



**Noblesville Schools  
PreK-12 Math Program Review**

**Report to the Board of School Trustees**

**2021-22**

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## Math Program Review Overview 2021-22

<b>August 2021</b>	<p><i>Form PK-12 committee (teachers, administrators, parents, school board members)</i></p> <ul style="list-style-type: none"> <li>-Notify committee of schedule, times, locations, and expectations</li> </ul>
<b>September 2021</b>	<p><i>Develop Initial Shared Beliefs and Prepare for Collaboration</i></p> <ul style="list-style-type: none"> <li>-Review purpose, goals, and actions of a program review</li> <li>-Draft shared beliefs about mathematics as a PK-12 committee: “What do we, as a committee, believe about sound math instruction?”</li> <li>-Read a variety of texts for discussion and shared learning, including Indiana Process Standards for Mathematics and articles from the National Council of Teachers of Mathematics (NCTM)</li> <li>-Begin unpacking the Indiana Process Standards for Mathematics for student and teacher actions</li> </ul>
<b>October 2021</b>	<p><i>Analyze Process Standards and District Performance Data</i></p> <ul style="list-style-type: none"> <li>-Revisit and revise shared beliefs about mathematics</li> <li>-Discussion based on selected shared reading texts</li> <li>-Unpack Indiana Process Standards for Mathematics for student and teacher actions</li> <li>-Review best-practices for data analysis</li> <li>-Analyze district growth and performance data: NWEA (grades K-8), ILEARN (grades 3-8), ISTEP+ (grade 10)</li> </ul>
<b>November 2021</b>	<p><i>Organize into Study Teams</i></p> <ul style="list-style-type: none"> <li>-Unpack Indiana Process Standards for Mathematics for student and teacher actions</li> <li>-Review data analysis summary</li> <li>-Establish study teams to areas of focus to support a comprehensive snapshot of a program review (assessment, instruction, school culture, and professional environment)</li> </ul>
<b>December 2021</b>	<p><i>Collaborate with Study Teams</i></p> <ul style="list-style-type: none"> <li>-Study teams formulate questions for program review and work on stakeholder surveys (student, staff, parent/guardian)</li> <li>-Discussion of semester one process and progress with outside consultants Ryan Flessner and Mike Steele</li> </ul>
<b>January 2022</b>	<p><i>Prepare for Classroom Learning Walks</i></p> <ul style="list-style-type: none"> <li>-Finalize learning walk rubric and share with outside consultants and committee members for review</li> <li>-Curriculum Coordinators try out learning walk rubric in sample classrooms (PK-12) in collaboration with outside consultants</li> <li>-Create schedule for learning walks and communicate purpose and schedule with teachers</li> <li>-Classroom learning walks (PK-12) - <i>Postponed due to COVID-19 Protocols</i></li> </ul>

<b>February 2022</b>	<i>Gather Feedback and Discuss Additional Artifacts to Support Program Review</i> -Revisit and revise shared beliefs about mathematics -Continue collaboration in study teams -Provide feedback on artifacts for program review (learning walks, surveys, focus groups)
<b>March 2022</b>	<i>Conduct and Synthesize Classroom Learning Walks</i> -Visit classrooms PK-12, summarize and analyze key findings into synthesis documents -Revisit and revise shared beliefs about mathematics -Review and provide feedback on learning walk and most recent student performance data -Attend NCTM's Regional Conference in Indianapolis for further learning to inform recommendations -Review, finalize, and distribute stakeholder surveys (staff, parent/guardian) -Conduct parent committee member interviews
<b>April 2022</b>	<i>Gather and Analyze Stakeholder Feedback (Student, Staff, Parent/Guardian)</i> -Conduct PK-5 student focus group interviews -Distribute grades 6-12 student survey -Provide work session for committee members to gather feedback on survey data -Synthesize all data and feedback, evaluate overall findings, compose recommendations with guidance from outside consultants
<b>May 2022</b>	<i>Present Program Review Recommendations</i> -Draft, edit, finalize committee report -Prepare presentation and present to Board of School Trustees

## **Math Program Review Comprehensive Snapshot of Learning**

A program review is a study of current instruction around a specific content area. The program review provides an opportunity to gather and analyze evidence of student learning that is centered on research and sound practices of instruction. This process culminates in year one with recommendations for action and in year two with potential revisions to curriculum and curriculum materials.

The program review is formed on the foundation of a professional learning community. A PLC is an ongoing process in which educators work collaboratively in recurring cycles of collective inquiry and action research to achieve better results for the students they serve. To ensure that all students in the district learn at high levels supports the larger purpose of the program review. This is done through a collaborative and collective effort and driven through actions formed on the evidence of student learning.

The last program review of mathematics in Noblesville Schools occurred in 2015. The following report outlines a systematic review that is aligned with the vision and mission of the district and provides pathways for action based upon the committee's findings and recommendations.

### *PLC Foundation Principle #1: A Collaborative Culture*

#### **Shared Math Belief Statements**

The math program review committee, composed of various stakeholders, first sought to form and establish a strong foundation around what they currently believed about sound math instruction PK-12. The committee reflected on practices needed for success for all learners both within and beyond schooling in Noblesville Schools. Through a collaborative process, each committee member had ownership and a voice in the creation of math belief statements formed around the guiding question of, "What do we, as a math program review committee, believe about sound math instruction?". This process highlighted the various beliefs uncovered from each member, yet through group affinity mapping and ongoing revisions throughout the program review, provided pathways for reflection of practice and constant evolvment of thinking as new learning, reading, and research was acquired. These math belief statements evolved throughout the course of the program review and were continually referred to for alignment and noticeable trends when analyzing various data sets and other evidence (see Appendix A).

#### **Shared Math Experiences**

Building collective efficacy surrounding the math program review involved honoring the previous math experiences that were brought to the committee. Committee members reflected on previous math experiences (both success and challenges) and what those experiences might tell us about ways of teaching and learning math. This provided open discussion around high quality teaching and learning, teachers and staff who promoted a positive learning environment and math identity, and the transfer of mathematics into the real world experiences of today. These conversations allowed committee members

to consider what they would want all Noblesville Schools students to say about their math experiences upon graduation from high school.

### **Study Teams**

To allow for the most comprehensive snapshot of current mathematics programming in Noblesville Schools, after establishing belief statements and engaging in a variety of shared learning experiences, committee members formed study teams around areas of specific focus. Committee members were asked for feedback on areas of desired continued learning and research and were then formed into study teams by curriculum coordinators in one of the following areas: Instruction, Assessment and Evaluation, Professional Environment, and School Climate. The purpose of these study teams was to engage in ongoing reading and research through an inquiry lens to further inform learning of the committee as well as specific areas of data collection and creation of artifacts to support the program review process.

### *PLC Foundation Principle #2: A Focus on Learning*

### **Reading and Discussion of the Research**

It was important to begin the work with common language and goals. At the recommendation of our outside consultants Ryan Flessner and Mike Steele, the committee read several key texts to launch discussion (*see bibliography of reviewed research*). Most meetings began with discussion of a reading in order to either grow the committee's common goals and beliefs or to grow our understanding of challenges specific to mathematics program improvement.

### **Process Standards for Mathematics**

Understanding the foundation of our Indiana Academic Standards and Process Standards for Mathematics supported the ongoing program review's readings, research, and data analysis. Standards are statements of what students should know, understand, and be able to do at grade level. These standards are designed with intended learning progressions and provide a foundation to curriculum materials currently used within the district. The process standards demonstrate ways in which students should develop conceptual understanding of mathematical content, and the ways in which students should synthesize and apply mathematical skills. Math program review committee members spent time at each work session unpacking process standards to guide further review on impact on the teaching and learning of mathematics in the district. Committee members discussed what learning would be visible if the process standard was being practiced through the lens of the student and teacher.

### **Professional Learning Opportunities**

On March 17-18, a number of Noblesville educators, administrators, and instructional coaches from the math program review committee attended the National Council of Teachers of Mathematics (NCTM) regional conference in Indianapolis. This conference provided two days of intensive learning and reflecting across topics such as family and community engagement in mathematics, strategies to reach all students, and up-to-date evidence-based practices for teaching math K-12. Learning from this conference

influenced discussion during math program review meetings and ultimately the final recommendations.

### *PLC Foundation Principle #3: A Results Orientation*

#### **Data Review**

Members reviewed different sources of student growth and performance data: ILEARN, ISTEP+, and our local benchmark, NWEA's MAP assessment. Data sets were disaggregated by demographics and reviewed by the team for areas of strength, opportunity, and next steps.

#### **Classroom Learning Walks**

Over 90 classrooms representative of PK-12 across all ten buildings in Noblesville Schools were visited as a part of the program review. The committee formed two teams of committee members including elementary, secondary, and school board representation for these learning walks to gather data aligned to the Indiana Process Standards for Mathematics. Findings will be discussed later in the report.

#### **Stakeholder Feedback**

Students, staff, and parents/guardians were surveyed as a part of this program review to gain a wide snapshot of stakeholder experiences with the math programming in Noblesville Schools PK-12. A representative sample of K-5 elementary students were interviewed in focus groups, and 6-12 students, staff, and PK-12 parents/guardians were asked to complete an online survey. All surveys were anonymous and optional, and translated versions were available to students and families. In all, 4,000 students, 110 staff members, and 471 parents/guardians responded (see Appendices B-D)

#### **Benchmark and Performance Data**

Several performance measures were analyzed using a common protocol. Below is a summary of findings.

#### **NWEA's Measure of Academic Progress (MAP)**

MAP is administered to students in grades K-8 as a local measure of student achievement. It is important to note that this assessment provides helpful information not just on a student's current level of performance but on how much they have grown in their own learning from one testing window to the next. The district reviews a student's overall score in relation to their grade level peers (average score) as well as whether they met or exceeded an individual growth goal set by the testing program. A review of the most recent data from MAP (Winter 2022) was considered during this program review.

#### **Strengths:**

- Districtwide percentage of students at or above average math growth was the highest in three years, including pre-pandemic. This trend occurred for both elementary and middle school students.
- The percentage of students at or above average math growth was the highest in



three years including pre-pandemic. This trend occurred for both elementary and middle school students.

- The percentage of students at or above average math achievement was higher than last winter but lower than pre-pandemic, and still above typical. This trend occurred in elementary.

#### **Areas of Opportunity:**

- Three grade-levels (K,2,8) showed high achievement/low growth in math from fall 2021 to winter 2022.
- The percentage of middle school students at or above average math achievement was the lowest in three years overall, but still above typical.
- The percentage of Asian, Black/African American, and Hispanic middle school students at or above average math achievement was the lowest in three years.

#### **ISTEP+ (Grade 10)**

It is important to note that ISTEP+ is no longer the accountability measure for student achievement in grade 10; during the 2021-2022 school year, Indiana transitioned to the SAT as the high stakes assessment for accountability but the data is not yet available for review.

#### **Strengths:**

- Noblesville is consistently well above the state average for overall proficiency: Pass rate in 2019 was 56.3% and 53.3% in 2021 (compared to state pass rates of 35.3% in 2019 and 37.1% in 2021).
- Special Education pass rates for math are above the state average.
- English Language Learner pass rates for math are above the state average.
- Free/Reduced Lunch student pass rates are above the state average.

#### **Areas of Opportunity:**

- Black and Hispanic students had the lowest rate of proficiency, with 19.2% and 22.8%
- Proficiency rates have decreased over time.
- Further explore the relationship between a student's performance on ISTEP+ and their current course enrollment.

#### **ILEARN (Grades 3-8)**

It should be noted that there was significant statewide impact on ILEARN as a result of COVID-19. Dr. Katie Jenner released in July of 2021, "these [ILEARN ELA and Math]

results confirm what we expected, and what we know -- student learning was significantly impacted by COVID-19.” An Academic Impact Study found that statewide students in elementary and middle school experienced significant academic impacts in mathematics. As a result, 2021 ILEARN data is not comparable to the previous 2019 ILEARN data; rather should be used to show impact. This data is also not comparable to the previous assessment of ISTEP+ used prior to ILEARN due to completely different platforms and measures.

### **Strengths:**

- 50.1% of Noblesville students in grades 3-8 were proficient on ILEARN math, which is higher than the state proficiency of 36.9%
- Above proficiency scores were above the state average for all three middle school grade levels. In sixth grade, 16.4% of students scored above proficiency; in 7th grade, 19.6% of students scored above proficiency; and in 8th grade, 19.2% of students scored *above proficiency*.
- High numbers of students (27.3%, 29.1%, and 26.7%, respectively, 6-8) were *approaching proficiency*, indicating that their levels of learning are closer than may be expected by simply looking at overall pass/fail rates.

### **Areas of Opportunity**

- Grade 6 students had the overall lowest level of proficiency across the district, with 33% of students passing. While percentages in 7th grade were higher at 46.5%, in 8th grade, 39.9% of students passed. Overall, proficiency levels in mathematics of our 6-8 grade students are an area where focus is needed.
- While all of Noblesville’s subgroups performed above state averages, there is still a “gap” between the general population and many of our subgroups (free and reduced lunch, English Language Learners, Hispanic, Black/African American students).

## **Synthesis of Stakeholder Feedback**

### **K-5 Student Focus Group Summary**

A representative sample of elementary students K-5 engaged in focus groups to gather student feedback and reflections around the teaching and learning of mathematics. Students were asked either individually or in small groups of 3-5 students to provide verbal feedback on various questions. These questions were shared with families for advance preview and were provided a student opt-out option if deemed. Student focus groups occurred in grades K, 1, 3, and 5 and were located at four out of our seven elementary schools (two Title I buildings and two non-Title I buildings). Overall strengths include students having a positive math identity that is supported by caring and supportive teachers and staff. Conditions are created for students to feel safe to take risks, ask questions, and collaborate within the learning environment. Students and

teachers capitalize on the need to employ the use of multiple strategies and resources to support the solving of problems. Areas of opportunity include continuing to promote a classroom environment where all students feel seen, valued, and heard for their mathematical thinking and knowledge. Another area of opportunity is supporting teachers and staff in designing learning experiences for students that are relevant and connected to real world experiences.

### **Strengths:**

- Teachers and staff promote a positive math identity and risk taking yet safe environment (MB 2 and 8)\*.
- Teachers and staff provide opportunities for collaboration, discussion, and questioning (MB 3).
- Teachers provide ample opportunities to share math thinking with peers in a variety of formats (MB 4).
- Different strategies and pathways for thinking are honored and recognized (MB 5).
- Students have access to various manipulatives and tools to support their learning in a fun and engaging way (MB 9).
- Students recognize and employ multiple strategies when approaching a problem to solve.
- Students have a positive response to mathematics that results in a positive math identity and approach to learning.
- There is some evidence of relevancy and real world connection to learning experiences (MB 10).

*\*Note: math belief statements that connect are listed next to statements as MB*

### **Areas of Opportunity:**

- Continued emphasis on real world connection, relevance, and transfer into the world outside of the classroom.
- Opportunities to connect curricular resources/content to relevant real world learning experiences for students.
- Continue to establish a learning environment where all students feel seen, valued, and heard to feel comfort in sharing math learning/thinking with all peers.

### **6-12 Student Survey Summary**

Over 4,000 students from 6-12 grade levels and courses took the student feedback survey. Students were very complimentary of their teachers, with *teacher helpfulness* being the most common positive mention in open-ended responses. One student noted, "I have never had a teacher who didn't genuinely want to help me and see me succeed

in their course.” Many students also noted that a key factor in their level of comfort in the classroom is a teacher who makes them feel comfortable: “I like how they don’t make you feel embarrassed about how much you know or don’t know.” Students also noted the helpfulness of group work and collaboration for their learning, and many students acknowledged they prefer a blend of technology and paper/pencil rather than always using an iPad for learning. Students also identified the need for time during class to practice with the teacher rather than working on new problems for homework. Students frequently noted that math is more interesting and relevant when it includes hands-on learning and real-world application. Many areas of opportunity emerged in the open-response as well. Students shared that anxiety around math makes it difficult to ask and answer questions during class, especially when the teacher calls on them randomly. Students frequently shared that instructional pacing is too fast and that instruction focuses more on surface-level content than deeper application and understanding. One representative comment: “When I need help, the teacher just does the problem for me really fast and expects me to know how to do it right away. I would like for some teachers to explain the steps slower.” Students also shared that assessment retakes are important for them, they do not find video instruction helpful, and that homework can be overwhelming in both amount and in content. Finally, students shared that they would like scheduling to be more clearly explained.

### **Strengths:**

- Engaging and helpful teachers, games and incentives, fun classroom environments, Academic Lab (NHS) and other time to get help during the school day, student collaboration and talk.
- A slight majority of students like or love math.
- A majority of students say they feel comfortable talking about math with their teacher or peers.

### **Areas of Opportunity:**

- More application needed to “real world” math and careers.
- Slower pacing is needed for students to understand the material at a deeper level.
- Revisit our learning goals: do goals match the depth of knowledge required by the standard?
- As the learning of mathematics is ever-evolving, a variety of teaching methods is needed.
- More time for collaboration and group discussion in classrooms is needed.
- Varying methods of asking students to answer questions (in particular, rather than randomly calling on students).
- Opportunities to grow math identity and interest, as just under half of our 6-12 students appear to have neutral or negative perceptions about math.

- Consider the importance of classroom environment and rapport with teacher on a student's comfort level in math.

### **PK-5 Teacher and Staff Surveys**

Over 70 survey responses were collected from elementary teachers and staff. These responses were representative of primary and intermediate general education teachers, special education teachers, certified staff (instructional coaches, learning specialists, EL collaborative teachers), classified staff, and administrators. Strengths included high quality teachers and staff as well as having access to support and ongoing development through support staff such as instructional coaches, math lead teachers, and learning specialists. Many highlighted key areas of math instruction taking place that all students should have access to in their learning environment including the workshop model, multiple tools and resources, solving problems with multiple strategies, and access to relevant, realistic, and real world learning experiences. There was also pro and con feedback provided on the current primary curriculum material of Everyday Math with emphasis on ways of supporting students who may need additional time and support with instruction. Areas of opportunity emphasized continued need for work within the PLC process to support vertical articulation, identify and unpack essential standards, and provide ways to have consistency in pacing and standard alignment with current curriculum materials across the district. Fluency practices, problem solving, and real world relevance was also highlighted as an area of opportunity. There was also a high need expressed for more professional development opportunities in math within the realm of balanced math, math workshop, and sound practices of math instruction.

#### **Strengths:**

- Students have access to high quality teachers and staff.
- Many students engage in math experiences that use multiple tools and strategies and are relevant, realistic, and real world.
- Teachers and staff have access to support staff who can support job embedded professional learning opportunities.
- The current curriculum material provides a variety of learning experiences for students.

#### **Areas of Opportunity:**

- Vertical articulation of standards PK-5.
- Essential standards of math instruction that are unpacked and vertically aligned.
- Consistency in pacing and standard alignment with current curriculum material across elementary buildings.
- Further evaluation of current curriculum materials in alignment with current needs of the district.
- Further knowledge and support surrounding fluency practices, problem solving,

and relevant, realistic real world application.

- Professional learning to continue to develop high quality teachers and staff.

### **6-12 Staff Surveys**

16 high school teachers completed the staff survey and 22 middle school teachers completed the staff survey. No middle/high school administrators completed the survey. Common positive responses include PLC collaboration, course varieties, and in some responses, teachers that are open to new instructional strategies. Staff acknowledged the need for vertical alignment, integration of the process standards into lessons and units, and deeper application instead of “rote memorization,” as one respondent put it. Some staff said that they really like Big Ideas as a primary curricular resource, and some others said they found it lacking in deeper-level content.

#### **Strengths:**

- Staff collaboration and willingness to try new techniques
- Variety of courses for students
- Teachers who care about both their colleagues and all students

#### **Areas of Opportunity:**

- Time for consistent professional development on research-based teaching methods
- Teachers noted the need for vertical alignment
- Secondary teachers in particular noted that they do not always feel prepared to plan instruction with student collaboration
- Time for teachers to engage in vertical alignment discussion
- More support for students entering Algebra I, especially regarding struggling students.
- A need to revisit Big Ideas as a primary resource, making sure it is vetted alongside other possible resources with teacher discussion and review
- For special education, more work is needed to align options for students

### **PreK-12 Parent and Guardian Surveys**

A Google Form survey was provided in both English and Spanish and 477 parents/guardians responded. The responses showed a mix of all grade levels PK-12, with a slight emphasis on parents of elementary school students. Parents shared appreciation for their child’s teachers and appreciation for being asked about their opinions and perspectives.

**Strengths:**

*The majority of parents/guardians feel...*

- there is math instruction on a variety of topics/concepts across a school year.
- their child/children are within a proper placement to receive math instruction most aligned to their individual needs
- they have a very strong awareness of how their child/children are performing in math.

**Areas of Opportunity:**

*The majority of parents/guardians feel...*

- that real-life applications of mathematics is the least focused on in Noblesville Schools.
- stronger communications and opportunities are needed for what current math instruction and practices are like in the classroom (as compared to previous teaching practices) in Noblesville Schools and how these practices foster deeper understanding of content.
- stronger communications are needed for pathways of support available for students needing additional assistance with math instruction.

**Synthesis of Learning Walks**

Program reviews typically include short classroom visits, called “learning walks” in this report. The rubric used for learning walks was based on the unpacked Indiana Process Standards for Mathematics. Teams composed of staff, Board members, and outside consultants completed learning walks in all ten schools and in over 90 classrooms PK-12. All members then discussed learning walks in March, noticing celebrations and challenges as well as identifying patterns across classrooms and drafting possible next steps as a result of discussion. While the committee would ideally have included more teams in this process, an increase in Covid numbers/decrease in substitute teacher access in January and early February required the scaling back of the number of participating teachers.

**PK-5 Summary****Strengths:**

- Students and teachers focus on multiple strategies and solutions for solving.
- Engaging and supportive teachers and staff are evident throughout the district.
- Flexibility in thinking is observed from students and supported by teachers and staff.
- Students are provided ongoing opportunities for collaboration through sharing, feedback, and reflection.

- Learning environment conditions are established for risk taking and vulnerability.
- Evidence of using curriculum material and additional supplemental curriculum materials to support student learning.

**Areas of Opportunity:**

- Identification of essential standards and learning targets in a vertical manner.
- Further development in student conceptual understanding and further depth and thinking in learning.
- Differentiation practices to support all student needs while grounded in accessible, essential, and consistent learning experiences.
- Real life application, in relation to relevant and realistic learning opportunities for students.
- Consistency with fact fluency practices across the district.
- Establishment of stronger pathways of providing and receiving student feedback.
- Support of productive struggle in the classroom.

**6-12 Summary**

**Strengths:**

- Math teachers collaborate on pacing and curriculum as a grade level, evidenced by common objectives and areas of focus from room to room.
- Some evidence of deep application, e.g. testing Pi with hands-on measurement.
- Visuals and models are used in many classrooms: 3d shapes to explore Geometry and measurement; multiple representations available during the graphing; students sketching and labeling in Geometry; using business profits as a way to apply the math in Algebra.
- Positive classroom community and rapport exists between teacher and students; teachers have calm, friendly ways of talking to students.
- The majority of students appear comfortable asking questions and working with peers.
- Students are focused with the math tasks presented to them.

**Areas of Opportunity:**

- There is more focus on errors than on asset-based analysis of assessment.
- There is more reliance on traditional methods of instruction; for example, teacher



lectures while students follow along and take notes.

- Students answer questions that are often surface-level.
- Powerful instructional methods and lesson design are inconsistent in degree and practice across grade levels and course levels.

### **Overall Findings PK-12**

Based on all data collected through the comprehensive snapshot of the math program review process, the overall committee findings may be found below.

#### **Strengths**

- PLC practices are evident in terms of teacher planning: clear evidence of teacher collaboration across grade levels, both in unit design and in what resources are used to plan and build lessons.
- Most PK-5 classrooms include a balance of fluency practice, procedure, and conceptual understanding.
- Students hold very positive perceptions about their teachers PK-12 and toward the levels of support received daily for learning.
- Students notice and appreciate when teachers and staff plan hands-on lessons that allow them to experience deeper-level thinking; when teachers and staff check to make sure that students understand content before moving on; and when teachers and staff spend time to build a positive, welcoming classroom environment where mistakes are valued and embraced.
- A strong group of core math lead teachers and instructional coaches K-5 has progressed in their mathematical practices over time with support from Ryan and Courtney Flessner, and the impact of that ongoing work is evident across elementary buildings.
- The high school has worked to address challenges common to students in Algebra I, resulting in a new Algebra Every Day class that will take place starting in the 2022-2023 school year.
- There is consistent PK-12 use of visual models and opportunities for drawing, labeling, and sketching.

#### **Areas of Opportunity**

- Teachers and staff have mixed perceptions about their current adopted core curriculum materials in mathematics (Everyday Math K-5 and Big Ideas Middle/High) which results in inconsistent usage of core curricular materials.
- Content and level of expectation for learning is inconsistent from grade-to-grade and does not always reflect the expected student outcomes from the Indiana Academic Standards as they are written.

- Not all teachers and staff have job-embedded opportunities for professional growth and learning, yet there is a need expressed for increased opportunities in mathematical practices in feedback from staff.
- Parent understanding and awareness of mathematics programming (e.g. reasons behind the approaches used for mathematics instruction; how and which sequences their child is placed into mathematics classes; how to find resources for intervention or enrichment) is inconsistent and parents/guardians conveyed confusion about the various ways their child learns mathematics.
- Instructional practices and questioning strategies/question prompts are more focused on coverage than deep understanding.
- Data continues to indicate low achievement levels for EL students, Hispanic, Black/African American students, and free/reduced lunch enrollment students.

### **Recommendations**

As a result of the math program review committee's systematic process, the following recommendations provide areas of celebration as well as continued areas of action to further strengthen mathematics programming in Noblesville Schools PK-12. These recommendations have been formed around the four essential questions of a professional learning community (PLC) with accompanying actions and proposed timeline of action(s). Directly below is a bulleted list of the recommendations, and then below, the recommendations are organized alongside key actions and timelines.

- Design a sequence of standards unpacking and alignment. Each grade level identifies common, district-wide essential standards and unpacks those essential standards into learning targets with description of proficiency.
- Create and revise assessments as aligned to essential standards.
- Provide teachers and staff frequent, job-embedded opportunities to practice the mathematics they are teaching and reflect upon implications for their own instructional practices.
- Invest in teacher leaders to support growth in the teaching and learning of mathematics at the building and district level.
- Develop a deep understanding of mathematical concepts and knowledge base to assist in decision making about mathematical programming.
- Ensure all teachers and staff have the tools needed to support the learning needs of all students.
- Engage in ongoing research and communications with meeting the diverse learning needs of students through the variety of pathways in mathematics in Noblesville Schools.

- Increase family communications in different forms (for example, parent/family nights, videos) for resources available to their child within and outside the school day for extra support.

### Recommendations with Actions

*PLC Question 1: What do we want all students to know and be able to do?*

<b>Recommendation: Design a sequence of standards unpacking and alignment. Each grade level identifies common, district-wide essential standards and unpacks those essential standards into learning targets with description of proficiency.</b>	
<b>PK-12</b>	
Action(s)	Engage in the identification of essential standards (Indiana Academic Standards and Math Process Standards) and unpack into learning targets.  Support the work of mathematics with collaborative teams at building level as part of the PLC process.
Timeline of Action(s)	Starting fall 2022-23 school year
<b>Recommendation: Provide teachers and staff frequent, job-embedded opportunities to practice the mathematics they are teaching and reflect upon implications for their own instructional practices.</b>	
<b>PK-5</b>	
Action(s)	Continue district and building level work with outside consultant (Professor Ryan Flessner) in differentiated professional learning experiences for teachers and staff as aligned to district and building level school improvement goals.  Increase emphasis on areas of balanced math, math workshop, and sound math instructional practices that include relevant, realistic, and real world experiences.
Timeline of Action(s)	2022-23 school year (ongoing)
<b>6-12</b>	
Action(s)	Begin district-level work with outside consultant Mike Steele for foundational professional learning experiences

	Include emphasis on areas such as equity and the opportunity gap reflected in our data, teaching methods and student collaboration, planning/designing mathematics tasks for deeper application of learning, and assessment practices
Timeline of Action(s)	Summer of 2021-2022 school year and ongoing

<b><u>Recommendation:</u> Invest in teacher leaders to support growth in the teaching and learning of mathematics at the building and district level.</b>	
<b>PK-5</b>	
Action(s)	Maintain elementary math leadership team comprised of math lead teachers, instructional coaches, additional support staff, and administrators who meet regularly throughout the school year alongside Ryan and/or Courtney Flessner.
Timeline of Action(s)	2018-present
<b>6-12</b>	
Action(s)	Establish a secondary math leadership team comprised of math lead teachers, coaches, and administrators who meet regularly throughout the school year alongside Mike Steele and district administrators
Timeline of Action(s)	2022-2023 school year

<b><u>Recommendation:</u> Develop a deep understanding of mathematical concepts and knowledge base to assist in decision making about mathematical programming.</b>	
<b>PK-12</b>	
Action(s)	<p>Complete a further analysis of strengths and areas of opportunity within current curriculum and curriculum materials for alignment with math program review findings and recommendations.</p> <p>Review and gain feedback on different curricular material options against an evaluation tool.</p> <p>Determine necessary training for successful use of core curriculum materials.</p>

	Communicate consistency in expectations with curriculum and instruction, curriculum materials, and supplemental materials with all teachers and staff.
Timeline of Action(s)	2022-23 school year with any adjustments to curriculum and/or materials starting 2023-24 school year.

*PLC Question 2: How will we know if they know it?*

<b>Recommendation: Create and revise assessments as aligned to essential standards.</b>	
<b>PK-5</b>	
Action(s)	Develop examples of assessments that align to identified essential standards and learning targets.  Gather feedback from collaborative teams and revise assessments through cross district collaborative opportunities.
Timeline of Action(s)	Pending essential standards work during 2022-23 school year. Start in the 2023-24 school year.
<b>6-12</b>	
Action(s)	Support math collaborative team leaders and department chairs in reviewing current assessments along with new learning from book study and professional development.  Review assessment design and administration practices and ensure that the depth of knowledge of the learning target is appropriately reflected in each item.
Timeline of Action(s)	Ongoing-fall of 2022 and beyond.

<b>Recommendation: Increase family communications in different forms (for example, parent/family nights, videos) for resources available to their child within and outside the school day for extra support.</b>	
<b>PK-12</b>	
Action(s)	Improve our districtwide efforts to involve all families through research and discussion of best practices in community engagement with each school’s math leaders.

	<p>Create resources (print, video) to house on the district's website that explain current instructional approaches to the ever-changing field of mathematics.</p> <p>Continue to survey parents and guardians at least once/per school year to better understand perceptions over time and areas of need.</p>
Timeline of Action(s)	Planning during summer of the 2021-2022 school year; implementation of increased parent communications during 2022-2023 school year

*PLC Questions 3-4:*

*How will we respond if they don't know it? How will we respond when they do know it?*

<b>Recommendation: Engage in ongoing research and communications with meeting the diverse learning needs of students through the variety of pathways in mathematics in Noblesville Schools.</b>	
<b>PK-12</b>	
Action(s)	<p>Strengthen understanding with teachers, staff, and families about math sequences available for students PK-12.</p> <p>Explore best practices in service models for teaching mathematics in high ability, EL, and special education programming.</p>
<b>6-12</b>	
Action(s)	Work alongside math department chairs from the three secondary buildings, collaborate with and provide resources for school counselors as they place students into their math classes.
Timeline of Action(s)	Planning during summer of the 2021-2022 school year; implementation of increased parent and counselor communications during 2022-2023 school year

**Recommendation: Ensure all teachers and staff have the tools needed to support the learning needs of all students.**

PK-12	
Action(s)	<p>Determine additional supplemental supports that align with essential mathematical practices for all students through the MTSS and IEP process.</p> <p>Provide professional learning needed to support use of supplemental supports.</p> <p>Increase access to curricular materials, manipulatives, and tools for all students and staff.</p>
6-12	
Action(s)	<p>Review possible frameworks of support for all students, including those enrolled in Algebra I and lab classes. This includes considering options beyond the currently used program <i>Ascend Mathematics</i>.</p> <p>Begin implementing new sections of Algebra 1 Every Day at the high school and support teachers with professional development.</p> <p>Begin implementing Speciality Algebra 1 Academic Lab.</p>
Timeline of Action(s)	Ongoing starting 2022-23 school year

**Next Steps for Mathematics Programming in Noblesville Schools**

Year one of the math program review in Noblesville Schools concludes with final recommendations for action. Year two of this review entails making potential curricular revisions to existing curriculum and/or the selection of curricular materials to support program review recommendations. This second phase of the program review process will take place during the 2022-23 school year. A deeper analysis of current curriculum and supplemental materials will be conducted with opportunities for feedback and evaluation from various stakeholders.

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[https://www.nctm.org/uploadedFiles/Research\\_and\\_Advocacy/research\\_brief\\_and\\_clips/Clip\\_15-Using\\_Data.pdf](https://www.nctm.org/uploadedFiles/Research_and_Advocacy/research_brief_and_clips/Clip_15-Using_Data.pdf)



National Council of Teachers of Mathematics. (2010, December 3) How can teachers use data effectively?

[https://www.nctm.org/uploadedFiles/Research\\_and\\_Advocacy/research\\_brief\\_and\\_clips/Clip\\_16-Using\\_Data\\_2.pdf](https://www.nctm.org/uploadedFiles/Research_and_Advocacy/research_brief_and_clips/Clip_16-Using_Data_2.pdf)

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Slides to Math Program Review Committee (2021-22) <https://bit.ly/MPR2122>

## **Appendix A: Math Belief Statements**

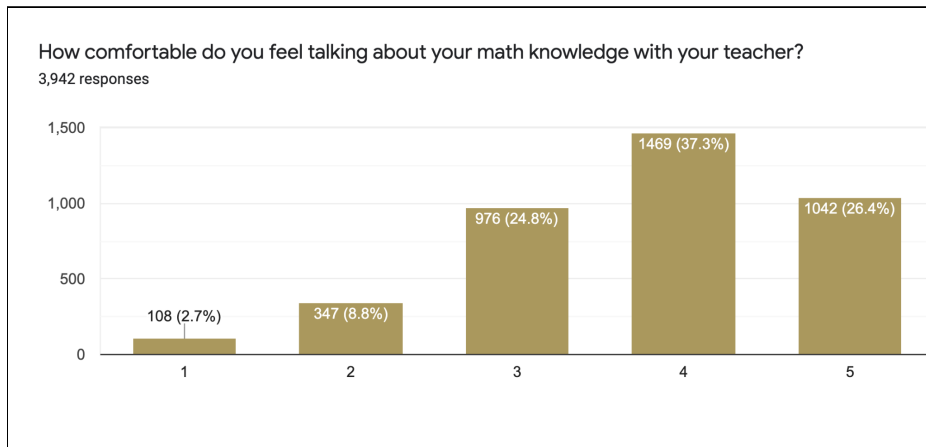
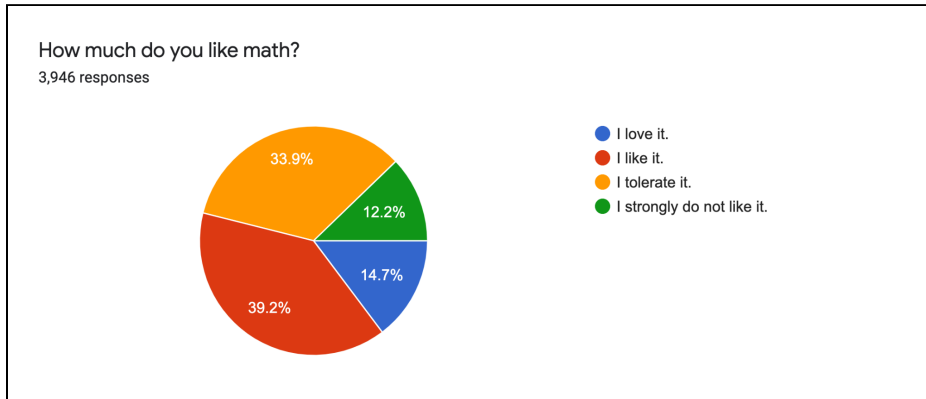
This is a list of the core math instruction beliefs composed and revised over the course of the year of committee meetings, by the math program review committee.

### **“What do we believe about sound math instruction?”**

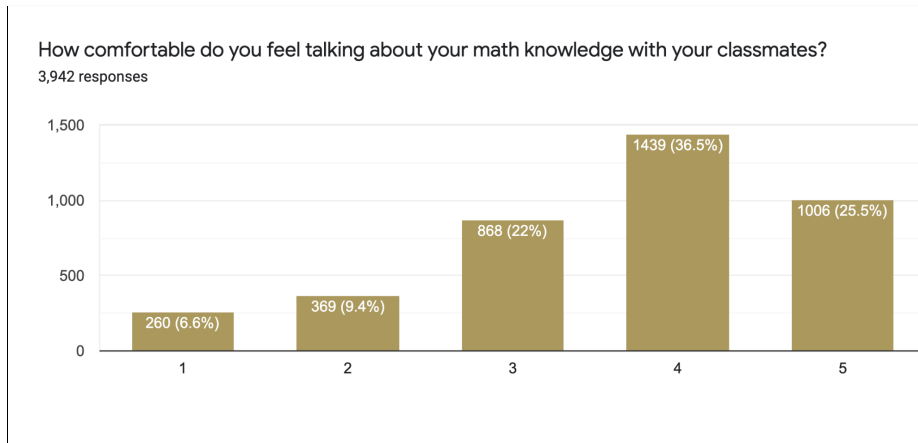
1. We believe sound math instruction is grounded in the K-12 Indiana Process Standards for Mathematics *and* the Indiana Academic Standards for Mathematics.
2. We believe sound math instruction emphasizes a growth mindset, productive struggle, risk-taking, and learning from mistakes and challenges.
3. We believe sound math instruction provides regular opportunities for collaboration, discussion, and questioning both orally and in writing.
4. We believe sound math instruction includes creating, conjectures, arguments, and justifying or questioning a particular strategy.
5. We believe sound math instruction is accessible for all students and encourages and honors different strategies and pathways for thinking.
6. We believe sound math instruction is a conceptual understanding leads to a better procedural understanding.
7. We believe sound math instruction focuses on teaching practices revolving around a strong conceptual foundation rather than shortcuts and tricks.
8. We believe sound math instruction supports all students to flourish in their identity as mathematicians.
9. We believe sound math instruction is creative, hands-on, interactive, and engaging.
10. We believe sound math instruction focuses on teaching for independent transfer to real-world application.

## Appendix B: 6-12 Student Survey Data

Summary of the quantitative survey data for the secondary students that responded. This does not include the open-ended response questions.



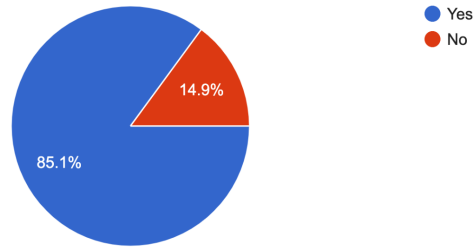
\*1 = not at all, 5 = completely comfortable



\*1 = not at all, 5 = completely comfortable

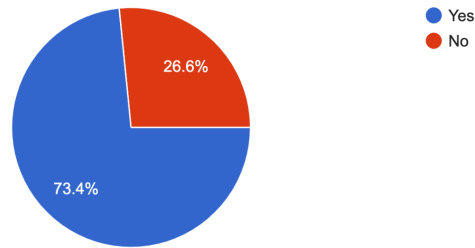
Does your teacher create learning experiences that are connected to the real world?

3,923 responses



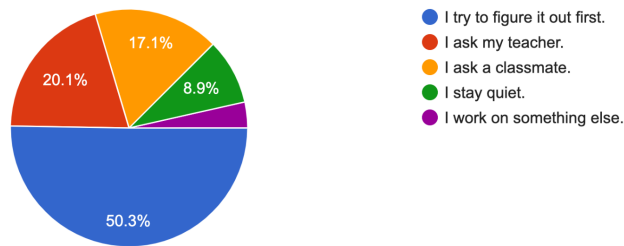
Have you heard about specific ways that math can help you in future careers?

3,930 responses



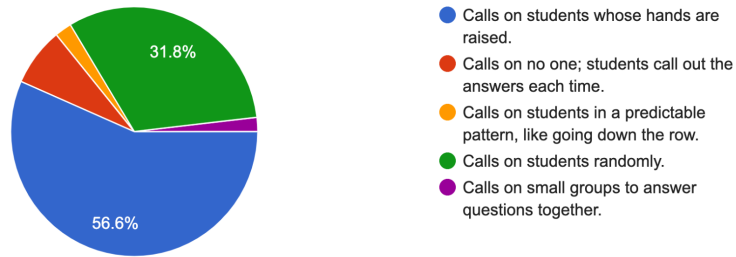
Which of the following BEST describes what you do when you don't understand something in math?

3,945 responses



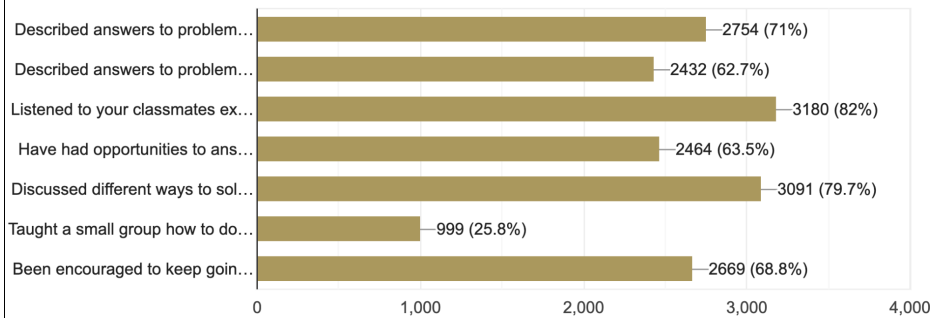
Which of these BEST describes your teacher's method of getting answers to questions?

3,928 responses



Which of the following have you done this year? Select ALL that apply.

3,878 responses

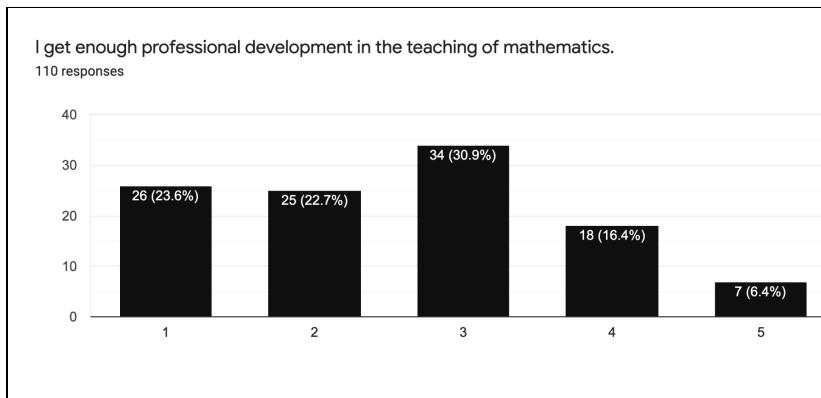
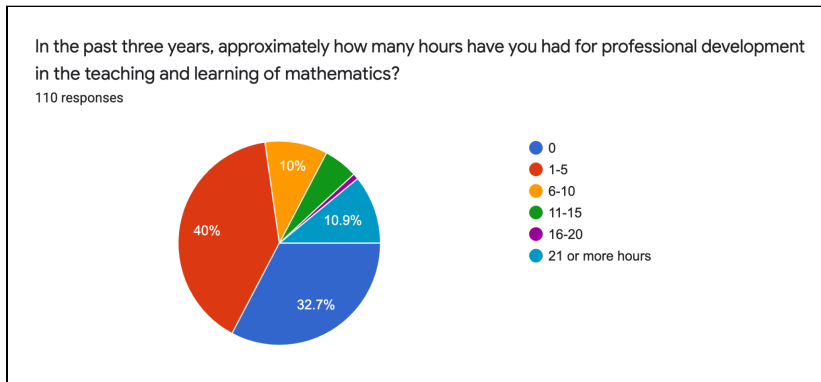


\*Options for question above:

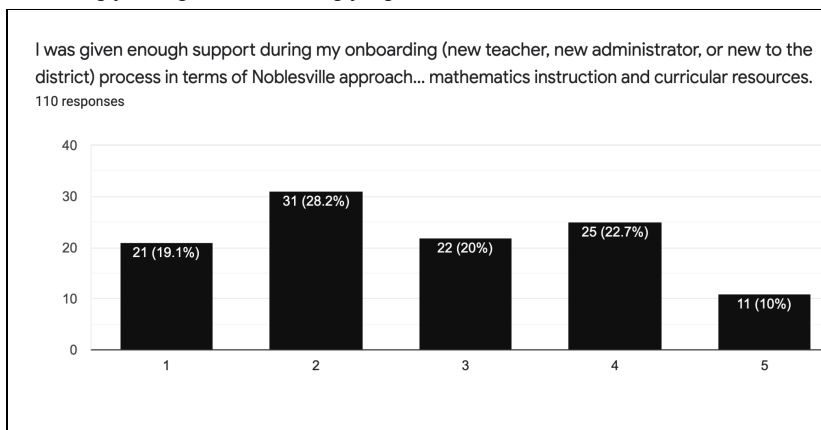
- Described answers to problems in writing
- Described answers to problems by explaining them out loud to the students or teacher
- Listened to classmates explain their strategies
- Have had opportunities to answer questions that your classmates ask about math
- Discussed different ways to solve math problems
- Taught a small group how to do a problem
- Been encouraged to keep going while solving a challenging problem and/or to change strategies as needed.

## Appendix C: PK-12 Teacher/Staff Survey Data

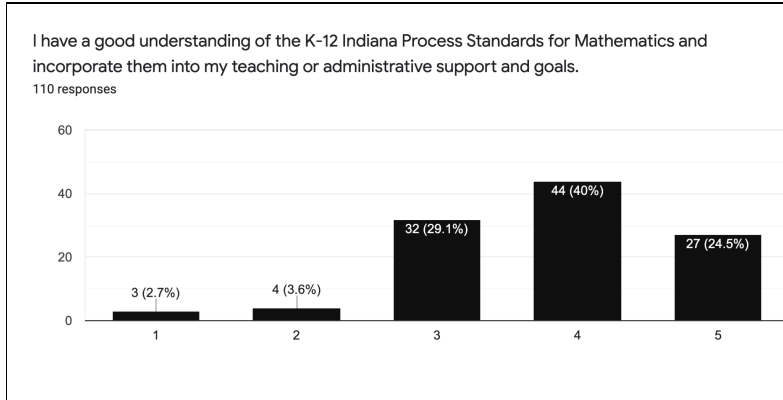
Summary of the quantitative survey data for the secondary students that responded. This does not include the open-ended response questions.



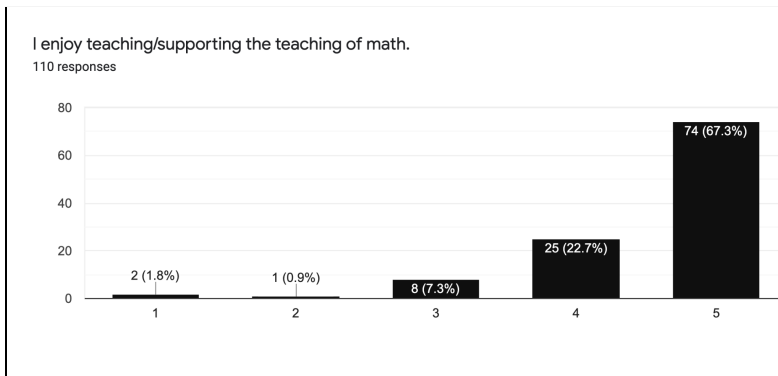
1 = strongly disagree, 5 = strongly agree



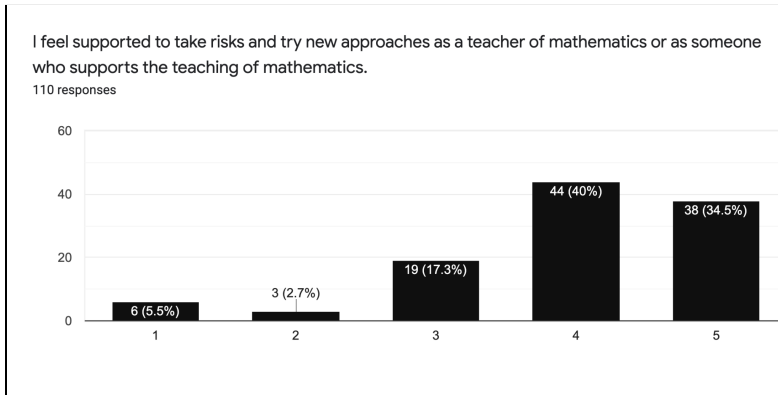
1 = strongly disagree, 5 = strongly agree



1 = strongly disagree, 5 = strongly agree



1 = strongly disagree, 5 = strongly agree



1 = strongly disagree, 5 = strongly agree

**(+) The majority of teachers and staff enjoy teaching mathematics to students in Noblesville Schools.**

**(+) The majority of teachers and staff feel supported to take risks within mathematics with an understanding of the Indiana Process Standards for Mathematics.**

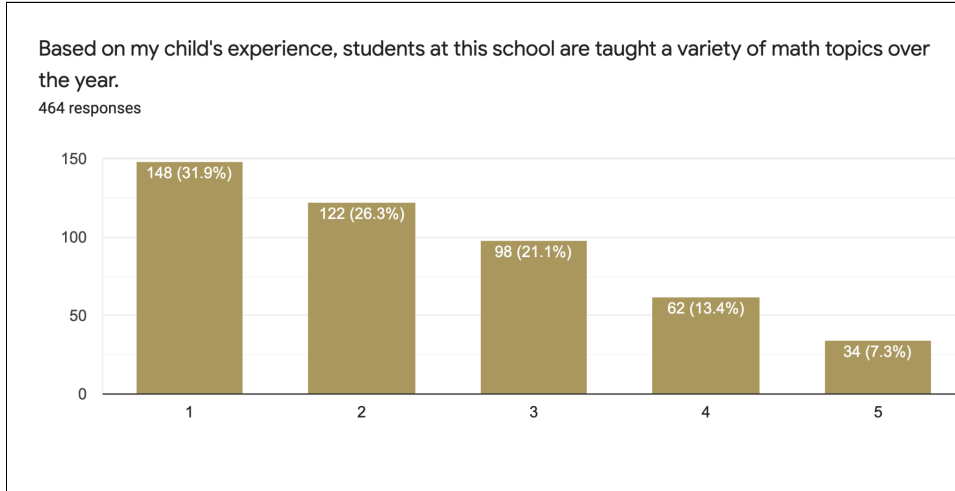
**(-) The majority of teachers and staff feel that they have not received enough professional learning around the teaching and learning of mathematics.**

**(-) Some teachers and staff did not feel as if they received enough support around the teaching and learning of mathematics with their onboarding to Noblesville Schools.**

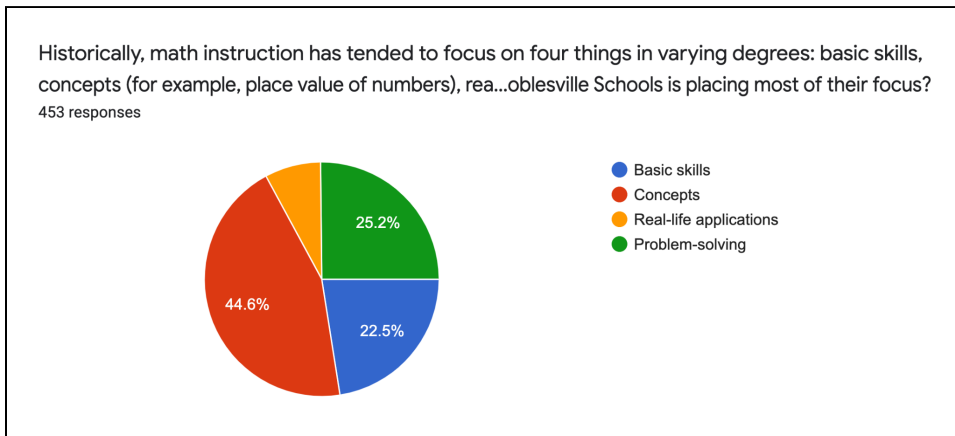
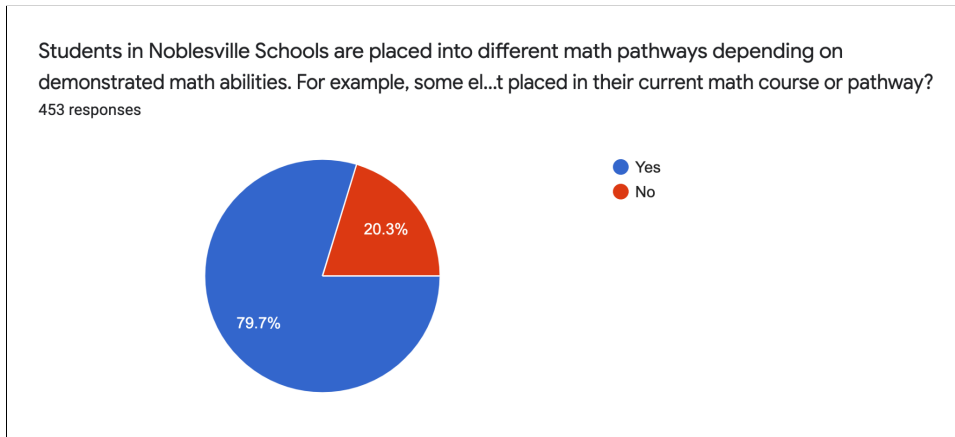
## Appendix D: Parent/Guardian Survey Data

Summary of the quantitative survey data for the PreK-12 parents and guardians that responded. This does not include the open-ended response questions.

### Curriculum and Instruction



\*1 = strongly agree, 5 = strongly disagree



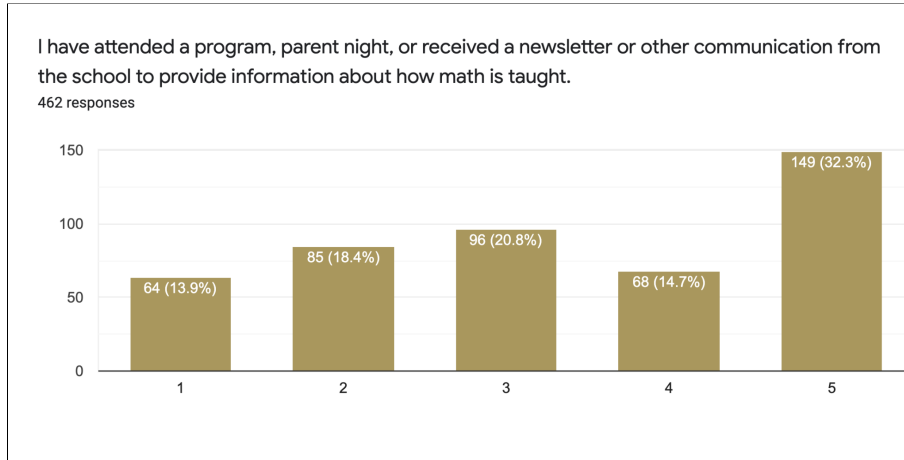


**(+) The majority of parents/guardians feel their child/children receive math instruction on a variety of topics/concepts across a school year.**

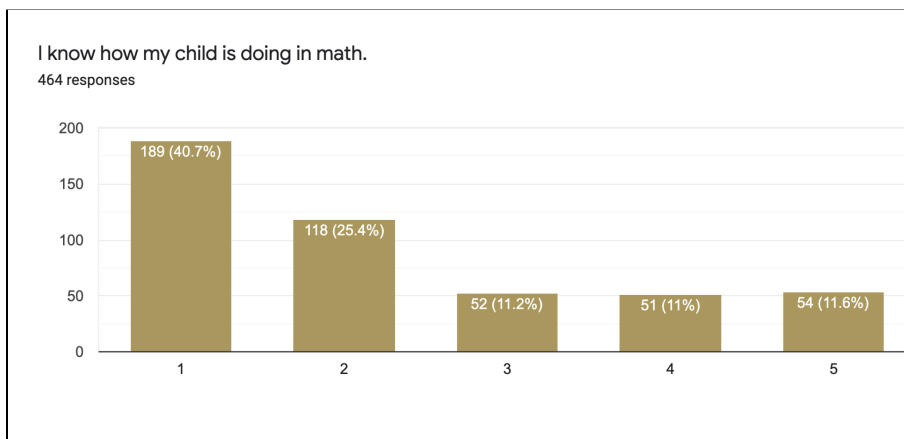
**(+) The majority of parents/guardians feel their child/children are within a proper placement to receive math instruction most aligned to their child/children's needs.**

**(-) The majority of parents/guardians feel that real-life applications of mathematics is the least focused on in Noblesville Schools.**

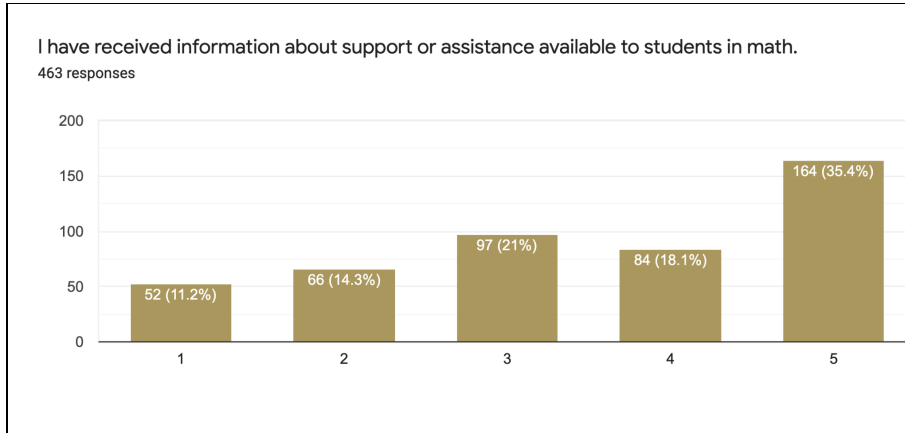
### Communication and Support



\*1 = strongly agree, 5 = strongly disagree



\*1 = strongly agree, 5 = strongly disagree



\*1 = strongly agree, 5 = strongly disagree

**(+) The majority of parents/guardians feel they have a very strong awareness of how their child/children are performing in math.**

**(-) The majority of parents/guardians feel stronger communications and opportunities are needed for what math instruction looks like/sounds like in Noblesville Schools.**

**(-) The majority of parents/guardians feel stronger communications are needed for pathways of support available for students needing additional assistance with math instruction.**