Arizona Department of Education

Arizona Adult Education ABE Teacher Standards for Mathematics

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Adult Education Teacher Standards Introduction

Purpose of These Standards

The Arizona Department of Education-Adult Education Services offers these standards to guide the preparation, hiring, and professional learning for adult educators. The standards specify what any individual responsible for teaching English Language Arts, mathematics, or English Language Acquisition to adult education students should know and be able to do—an agreed upon body of knowledge and skills that defines high quality instruction.

Value to the Adult Learner

The standards offer a common set of professional standards for the benefit of the students that adult educators serve. The standards represent a proactive effort by Arizona's adult education community to establish a strong foundation for effective delivery of services to adult learners and to foster positive learner outcomes.

Value to Programs and Instructional Practices

The standards serve as a framework and reflective tool for program administrators to use with their staff to improve—not punish—teachers and to share best practices across the program. Such standards will enable program administrators and adult educators to identify areas of strengths and weaknesses, and to plan for program and instructional improvement. Program administrators may adapt the standards to develop instruments for performance observations, self-appraisals, hiring, and professional learning goals.

Value to the Profession of Adult Education

The Standards Initiative raises the bar on instructional performance and accountability that, in turn, will serve to increase the credibility of adult education. Adherence to these standards should ensure the public that adult teachers in Arizona are prepared to implement research and evidence based instructional practices.

How the Standards Were Developed

An outstanding cadre of adult educators throughout the State and college faculty developed these standards. They worked for almost two years—through a series of regular face-to-face meetings, analyses of research, and electronic communications—to identify skills, behaviors, and practices that characterize effective instruction. The teams—English Language Arts, English Language Acquisition, and mathematics—collected and analyzed a range of literature, including research on adult learning theory, instructional strategies, and professional teaching

knowledge, as well as national and international models of teacher standards.

The standards were developed in several phases. First, a set of standards was developed that could serve as a framework for all adult educators (the common content is shaded). Then, standards were added to specifically address the work of each of the disciplines in promoting language development, literacy, and mathematics proficiency in their students. The intent of the team from the very start was to develop a document that included a core set of competencies that were at once complete, yet not overwhelming. Through multiple drafts and re-writes and robust discussions over the course of several months, a fundamental priority was to produce a user-friendly document that contains clear and concise language understandable to all.

How to Read These Standards

The standards outline competencies related to subject matter knowledge, a range of pedagogical and technical skills, and professional learning and development. The instructor competencies are divided into five broadly defined categories:

STANDARD I: ***Foundational Knowledge:*** The teacher demonstrates knowledge of adult learning and the process by which learners acquire a new knowledge and skills.

STANDARD II: ***Ongoing Assessment:*** The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to document learner progress, and to make decisions about planning and instruction.

STANDARD III: ***Instructional Design/Planning:*** The teacher demonstrates knowledge of the AZ Adult Education content standards and designs instruction to ensure learner engagement and achievement.

STANDARD IV***: Instructional Delivery:*** The teacher understands and uses a variety of student-centered instructional strategies to build on what learners already know and to encourage learners to apply new knowledge and skills.

STANDARD V: ***Teacher Quality and Leadership:*** The teacher is a reflective practitioner who strives to strengthen the effectiveness and quality of instruction and collaborates with colleagues to improve student performance.

Performance indicators, discussion questions, and sub-indicators operationally define each one of the standards. In addition, sample “evidence" was developed that provides concrete examples of how the indicators may be demonstrated in teaching and learning environments.

STANDARD I

Foundational Knowledge: The teacher demonstrates knowledge of adult learning and the process by which learners acquire new knowledge and skills.

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
A. Adult Learners and Development[1] *How does student diversity impact planning, instruction, and assessment?* *How can you cultivate a classroom environment that promotes respect for all?*	1. Knows and addresses who adult learners are and their sources of motivation 2. Demonstrates knowledge that: a. Adults have accumulated a foundation of life experiences and knowledge from work- and family-related activities, and/or previous education that is valued and connected to instruction b. Adult learning differs from children's learning in that it needs to be largely self-directed, problem-centered, experiential, goal-oriented, and of immediate value to students' personal and professional lives c. It is important to reduce anxiety and improve self-esteem and motivation in learners (i.e., the affective filter) through a variety of methods in order to break down barriers to learning 3. Knows the importance of: a. Engaging learners in decision-making about key aspects of their learning b. Creating classroom climates that are sensitive to student diversity and student goals c. Providing advice and referral to support students' learning, college, and career readiness goals 4. Knows and addresses learning differences in students and applies accommodations and adaptations as needed	• Teacher models respectful attitudes toward students from various cultural communities, educational experiences, and economic and professional backgrounds • Teacher connects lessons to student goals and interests • Teacher fosters motivation and builds student confidence • Students have ample opportunities to actively participate in their learning
B. Mathematical Proficiency *What is your comfort level with mathematics?*	1. Demonstrates knowledge of major mathematics concepts, algorithms, procedures, connections, and applications within the major content domains of mathematics 2. Understands the concepts in the AZ Adult Education	• Teacher demonstrates mastery of mathematical content. • Teacher demonstrates the ability to make connections across mathematical content areas.

[1] Shaded portions are common to all Adult Education Teachers.

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
What is your fluency with all levels of mathematics? *What strategies do you use to model proficient mathematics in your classroom?* *What is your experience using mathematics in a variety of contexts?*	Mathematics Standards including but not limited to: a. **Number Sense:** Place Value, Fractions, Decimals, Percents, Ratio & Proportion, Estimation, Rounding, Scientific Notation, Exponents & Roots, Properties of Real Numbers b. **Data Collection and Probability:** Measures of Central Tendency, Properties of Normal Curves, Patterns, Probability c. **Algebra:** Solving Equations and Inequalities, Properties of Functions, Quadratic Equations, Polynomials, Solving Systems of Equations d. **Geometry:** Angles, Similarity and Congruence, Coordinate Geometry, Geometric Figures, Right Triangles and Trigonometry Functions, Using Properties and Theorems to Make Conjectures and Solve Problems e. **Measurement** 3. Understands that the content standards influence the mathematical content knowledge and instruction needed for teaching adult students	
C. Understanding Mathematical Practices *How do you make connections in mathematics to real-world contexts?* *How do you encourage students to persevere in solving difficult mathematics problems?* *How do you verify or correct students' line of reasoning?*	1. Understands the importance of problem solving, reasoning, modeling, attending to precision, identifying elements of structures, generalizing, engaging in mathematical communication, and making connections as essential mathematical practices 2. Understands how these practices intersect with mathematical content and that understanding of mathematical content relies on the ability to demonstrate these practices within each of the content domains 3. Reasons abstractly and quantitatively constructing viable arguments and critiquing the reasoning of others	• Teacher organizes mathematical thinking and uses the language of mathematics to express ideas precisely orally and in writing to multiple audiences. • Teacher demonstrates the interconnectedness between and among mathematical ideas and across various content areas and real-world contexts. • Teacher uses appropriate mathematical vocabulary and symbols to communicate mathematical reasoning.

STANDARD II

Ongoing Assessment: The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to document learner progress, and to make decisions about planning and instruction.

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
A. Summative and Formative Assessments *What is important to remember when administering standardized assessments?* *What data sets do you collect and analyze and how can you use them to plan instruction?* *How can you provide feedback to your students?*	1. Understands and implements state assessment policies 2. Administers standardized assessments with high fidelity 3. Uses multiple formative measures to assess students on their progress and to inform instruction 4. Provides timely, appropriate, and useful feedback to learners on their progress	• Teacher provides information on the variety of assessments used • Teacher demonstrates test administration processes that align with standardized test practices • Teacher explains how feedback on assessments is provided to learners • Teacher uses a range of formative assessments such as performance, projects, observations, simulations, and student work products
B. Monitoring and Adjusting Instruction *How do you know when the lesson is not working as planned?* *What do you do when a lesson is not working as planned?* *How do you guide learners to identify their own errors?*	1. Uses learner feedback to adjust the pace of instruction and modify instructional strategies 2. Provides prompt and accurate feedback to reinforce learning 3. Engages learners in self-assessment and monitoring of their own progress	• Teacher regularly monitors student understanding of lesson content by circulating around the room to check on students' work, listening to students' verbal responses and paying attention to students' non-verbal cues • Teacher provides feedback by modeling the correct answer, asking simpler questions, providing hints, or asking students to explain their answers • Students are given the opportunity to reflect on what they've learned or practiced orally and/or in writing

STANDARD III

Instructional Design & Planning: The teacher demonstrates knowledge of the AZ Adult Education content standards and designs instruction to ensure learner engagement and achievement.

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
A. Effective Lesson Design *How do you design student-centered lessons?* *What learner considerations do you include in your planning?* *How can you use assessment data to design lessons?* *How do you choose the activities and strategies for your lesson?*	1. Uses student assessment data to guide lesson development 2. Designs lessons that target specific content standards 3. Designs learning experiences that accommodate the specific needs of students, including different rates and styles of learning 4. Designs lessons that include a. Measurable objectives b. Connections to prior knowledge and previous lessons c. Sufficient opportunities for practice d. Checking for understanding e. Applications to the real world f. Effective pacing of lesson activities g. Student reflection on their learning 5. Integrates a variety of instructional and technology resources into the lesson 6. Designs assignments/classroom activities that extend beyond knowledge and recall to include higher level thinking skills 7. Varies the types of interaction in the lesson to maximize motivation and engagement of all students (e.g., independent, small group, pair, and whole class)	• Teacher provides a written lesson plan aligned to student data, content standards, and sub-indicators • Teacher selects appropriate curricular resources and instructional materials to support student learning • Teacher creates a range of learning experiences, including problem-solving, reflection, application, analysis, evaluation, and/or synthesis of new skills and information. • Lesson moves along at a good pace so that students are challenged but not overly frustrated or bored.
B. Design Priorities for Mathematics *What factors to you consider when planning and designing lessons?*	1. Focuses strongly on concepts and foundational knowledge emphasized in the standards 2. Ensures that instruction is based on the key advances in mathematics that include: • A strong focus on the Mathematical Practices • Designing learning around coherent progressions from level to level • Rigor to pursue conceptual understanding, procedural skills and fluency, and application- all with equal intensity	• Teacher participates in math specific professional development and utilizes learning in instructional planning and design. • Teacher includes differentiated instruction in lessons to ensure all students are able to access the mathematical content. • Teacher makes connections between mathematics and everyday life in lessons. • Teacher includes authentic learning, application of mathematical skills, student-directed inquiry, analysis,

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
How do you teach a concept to multiple learning styles? *How do you select and use manipulatives to support student learning?*	3.Thinks across ABE/ASE levels when designing lessons/units and links concepts and skills in logical and meaningful ways 4. Analyzes and considers best practices in planning for and leading students in rich mathematical experiences 5. Plans lessons and units incorporating a variety of strategies and mathematics-specific and instructional technologies to build all students' conceptual understanding and procedural proficiency 6. Provides students opportunities to communicate about mathematics and make connections among mathematics, other content areas, everyday life, and the workplace 7. Applies mathematical content and pedagogical knowledge to select and use manipulatives and mathematical tools to enhance teaching and learning, and recognizes both the insights to be gained and possible limitations of such tools	evaluation, and /or reflection in lessons. • Teacher provides multiple opportunities through a variety of approaches for students to practice perseverance in problem solving. • Teacher utilizes mathematical tools such as drawings, physical models, virtual environments, spreadsheets, presentation tools, and mathematics-specific technology (e.g., graphing tools, interactive geometry software, computer algebra systems, statistical packages, and data-collection devices).

STANDARD IV

Instructional Delivery: The teacher understands and uses a variety of student-centered instructional strategies to build on what learners already know and to encourage learners to apply new knowledge and skills.

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
A. Learning Environment *What do you do to create a supportive environment that engages all learners?* *How do you physically organize your classroom space to facilitate student engagement?*	1. Creates environments that build a safe and supportive learning community 2. Keeps all learners purposefully engaged 3. Models and promotes constructive and respectful interactions in the classroom 4. Integrates information and communication technologies into instruction	• Classroom is organized in a way that encourages students to collaborate with each other • Classroom norms and routines are evident • Students are actively engaged and on-task • Teacher integrates digital literacy skills by using collaborative tools and environments such as Web 2.0 technologies

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence

B. Effective Elements of Instruction
 	
What strategies do you use to make activities accessible to all students?
 	
Are your activities relevant to students' experiences outside of class?
 	
How do you use questions to challenge students and promote critical thinking?
 	
What are some different ways to check for student understanding?
 	
How can you help students develop strategies for monitoring their own thinking process?
	1. Implements lessons that:
	a. Communicate lesson objectives clearly to students
	b. Explicitly link new concepts to familiar concepts and make connections to prior knowledge
	c. Explain concepts and tasks clearly using a variety of techniques (e.g., modeling, visuals, gestures and body language, hands-on materials, demonstrations)
	d. Provide sufficient opportunities for guided and independent practice
	e. Use scaffolding techniques that move students from one level of understanding to a higher level, and systematically reduce assistance as students become proficient
	f. Appropriately sequence and pace the learning
	g. Monitor individual and group activities for understanding and provide feedback as appropriate
	h. Provide closure to a lesson that reviews lesson objectives, summarizes student learning, and previews the next lesson
	
	2. Provides learning experiences that:
	a. Promote cooperation and collaboration, including meaningful interactions with the teacher and with one another
	b. Offer adult learners instruction and practice in using language and opportunities for authentic or real-world applications of newly learned skills and knowledge
	
	3. Engages in effective questioning techniques that:
	a. Foster opportunities for students to pose their own questions in order to clarify key concepts, increase their understanding, and take ownership of their learning
	b. Elicit learners' prior knowledge and skills in order to make connections to new concepts and skills
	c. Require students to apply, analyze, synthesize or evaluate what they are learning and to clarify or explain their answers
	d. Consistently provide sufficient wait-time for student responses to questions
	4. Models meta-cognitive strategies for students to encourage them to reflect on and monitor their progress
		• Communicating Objectives
		  • Teacher identifies what knowledge and skills the students will be learning (e.g., in writing, orally, visually, through an activity) and
		• Linking New to Familiar Concepts
		  • Students demonstrate (verbally or through body language) that they have prerequisite knowledge/ skills to understand lesson content
		  • Teacher elicits prior knowledge of students and asks how that knowledge can be applied to the new lesson when appropriate
		• Scaffolding Techniques
		  • Teacher provides time for independent and guided practice to reinforce the knowledge and skills from the lesson
		• Pacing Lessons
		  • Students appear to be following and understanding the content as teacher presents it
		  • Teacher builds activities one on another
		• Providing Learning Experiences
		  • Students actively participate in the lesson through discussions, collaborative projects, and independent work.
		• Questioning Strategies
		  • Teacher uses question strategies to find out what students already know
		  • Teacher offers sequences of questions to stimulate student thinking and to check on understanding
		  • Teacher varies wait time for students to respond to question/s and provides more time for cognitively demanding questions
		• Meta-cognitive Strategies: Teacher prompts students with questions like: "When you get stuck, what might you do?" "Why are we practicing this skill?" "How will it help you?" "How will you use what we are learning outside of class?" "What did we learn today?"

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
C. Instructional Strategies for Mathematics *How do you cultivate student interest in mathematics?* *How do you move students forward towards achieving independence?* *How do you relate mathematical concepts to your students' lives?* *How do you ensure that math lessons are designed to be focused on mathematical practices,*	1. Engages students through relevant, thought-provoking questions, problems, and tasks that stimulate interest and elicit mathematical thinking 2.Provides a range of problems that move from simple to more complex to address the full range of the standard(s) 3. Engages students in their day-to-day learning with appropriate technology. 4. Builds and draws upon students' procedural skill and fluency in computation where called for in the standards 5. Requires students to demonstrate deep conceptual understanding through complex problem solving, in addition to writing and speaking about their understanding 6. Makes connections and provides opportunities for students to transfer knowledge and skills within and across mathematical domains and learning progressions 7. Uses and encourages precise and accurate mathematics, academic language, terminology, and representations (e.g. pictures, symbols, expressions, equations, graphics, models) for the discipline 8. Identifies mathematical practices that are central to a lesson and connects them to the specific content being addressed 9. Provides opportunities for students to independently apply mathematical concepts in real-world situations, choosing and applying an appropriate model or strategy to new situations	• Teacher models how development of specific mathematical understanding intersects with the mathematical practices of problem solving, reasoning, communication, connections, and representations. • Teacher requires students to demonstrate conceptual understanding through speaking and/or writing about their understanding, as well as solving short or long problems that draw on conceptual understanding • Teacher asks students to describe their thought processes used for math tasks and analyzes student responses to monitor and adjust their instruction • Teacher models error analysis of student work. • Teacher fluently addresses student questions. • Teacher shows students how to use a range of mathematics-specific technology as applicable (e.g., calculators, graphing tools, spreadsheets interactive geometry software, computer algebra systems, statistical packages, and data-collection devices). • Teacher uses a mix of instructional approaches for a variety of learners, including such strategies as multiple representations, using a range of questions, checking for understanding, flexible grouping, pair-share, etc.

STANDARD V

Teacher Quality and Leadership: The teacher is a reflective practitioner who strives to strengthen the effectiveness and quality of instruction and collaborates with colleagues to improve student performance.

Indicators & Guiding Questions	Sub-Indicators	Sample Evidence
A. Reflective Practice *What do you think are some of your strengths as a teacher?* *What do you think are some areas in need of improvement?*	1. Makes constructive self-appraisal of teaching, including assessing strengths and development needs 2. Reflects on practice of teaching and student learning through learning communities to foster collective responsibility for improving student performance	• Teacher shares a reflection journal • Teacher participates in professional learning communities • Teacher takes part in pre and post observation discussion and protocols • Teacher participates in collaborative professional development models, such as study groups, critical friends groups, etc.
B. Continuous Learning *What can you do to strengthen and broaden your content knowledge and instructional skills?* *How can you contribute to your profession?*	1. Aligns personal professional development goals with program goals and student learning needs 2. Actively engages in coherent and sustained professional development that builds knowledge and skills to improve instructional practice 3. Seeks out opportunities to advance his/her profession within the broader community	• Teacher participates in an on-going and collaborative process to plan, implement, and evaluate professional learning that is aligned to professional learning standards and results driven • Teacher shares individual professional learning plan • Teacher participates in professional organizations • Teacher engages in or facilitates professional learning at the local, state, and national levels
C. Program Improvement *How do you contribute to the success of your adult education program?*	1. Participates in and contributes to program improvement efforts 2. Uses data to monitor and manage the program's student learning and performance goals	• Teacher can articulate the mission and goals of the program and/or institution • Teacher collaborates with other teachers to set clear learning goals for his or her program • Teacher partners with other stakeholders to plan and implement professional learning that aligns teacher, student and program goals • Teacher regularly collaborates with other teachers in their program to ensure they are all teaching similar content to the same level/s of students • Teacher works with other teachers to link curriculum across levels of adult learning (vertical alignment)

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