ACS PreK-12 Math Framework

In Asheville City Schools we believe every student can be successful in mathematics and persevere in problem solving.

As a district we integrate mathematics in all content areas through:

- Whole group instruction
- Small group instruction
- Independent work with conferring
- Writing
- Collaborative Learning
- Teacher Think Aloud (modeling problem solving)
- Discussion of complex problems
- Explicit Vocabulary Instruction

Supportive and Equitable Learning Environment
Teachers will ● Plan and implement challenging mathematical activities that develop perseverance in problem-solving ● Use formative and summative assessments and other sources of data to provide a highly differentiated classroom and guide instruction on a regular basis (pre-assessments, mid-unit assessments, benchmarks, common formative assessments, exit tickets) ● Use flexible grouping in order to increase student mastery ● Be knowledgeable of and use evolving math content standards and the Common Core Standards for Mathematical Practice ● Offer additional practice--in and out of the classroom--that strengthens content knowledge and meets the needs of individual students ● Provide multiple methods of learning a standard ● Provide opportunities for students to ○ Develop a variety of ways to think, problem solve, and explain their reasoning ○ Synthesize knowledge and draw conclusions ○ Engage in error analysis to justify or make sense of their thinking ○ Create products that demonstrate the creative thinking process ○ Self assess both their content mastery and development of process skills throughout lessons

Writing, Speaking and Listening in Mathematics
Teachers will ● Intentionally teach students how to write and speak about their mathematical thinking using correct academic vocabulary ● Serve as a facilitator for group discussion ● Provide opportunities for students to ○ Reflect, explain, analyze, and persuade ○ Confer and share feedback ○ Verbalize their thinking in a supportive and safe environment ○ Use discourse to construct viable arguments and critique the reasoning of others

Problem Solving

Teachers will

- Challenge students daily to think about mathematical problem solving
- Encourage students to evaluate different strategies and analyze errors
- Normalize struggle and create a safe environment for students to collaborate and explore ideas
- Provide opportunities for students to
    - Self-monitor and reflect
    - Use close reading strategies for comprehension
    - Visually represent information
    - Estimate and round
    - Make connections and generate questions
    - Apply known strategies to problem solve and use appropriate tools strategically
    - Restate and summarize during problem solving
    - Determine importance and accuracy
    - Draw inferences and/or conclusions
    - Model with mathematics

Vocabulary

Teachers will

- Provide explicit vocabulary instruction in mathematics
- Use vertical alignment to ensure fluidity in language
- Use Tiered Vocabulary System for instruction
    - Tier 1: everyday words (ex: clock, baby, happy, walk)
    - Tier 2: academic words (students use these words in a variety of academic settings; ex: analyze, sequence, explain)
    - Tier 3: words that are not frequently used except in mathematics (ex: radius, parabola, denominator, factors)

Digital Literacy

Teachers will

- Design and develop digital age learning experiences in which students will
    - Model and interact with mathematics
    - Evaluate information & determine credibility of sources
    - Use digital tools to create products that demonstrate learning
    - Communicate ideas and information to a larger audience
    - Model ethical use of technology