

## A Quick Guide for Observing Classroom Content and Practice Content

During an Adult Basic Education (ABE) intermediate level Math class, you should observe the teacher integrating the corresponding level CCR Standards and students engaging in a variety of standards and practices:

Number and Operations (*NBT, NF, NS, RP)	Algebraic Thinking (*OA, EE)	Geometry (*G)
<ul style="list-style-type: none"> <li>Understand fraction equivalence and ordering</li> <li>Operate with fractions</li> <li>Use decimal notation for fractions with 10 and 100 as denominators</li> </ul>	<ul style="list-style-type: none"> <li>Write an equation to express the dependent in terms of the independent variable; analyze the relationships using graphs and tables</li> <li>Write inequalities to represent a constraint or condition; represent inequalities on a number line, including those with infinite solutions</li> </ul>	<ul style="list-style-type: none"> <li>Graph points on the coordinate plane to solve problems</li> <li>Draw polygons given coordinates; find coordinates based on polygons</li> </ul>
<ul style="list-style-type: none"> <li>Compare decimals by reasoning about their size (use inequality symbols); justify by using a visual model</li> <li>Operate with whole numbers and decimals to hundredths using concrete and visual models, place value, properties, or the relationship between addition and subtraction</li> </ul>	<ul style="list-style-type: none"> <li>Generate number or shape patterns that follow a given rule and analyze pattern features</li> <li>Solve one-variable equations and inequalities</li> </ul>	<ul style="list-style-type: none"> <li>Use formulas to determine volume and surface area of a cube with whole number exponents</li> </ul>
<ul style="list-style-type: none"> <li>Compute with multidigit numbers; find common factors and multiples; use the distributive property</li> <li>Understand the concept of ratio and unit rate to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>Determine whether a given number is a multiple of another given number</li> <li>Gain familiarity with factors and multiples; use this understanding for multiplicative comparisons</li> </ul>	<ul style="list-style-type: none"> <li>Compose area into rectangles or decompose into triangles and other shapes</li> <li>Represent 3D figures using nets made up of rectangles and triangles; use nets to find surface area</li> </ul>
<h3>Representations of Data and Measurement</h3> <p>(As a tool for teaching number and operations, algebraic thinking, and geometry; *MD and *SP)</p>		
<ul style="list-style-type: none"> <li>Create a line plot to display a data set of measurements in fractions of a unit</li> <li>Operate with fractions to solve problems using information presented in line plots</li> <li>Understand a set of data has a distribution described by its center, spread, and overall shape</li> </ul>	<ul style="list-style-type: none"> <li>Display numerical data in plots on a number line, including dot plots, histograms, and box plots</li> </ul>	<ul style="list-style-type: none"> <li>Use formulas for area, surface area, and perimeter to solve real world and mathematical problems</li> </ul>
<ul style="list-style-type: none"> <li>Convert among measurement units in a given measurement system (e.g., convert 5 cm to 0.05 m)</li> <li>Use a number line diagram to compare decimals</li> </ul>	<ul style="list-style-type: none"> <li>Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale</li> </ul>	<ul style="list-style-type: none"> <li>Understand concepts of volume (i.e., unit cubes); relate volume to multiplication and division</li> <li>Measure and sketch angles in whole-number degrees using a protractor</li> <li>Connect degree angles to percentages on a circle graph</li> </ul>

*\*NBT = Number and Operations: Base 10; NF = Number and Operations: Fractions; NS = The Number System; RP = Ratios and Proportional Relationships; OA = Operations and Algebraic Thinking; EE = Expressions and Equations; G = Geometry; MD = Measurement and Data; SP = Statistics and Probability*

You should also observe all students engaging in **mathematical practices**, such as:

- Participating and persevering in solving problems that require deep thinking (DOK), have multiple ways they can be solved or multiple correct solutions, and/or are real-world (messy, require research and decision-making).
- Using mathematical language to talk about each other's thinking and revise their own based on new information.

## Practices

The examples below feature several Indicators from the [ABE Professional Standards](#). These Indicators are just a sampling from the full set of the ABE Professional Standards and were chosen because they create a sequence: the teacher plans a lesson that sets clear and high expectations, the teacher then delivers high quality instruction, and finally the teacher uses a variety of assessments to see if students understand the material or if re-teaching is necessary. These examples highlight teacher and student behaviors aligned to these Indicators that you can expect to see in a rigorous ABE intermediate level Math class. [Click this link](#) to see how these standards look in action before visiting a class.

<p><b>PLANNING</b> (Indicators P1.1, P1.2, C1.1)</p>	<p>The teacher plans and implements CCRSAE-aligned, academically rigorous, differentiated lessons that include clear content and language objectives, set high expectations for all learners, cultivate a safe classroom environment, encourage productive struggle, and motivate all students to succeed.</p>
<p><b>Virtual/Hands-On Tools:</b> <a href="#">a problem to engage with</a> at arrival; <a href="#">thinking tools</a> (unit cubes and 3D objects) and <a href="#">materials</a> (graph paper or <a href="#">strips of colored paper</a>) accessible to students; options to process new information (<a href="#">drawings, visual models</a>); <a href="#">non-routine math problems and experiences</a>.</p>	
<p><b>What is the teacher doing?</b></p>	<p><b>What are adult learners doing?</b></p>
<ul style="list-style-type: none"> <li>Communicating a lesson’s connections to unit essential questions and goals</li> <li>Creating or selecting <a href="#">culturally responsive lessons</a> that engage and sustain student attention</li> <li>Establishing <a href="#">classroom routines</a> that support students to communicate their thinking</li> <li>Representing and relating solution methods orally, visually, and with concrete objects</li> </ul>	<ul style="list-style-type: none"> <li>Understanding what they will learn in a lesson and how it connects to prior learning</li> <li>Persistently applying mathematical strategies and concepts when engaging with <a href="#">meaningful real-world problems</a></li> <li>Using mathematical language precisely to convey meaning and understandings of concepts</li> <li>Representing problems and solution methods using <a href="#">visual models</a>, virtual manipulatives, or number sentences</li> </ul>
<p><b>INSTRUCTION</b> (Indicators P1.3, P1.4)</p>	<p>The teacher delivers high quality, culturally responsive instruction that meets the diverse needs of all students and engages them with meaningful topics and tasks that develop students’ critical thinking and problem-solving skills.</p>
<p><b>Virtual/ Hands-On Tools:</b> <a href="#">number lines</a>, <a href="#">1” square tiles</a>, <a href="#">grid paper</a>, <a href="#">virtual (or paper) sticky notes</a>, <a href="#">area models</a>, <a href="#">bar models</a>, <a href="#">pattern blocks</a>, <a href="#">base 10 blocks</a>.</p>	
<p><b>What is the teacher doing?</b></p>	<p><b>What are adult learners doing?</b></p>
<ul style="list-style-type: none"> <li>Selecting meaningful problems with opportunities to <a href="#">apply learning and solve problems in collaboration with peers</a></li> <li>Encouraging students to <a href="#">interpret structures</a> and <a href="#">formulate conjectures</a> about mathematical situations</li> <li><a href="#">Providing opportunities to evaluate different approaches</a>, including using digital tools such as <a href="#">Desmos</a> or <a href="#">TinkerPlots</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Working cooperatively on a shared activity</a>—developing an understanding or applying knowledge to solve problems</li> <li>Interpreting structures and formulating conjectures about mathematical situations</li> <li>Explaining how multiple representations of numbers, operations and shapes relate to one another</li> </ul>
<p><b>ASSESSMENT</b> (Indicators P2.1, P2.2, P2.3)</p>	<p>The teacher uses a variety of formative and summative assessments to measure student learning and understanding, evaluate the effectiveness of instruction, develop differentiated and advanced learning experiences, and inform future instruction.</p>
<p><b>Virtual/Hands-On Tools:</b> <a href="#">exit tickets</a>, math journals or logs, <a href="#">My Favorite No</a>, checklists for teacher <a href="#">observation of objectives being demonstrated or evidence of learning</a>.</p>	
<p><b>What is the teacher doing?</b></p>	<p><b>What are adult learners doing?</b></p>
<ul style="list-style-type: none"> <li>Prompting students’ reasoning; <a href="#">listening to responses to gauge their understanding</a></li> <li><a href="#">Conducting frequent checks for understanding</a> and adjusting instruction accordingly</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Demonstrating their thinking</a> by drawing, using manipulatives (either physically or using virtual manipulatives) discussing and sharing their work</li> <li><a href="#">Revising their thinking</a> based on their engagement with peers, the teacher, or the math</li> </ul>