

Monitoring of Board Policy 2020 – Fundamental 5 May 26, 2016

Fundamental 5: Cultivate and foster thinking and process skills such as analytical and critical thinking, cross-discipline thinking, creativity, innovation, collaboration, communication, problem-solving, and information and technology literacy in curriculum design.

This represents the third annual full governance monitoring of Fundamental 5. This administrative report incorporates the Superintendent’s Interpretation of Fundamental 5, approved by the Board on January 26, 2012, and follows the same themes as described in that interpretation. The report highlights both qualitative and quantitative indicators of measurement, using the Mixed Method Assessment.

QUANTITATIVE INDICATORS

Numerous quantitative factors from the Educational Effectiveness Survey (EES) were considered to highlight implementation of Fundamental 5. Significant revisions and additional questions were made to the EES during the 2012-13 and 2013-14 school years. All the questions used as indicators were a result of these revisions and additions.

		SY 11-12	SY 12-13	SY 13-14	SY 14-15	SY 15-16
Theme 1 – Analytical and Critical Thinking, Cross-Discipline Thinking and Problem Solving	% 4 th and 5 th grade students who agree that “I am good at figuring out the best solution to problems I’m facing.”	*	*	79	74	80
	% secondary students who agree that “I am good at figuring out the best solution to problems I’m facing.”	*	*	72	74	77
	% 4 th and 5 th grade students who agree that “I solve problems by first breaking them into smaller steps.”	*	65	73	57	64
	% secondary students who agree that “I solve problems by first breaking them into smaller steps.”	*	58	66	56	58
	% 4 th and 5 th grade student who agree that “When my solution to a problem is not working, I try to figure out what went wrong.”	*	*	87	81	88
	% secondary student who agree that “When my solution to a problem is not working, I try to figure out what went wrong.”	*	*	79	78	81

	% elementary staff who agree that "Students are provided tasks that require higher-level thinking skills."	*	63	64	69	73
	% secondary staff who agree that "Students are provided tasks that require higher-level thinking skills."	*	68	64	66	67
	% of teachers on Comprehensive Evaluation rated proficient or distinguished in Danielson's component 3c "Engaging Student in Learning"	*	*	89	83	NA
Theme 2 – Creativity and Innovation	% 4 th and 5 th grade students who agree "I try to think of many solutions when I have a problem"	*	*	82	77	84
	% secondary students who agree "I try to think of many solutions when I have a problem"	*	*	70	73	80
	% 4 th and 5 th grade students who agree that "I am a creative person."	*	*	92	89	91
	% secondary students who agree that "I am a creative person."	*	*	77	78	78
	% 4 th and 5 th grade students who agree that "I can come up with new ideas."	*	85	93	86	94
	% secondary students who agree that "I can come up with new ideas."	*	79	81	84	85
	% 4 th and 5 th grade students who agree that "I like to imagine new ways to do things."	*	*	87	81	87
	% secondary students who agree that "I like to imagine new ways to do things."	*	*	74	74	78
	% of teachers on Comprehensive Evaluation rated proficient or distinguished in Danielson's component 3e "Demonstrating Flexibility and Responsiveness"	*	*	94	94	NA
Theme 3 – Communication and Collaboration	% 4 th and 5 th grade students who agree that "My teacher(s) help us learn in more ways than just talking in front of class."	*	*	88	83	85
	% secondary students who agree that "My teacher(s) help us learn in more ways than just talking in front of class."	*	*	64	67	66
	% of teachers on Comprehensive Evaluation rated proficient or	*	*	83	74	NA

	distinguished in Danielson's component 3b "Communicating Clearly and Accurately"					
--	--	--	--	--	--	--

* Question not asked during the specified timeframe

NA – Not Available - Data not yet available for current school year

These data show that teachers are working on experiences for students that involve critical thinking, problem solving, creativity, innovations, and communication and collaboration, and teachers are supporting their students with engaging learning environments, clear communication, flexibility, and responsiveness. Of particular note is the increase in the percent of students who agree "I try to think of many solutions when I have a problem" (84% and 80%) and "I am good at figuring out the best solution to problems I'm facing" (80% and 77%).

QUALITATIVE INDICATORS:

The following qualitative data provide snapshots into Fundamental 5 – Develop 21st Century Thinking and Process Skills. Several, but not all, will be highlighted at the May 26, 2016 board meeting.

Theme 1: Analytical and Critical Thinking, Cross-Discipline Thinking and Problem Solving

IP 21 Acres Learning Center experience: In conjunction with their science nutrition unit and social studies focus on Washington state regions and resources, fourth grade students visit 21 Acres Learning Center in Woodinville, WA. While there, the students study the agricultural heritage of our region, learn about sustainable agricultural design and technologies, and explore ways to maximize the beneficial aspects of fresh local produce and farm products. Utilizing the center's commercial kitchen the students learn about the economics of small farms, conservation systems that support them, and how to help their families cook healthier meals. Students plan and prepare a healthy meal, review composting procedures and examine other green principles.

Elementary Interdisciplinary Unit: iPads and science; use of technology to create student ownership of concepts in science. 5th grade teachers at West Mercer have students using the program Green Screen to produce videos to teach and learn about the solar system and flight. Each child is responsible for a particular idea (Saturn, gravity, thrust). The student uses the green screen to create a video about that idea, complete with learning goals. Students vetted each other's videos to check for accuracy. Students then presented to their home class and then to another class.

Covered in this project:

- technology (the big buy-in for students)
- reading for information-both books and internet
- research on the internet of current science sources

- writing (and public speaking) a script
- creating a storyboard to sequence the video
- assessment-in the form of the video, and summative in a quiz for which each student has written a question

Elementary Rigor in Questioning and Task: Teachers have continued to apply their learning from 2014-15 about the Hess Rigor Matrix, and other tools for questioning, to strategically build questions at different levels of complexity and rigor, pushing students' thinking not only about key ideas in a text, but also about an author's craft and the structure of a text, and how they affect meaning. In the professional development for the K-2 and 3-5 *Mondo* English Language Arts (ELA) implementations, teachers engaged in learning and collaboration about ways to use leveled texts with students. Part of that work included considerations of rigor, and how the task surrounding a text can be altered to boost the cognitive demand in one group, while presenting a less demanding task for another group who need more scaffolded support. Teachers have also applied these concepts of rigor to their work in writing, math, and other content area instructional planning.

Elementary and IMS Robotics Clubs: Each year in December, FLL (First Lego League) sponsors a world-wide competition with four components based around a global situation. This year's theme was "Trash Trek Challenge." Teams (4-8th grade) built robots designed to solve situations related to the theme. They researched, interviewed, understood, planned, and proposed a solution to a community's possible problem - which they presented to a committee. They collaborated and presented themselves as a cohesive team throughout the competition, and finally they explained their designs of robotic functions to an engineering committee.

Lakeridge Rocketry Club: The purpose of this club is to actively learn the physics involved in the flight of rockets. Students are tasked individually with the construction of a fully functional rocket. As a group, students design and conduct an experimental research project using our rockets as test vehicles. New for 2016 will be additional activities and demonstrations using Kerbal Space Program as a simulator, as well as small radio-controlled quadcopters to demonstrate physical laws relevant to flight and rocketry.

IMS Computer Programming: All IMS students have multiple opportunities to utilize critical thinking and problem solving strategies through experiences involving computer programming. All 6th grade students are introduced to programming and a series of lessons around basic coding using the LegoEducation Mindstorms curriculum in Science classrooms. This unit culminates with an independent project where students model a "real world" working machine. 6th grade students also learn basic computer software skills and explore concepts of digital citizenship and cybersafety through the required trimester TechBlock course. In addition, students in 7th and 8th grade can explore computer programming in our Video Game Programming elective. For the 2016/17

school year, IMS has renamed the Video Game Programming course to Introduction to Programming in order to try to appeal to both male and female students. Prospective enrollment in this course by female students has increased more than four times. IMS has also offered ancillary programs to students, such as, a Code Academy club, and participated in Code.org's Day of Code for the last several years.

HS Marketing Plan: Students in the MIHS Marketing Class devise, implement, and analyze a full marketing plan for other classes, groups, or vendors for the high school. Student teams within the marketing class select potential "clients" (e.g. the student store, the horticulture class, Bloodworks NW, etc.) and conduct client interviews to identify the needs, wants, product line, customer demographics, and desired outcomes for each client. They then craft a full marketing plan to meet the client's needs including all promotional materials, branding, financing, etc. and present the plan to the client. The client then chooses the plan that best meets their needs and the class implements and monitors the success of the plan for the client. This real-world experience of crafting, implementing, and monitoring a marketing plan provides valuable learning opportunities for students, as well as a necessary service for various school, community and business groups.

HS Volcanic Lava Flow Prediction: After viewing an online video about a volcanic eruption, Grant Weed's math students used critical thinking and problem solving skills to predict when the lava from the eruption would reach a nearby city. Students had to identify the relationship between the lava flow and the distance to determine which mathematical formulas to use and then work collaboratively to solve the problem and predict how long it would take for the lava to reach the city. In this cross-curricular lesson, students also learned about the Pacific Ring of Fire and its proximity to and impact on our region.

Theme 2: Creativity and Innovation

Elementary Museum of Flight: Fifth graders go to the Museum of Flight to participate in a simulation of space travel to Mars. Students must problem-solve their way to the red planet by accomplishing specific missions. This activity includes prior classroom preparation in which students are divided into teams focused on Communications, Data, Navigation, Medical, Probe, and Life Support. Incorporating problem solving, decision making, communication, writing, math, and reading comprehension skills, students create a mission plan that is tested for effectiveness during the simulation.

Elementary Destination Imagination: This extracurricular program takes place after school for interested students at elementary, middle, and high school levels. The purpose of the program is to "inspire and equip students to become the next generation of innovators and leaders." The program presents students with a challenge to tackle over several weeks. With support from coaches, students learn to imagine and innovate solutions to their challenges. They work collaboratively with their teams to create,

develop, and practice a solution to the challenge. Following that they compete in a local tournament, and, if successful, advance through tournament levels to the Global Finals. This year, 16 teams took part in the Regional Tournament. Six of these teams moved on to the state competition. Five of those teams placed 1st or 2nd at the state competition, and three of the teams will move on to the Global Finals.

7th Grade Legacy Project: 7th grades students were challenged to develop a solution to an issue impacting a community and/or culture to which they are connected and that falls within their own passionate interest areas potentially beginning their own legacy even at this young age. A few of the topics explored included issues such as using drones to improve access to vaccinations, creating innovative futuristic prosthetics for amputees, and developing online forums to give young voices a platform to express opinions about significant issues. Students were expected to become deeply familiar with the details of the issue so that solutions were founded on accurate, detailed understanding. For additional understanding, students conducted interviews with an expert on the chosen topic. When it came time to develop a solution, students were challenged to synthesize their own ideas with other solutions proposed by published writers and thinkers building a larger plausible paradigm for their outside-the-box solutions. This project provided students with opportunity to apply skills developed side-by-side in Language Arts and Social Studies (and for many, skills from Science and Math as well). Students were challenged to consider their own roles thus defining their legacy. Actual products ranged from published websites, awareness campaigns, and initiatives to government leaders, innovative prototypes or big ideas for prototype development. The Legacy Project was featured at this year's *Breakfast of Champions* fundraiser.

8th Grade Independent Research Project: The 8th grade science Independent Research Project (IRP) asks for a high level of creative thinking as students determine a question that is both testable and personally relevant. Students experience authentic adversity as most questions are initially rejected (not challenging enough, student already know the answer, etc.). The next layer of adversity comes as students collect data. Unlike most in-class labs, there is no procedure or scripted data table to use. Students innovate methods in the "field" (often literally the lacrosse field) and analyze, organize, and present their data.

The IRP is a practical application of research, writing, presentation, and investigation skills. Struggling learners can fully engage in the process through the selection of a simple question. Highly Capable students (whether in the program or a mainstream class) can be challenged with the selection of a more rigorous question and the encouragement to publish their results in the online Google Science Fair. Many students report that it is their favorite assignment of the year because it is "their" work and their pride and ownership is evident in the final product.

HS "Travel as a Political Act" Blog: Why should someone travel as a political act? How can travel change me? These were the essential questions that guided students

through a unit in Alex Baker's International Studies class. Students' culminating project for the unit was to create a fictitious, first person narrative (blog) that applied a philosophical approach to culture and conflict in the Middle East and North Africa. Using Rick Steves' blog as an example, within their own blogs students embedded videos, links, and images that demonstrated how travel impacts the traveler and the location being visited.

Theme 3: Communication and Collaboration

Math Talk in K-5 Mathematics Instruction: Math Talk is a research-based structure used in every classroom to support students in developing their ability to share their strategies for problem solving, describe and justify their thinking, and engage in student-to-student discourse about mathematics. In Math Talk, teachers provide a routine in which students solve mathematics problems, individually, in partners, or in small groups, and share their solutions and solution strategies with the class. Other students listen, ask clarifying questions, and provide feedback, with scaffolding and support from the teacher as needed. Teachers can capitalize on errors and creative solution paths to address misconceptions and enhance everyone's learning. We intend to provide on-going coaching and supports for our teachers to help them increase the strategic use of this structure to support better mathematical discourse.

Elementary Literacy Block

Writer's Workshop. The instructional strategies and practices in Writer's Workshop develop students' oral and written communication and collaboration skills. The architecture of the daily Writer's Workshop Mini-lesson always includes a section called "Active Engagement." In this portion of the lesson, students are often encouraged to discuss with a partner their ideas about their writing or the lesson target of the day. Often, students work collaboratively with writing partners to help one another develop a text or to analyze and revise a collaborative text. Students develop their oral and written communication skills while thinking critically about the craft and structure of writing.

Mondo's Bookshop Common Core: The instructional practices and methodologies that are contained within *Mondo's Bookshop Common Core* have aided in students becoming better collaborators and communicators both with other students and teachers. The whole group reading sessions include Read-Alouds and Shared Reading. Read-Alouds are intended to allow students to develop and practice their listening skills, as they listen to a text, answer questions, and discuss meaning. Shared Reading allows students to have the text visible, but still encourages thoughtful discourse that involves deep analytical thinking through text-dependent questions. Students are asked to turn and talk with their peers as well as share with the whole class their thinking. The oral language component of *Mondo's Bookshop Common Core* assesses and fosters oral language in students. Oral language is an important aspect of learning to

read, as it impacts both reading comprehension and writing composition. Throughout the entirety of the program, one can see connections to speaking and listening that the Common Core demands. Ultimately, this encourages the use of strong academic language whenever students are discussing texts.

IMS Debate Club: Based on the interest of students, Islander implemented an after-school debate club for the 2015-16 school year. This club, coached by IMS teacher Alexis Guerriero, brings together students after school who may, or may not, have the opportunity to take the formal IMS Debate class during the school day. In the club, students learn the finer points of formal debating and are provided formal and informal opportunities to practice their craft. The group is attempting to schedule an evening event for formal debates and an opportunity to share their hard work with their families and peers.

HS #GRATTHAT Campaign: Students in Bryan Wanzer's Business Communications Class are currently implementing a social media marketing campaign via their Twitter handle: @GRATTHAT. In student-led teams students work to create, plan, implement, and analyze their campaign. Using *analytics* they research and reflect on their reach to the targeted audience. Students are learning how to spread their message and what it takes to effectively engage in social media beyond their personal social media forums. Their goal as stated on their Twitter page is: "To spread gratitude across the world."

HS Career Journeys: This spring all MIHS students participated in an engaging and meaningful career exploration process over the course of BRIDGES lessons to help them define and connect their passions, talents, and values with real-world opportunities and professionals. The process culminated in a two-hour speaker/workshop event with over 55 speakers/professionals on April 29 during the school day for all students. Students were provided with a comprehensive "Take Charge" career guide that provided students with valuable resources and references throughout their "Career Journey" including: career vision statement, resume building, networking tips, interview tips, and speaker contact information.

Theme 4: Information and Technology Literacy in Curriculum Design

K-12 Digital Citizenship: In acknowledging both Best Practice and Federal Mandates the Mercer Island School District provides direct instruction annually for all students K-12 on Digital Citizenship. At the elementary level, topics range from safe websites and simple passwords for young students to protection of personal information, online safety and an introduction to cyber-bullying for older students. In 8th through 12th grades these concepts grow in complexity and depth covering social media, etiquette, digital footprint and online presence as well as advanced search techniques and critical thinking for online research. In addition to succinct direct instruction these topics are often imbedded in classroom discussion integrated into the curriculum and student projects.

K-2 iPads: Students in our K-2 classrooms have access to a set of seven (7) iPads in each room. This allows for teachers to conduct a hands-on small group lesson or rotate students through independent stations by table groups or ability levels. Teachers also have the option to borrow from a neighboring class to acquire 14 iPads for a 1:2 model or borrow from all classes in that grade level for a 1:1 model when appropriate. All available apps in the separate K, 1 and 2 app catalogs have been aligned to the Common Core and are screened for content and age appropriateness.

4th and 5th Grade 1-1 iPads: All Mercer Island 4th and 5th grade classrooms participate in a 1:1 iPad program. With a dedicated iPad for each student, teachers are able to engage their classes on a new level. Particularly powerful was the ability for students to have instant timely access to online research as opposed to previous experience with shared laptops. The most commonly installed apps are Word, Powerpoint and Garageband. With Word and Powerpoint, students have access to OneDrive which allows them to continue working on a project at home as well as save their work so they could access the changes on their school iPad. Some new ways that classrooms in the elementary schools are also using iPads in innovative ways: students are using stop motion video to capture plant growth, iMovie for book summaries, access and extension tools for MONDO with Notability for shared passages, digital access to guided readers, a wide variety of independent novels with myON, and several word study aligned apps.

6th – 12th Grade 1-1 iPad Program: With a focus on personalized learning from the MISD 20/20 vision, the 1:1 iPad initiative continues so all students in grades 6-12 have an iPad. Placing an iPad in the hands of each student challenged students and teachers alike to adjust to a new learning experience or expand on successes from the past year. For students, the iPad not only provided them an organizational tool, but it also opened up new opportunities for higher level thinking, communication, and an array of ways to show their understanding of the skills and content they were learning. Teachers in 6th – 12th grade benefited from the accessibility of information and the formative data they gathered from the students to help them better respond to the needs of their students. From Notability, Pic Collage, Socrative, Educreations, to creating iMovie projects with green screen features, the students and teachers used the iPads to enhance their learning.

IMS Schoology: Islander is in its fifth year of utilizing Schoology as an interface between the classroom and home. Schoology is similar to Facebook in its layout, usability, and two-way communication and collaboration opportunities. It is different than Facebook in that it is a closed community. Teachers post assignments, upload documents, use it for on-line discussions and assessments. Students access homework that all downloads onto a calendar. This allows them to go to one place and see all of their work from all of their classes. Educators are thrilled with the way students use Schoology for communication and collaboration. When they have a question they can post it to a classroom wall and both the students and the teacher can respond and dialogue about that question. Students can use it to work together from home. Our

teachers have also found incredible ways to connect Schoology with the 1:1 iPad implementation. Students download work from Schoology and also Dropbox assignments back to Schoology both within the classroom and from home.

RECOMMENDATION:

The superintendent recommends the board achieve a strong majority or unanimous decision on the monitoring of Fundamental 5. To that end, he further recommends that should additional data and/or indicators be requested, such additional information or identification of new indicators be a board decision and not a request of an individual or two. In other words, three or more of you need to determine what additional information/indicators, if any, are needed.