

Whitefish Bay School District 4K Mathematics Curriculum Renewal and Design Report

May 25, 2022

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Introduction

During the 2019-2021 school years, a committee was formed to evaluate the current 4K-12 Mathematics program and to recommend potential curriculum renewal and design enhancements. The last Mathematics program evaluation was completed during the 2011-2012 school year. At that time, the Wisconsin Model Academic Standards (WMAS) were used to guide the curriculum development and resource selection of the May 2021 Math review process. Two of our 4K teachers participated in that review process in 2019-2021, however, they did not select a math resource for future implementation.

The purpose of this report comes from the May 2021 School Board Report and Elementary recommendations section which states, "Four-Year-Old Kindergarten needs to have a more clearly defined curriculum and resource materials, which will be easily integrated within their instructional center structure. This should be more researched and defined during the 2021-2022 school year." The following report will recommend modifications for the renewal and design of the 4K mathematics curriculum and instructional practices, ensuring that the Whitefish Bay School District is:

a. aligned and exceeding both current state and national standards;

b. aligned to the most current best practice research in the mathematics and educational fields;c. consistent with the WFB Focus Plan, the Department of Public Instruction's definition of Educational Equity, and the adopted Seven Thriving Dispositions.

Background

In the fall of 2021, the 4K teacher team and math coaches were reconvened to review potential curricular resources that would be in alignment and support the implementation of the K-12 Illustrative Math implementation. The same process of reviewing potential curricular resources was followed during the winter of 2021 as was followed for the 2019-2021 math review process. Additionally, the sections below include the purpose of the review, committee membership during the 2021-2022 school year, the program mission, goals, and beliefs from the 2019-2021 review.

Purpose of the 4K Math Review: Four-Year-Old Kindergarten needs to have a more clearly defined curriculum and resource materials, which will be easily integrated within their instructional center structure. This should be more researched and defined during the 2021-2022 school year.

Committee Membership and Work Team Process

In this section, a description of the committee, leadership, organization, and timeline of the program evaluation process are included. A collaborative and representative team of stakeholders in the District is vital in carrying out a reliable and valid program evaluation. Thus, the Whitefish Bay School District's program evaluation committee was composed of 4K teachers, math coaches, and district leadership.

Committee Membership

Member	Role
Becca Weber 4K Teacher at Cumberland	
Becki Koch 4K Teacher at Cumberland	
Kim Schaefer 4K Teacher at Richards	
Kelly Kubicki	4K Teacher at Richards
Matthew Skinner	Math Coach at Cumberland
Susan Jones Math Coach at Richards	
Jamie Foeckler Director of Teaching and Learnin	

Work Team Process and Timeline

Date	Meeting Purpose
10/29/21	The 4K Math review team will work to determine the current state of math instruction in K4 and what next steps need to be taken to provide alignment with K5 math standards and expected outcomes.
11/29/22	The 4K Math review team will work to review IMET results from two math curricula and see how they align to our instructional resources for Illustrative Math and what the time requirements are for instruction related to expected outcomes for math in 4K.
1/24/22	The 4K Math review team will analyze the alignment and fidelity of the Bridges in Mathematics curricular resource to identify strengths and gaps related to what we want students to know and be able to do.
3/18/22	The 4K Math review team will review the draft of the final report and action plan developed as a result of the 4K math resource review process.
5/11/22	The Teaching and Learning Council will review the final report and action plan developed as a result of the 4K math resource review process.
5/25/22	The Director of Teaching and Learning will present the final report and action plan developed as a result of the 4K math resource review process.
6/8/22	The Director of Teaching and Learning will present the final report and action plan developed as a result of the 4K math resource review process for School Board approval.

School District of Whitefish Bay Program Mission, Goals and Beliefs 4K – 12 Mathematics

Mission Statement

Every student will be empowered with mathematical reasoning, conceptual understanding, and procedural fluency necessary to excel in a changing world through mathematical experiences that are rich in curiosity, collaboration, and innovative problem-solving.

*Vision



*Equity Guiding Beliefs

- Every student has the right to learn significant mathematics.
- Mathematics instruction must be rigorous and relevant.
- Purposeful assessment drives mathematics instruction and affects learning.
- Learning mathematics is a collaborative responsibility.
- Students bring strengths and experiences to mathematics learning.
- Responsive environments engage mathematics learners.

Broad Goals

- 1. A focused, balanced coherent progression of mathematics learning, with an emphasis on proficiency with key topics, should become the norm. Any approach that continually revisits topics, without closure or mastery, is to be avoided.
- 2. Math curriculum and goals should simultaneously develop conceptual understanding, computational fluency, and problem-solving skills. These skills are mutually supportive. Teachers should emphasize these during instruction of:
 - a. conceptual understanding of mathematical operations,
 - b. fluent execution of procedures, and
 - c. fast access to number combinations jointly support effective and efficient problem solving.
- 3. To promote students becoming effective, efficient problem solvers, instruction should emphasize thinking, and using math in the context of meaningful examples and situations Tasks that promote reasoning and problem solving are used regularly during instruction wherein students can transfer their understanding to new contexts/situations.
- 4. Teachers must strike an effective use of instructional methodologies including:
 - a. whole group instruction.
 - b. small group instruction and collaboration.
 - c. individual/personalized instruction, as needed.
- 5. Facilitate meaningful mathematical discourse and perseverance- student builds a shared understanding of mathematical ideas by analyzing and comparing approaches and arguments, which is a key instructional strategy helping the brain process and remember concepts and skills.

- 6. Build procedural fluency from conceptual understanding with whole number operations, which is dependent on sufficient and appropriate practice to develop automatic recall of addition and related subtraction facts, and of multiplication and related division facts. This requires fluency with standard algorithms for addition, subtraction, multiplication, and division.
- 7. Explicit instruction with students who have math learning difficulties has shown consistently positive effects on performance. Explicit instruction means: a. teachers provide clear models for solving a problem type using an array of examples, b. students receive appropriate practice, c. students are provided opportunities to think aloud as they solve the problem, and d. students are provided with extensive, specific feedback.
- 8. Redefining Ready through College and Career Readiness- Algebra is a college readiness indicator that is rooted in a rigorous K-12 academic mathematics program. Research shows the completion of Algebra II correlates significantly with success in college and earnings from employment. A major goal for elementary and early middle school math education should be the focus on three key areas: whole numbers, fractions and particular aspects of geometry and measurement, which are the critical foundations for Algebra in 8th grade and high school.
- 9. Teachers' expertise in both math content knowledge and proven instructional methodology are critical to the success of student learning.
- 10. Fidelity of instructional programs ultimately results in consistent, targeted math learning, and achievement for all students. Textbooks do not solely constitute a comprehensive math program.

^{*}Retrieved from Wisconsin Department of Public Instruction on 1.24.20: Board approved 6.10.20

Current State of 4K Math Instruction

In this section, a review of the current state of 4K math instruction includes both aspects of the current program that are working well as well as aspects of the current program that are opportunities for growth. In summary, the levels of high student engagement, number sense, and pacing were all positive aspects of the current program implementation while there were several areas to grow which included common assessments and multiple resources.

Current State of 4K Math Instruction

Working Well:

- Games and Small Groups- high engagement and routines prepares students well for Illustrative Math, deep thinking and transfer of learning, all students feel success with games (tasks and learning is accessible for all students)
- Number Sense- opportunity to write, use visible models, identify that a number and word goes with a quantity, frequent formative assessment, what numbers go together to make a quantity (subitizing)
- Structure and pacing- focusing on slowing down, warm-up and review.

Areas to Grow:

- Common assessments
- Cardinality (lowest area)- possibly add to Report Card
- More games
- RI- using Engage NY
- CU- some of Engage NY and Kathy Richardson's materials

4K Curriculum Resources Reviewed: Bridges in Mathematics and Eureka

The 4K Math review team reviewed the Bridges in Mathematics and Eureka math curriculum resources as two viable options to best meet the needs of our 4K mathematicians. After analyzing both resources using the Instructional Materials Evaluation Tool (IMET), the team found more benefits with the Bridges in Mathematics resource which provided content that was consistent with grade level standards and progressions, appropriate rigor and balance, and authentic connections to the standards. Through further analysis of both resources, Bridges in Mathematics also provides more opportunities to access grade level standards for all students in areas involving the development of conceptual understanding, scaffolding, and differentiation.

Instructional Materials Evaluation Tool (IMET)

Bridges in	n Mathematics			Ratings: Meets (3) Partially Meets (2) Does Not Meet (1)
				K4
	Steps	ID	Metric	Rating
		NN-2A	Students and teachers using the materials as designed devote the large majority of time to the Major Work of the grade.	3
	Non-Negotiable 2: Materials must focus	NN-2B	Supporting Work enhances focus and coherence simultaneously by also engaging students in the Major Work of the grade.	3
Focus and Coherence	coherently on the Major Work of the grade in a way that is consistent with the progressions in the	NN-2C	Materials follow the grade-by-grade progressions in the Standards. Content from previous or future grades does not unduly interfere with on-grade- level content.	3
	Standards.	NN-2D	Lessons that only include mathematics from previous grades are clearly identified as such to the teacher.	3
	Rigor and Balance: Materials must reflect	AC-1A	The materials support the development of students' conceptual understanding of key mathematical concepts, especially where called for in specific content standards or cluster headings.	3
Rigor and Balance	the balances in the Standards and help students meet the	AC-1B	The materials are designed so that students attain the fluencies and procedural skills required by the Standards.	3
Standards' rigorous expectations.	AC-1C	The materials are designed so that teachers and students spend sufficient time working with applications, without losing focus on the Major Work of each grade.	3	
Standards for	Materials must authentically connect	AC-2A	Materials address the practice standards in such a way as to enrich the Major Work of the grade; practice standards strengthen the focus on Major Work instead of detracting from it, in both teacher and student materials.	3
Mathematical Practice	content standards and practice standards.	AC-2B	Tasks and assessments of student learning are designed to provide evidence of students' proficiency in the Standards for Mathematical Practice.	3

		AC-3A	Support for English Language Learners and other special populations is thoughtful and helps those students meet the same Standards as all other students. The language in which problems are posed is carefully considered.	2
Access to the Standards for All Students	Materials must provide supports for English Language Learners and other special populations.	AC-3B	Materials provide appropriate level and type of scaffolding, differentiation, intervention, and support for a broad range of learners with gradual removal of supports, when needed, to allow students to demonstrate their mathematical understanding independently.	3
		AC-3C	Design of lessons attends to the needs of a variety of learners (e.g., using multiple representations, deconstructing/reconstructing the language of problems, providing suggestions for addressing common student difficulties).	3
			Average Score for Grade Level	2.9

Eureka				Ratings: Meets (3) Partially Meets (2) Does Not Meet (1)
				K4
	Steps	ID	Metric	Rating
		NN-2A	Students and teachers using the materials as designed devote the large majority of time to the Major Work of the grade.	3
	Non-Negotiable 2:	NN-2B	Supporting Work enhances focus and coherence simultaneously by also engaging students in the Major Work of the grade.	3
Focus and Coherence	Materials must focus coherently on the Major Work of the grade in a way that is	NN-2C	Materials follow the grade-by-grade progressions in the Standards. Content from previous or future grades does not unduly interfere with on-grade- level content.	3
	consistent with the progressions in the Standards.			3
		NN-2D	Lessons that only include mathematics from previous grades are clearly identified as such to the teacher.	
Rigor and	Rigor and Balance: Materials must reflect		The materials support the development of students' conceptual understanding of key mathematical	
Darance	the balances in the	AC-1A	concepts, especially where called for in specific	2

	Standards and help		content standards or cluster headings.	
	Standards' rigorous		The materials are designed so that students attain the fluencies and procedural skills required by the Standards.	3
		AC-1C	The materials are designed so that teachers and students spend sufficient time working with applications, without losing focus on the Major Work of each grade.	2
Standards for Mathematical	Materials must authentically connect content standards and	AC-2A	Materials address the practice standards in such a way as to enrich the Major Work of the grade; practice standards strengthen the focus on Major Work instead of detracting from it, in both teacher and student materials.	2
Practice	practice standards.	AC-2B	Tasks and assessments of student learning are designed to provide evidence of students' proficiency in the Standards for Mathematical Practice.	3
		AC-3A	Support for English Language Learners and other special populations is thoughtful and helps those students meet the same Standards as all other students. The language in which problems are posed is carefully considered.	2
Access to the Standards for All Students	Materials must provide supports for English Language Learners and other special	AC-3B	Materials provide appropriate level and type of scaffolding, differentiation, intervention, and support for a broad range of learners with gradual removal of supports, when needed, to allow students to demonstrate their mathematical understanding independently.	2
	populations.	AC-3C	Design of lessons attends to the needs of a variety of learners (e.g., using multiple representations, deconstructing/reconstructing the language of problems, providing suggestions for addressing common student difficulties).	2
			Average Rating for Grade level	2.5

Additional Math Resource Review Selection Criteria

Within Whitefish Bay's School Board policies related to Teaching and Learning, the 4K-12 Content Area Curriculum Renewal and Design Committees are responsible for overseeing the following phases in the curriculum renewal and design process. More specifically, in School Board Policy #334, Curriculum/Instructional Program Evaluation, there is an opportunity for a review of current programming as well as the development of the program's intent which allows for the review and analysis of standards, best practices, and beliefs when working towards a program direction. The resource review conducted with the Bridges in Mathematics math resource provided greater analysis of the connections to Whitefish Bay's Focus Plan, identified DPI vision and standards of math, and the 7 Thriving Dispositions. Through the analysis below, there were overall ratings in each of the previously listed areas ranging from 2.5 to 3, revealing a strong alignment to the Whitefish Bay Focus Plan, identified DPI vision and standards of math, as well as the 7 Thriving Dispositions.

Criteria and Ratings for the Bridges in Mathematics Curricular Resource

Purpose: The review criteria below will be used to evaluate curriculum resources that support the Whitefish Bay School District's Focus Plan, identified DPI vision and standards, and the 7 Thriving Dispositions (Note: Adapted from Wagner's (2008), "Seven Survival Skills"). Additionally, the ratings are defined as follows: 1 = Does not meet expectations, 2 = Partially meets expectations, 3 = Meets expectations.

Curriculum Resource: Bridges in Mathematics Grade Level(s): K4

Focus Plan

The School District of Whitefish Bay, in partnership with families and community, is student-centered with a tradition of educational excellence. We will build upon this tradition by: Empowering students with the knowledge, skills, and character necessary to thrive in a changing, global society. Respecting the diversity of our students and engaging them as individual learners in an innovative learning community. Addressing the needs of the whole child in a caring, inclusive environment.

Criteria: Focus Plan	F	Rating and Evidenc	e
Every student will meet or exceed comprehensive learning standards to promote future success within	Select the rating be	elow:	
our global society.	1	2	3
	Evidence for the r	ating: IMET tool a	nd meets the
Every student will experience a caring, inclusive learning environment that supports the development of the whole child with balanced attention to physical, social, emotional, and intellectual well-being (SEL).	Select the rating below:		
	1	2	3
	Evidence for the rating: Peer discussion and collaborative learning are strong. Second language students and special education students have some resources and could be stronger		
	Overall Rating = 2	.5 out of 3	

Resources:

Whitefish Bay Schools Focus Plan (2021). Retrieved from:

https://www.wfbschools.com/District/201920/focusplan/WFBSDFocusPlan%20Original19F2.pdf Culturally Responsive Practices (2021). Retrieved from:

https://dpi.wi.gov/sites/default/files/imce/statesupt/pdf/WI Model Inform CRPs 2019.pdf

Educational Equity and Culturally Responsive Practices

The School District of Whitefish Bay utilizes what the "Wisconsin Department of Public Instruction, the Wisconsin RtI Center and the Disproportionality Technical Assistance Network have collaboratively developed a Model to Inform Culturally Responsive Practice" for analysis of curricular resources (https://dpi.wi.gov/rti/equity, February 2022). Our goal is to "reach and teach diverse learners and achieve equity within their multi-level systems of supports" (https://dpi.wi.gov.rti/equity, February 2022).

Criteria: Educational Equity and Culturally Responsive Practices	R	ating and Evider	nce
"Educational equity means that every student has access to the resources and educational rigor they need at the right moment in	Select the rating become self-awa		
their education, across race, gender, ethnicity, language, ability, sexual orientation, family background, and/or family income"	1	2	3
(Online, dpi.wi.gov/rti/equity, February 2022).			
Become self-aware: Staying alert to the ways identity and culture affect who we are and how we interact with learners		pact of systems, actices on learner	=
and families;	1	2	3
• Examine the impact of systems, structures, policies, and			_
practices on learners and families: Analyzing who the			

system serves and underserves;

- Believe all learners can and will achieve at high levels:
 Examining and intentionally pushing back on societal biases and stereotypes;
- Understand all learners have a unique world view:

 Recognizing each adult and learner represents a complex blend
 of cultures, identities, and roles, with singular differences;
- Know and respect the communities: Understanding and valuing the behaviors, beliefs, and historical experiences of families and community members served by the school;
- Lead, model, and advocate for equity: Challenging prejudice and discrimination as barriers to equity and giving voice to those inequitably impacted by school and district decisions, policies and practices;
- Accept the responsibility for learner success: Recognizing equitable outcomes depend on changing the school's and district's beliefs and practices, rather than fixing learners and families; and
- Using practices, curriculum, and policies that respect the identities and cultures of learners and families served by schools.

Believe all learners car	and will	achieve	at high
levels			

1 2	3
-----	---

Understand all learners have a unique world view

		1
1	2	3

Know and respect the communities

1	2	3

Lead, model, and advocate for equity

1 2 3	_	, ,		1 J
		1	2	3

Accept the responsibility for learner success

1 2 2

Using practices, curriculum, and policies that respect the identities and cultures of learners and families served by schools

	T .	
1	2	3

Overall evidence for the ratings: Areas scored with a 1 or 2 represent issues that are systemic and parts beyond the resource. While important we are not sure a math text book can address these issues

Overall Rating = 2.5 out of 3

Resource:

Educational Equity and Culturally Responsive Practices (2022) Retrieved from: https://dpi.wi.gov/rti/equity

Culturally Responsive Practices (2021). Retrieved from: https://dpi.wi.gov/sites/default/files/imce/statesupt/pdf/WI_Model_Inform_CRPs_2019.pdf

7 Thriving Dispositions

Whitefish Bay Schools has adapted Tony Wagner's (2008) work on the "Seven Survival Skills" in the form of "7 Thriving Dispositions" from the book, *The Global Achievement Gap*. Within Wagner's (2008) book, he explains the competencies high school and college graduates need in order to be successful young professionals and global citizens in today's society.

Criteria: 7 Thriving Dispositions	R	ating and Eviden	ice
Critical Thinking and Problem Solving	5 to 7 Thriving Di	1	O
Agility and Adaptability	2 to 4 Thriving Di 0 to 1 Thriving Di		0
Curiosity and Imagination	Select the rating below:		
Initiative/Entrepreneurialism	1	2	3
Access and Analyze Information	Evidence for the r	ratino (list dispositi	on and
Effective Oral and Written Communication	Evidence for the rating (list disposition and information as needed):		
Collaboration	Overall Rating = 3 out of 3		

Resource:

7 Thriving Dispositions (2021). Retrieved from:

https://www.wfbschools.com/District/Newsletters/071316%207%20Thriving%20Dispositions.pdf as adapted from Wagner, T., The Global Achievement Gap (2008). Basic Books: New York, NY.

Alignment and Fidelity of the Bridges in Mathematics Curricular Resource

As a part of the review process and overall outcomes and expectations for the reviewed resource, the 4K team and coaches engaged in an analysis and discussion about (1) strengths related to what we want students to know and be able to do and (2) areas where there are gaps in the curriculum resources related to what we want students to know and be able to do. Additionally, the team analyzed and discussed the time requirements related to the overall expected outcomes related to what we want students to know and be able to do by the end of 4K. The previous analysis was done with a lens on what the expectations are of our students as they enter into the Illustrative Math curriculum in Kindergarten. Through the analysis below, the team found many strengths within the Bridges in Mathematics resource some of which included a scope and sequence of lessons and units, opportunities to build centers focused on standards and skills that align well with what is expected of a 4K student by the end of the year.

Overall Plus/Delta: Alignment of Bridges in Mathematics as a Curricular Resource

Questions considered:

- What are the strengths related to what we want students to know and be able to do?
- What are the areas where there are gaps in the resource related to what we want students to know and be able to do?

Strengths

- Good scope and sequence, nicely laid out
- Themes are similar to what we see in k4
- Allows students to explore more during "workplaces"
- Workplaces turn into centers
- Lessons do not take up too much time
- Literature that goes with curriculum (provides titles that go with the theme)
- Having a scope and sequence is very beneficial
- Aligns with what we already have in our curriculum (sorting, patterning, comparing, shapes).
- Subitizing
- Matching sets to a numeral

Areas to Grow

Resources for ELLs

Overall Plus/Delta: Fidelity of Bridges in Mathematics as a Curricular Resource

Question considered:

- What are the time requirements related to the overall expected outcomes related to what we want students to know and be able to do by the end of 4K?
 - Adaptations for short weeks is a positive
 - Provides flexibility with time
 - Built for a 25 minute block (with flexibility)
 - Number corner is built in to the lesson time

4K Math Program Action Plan and Recommendations

The 4K math team and elementary coaches reconvened in the 2021-2022 year, after reviewing the following recommendation from the math review team in May of 2020: "Four-Year-Old Kindergarten needs to have a more clearly defined curriculum and resource materials, which will be easily integrated within their instructional center structure. This should be more researched and defined during the 2021-2022 school year." The following recommendations regarding the elementary educational program were developed by the 4K teachers and math coaches on the Committee and/or WFB Administration:

4K Math Action Plan 2021-2023

Goal: Throughout the 2021-2022 and 2022-2023 school years, the 4k team will be involved and engaged in the development and/or refinement of the principles and methodologies of math for all students in WFB schools within their 4K experience.

and/or refinement of the principles and methodologies of math for all students in WFB schools within their 4K experience.			
Action(s)	Date(s)	Measure(s) of Progress	
The 4K team will complete the curriculum writing process during the 2022-2023 year for implementation in the 2023-2024 year.	Fall 2022- Spring 2023	 Timeline and Plan for curriculum writing process Completed lessons to teach in the 2023-2024 year (UbD framework) Curriculum writers will engage in the Assessment for Learning and Curriculum Writing Class as needed (District) 	
2. The 4K team will engage in professional learning with the selected curricular resource (Bridges in Mathematics). a. Budget implications would include a cost TBD for professional learning for 4K teachers at Cumberland and Richards.	Fall 2022- Spring 2023	Professional learning plan, feedback, and outcomes	
3. The 4K team will provide feedback after piloting lessons for the curriculum implementation in 2023-2024.	2022-2023 school year	Feedback themes and actions used by coaches for continued professional learning.	
4. The 4K team will revise/refine the progress report areas as needed for implementation in the 2023-2024 school year.	2022-2023 school year	Finalized progress report at the conclusion of the 2022-2023 year.	
 5. The 4K team will implement Bridges in Mathematics in the 2023-2024 school year. a. Budget implications would include a cost of \$5874.00 for the purchase of curriculum materials for 4K teachers at Cumberland and Richards. 	2023-2024 school year	Curriculum implementation Teacher feedback on implementation used by coaches for continued professional learning.	