**Standards for Mathematical Practice**

Specific expectations for grade bands K-2, 3-5, 6-8 and 9-12 can be found starting on page 97 of the Alaska English/Language Arts and Mathematics Standards document.

| **Mathematical Practice:** | **Mathematically proficient students will:** |
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| 1. **Make sense of problems and persevere in solving them.** | * Explain the meaning of the problem to themselves. * Look for a way to start and note the strategies that will help solve the problem. * Identify and analyze givens, constraints, relationships and goals. * Make inferences about the form and meaning of the solution. * Design a plan to solve the problem. * Use effective problem solving strategies. * Evaluate the progress and change the strategy if necessary. * Solve the problem using a different methods and compare solutions. * Ask, “Does this make sense?” |
| 1. **Reason abstractly and quantitatively.** | * Make sense of quantities and their relationships in problem solutions. * Use two complementary abilities when solving problems involving number relationships.   + Decontextualize- be able to reason abstractly and represent a situation symbolically and manipulate the symbols   + Contextualize- make meaning of the symbols in the problem * Understand the meaning of quantities and are flexible in the use of operations and their properties. * Create a logical representation of the problem. * Attends to the meaning of quantities, not just how to compute them. |
| 1. **Construct viable arguments and critique the reasoning of others.** | * Analyze problems and use stated mathematical assumptions, definitions, and established results in construction arguments. * Justify conclusions with mathematical ideas. * Listen to arguments of others and ask useful question to determine if an argument makes sense. * Ask clarifying questions or suggest ideas to improve/revise the argument. * Compare two arguments and determine correct or flawed logic. |

| **Mathematical Practice:** | **Mathematically proficient students will:** |
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| 1. **Model with Mathematics** | * Apply mathematics to solve problems arising in everyday life, society, and the workplace. * Translate real-world scenarios into mathematical representations and reflect on whether the results in make sense in that context. * Use models to analyze relationships and draw conclusions. * Evaluate the effectiveness of a model and refine it when necessary to better reflect the situation. * Make assumptions and approximations to simplify complex situations, realizing that revisions may be needed later. * Identify important quantities in a practical situation and map their relationships using diagrams, graphs, two-way tables, formulas, or equations. |
| 1. **Use appropriate tools strategically.** | * Use available tools recognizing the strengths and limitations of each. * Use estimation and other mathematical knowledge to detect possible errors. * Identify relevant external mathematical resources to pose and solve problems. * Use technological tools to deepen their understanding of mathematics. |
| 1. **Attend to precision.** | * Communicate precisely with others and try to use clear mathematical language when discussing their reasoning. * Understand meanings of symbols used in mathematics and can label quantities appropriately. * Express numerical answers with a degree of precision appropriate for the problem context. * Calculate efficiently and accurately. |
| 1. **Look for and make use of structure.** | * Apply general mathematical rules to specific situations. * Look for overall structure and patterns in mathematics. * See complicated things as a single object or as being composed of several objects. * Be able to look at problems from a different perspective. |
| 1. **Look for and express regularity in repeated reasoning** | * See repeated calculations and look for generalizations and shortcuts. * See the overall process of the problem and still attend to details. * Understand the broader application of patterns and see the structure in similar situations. * Continually evaluate the reasonableness of their intermediate results. |