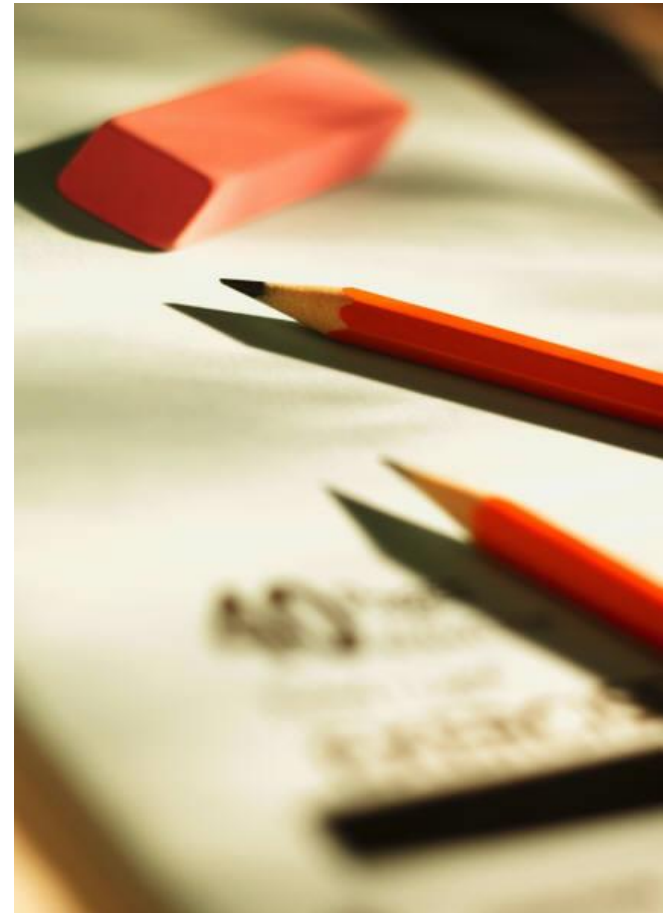


## Grades K-3 Mathematics Curriculum Overview

This document presents our mathematics standards through the lens of Understanding by Design. We began by identifying the important broad understandings and the essential questions for mathematics. These particular understandings and questions allow us to answer the major question: What are the most significant ideas that we want all students to appreciate after completing the study of mathematics in the Sharon school system? We also determined the broad understandings for number sense, algebra and geometry. After that, we worked on the knowledge and skills that students K-12 need to learn. For many, this change in emphasis on the understandings of mathematics, rather than on memorizing steps is new. However, with depth of understanding, students will be more able to apply what they learn to new situations - which is truly the essential goal of education. We will revisit this document as we use it in our classrooms and consider modifications.

At the elementary level, the Sharon mathematics program (through the Everyday Math series) encourages students to form a positive attitude towards mathematics through meaningful activities where all participants remain active and engaged in the learning process. The goal is to help students to transform into independent and comfortable thinkers about mathematical ideas. Mathematics is integrated into other curriculum areas, such as science, social studies, and the visual arts. The program focuses on connecting math to real-world situations, communicating about math, and solving math problems encountered in everyday experiences. Thinking with math becomes as natural as thinking with language. The math curriculum includes practical routines to help build the arithmetic skills, and quick responses that are essential for building number sense, estimation skills, and flexibility in a math-rich environment. The math curriculum also spirals so that some math elements are introduced early in the program without the expectation that these elements become secure, while other concepts are reinforced or applied.



## **K-12 Mathematics Standards**

The following list of standards represents the major understandings and questions that underlie all classes in mathematics. We would like you to keep these in mind throughout your reading because they are an important part of each grade. Problem solving, making connections, estimation, patterns, and appropriate use of technology are essential ingredients throughout our program.

### ***Students will understand that:***

- *Through modeling events in the real world, mathematics is the foundation for many aspects of society.*

#### Essential Questions:

- How do we use each type of mathematics to model situations in the real world?
- How do we create, test and validate a model?
- What mathematics can be used to obtain a desired product or outcome?
- What models produce the best solutions for a given problem?
- What are the benefits & limitations of modeling situations?

- *Successful problem solving involves flexible thinking, asking questions and taking risks. Additionally, a variety of problem solving strategies may be used to arrive at appropriate solutions.*

#### Essential Questions:

- What are the most appropriate problem solving strategies for a given situation?
- How are visual and physical models of a mathematical idea helpful for representing concepts and solving problems?
- What information is relevant or superfluous?
- Is estimation more appropriate than finding an exact answer?
- Is the proposed solution reasonable?

- *Patterns & relationships can be used to represent information, interpret data and make predictions.*

#### Essential Questions:

- What patterns or relationships do we see in each type of mathematics?
- What are the different ways to represent the patterns or relationships?
- What different interpretations can be obtained from a particular pattern or relationship?
- What predictions can the patterns or relationships support?

- How can we use or test our predictions? Are they valid? Are they significant?

➤ *Mathematics is a language for communicating ideas.*

Essential Questions:

- How do we translate verbal ideas to the language of mathematics?
- How do we translate the mathematics into English?
- What are the different ways of communicating mathematics with clarity?
- What is the most appropriate way of communicating a mathematical idea in a particular situation?

➤ *Connections exist between current learning and prior understanding. Also, connections can be made to various strands of mathematics, as well as to other disciplines.*

Essential Questions:

- What previous learning helps us to understand the new material?
- How does what we are learning relate to other areas of mathematics?
- How does what we are learning relate to other disciplines?

➤ *Properties, postulates and theorems form a foundation for the structure of mathematics.*

Essential Questions:

- Where did the properties, postulates and theorems originate?
- How did the properties, postulates and theorems originate?
- Who were some of the people responsible for developing the different theories of mathematics?
- Why is a universally accepted set of properties, postulates and theorems essential?
- How are the properties, postulates and theorems used in mathematics?

➤ *Technology and other resources can be used to support mathematical investigations.*

Essential Questions:

- What technological tools or other resources are available?
- Which tool(s) is (are) most effective in a particular situation?
- How do we determine the reasonableness of technological results?
- When is it appropriate to use technology?