Sanborn Regional School District
K-6 Math Program Selection Report

Patricia Haynes, PhD
March 24, 2021
# Table of Contents

- Introduction...................................................................................................................... 3
- Committee Members ....................................................................................................... 4
- Historical View ................................................................................................................ 5
- Math Program Selection Process ...................................................................................... 7
- Findings ............................................................................................................................ 8
- Recommendation ............................................................................................................. 10
- Implementation Timeline ............................................................................................... 11
- Conclusion ....................................................................................................................... 11
- References ....................................................................................................................... 12
- Appendix A ..................................................................................................................... 13
- Appendix B ...................................................................................................................... 14
Introduction

Our K-6 Math Program selection process officially began in the spring of 2019 when Donna Donnell and Dr. Patricia Haynes attended a math curriculum conference sponsored by the New Hampshire School Administrators Association. Conversations in the district up to that point had been focused on the need to update the K-6 math program, which had not changed in over a decade. The purpose of the conference was to introduce attendees to programs and highlight features and benefits. Publishers with programs of interest were contacted for additional information.

The district reconfiguration, combined with the COVID-19 pandemic, delayed the assembly of the mathematics committee until fall of 2020. The mathematics committee solicited membership on a volunteer basis with the intent of providing a representation of teachers across buildings and grade levels. To that end, our review committee consisted of 9 classroom teachers, one at each grade level from Kindergarten to Grade 6 and two special education teachers, one from each elementary school.

The committee was charged with reviewing available elementary math programs using a standardized tool, the Instructional Materials Evaluation Tool, researching the programs through EdReports and determining alignment with a district checklist of needs for a new program. The work began in September and concluded in February when the committee made a recommendation for adoption. Teachers on the committee completed these evaluations in addition to teaching their students during a pandemic, which resulted in an evolving educational landscape. Their diligence in completing this task demonstrates their dedication to their craft and their students, and is sincerely, wholeheartedly appreciated.
Committee Members

Amy Carroll – Kindergarten Teacher, DJ Bakie Elementary School
Gail Charest – First Grade Teacher, DJ Bakie Elementary School
Trisha Black – Second Grade Teacher, DJ Bakie Elementary School
Bonnie Banyas – Third Grade Teacher, DJ Bakie Elementary School
Jolene Johnson – Special Education Teacher, DJ Bakie Elementary School
Carrie Daigle – Fourth Grade Teacher, Memorial School
Rich LaPorte – Fifth Grade Teacher, Memorial School
Shari Allessio – Sixth Grade Teacher, Memorial School
Sue Burns – Special Education Teacher, Memorial School
Donna Donnell – District Math Coordinator, K-6
Patricia Haynes, PhD – Director of Teaching & Learning
Historical View

The elementary math program at Sanborn since 2007 has been Everyday Math, published by McGraw-Hill. An updated edition of the program came in 2012, when the Common Core Edition was released to align more fully with the Common Core State Standards, upon which New Hampshire relies. Another edition came in 2016 with some added minor adjustments.

Over the course of the last five years, from 2015-2019, it became apparent that student math achievement on statewide assessments had stagnated, as displayed in Figure 1. This data has been previously reported in the District annual reports.

![Figure 1. Percent of Students Scoring Proficient or Above on State Math Assessments 2015-2019](image)

<table>
<thead>
<tr>
<th>Year</th>
<th>Grade Level</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>68</td>
<td>59</td>
<td>53</td>
<td>39</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>47</td>
<td>50</td>
<td>57</td>
<td>62</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>66</td>
<td>54</td>
<td>56</td>
<td>59</td>
<td>48</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>53</td>
<td>53</td>
<td>66</td>
<td>46</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>54</td>
<td>55</td>
<td>67</td>
<td>25</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>33</td>
<td>52</td>
<td>53</td>
<td>30</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

While the actual percentages of students by grade level scoring proficient or higher on the statewide assessments have fluctuated from year to year, the overall gains do not ever break 70 percent. Although teachers followed the Everyday Math program closely, implementing the lessons and related assessments as prescribed, there was no growth in student scores. Adjustments to instruction each year were made, with supplemental methods added in an effort to improve student learning, however these did not substantially raise scores.
The same data can also be viewed by looking at the cohort, or group of students, as displayed in Figure 2. By tracking the same groups of students from year to year, following them through their career in school, educators can assess the program being used for instruction to see if it is meeting the overall goals of the content area.

Each cohort of students is represented by a different line. Although there are peaks and valleys for each cohort, the starting percentage is essentially unchanged from the final one represented on the graph, which is the testing from 2019. For example, the cohort that was in Grade 3 in 2015, represented by the blue line, had 68 percent of students score proficient on the math assessment that year. By the time they were in grade 7 in 2019, 70 percent of students scored proficient on the math assessment, an increase of only 2 percent. Similar outcomes are evident for other cohorts represented in the graph.

Results such as these point to an issue with the math program that is being used throughout the district. The District supplemented the math program with alternate materials and lessons in order to improve student math learning, but the scores showed no improvement. Deficiencies in the design of the program persist as students advance through the grades.
Math Program Selection Process

The math selection process was a complex undertaking for the teachers in the committee. Twenty programs, from various publishers, were considered for recommendation of adoption. Teachers worked independently as well as in collaboration with each other. Meetings were held regularly by building or through Zoom, beginning in September 2020. Multiple tools were used to review possible programs. Each tool had its own benefits, and provided information used to make a final recommendation.

The committee used the math program vision “Every student will see themselves as a mathematician” as the lens through which to conduct their work. Each meeting was conducted with the purpose of choosing a math program to foster a love of math in our students, and develop within each one of them the ability to think like mathematicians.

IMET
The committee employed the Instructional Materials Evaluation Tool (IMET). The IMET was created in response to the development of the Common Core State Standards to help educators evaluate the alignment of programs to the standards. It guides reviewers to find and record evidence that certain criteria are present in the materials they are investigating. The IMET criteria fall into three categories: Non-Negotiable Criteria, Alignment Criteria, and Indicators of Quality. Each criterion includes a set of metrics that help reviewers zero in on evidence that the criterion is present. Each Non-Negotiable must be met completely for the curriculum to be considered aligned.

Programs that met the non-negotiables were kept in the process and further reviewed for alignment and quality. Any program that did not meet even one of the non-negotiables was immediately eliminated from the group of possible programs.

EdReports
In addition to the IMET, the committee researched each program on EdReports to gather additional information about the depth and breadth of the instructional materials within each program. EdReports scores are assigned after a series of rigorous reviews of materials, conversations with publishers, and analysis of outcomes. These scores served to balance the information gathered through the IMET.

Programs that met all areas on the IMET, but were scored low in EdReports were eliminated from the selection. Any program that successfully passed the IMET and also met expectations as reviewed by EdReports was considered for piloting in classrooms with students.

District Needs
The final phase of selection looked at how the program would fit in with the needs of the teachers, students, families and our technology expectations. A district checklist was developed to find a program that incorporates the Mathematics Teaching Practices, reflects the Sanborn Graduate Success Profile, is compatible with student development and scheduling constraints, and provides digital resources to support teachers in the new post-pandemic era of teaching. Particular attention was paid to finding a
program with application of rigor as well as high student engagement, qualities that would help our students develop as mathematicians. Publishers were invited to present their programs to the committee and answer questions about it in January 2021. A family survey was sent out by email and through Constant Contact on January 30, 2021 asking for family input on math instruction throughout the district. The data was used to inform the program selection.

The teachers on the committee also tested the programs in their classrooms, and taught a unit as designed with their students. After teaching the unit, they administered the program assessment to gather information on how the students performed.

Findings

Through using the IMET and EdReports, the committee was able to eliminate 12 of the 20 potential programs. One of the programs eliminated was the current program in the district, Everyday Math.

Everyday Math did not meet some of the alignment criteria in the IMET. EdReports scored Everyday Math very low in the area of Rigor & Mathematical Practices for grades 2 through 6, and scored it low in the area of Focus & Coherence for grades 1 through 6. The overall rating on EdReports of Everyday Math, our current program, was “Does Not Meet Expectations”.

Additional programs were eliminated from consideration as a result of the in-house checklist which looked at usability, technology, special education/504/English Language Learner student needs, and availability. By mid-December, three programs remained that scored highly on the IMET, in EdReports and on the district checklist: EnVision, Reveal and Illustrative Mathematics. All three of these programs were piloted in the classroom with students.

Family Survey Results

The family survey that was deployed to all Sanborn families on January 30, 2021 remained actively collecting information until February 8, 2021, and gathered 136 responses. Most of the responses came from families with students at the elementary and middle level, as shown in Figure 3.

The survey collected information about how students feel when doing math, and how families see their students’ learning, to determine our current programming alignment with the math program vision “Every student will see themselves as a mathematician”. These results are shown in Figure 4.
My child feels successful in math.
My child has a strong mathematical foundation.
My child can complete math homework (other than games) independently.
My child can complete homework assignments in other subject areas independently.
My child completes his/her math homework in a reasonable amount of time.
I have enough understanding of the math program to assist my child with his/her math homework.
The district provides me with the necessary reference materials to assist my child with his/her homework.
The district provides enough opportunities for parent education in math.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>Don't Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>My child feels successful in math.</td>
<td>26</td>
<td>74</td>
<td>28</td>
<td>26</td>
<td>1</td>
</tr>
<tr>
<td>My child has a strong mathematical foundation.</td>
<td>28</td>
<td>67</td>
<td>65</td>
<td>69</td>
<td>3</td>
</tr>
<tr>
<td>My child can complete math homework (other than games) independently.</td>
<td>23</td>
<td>65</td>
<td>69</td>
<td>61</td>
<td>11</td>
</tr>
<tr>
<td>My child can complete homework assignments in other subject areas</td>
<td>25</td>
<td>22</td>
<td>29</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td>My child completes his/her math homework in a reasonable amount of time.</td>
<td>22</td>
<td>19</td>
<td>52</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td>I have enough understanding of the math program to assist my child with</td>
<td>19</td>
<td>37</td>
<td>39</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>his/her math homework.</td>
<td>11</td>
<td>28</td>
<td>48</td>
<td>18</td>
<td>30</td>
</tr>
<tr>
<td>The district provides me with the necessary reference materials to assist</td>
<td>4</td>
<td>28</td>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>my child with his/her homework.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The district provides enough opportunities for parent education in math.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
While the results of the survey show that students overall feel successful in math, and their families feel their math foundation is strong, the district needs to improve on providing reference materials to families to help their children, and communicate math instruction more comprehensively to families.

**Recommendation**

The math committee recommends the adoption of the EnVision Mathematics Common Core program for the 2021-2022 school year. This recommendation comes as a result of the thorough process of research, vetting and testing of numerous math programs available to educators this year. EnVision met all of the requirements set out in the IMET and is aligned to the Common Core Math Standards which are used to develop the standardized and achievement tests used by the district. EdReports scored EnVision high in the areas of Focus & Coherence, Rigor & Mathematical Practices, and Usability, for all grade levels K through 6 and rate it as “Meets Expectations”.

In addition to scoring highly on the standardized measures, the committee discovered qualities of EnVision math program that make it an improvement over the current program in use as well as an ideal match to Sanborn:

- **Alignment to Mathematics Teaching Practices** – these are research-based teaching practices that should be consistent components of every math lesson so that students can develop math understanding (Appendix A). These practices have been a focus of the professional development in the district this year and easily incorporate with the program.
- **Fulfill the Standards for Mathematical Practice** – the program ties together conceptual understanding, procedural fluency, strategic competence, and reasoning that are evident when students learn mathematics (Appendix B).
- **Scope and Sequence** – units are cohesive and do not spiral, giving students a solid opportunity to interact with the material and become proficient in math concepts before moving on.
- **Structured** – the program is highly structured, and lessons are designed in a way to bring students into the material in a similar way from unit to unit. Skill practice is a feature of each lesson, so students practice math while also learning the concepts behind the operations they are learning. Visuals are included to support learners.
- **Purposeful work** – students experience math solving real-world problems that are engaging and have routines that carry on to other sections of the lesson.
- **Family connection** – each unit includes a topic letter for teachers to send home introducing the focus of the unit, as well as how families can support learning at home. Reference materials are included in the lessons.
- **Technology** – the technology included with the program supports student learning, by creating interest in the concepts being covered and is accessible both in school and at home. Continuous teacher learning is also supported, as there are videos provided for professional development that can be used when needed.
Implementation Timeline

In order to successfully implement the new math program from Kindergarten through Grade 6, the district would need to order materials in the spring of 2021 to ensure arrival in the summer. All grade levels would begin using the program in August 2021 with their students.

Donna Donnell, District Math Coordinator: K-6, would work with the publisher to arrange for initial professional development for all teachers. The professional development would also be ongoing, so that teachers would have opportunities to not only grow in their knowledge of the program, but also in their understanding of how to work with students to advance learning.

Data would be collected from teachers to see how the implementation is going, informally through their regular math curriculum meetings, as well as formally on a trimester basis.

Conclusion

The math committee is confident that the process used to recommend the new K-6 math program has led them to the selection of the best program for the district. EnVision meets the instructional expectations outlined in the math standards used to develop the high-stakes tests. EnVision supports learners at all levels, and encourages deep thinking in mathematics, furthering the characteristics outlined in the Sanborn Graduate Success Profile. It also supports the ongoing learning of teachers, which will make onboarding new staff easier. Finally, EnVision provides resources for students and families to use at home, enabling families to support learning.

Sanborn’s math program vision, “Every student will see themselves as a mathematician”, is embodied in each classroom during math instruction. Supporting this vision is the goal of each teacher, and having the correct tools will make the vision a reality for all our students.
References


## Effective Mathematics Teaching Practices

<table>
<thead>
<tr>
<th>Practice</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Establish mathematics goals to focus learning</strong></td>
<td>Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.</td>
</tr>
<tr>
<td><strong>Implement tasks that promote reasoning and problem solving</strong></td>
<td>Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.</td>
</tr>
<tr>
<td><strong>Use and connect mathematical representations</strong></td>
<td>Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.</td>
</tr>
<tr>
<td><strong>Facilitate meaningful mathematical discourse</strong></td>
<td>Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments.</td>
</tr>
<tr>
<td><strong>Pose purposeful questions</strong></td>
<td>Effective teaching of mathematics uses purposeful questions to assess and advance students’ reasoning and sense making about important mathematical ideas and relationships.</td>
</tr>
<tr>
<td><strong>Build procedural fluency from conceptual understanding</strong></td>
<td>Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.</td>
</tr>
<tr>
<td><strong>Support productive struggle in learning mathematics</strong></td>
<td>Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.</td>
</tr>
<tr>
<td><strong>Elicit and use evidence of student thinking</strong></td>
<td>Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.</td>
</tr>
</tbody>
</table>

---


[www.nctm.org/principlesactions](http://www.nctm.org/principlesactions)
Appendix B

Standards for Mathematical Practice

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important “processes and proficiencies” with longstanding importance in mathematics education.

1. Make sense of problems and persevere in solving them.
   Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make guesses about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider similar problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary.
   Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2. Reason abstractly and quantitatively.
   Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.
   Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make guesses and build a logical progression of statements to explore the truth of their assumptions. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions.
Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen to or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

4. **Model with mathematics.**
Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. **Use appropriate tools strategically.**
Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6. **Attend to precision.**
Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high
school they have learned to examine claims and make explicit use of definitions.

7. **Look for and make use of structure.**
Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see $7 \times 8$ equals the well-remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the $14$ as $2 \times 7$ and the $9$ as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as $5$ minus a positive number times a square and use that to realize that its value cannot be more than $5$ for any real numbers $x$ and $y$.

8. **Look for and express regularity in repeated reasoning.**
Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing $25$ by $11$ that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through $(1, 2)$ with slope $3$, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.