next to learn about the objectives that will be covered.

## Objectives: 1 - 4

### Module Objectives: 1 - 4

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1. Describe the purpose of the CCRS.
2. Identify at least two benefits of using the CCRS for adult education staff and learners.
3. Define vocabulary related to the organization of the CCRS.
4. Describe how the math standards are organized, recognizing the organization of content standards by level and domain.

#### Notes:

In this module, you will become more familiar with the content of the Math CCRS including the purpose of the CCRS and some benefits to using them.

After you have reviewed the objectives on this screen, please click Next to continue.

## Objectives: 5 - 8

### Module Objectives: 5 - 8

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5. Describe the key shifts for math instruction.
6. State the purpose of the Standards for Mathematical Practice.
7. Describe how the standards connect to lesson planning and teaching ABE and ESL students.
8. Identify sample students' CCRS levels based upon the description of student skills provided.

#### Notes:

You will also be able to describe the key shifts in math instruction associated with the CCRS along with the Standards for Mathematical Practice. The key shifts and Standards for Mathematical Practices will be covered in more depth in separate modules. You will be able to state the purpose of the Standards for Mathematical Practice and we will help you to connect the standards to planning your instruction. Finally, you will be able to help navigate the math CCRS, enabling you to identify CCRS levels based on the math skills a student possesses.

After you have reviewed the objectives on this screen, please click on the Next button to continue.

**Activity: What is your familiarity with CCRS?**

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### ACTIVITY: What's your familiarity with CCRS?

**Instructions:** Click the circles to indicate your familiarity level with each topic.

	Not Familiar	Somewhat Familiar	Very Familiar
Benefits of using the CCRS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Organization of the CCRS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Incorporating CCRS into your instructional practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**Notes:**

Let's take a moment to assess what your familiarity level is with the College and Career Readiness Standards that will be detailed in this module. Click the circles to indicate your familiarity level with each topic. Keep in mind that it is acceptable if you have no prior knowledge of these topics. Click Submit when you have completed this activity.

## End of Introduction

### End of Introduction

You've reached the end of this section. The next section of the module is:

#### **SECTION 1:** **Why use the CCRS?**

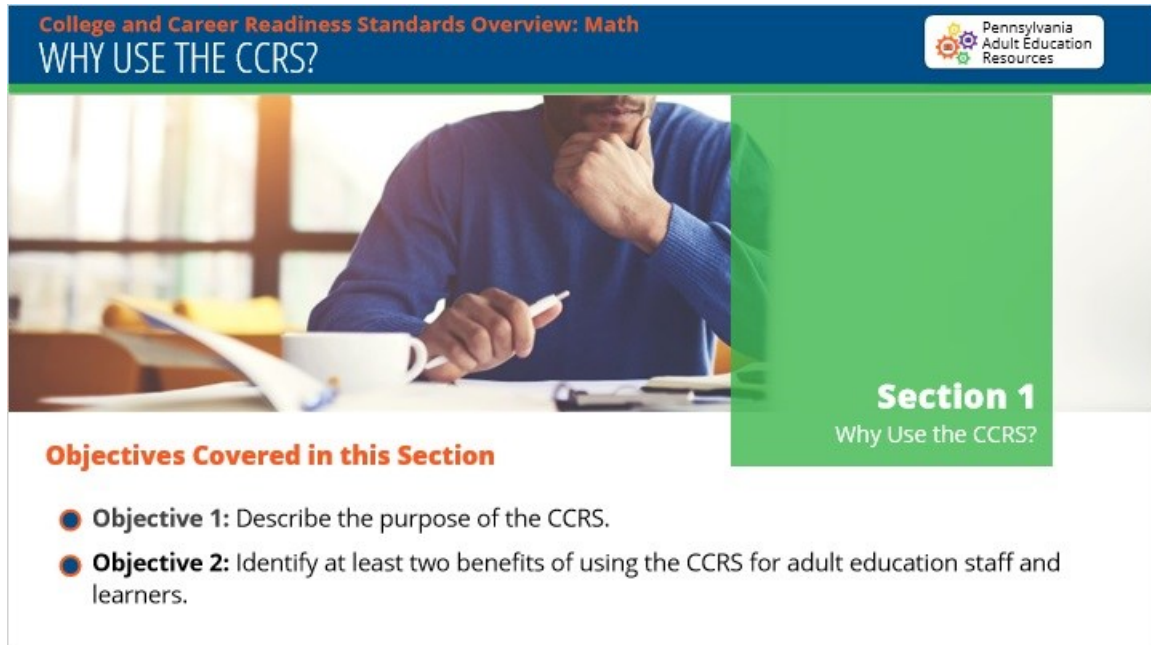


#### Notes:

Congratulations, you've reached the end of this section. Please advance to the next section to continue the module.

## Why Use the CCRS?

### *Why use the CCRS?*



The image is a screenshot of a presentation slide. At the top, a dark blue header contains the text 'College and Career Readiness Standards Overview: Math' in orange and 'WHY USE THE CCRS?' in white. In the top right corner, there is a logo for 'Pennsylvania Adult Education Resources' featuring three interlocking gears. The main body of the slide shows a man in a blue sweater sitting at a desk, looking thoughtful with his hand on his chin. A large green rectangular overlay on the right side of the slide contains the text 'Section 1' in white, with 'Why Use the CCRS?' in a smaller font below it. Below the image, the text 'Objectives Covered in this Section' is written in orange. Underneath, there are two bullet points, each with a blue circle containing a white dot:

- **Objective 1:** Describe the purpose of the CCRS.
- **Objective 2:** Identify at least two benefits of using the CCRS for adult education staff and learners.

#### **Notes:**

In this section, you will have a chance to learn about why we use the College and Career Readiness Standards (CCRS) and the benefits of using the CCRS. Read the objectives for this section and then click Next to continue.



## CCRS General Information

### CCRS: General Information

Adapted from the Common Core State Standards

- Focus on skills needed for success in college and the workplace.

Standards for Adult Education in English Language Arts and Math

Required at federal and state level

- WIOA requires standards-based instruction.
- PDE requires CCRS-aligned instruction.

#### Notes:

The CCRS were developed nationally based on the Common Core State Standards, a set of standards developed for K-12 education. They were identified as the standards that are most essential for adults to be successful in college and/or the workplace.

There are two sets of standards, one for language arts and the other for math.

It is important to know that the Workforce Innovation and Opportunity Act (WIOA) mandates that states adopt standards for their adult education programs that align to those used in K-12 education. Pennsylvania has adopted the CCRS, mandating programs align instruction to them.

## College and Career Readiness

### College and Career Readiness

“The importance of college and career readiness for adult students cannot be overstated ... It is crucial, then, that adult education programs provide students the opportunity to acquire these skills to pursue their long-term career aspirations and goals.” (CCRS, p. 2)

Pimentel, S. (2013). *College and Career Readiness Standards for Adult Education*. Retrieved from <http://lincs.ed.gov/publications/pdf/CCRStandardsAdultEd.pdf>

#### Notes:

The skills addressed in the CCRS are essential for students, not only to do well on high school equivalency tests such as the GED® or HiSET® exams, but also in order to be successful in postsecondary education and the workplace.

By mastering these skills, students will be more prepared to enter postsecondary education and training programs, without needing remediation. The CCRS also includes skills that learners will use in the workplace.

## *The Workforce Innovation and Opportunity Act*

## The Workforce Innovation and Opportunity Act

### WIOA, Title II, Sec. 202

It is the purpose of this title to create a partnership among the Federal Government, States, and localities to provide, on a voluntary basis, adult education and literacy activities, in order to—

- 1) assist adults to become literate and obtain the knowledge and skills necessary for employment and economic self sufficiency.
- 2) assist adults who are parents or family members to obtain the education and skills that—
  - A) are necessary to becoming full partners in the educational development of their children; and
  - B) lead to sustainable improvements in the economic opportunities for their family.

113th Congress. (2014). Retrieved from <http://www.congress.gov>: <https://www.congress.gov/113/bills/hr803/BILLS-113hr803enr.pdf>

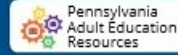
### Notes:

The Workforce Innovation and Opportunity Act, also known as WIOA, was signed into law in 2014. Our work in adult education is governed by this law, and this law requires the use of standards to guide instruction.

## ***Adult Education and Family Literacy Guidelines***

College and Career Readiness Standards Overview: Math

WHY USE THE CCRS?



### **Adult Education and Family Literacy Guidelines**

#### **401 Quality of Instruction**

At a minimum, quality instruction will:

1. Be grounded in research;
2. Incorporate the College and Career Readiness Standards for Adult Education;
3. Be provided by qualified staff;
4. Be contextualized; and
5. Incorporate technology.

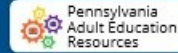
#### **Notes:**

In order to meet the WIOA requirements of standards adoption, The Division of Adult Education has implemented the CCRS which are aligned with the Pennsylvania Core Standards. The PDE Adult Education and Family Literacy Guidelines state that these standards must guide lesson planning and instruction.

## Adult Education and Family Literacy Guidelines

College and Career Readiness Standards Overview: Math

WHY USE THE CCRS?



### Adult Education and Family Literacy Guidelines

#### 402.6 Standards-Based Instruction

Standards-based education provides a structured approach for adult basic education and family literacy programs to create a system that explicitly links standards, assessments, and instructional delivery. PDE's Standards Aligned System (SAS) is the comprehensive system to support student achievement across the commonwealth. The Pennsylvania Core Standards, adopted in 2013, reflect the organization and design of the Pennsylvania Academic Standards.

The Division of Adult Education has implemented the College and Career Readiness Standards for Adult Education (CCRS) that were released by the federal Office of Career, Technical, and Adult Education (OCTAE). The CCRS are fully aligned with the Pennsylvania Core Standards. These standards must guide lesson planning and instruction.

Administrator Resources. (n.d.). Retrieved from Pennsylvania Adult Education Resources: <https://www.paadultedresources.org/wp-content/uploads/2020/07/DRAFT-2020-21-Adult-Education-and-Family-Literacy-Guidelines.pdf>

#### Notes:

The PDE Adult Education and Family Literacy Guidelines state that these standards must guide lesson planning and instruction.

Click Next to continue.

## Alignment of Adult Education Instruction to...

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WHY USE THE CCRS?

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### Alignment of Adult Education Instruction to ...

**Directions:** Click on each of the buttons below for more information.

K-12 and Post-Secondary Education

Other Adult Education Providers and Partners

Assessments and Credentials

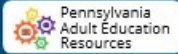


#### Notes:

The CCRS identifies three key areas of alignment that are benefits to the utilization of the standards. These include alignment to the K-12 and postsecondary systems; the ability to create partnerships and common tools and materials between programs and states; and helping students prepare for assessments such as the high school equivalency exams. You may click any of the boxes on this slide for the complete description provided in the CCRS documentation. After you have read all of the information, click Next to continue.

## K-12 and Post-Secondary

College and Career Readiness Standards Overview: Math  
WHY USE THE CCRS?



### Alignment of Adult Education Instruction to ...

**Directions:** Click on each of the buttons below for more information.

**K-12 and Post-Secondary Education**

**Other Adult Education Providers and Partners**

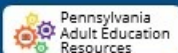
**Assessments and Credentials**

**K-12 and Post-Secondary Education**

Consistent expectations between K-12 and adult education systems so all students – whatever their pathway to graduation – will have access to the preparation they need to enter credit-bearing freshman courses without a need for remediation.

## Other Providers and Partners

College and Career Readiness Standards Overview: Math  
WHY USE THE CCRS?



### Alignment of Adult Education Instruction to ...

**Directions:** Click on each of the buttons below for more information.

**K-12 and Post-Secondary Education**

**Other Adult Education Providers and Partners**

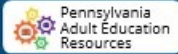
**Assessments and Credentials**

**Other Adult Education Providers and Partners**

Partnerships between and among states and programs to combine financial resources and human capital to create common tools and materials to support implementation.

## Assessment & Credentials

College and Career Readiness Standards Overview: Math  
**WHY USE THE CCRS?**



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### Alignment of Adult Education Instruction to ...

**Directions:** Click on each of the buttons below for more information.

<b>K-12 and Post-Secondary Education</b>	<b>Assessments and Credentials</b> Student preparation for new assessment models using knowledge and skills identified by the CCSS required for the attainment of a high school diploma or its equivalent (e.g., GED, Partnership for Assessment of Readiness for College and Careers, and Smarter Balanced Assessment Consortium).
<b>Other Adult Education Providers and Partners</b>	
<b>Assessments and Credentials</b>	

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## ***Benefits to Programs, Teachers, & Learners***

The screenshot shows a webpage header with the text "College and Career Readiness Standards Overview: Math" and "WHY USE THE CCRS?". On the right is the "Pennsylvania Adult Education Resources" logo. Below the header is a sub-header "Benefits to Programs, Instructors, and Learners". Underneath is a "Directions" section: "Directions: Click on each of the areas to learn more." Below this are three blue buttons with white text: "Programs", "Instructors", and "Learners".

### **Notes:**

Additionally, using the CCRS can have benefits for your program, instructors, and learners. Click on each of the areas to learn more.

### **Programs:**

Using the CCRS can benefit your program in several ways. First, the CCRS clearly defines the content and academic skills needed for students. It provides a framework for your curriculum so that programs have more clarity on what skills to teach for students at each level.

Some programs have also said that they have anecdotally noticed an impact on outcomes after incorporating the CCRS into their teaching.

### **Instructors:**

Instructors benefit from using the CCRS for lesson planning because the standards provide clear guidance on what skills students need at each level. They provide measurable expectations that teachers can use to plan instruction and assess improvement.

While learning the standards and using them in lesson planning may take some time at first, instructors often find lesson planning becomes easier as they become more familiar with the standards.

The CCRS key shifts (which we'll further discuss in the module) also provide strategies that can be used in all lessons to ensure students are improving skills needed for workplace and academic success.

**Learners:**

Learners benefit from receiving instruction that is aligned to the standards because it ensures they are being taught skills they will need for workplace and postsecondary education success. They also benefit by learning skills that are measured by the GED® and HiSET® high school equivalency exams.

When programs adopt the CCRS to develop their curriculum, students may find that instruction is more cohesive because the skills are presented in a progression aligned to skill levels.

**Activity: Select benefits that are important to you.**

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WHY USE THE CCRS?

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**Directions:** Consider for a moment these benefits according to their importance to your professional practice. Select at least two options from the list below that you **currently use** in your classroom, or select two options from the list below that you **want to use** in the future.

Framework for curriculum	Provide consistent expectations for career skills
Rigorous instruction intended to guide learners toward their goals	Framework for assessment
Instruction that enables learners to attain their goals	Provides consistent expectations for college
Framework for instruction	Guiding set of measurable skills for planning lesson objectives

**Notes:**

Consider for a moment these benefits according to their importance to your professional practice. Select at least two options from the list below that you currently use in your classroom, or select two options from the list below that you want to use in the future.

## End of Section 1

### End of Section 1

You've reached the end of this section. The next section of the module is:

#### **SECTION 2:** Understanding the Standards

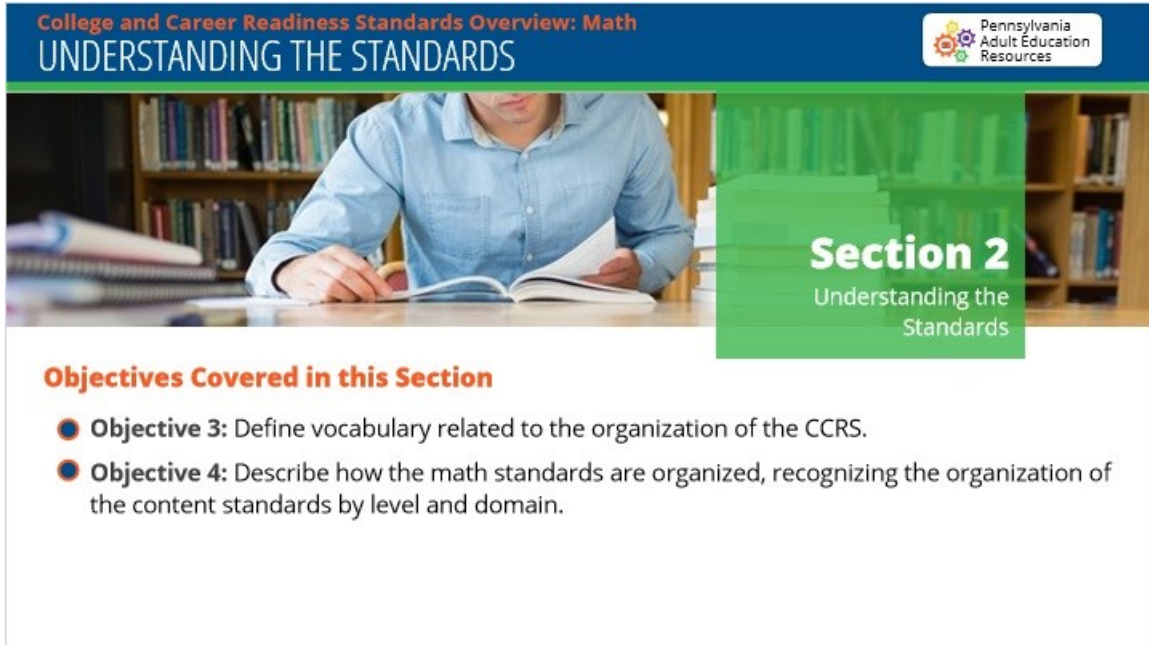


#### Notes:

Congratulations, you've reached the end of this section. Please advance to the next section to continue the module.

# Understanding the Standards

## *Understanding the standards*



College and Career Readiness Standards Overview: Math  
UNDERSTANDING THE STANDARDS

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**Section 2**  
Understanding the  
Standards

**Objectives Covered in this Section**

- **Objective 3:** Define vocabulary related to the organization of the CCRS.
- **Objective 4:** Describe how the math standards are organized, recognizing the organization of the content standards by level and domain.

### **Notes:**

In this section we will discuss the structure and layout of the standards, in addition to tips for understanding them. Read the objectives for this section and then click Next to continue.

### ***Warm Up Activity***

*(Drag and Drop, 0 points, 2 attempts permitted)*

## Activity

**Directions:** Drag and drop the descriptions to the correct pictures below.

Reading

Statistics and  
Probability

Operations and  
Algebraic Thinking

Writing

The Number  
System

Expressions and  
Equations

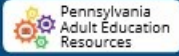


### Notes:

Let's see what you already know about College and Career Readiness Standards, specifically how they relate to mathematics standards. Match the domains by dragging them to the correct section, ELA or Mathematics. Keep in mind that it's OK if you are not familiar with these yet.

## CCRS Content Areas

College and Career Readiness Standards Overview: Math  
**UNDERSTANDING THE STANDARDS**



### CCRS Content Areas

Mathematics	English Language Arts
The Number System	Reading
Operations and Algebraic Thinking	Writing
Functions	Speaking and Listening
Geometry	Language
Measurement and Data	Foundational Skills K-5
Statistics and Probability	

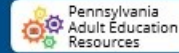
### Notes:

The CCRS is divided into two main subject areas, mathematics and English language arts. The mathematics standards address skills related to: the number system, operations and algebraic thinking, functions, geometry, measurement and data, and statistics and probability. The ELA standards are also included on this slide so you can see how they differ in organization; however, the focus of this module will be the mathematics standards. For more information on the ELA standards, please consider viewing the modules for ELA CCRS.

## English Language Proficiency Standards (ELPS)

College and Career Readiness Standards Overview: Math

### UNDERSTANDING THE STANDARDS



## English Language Proficiency Standards (ELPS)

Focused on English Language Learners (ELLs)

Includes correspondences with CCRS

“The ELP Standards for AE are essential to ensuring that adult ELLs receive the focused and effective instruction they need to access states’ academic content standards. To that end, the ELP Standards strongly emphasize the academic language needed by ELLs to engage with and meet state-adopted content standards.” (ELPS, p. 1)

English Language Proficiency Standards for Adult Education (2016). Retrieved from <https://lincs.ed.gov/publications/pdf/elp-standards-adult-ed.pdf>

### Notes:

If you are teaching English as a Second Language, you may also consider the English Language Proficiency Standards, or ELPS. This set of standards focuses on skills for English language learners and includes correspondences with the College and Career Readiness Standards.

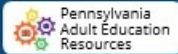
You can download the standards in the course Resources section or by clicking the link listed on this slide.

**(Link: <https://lincs.ed.gov/publications/pdf/elp-standards-adult-ed.pdf>)**



## Structure of the Math CCRS

College and Career Readiness Standards Overview: Math  
UNDERSTANDING THE STANDARDS



### Structure of the Math CCRS

Levels	Domains
A: Kindergarten and 1 <sup>st</sup> grade	Number and Ratios
B: Grades 2-3	Algebra and Functions
C: Grades 4-5	Geometry
D: Grades 6-8	Data, Probability, and
E: High School	Statistical Measurement

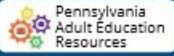
### Notes:

There are two terms to know with respect to the structure of the standards - level and domain. Level refers to the grade level students are working at. There are five levels. Level A represents kindergarten and first grade while level B represents grades 2 and 3. Level C represents grades 4 and 5, level D is grades 6 through 8 and level E is high school-level math.

The second term involves the domain. They include number and ratios, algebra and functions, geometry, and the combination of data, probability, and statistical measurement.

The next slide will show you an overview of how the domains are addressed at each level.

## An Overview of the Domains Across Each Level

College and Career Readiness Standards Overview: Math		UNDERSTANDING THE STANDARDS				 Pennsylvania Adult Education Resources
An Overview of the Domains Across Each Level						
	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)	
Number and Ratios	Number and Operations in Base 10		Ratios and Proportions		Number and Quantity	
		Fractions	The Number System			
Algebra and Functions	Operations and Algebraic Thinking		Expressions and Equations		Algebra	
				Functions		
Geometry	Geometry					
Data, Probability, and Statistics	Measurement and Data			Statistics and Probability		

Modified for PA Adult Education Resources from Progressions and Learning Trajectories  
<http://www.bitingintothecore.com/progressions-and-learning-trajectories.html>

### Notes:

This slide shows you how the domains progress as students advance from level to level. You may notice that there are more progressions in the Number and Ratios and Algebra and Functions domains. Both focus heavily on operations until around the 5<sup>th</sup> grade level before advancing to more complex work with numbers and variables. Geometry is a more gradual build, while Data, Probability and Statistics is focused on measurement and data through level C before advancing to statistics and probability for levels D and E.

This is just a broad view of the progressions for each domain. Next we'll look more closely at how the specific standards are organized.

## Looking at a Standard

### Looking at a Standard

**4.NBT.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

#### Notes:

Here is an example of one of the math standards. Forget for a second the boldface letters and numbers at the start - this is coding that will be explained in a minute. Looking at the standard itself you can see that it involves addition and subtraction of whole numbers. There are also two key terms in this standard. The first is “fluently,” which refers to students being able to comfortably solve problems efficiently and correctly. The other is “using the standard algorithm,” meaning there is a specific way students should perform addition and subtraction. The key is that students understand the place value of digits they are adding and subtracting. There is a link to a video explaining the standard algorithm for those that are interested in more information about it. When you are ready, click Next to continue.

## Looking at a Standard

### Looking at a Standard

**4.NBT.4** Fluently add and subtract multi-digit whole numbers using the standard algorithm.

**4.NBT.4**

**Fourth Standard  
Number Base Ten  
Fourth Grade Level**

#### Notes:

Now for the coding at the beginning of the standard. The number at the beginning refers to the grade level - remember, the CCRS are based on K-12's Common Core State Standards, so this standard is at grade level 4. The letters after the decimal refer to the part of a domain it relates to, which in this case is numbers base ten. This is part of the Numbers and Ratios domain. The next slide will provide a listing of the abbreviations used in levels A through D. The 4 at the end is simply to separate the standards within the level and domain, so this is the fourth standard for number base ten at the fourth grade level.

## Abbreviations: Levels A - D

### Abbreviations: Levels A - D

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<b>NBT:</b> Number Base 10	<b>EE:</b> Expressions and Equations
<b>NF:</b> Fractions	<b>F:</b> Functions
<b>NS:</b> Number Systems	<b>G:</b> Geometry
<b>RP:</b> Ratio and Proportional Reasoning	<b>MD:</b> Measurement and Data
<b>OA:</b> Operations and Algebraic Thinking	<b>SP:</b> Statistics and Probability

#### Notes:

This slide provides a listing of the abbreviations used in levels A through D of the math standards. Take a minute to read over the abbreviations. When you are ready, click Next to continue.

## Related Standards

### Related Standards

---

Write, read, and evaluate expressions in which letters stand for numbers.

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract  $y$  from 5" as  $5 - y$ .

Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression  $2(8 + 7)$  as a product of two factors; view  $(8 + 7)$  as both a single entity and a sum of two terms.

#### Notes:

You may feel intimidated thinking about the number of math standards, trying to think about how to address them in the time your students are in class. Keep in mind, you will often address multiple standards in a particular classroom session. Standards within the same domain and level are often related, making grouping them a fairly straightforward task. In some cases, specific standards are linked to allow tasks to be approached from different angles. These standards all involve a basic ability to write and interpret expressions. The first standard is very general, requiring students to write, read, and evaluate expressions. The next two specify ways students may do those very things. Consider how these would likely be part of the same lesson. The next slide will describe how they are coded to indicate this relationship.

## Related Standards

### Related Standards

**6.EE.2 (Expressions and Equations)** Write, read, and evaluate expressions in which letters stand for numbers.



**6.EE.2a** Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract  $y$  from 5" as  $5 - y$ .

**6.EE.2b** Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression  $2(8 + 7)$  as a product of two factors; view  $(8 + 7)$  as both a single entity and a sum of two terms.

#### Notes:

As these slides essentially involve the same task, it probably isn't surprising they are the same domain and level. They are all at the sixth grade level in the Expressions and Equations domain. The first standard is just a general writing, reading, and evaluating expressions, and is coded 6.EE.2. The next two specify ways students may do those very things, so instead of having them be the third and fourth standards, they are labeled 2a and 2b to link them to the first standard.

This is done to help teachers link standards as they develop lessons. Identifying the skills and concepts learners need to be successful is a good start to developing lesson objectives. Considering how you will measure fluency and understanding for the standards you use for a specific lesson will help you develop SMART objectives.

## Knowledge Check

(Drag and Drop, 10 points, 2 attempts permitted)

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UNDERSTANDING THE STANDARDS

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### Knowledge Check

**Directions:** Match the domain, standard, and grade level.

Accessible Version

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, for every vote candidate A received, candidate C received nearly three votes.”

**This is standard 6.RP.1.**

6.	RP.	1
	Domain	
	Grade	
	Standard	

### Notes:

Let's see what you have learned about how the standards are coded. Match the domain, standard, and grade level by dragging each part of a standard to what it represents.



## End of Section 2

### End of Section 2

You've reached the end of this section. The next section of the module is the:

### Section 3: The CCRS and Math Instruction

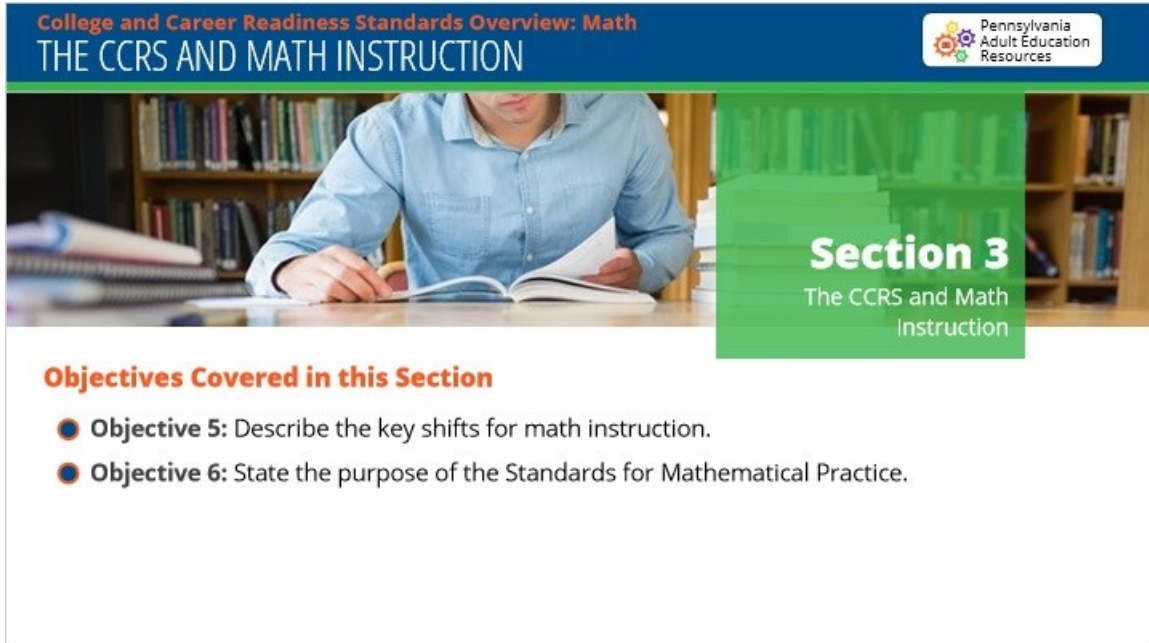


#### Notes:

Congratulations, you've reached the end of this section. Please click Next to continue.

## The CCRS and Math Instruction

### *The CCRS and Math Instruction*



The screenshot shows a presentation slide with a blue header and a green sidebar. The header contains the text 'College and Career Readiness Standards Overview: Math' and 'THE CCRS AND MATH INSTRUCTION'. The sidebar contains the text 'Section 3' and 'The CCRS and Math Instruction'. The main content area features a photograph of a person reading a book and a list of objectives.

**College and Career Readiness Standards Overview: Math**  
**THE CCRS AND MATH INSTRUCTION**

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**Section 3**  
The CCRS and Math Instruction

**Objectives Covered in this Section**

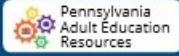
- **Objective 5:** Describe the key shifts for math instruction.
- **Objective 6:** State the purpose of the Standards for Mathematical Practice.

#### **Notes:**

Now that you have a general understanding of the purpose and structure of the College and Career Readiness Standards, we'll talk about how they relate to quality math instruction. The standards themselves are content standards, intended to identify what should be taught in adult education classes for students to be college and career ready. There is also some guidance for teachers in how they might approach instruction. As mentioned earlier, these will be introduced now and addressed in more detail in a separate module. Read the objectives for this section and then click Next to continue.

## The Key Shifts

College and Career Readiness Standards Overview: Math  
THE CCRS AND MATH INSTRUCTION



### The Key Shifts

Focus	Coherence	Rigor
Instruction focuses on <b>mastery</b> of the standards.	Link instruction to prior and future learning.	Incorporates: <ul style="list-style-type: none"><li>• Procedural skills and fluency</li><li>• Conceptual understanding</li><li>• Application</li></ul>

### Notes:

The CCRS demands a shift in instructional practice to make the standards accessible to adult learners. In this module we will use the term key shifts to reference the changes in teaching practice. You may also hear this being referred to as instructional advances or instructional shifts. In regard to the CCRS, these terms reference the same thing: the overarching changes in instructional practices that will help learners to gain college and career readiness skills. Included in the College and Career Readiness Standards are three key shifts in instruction for both math and ELA. For math, the key shifts are focus, coherence, and rigor.

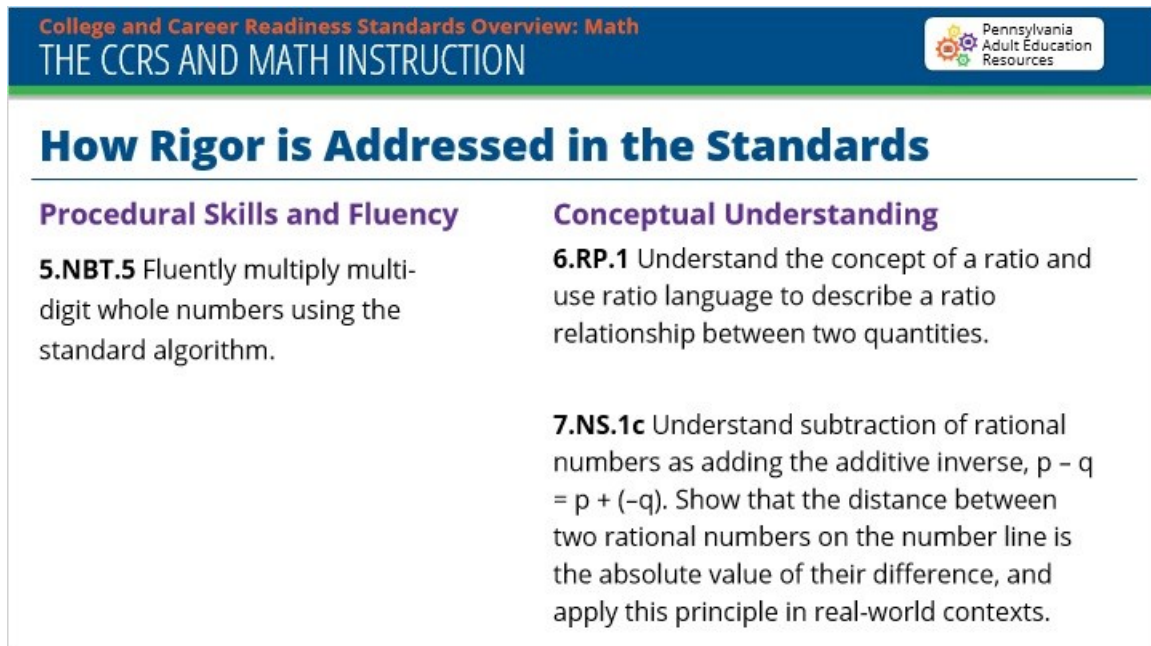
Focus involves digging deeper with the content identified in the standards, and ensuring students truly master content before advancing.

Coherence is the linking of math lessons, where students make connections between what they are doing and what they have already done, as well as

what they will do in the future. This helps students master new content by linking it to what they already know and can do.

The last advance is rigor, where teachers incorporate procedures, understanding, and application into their instruction.

### ***How Rigor is Addressed in the Standards***



**College and Career Readiness Standards Overview: Math**  
**THE CCRS AND MATH INSTRUCTION**

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## **How Rigor is Addressed in the Standards**

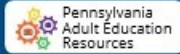
<b>Procedural Skills and Fluency</b>	<b>Conceptual Understanding</b>
<b>5.NBT.5</b> Fluently multiply multi-digit whole numbers using the standard algorithm.	<b>6.RP.1</b> Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.
	<b>7.NS.1c</b> Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$ . Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

#### **Notes:**

As you get more comfortable with the standards, you will probably notice most standards reference either procedural skills or conceptual understanding. Procedural understanding is when students know how to use the set of procedures to get the answer, even when not prompted, in a variety of contexts. They often use terms like “fluently” and “understand.” In conceptual understanding, “Instead of each standard signaling a new concept or idea, standards at higher levels become extensions of previous learning. The focus on understanding numbers and their properties through the levels also exemplifies the progression from number to expressions and equations and then to algebraic thinking.” Some of the standards addressing conceptual understanding also include language to include application; standard 7.NS.1c requires students to understand subtraction and then apply their understanding in real-world contexts.

## Procedural Definition

College and Career Readiness Standards Overview: Math  
THE CCRS AND MATH INSTRUCTION

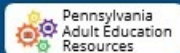


### How Rigor is Addressed in the Standards

Procedural Skills and Fluency	Conceptual Understanding
<p>Students know how to use the set of procedures to get the answer, even when not prompted, in a variety of contexts. (CCRS pg 45)</p>	

## Conceptual Definition

College and Career Readiness Standards Overview: Math  
THE CCRS AND MATH INSTRUCTION



### How Rigor is Addressed in the Standards

Procedural Skills and Fluency	Conceptual Understanding
<p><b>5.NBT.5</b> Fluently multiply multi-digit whole numbers using the standard algorithm.</p>	<p>“Instead of each standard signaling a new concept or idea, standards at higher levels become extensions of previous learning. The focus on understanding numbers and their properties through the levels also exemplifies the progression from number to expressions and equations and then to algebraic thinking.” CCRS Pg 44-45</p>

## Two Sets of Math Standards

### Two Sets of Math Standards

---

#### 1. Content Standards

- Identify specific content for math instruction
- The focal point of this module

#### 2. Standards for Mathematical Practice

- Identify ways people learn, discuss, and use math
- Strengthen ability to learn and apply math

#### Notes:

Now for a curve ball! There are actually two sets of standards related to math within the College and Career Readiness Standards. The content standards identify the specific content you should address with your math instruction. They are the focal point of this module and are the set of standards discussed so far.

The second set of standards are the Standards for Mathematical Practice. They are commonly referred to as the math practices. The math practices provide ways that people learn, discuss, and use math. Comfort applying the math practices will strengthen a student's ability to learn math in your classroom and apply math in everyday life. You will get a brief overview of the math practices in the next few slides. However, for more in depth information around the math practices and the key shifts, you may want to view the related modules and speak with your agency's in house professional development specialist.

## Learning Math

### Learning Math

**Directions:** Write answers to the following questions.

What are some characteristics of a good math student?

type your response here

What skills help people learn math?

type your response here

#### Notes:

Before looking at the math practices, take a minute or two to answer these questions: What are some characteristics of a good math student? Or, phrased differently, what kinds of skills help people learn math? Click Submit when you have answered both questions.

## *Standards for Mathematical Practice*

### **Standards for Mathematical Practice**

---

- MP 1:** Make sense of problems and persevere in solving them.
- MP 2:** Reason abstractly and quantitatively.
- MP 3:** Construct viable arguments and critique the reasoning of others.
- MP 4:** Model with mathematics.
- MP 5:** Use appropriate tools strategically.
- MP 6:** Attend to precision.
- MP 7:** Look for and make use of structure.
- MP 8:** Look for and express regularity in repeated reasoning.

#### **Notes:**

The math practices are meant to address the questions you just considered. This slide shows the eight Standards for Mathematical Practice. There is a handout on the PA Adult Education Resources site that provides detail about each. You can also find a copy in the resource section of this module. Read over the Standards and then click Next to continue.



## *Standards for Mathematical Practice in the Classroom*

### **Standards for Mathematical Practice in the Classroom**

Skills that students develop

Develop lessons/activities for providing opportunities for students to use math practices:

- Math discussion
- Structure and patterns in math
- Appropriately challenging problems/situations

#### **Notes:**

The Standards for Mathematical Practice were developed as a guide for how students can best learn, discuss, and use math in and out of the classroom. They are not necessarily things to be taught as much as things for students to develop.

Teachers can support students in developing these practices by using activities that encourage discussion of math concepts and problems that encourage students to see the structure and patterns of math, and offer appropriately challenging problems and situations for students to address.

## End of Section 3

### End of Section 3

You've reached the end of this section.  
The next section of the module is the:

#### **Section 4: Aligning Instruction to the CCRS**

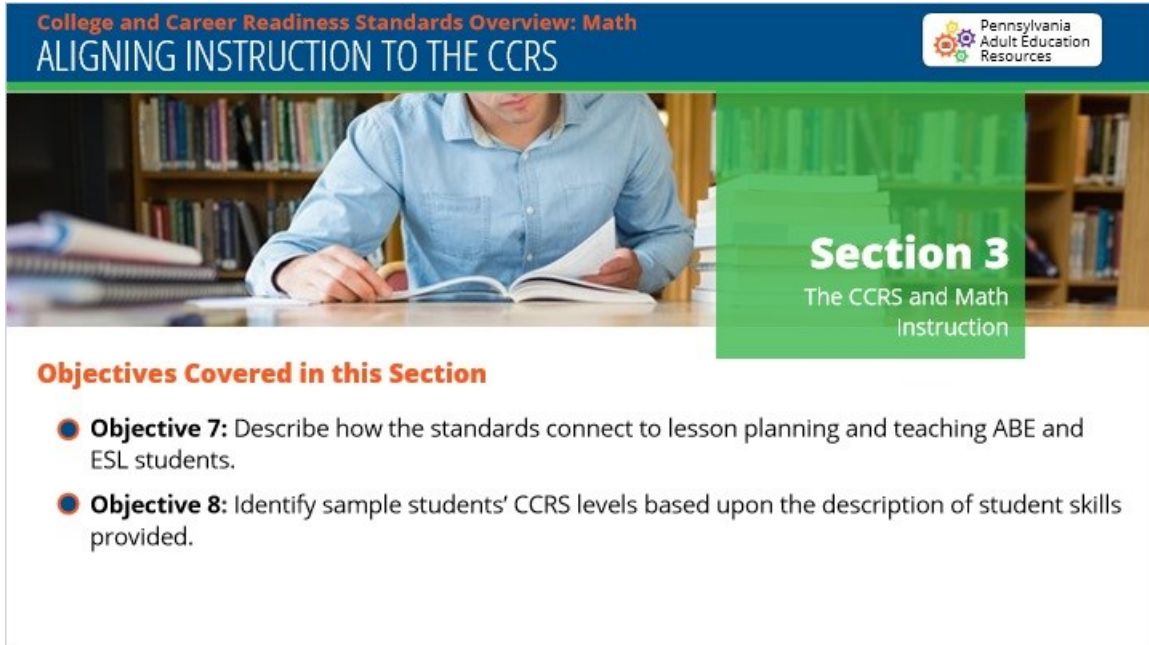


#### Notes:

Congratulations, you've reached the end of this section. Please click Next to continue the module.

# Aligning Instruction to the CCRS

## *Aligning instruction to the CCRS*



The screenshot shows a presentation slide with a blue header and a green sidebar. The header contains the text 'College and Career Readiness Standards Overview: Math' and 'ALIGNING INSTRUCTION TO THE CCRS'. The sidebar contains the text 'Section 3' and 'The CCRS and Math Instruction'. The main content area features a photograph of a person reading a book and a list of objectives.

**College and Career Readiness Standards Overview: Math**  
**ALIGNING INSTRUCTION TO THE CCRS**

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**Section 3**  
The CCRS and Math Instruction

**Objectives Covered in this Section**

- **Objective 7:** Describe how the standards connect to lesson planning and teaching ABE and ESL students.
- **Objective 8:** Identify sample students' CCRS levels based upon the description of student skills provided.

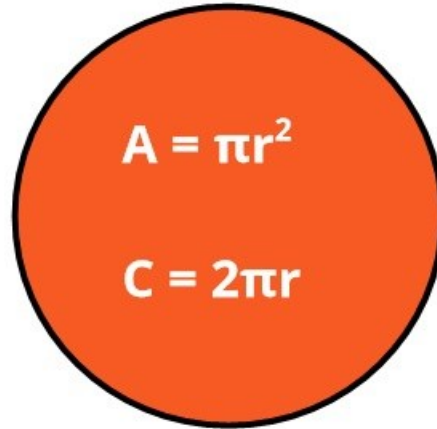
### Notes:

Now let's take some time to consider how to align your classroom instruction to the College and Career Readiness Math Standards. Read the objectives for this section and then click Next to continue.

## Using a Standard – Lesson Objectives

### Using a Standard – Lesson Objectives

**7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.



#### Notes:

One thing you can begin doing is using the standards as a basis for writing objectives for your classroom lessons. The standard on this slide involves the formulas for circumference and area of a circle. There are actually more than one thing students are asked to do, so you could probably write multiple objectives based on this standard. Before you advance to the next slide, try to develop one or more objectives on your own. When you are ready, proceed to the next slide to see a couple of examples.

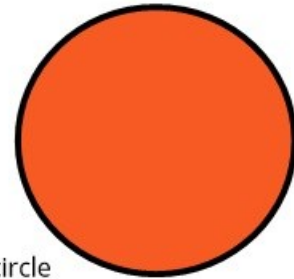
## Using a Standard – Lesson Objectives

### Using a Standard – Lesson Objectives

**7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

**Lesson Objectives:**

- Write the formula for circumference of a circle.
- Write the formula for area of a circle.
- Given the diameter or radius, find the correct area and circumference of a circle (80% of the time).
- Describe the relationship between circumference and area of a circle



**Notes:**

The first part of this objective requires students to know the formulas. Writing objectives for this part is pretty straight-forward, involving writing the formulas, as this is what you would expect students to do at the completion of your lesson.

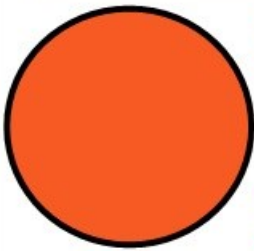
It also requires students to use the formulas to solve problems, so you should also account for this in a lesson addressing this standard. The objective included here provides information about mastery, that students will get the answer correct 80% of the time. This helps make it measurable, so teachers and students can know when it is mastered.

The last part gets into a student's ability to understand circumference and area well enough to describe the relationship between them. This can't be measured as clearly as the previous parts, but writing an objective asking them to describe the relationship at least clarifies how you might assess their mastery of this part.

## Using a Standard – Rigor

### Using a Standard – Rigor

**7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.



**Given the diameter or radius, find the correct area and circumference of a circle (80% of the time).**

Guided and independent practice

**Describe the relationship between circumference and area of a circle.**

Probing questions that ask students to consider “why”

#### Notes:

This particular standard requires two components of rigor. Students to use procedural skills and fluency in solving the problems required for the objective related to finding the correct area and circumference. As you plan instruction for a standard such as this, it is important for students to practice the skill enough to achieve mastery. It is often helpful to provide time for guided practice as well as independent practice.

Students also need to demonstrate conceptual understanding of the formulas to derive the relationship. This is often more challenging than procedural skills and fluency. A helpful tip for conceptual understanding is to ask students questions involving why they do certain procedures. In this case, possibly asking why they think area uses radius while circumference uses diameter, or why they square the radius for area but don't square the diameter to find circumference.

If this objective involved application, perhaps mentioning solving real-world problems, you could work more with situations or scenarios from the real world involving area and circumference.

This will be explored with more depth in a later module, this slide is simply designed to give you a few ideas!

### ***Using a Standard – Assessment***

College and Career Readiness Standards Overview: Math  
ALIGNING INSTRUCTION TO THE CCRS

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## **Using a Standard – Assessment**

**7.G.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

Procedural: Worksheets, quizzes

Conceptual: Discussion, writing assignments

**Application:** Projects, scenarios



#### **Notes:**

Assessment of mastery as part of your teaching is made easier when you write good objectives. Keep in mind, this is different than the pre- and posttests administered to students; this is assessing their readiness to apply the learning of specific lessons. When considering assessment of math, especially when adopting the CCRS, it will often tie into the component of rigor used in the standard.

Procedural objectives can typically be measured through the typical math assignments such as worksheets or even quizzes. You may observe student work as well, but for the student to be considered fluent there needs to be repeated successful work.

Conceptual objectives are more challenging, typically requiring student discussion of the topic, and possibly written responses to prompts related to the objective.

Application may be assessed through word problems, although this typically doesn't address their ability to apply learning to the real world - most word problems focus more on using procedures. It is better to incorporate projects for students to complete involving students bringing real-life information or materials, or scenarios where students apply what they have learned.

### ***Accessing the Standards***

**College and Career Readiness Standards Overview: Math**  
**ALIGNING INSTRUCTION TO THE CCRS**

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## **Accessing the Standards**

### **The College and Career Readiness Standards**

- ELA/Math content standards
- Key shifts
- Math practices

### **CCR Content Progressions**

- Math content standards only
- Organized by domain

### **Critical Concepts and Fluencies of the Level**

- Provide overview of skills and concepts by level/domain

College and Career Readiness Standards for Adult Education  
Issue Periodic 2019  
AMPER



**Notes:**

There are a few ways to access the math CCRS. There is a large document containing the math and ELA content standards, key shifts, and math practices. The standards are listed according to level, so all level A standards are listed, followed by level B, and so on.

There is also a document called the CCR Content Progressions, which only includes the math content standards. These are organized by domain, meaning all number and ratio standards are listed together, by level, followed by the remaining domains.

Finally, there is a document that provides a broader look at what skills and concepts are appropriate for each domain at each level. It is called Critical Concepts and Fluencies of the Level. For each level, it provides some of the concepts and fluencies emphasized.

Each of these documents can be found in the resources section of this module.

## Key Instructional Shifts Activity

College and Career Readiness Standards Overview: Math  
**ALIGNING INSTRUCTION TO THE CCRS**

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### Which Key Instructional Shift is being addressed?

**Directions:** Match each learning activity with one of the key instructional shifts.

	Focus	Rigor	Coherence
1. As students learn about finding areas of shapes, they not only solve the formulas when given the values to build speed and accuracy, but also develop their own word problems for other students to solve to show that they understand the concept of area and when it is used in real-life contexts.			
2. Rather than quickly covering a wide variety of math topics over a 10-week class, the instructor focuses on strengthen the students' understanding of the major math concepts that match the students' skill levels.			
3. As the instructor teaches percents, he/she explicitly describes how this content relates to the fractions that students learned earlier by having students show equivalent percents and fractions on a circle graph.			

[Accessible Version](#)

### Notes:

In this activity, for each learning activity, match each lesson activity example with the appropriate Key Instructional Shift. Click Submit when you are finished.

## Accessible Key Instructional Shift Activity

### Which Key Instructional Shift is being addressed?

**Directions:** Match each learning activity with one of the key instructional shifts.

1. As students learn about finding areas of shapes, they not only solve the formulas when given the values to build speed and accuracy, but also develop their own word problems for other students to solve to show that they understand the concept of area and when it is used in real-life contexts.

Rigor

2. Rather than quickly covering a wide variety of math topics over a 10-week class, the instructor focuses on strengthen the students' understanding of the major math concepts that match the students' skill levels.

Focus

3. As the instructor teaches percents, he/she explicitly describes how this content relates to the fractions that students learned earlier by having students show equivalent percents and fractions on a circle graph.

Coherence

#### Notes:

In this activity, for each learning activity, match each lesson activity example with the appropriate Key Instructional Shift. Click Submit when you are finished.

## CCRS & Instructional Practices

### Tying the CCRS to Instructional Practices

Consider for a moment how you use the CCRS for lesson planning. Select two options from the list below that you currently use in your classroom, or select two options from the list that you want to use in the future.

- I (will) choose real-world examples for my learners.
- I (will) not only focus on speed and accuracy with math, but also make sure students understand the concepts related to the math they are doing.
- I (will) focus on the major math concepts on each level and focus on going deeper with these topics rather than covering a large number of topics with little depth.
- I (will) show connections between the math students are currently learning to the math that was previously taught.
- I (will) design lessons that encourage students to demonstrate the Standards of Mathematical practice when solving problems.

#### Notes:

Let's reflect on using the CCRS in lesson planning. Complete the activity on the screen considering your current practices or what you plan to do in the future.

## End of Section 4

### End of Section 4

You've reached the end of this section. The next section of the module is the:

#### Conclusion



#### Notes:

Congratulations, you've reached the end of this section. Please advance to the next section to continue the module.

## Conclusion

### *Conclusion*

College and Career Readiness Standards Overview: Math  
**CONCLUSION**

Pennsylvania Adult Education Resources

**What's Covered in this Section**

- Objectives Review (Self-Assessment)
- Reflection
- Next Steps

**Module Conclusion**

#### **Notes:**

You have now reached the final section of the CCRS Standards Overview - Math module. In this section, you'll have a chance to self-assess your grasp of the module objectives, reflect on your learning, and review the next steps you should take.

## Objectives Review

### Objectives Review

1. Describe the purpose of the CCRS.
2. Identify at least two benefits of using the CCRS for adult education staff and learners.
3. Define vocabulary related to the organization of the CCRS.
4. Describe how the math standards are organized, recognizing the organization of content standards by level and domain.
5. Describe the key shifts for math instruction.
6. State the purpose of the Standards for Mathematical Practice.
7. Describe how the standards connect to lesson planning and teaching ABE and ESL students.
8. Identify sample students' CCRS levels based upon the description of student skills provided.

#### Notes:

In this module, we've focused on the objectives listed on this slide. In a moment, you will take a short quiz to measure your new knowledge and skill based on the content of this module. Take a moment and read through the objectives. Do you feel comfortable with all of them? If not, you may go back to any of the earlier sections to review. If you'd like to learn more about College and Career Readiness Standards, other CCRS modules are available in the PD Portal.

## Reflection Questions

### Reflection Questions

**Directions:** Take a moment to think about the answers to these reflection questions. You may want to write your responses to prepare for your meeting with your agency onboarding mentor.

- What are your key takeaways from this module (what did you learn)?
- What are two (2) things you want to immediately focus on implementing from this module in your own practice/position?
- What are one or two (1-2) things you learned from this module that you don't fully understand or are concerned about implementing in your own practice?

#### Notes:

Take a moment to think about the answers to these reflection questions. You may want to write your responses to prepare for your meeting with your agency onboarding mentor. A copy of these questions can be downloaded under the Resources tab.



## Next Steps

### Next Steps

1. Please close this module and take the module quiz found in the PD Portal.
2. Download and save your certificate of completion for this module.
3. Meet with your agency onboarding mentor to discuss the reflection questions.

*You must achieve a score of 80% in order to receive a certificate of completion.*

#### Notes:

To complete this activity, close this module and take the module quiz found in the PD Portal. Note, you must achieve a score of 80% to receive a certificate of completion. Download and save your completion certificate, and meet with your agency onboarding mentor to discuss the reflection questions.

## Exit

College and Career Readiness Standards Overview: Math

CONCLUSION


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Resources

### Congratulations

You have successfully completed this module.

- Save any resources located under the Resources tab.
- Click Exit to close the module.

**Exit**



### Notes:

Congratulations! You have completed this module. Be sure to download any resources you want to save by clicking on the Resources tab. Click on the Exit button below to close the module.