**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?”
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| 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.
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| 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.
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| **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.
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| 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.
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| 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.
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| 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.
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| 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.
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