



**Noblesville Schools
K-12 Science Program Review**

Report to the Board of School Trustees

2023-24

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Science Program Review Overview 2023-24 (One Year Process Overview)

August 2023	<i>Form K-12 committee (teachers, administrators, parents, school board members)</i> -Notify committee of schedule, times, locations, and expectations
September 2023	<i>Develop Initial Shared Beliefs and Prepare for Collaboration</i> -Review purpose, goals, and actions of a program review -Draft shared beliefs about science as a K-12 committee: "What do we, as a committee, believe about sound science instruction?" -Read a variety of texts for discussion and shared learning, including excerpts from <i>Ambitious Science Teaching</i> -Gather committee feedback on surveys to distribute to various stakeholder groups -Distribute surveys to various stakeholder groups (students, staff, families) -Engage in ongoing collaboration with outside consultants to support planning and process
October 2023	<i>Begin to Analyze Evidence of Learning and Prepare for Classroom Learning Walks</i> -Conduct elementary student focus groups (in lieu of surveys) -Revisit and revise shared beliefs about science -Finalize learning walk rubric with outside consultants and share with committee members for review and feedback -Create schedule for learning walks and communicate purpose and schedule with teachers -Engage in ongoing collaboration with outside consultants to support planning and process
November 2023	<i>Conduct Classroom Learning Walks and Synthesize Data Artifacts to Support Program Review</i> -Visit classrooms across all buildings (K-12), summarize and analyze key findings into synthesis documents -Revisit and revise shared beliefs about science -Review and provide feedback as a committee on data artifacts for program review (learning walks, all surveys, focus groups, student performance) -Formalize findings and recommendations with outside consultants and committee members
December 2023	<i>Present Program Review Recommendations</i> -Draft, edit, finalize committee report -Prepare presentation and present to Board of School Trustees
January 2024- spring 2024	<i>Begin to Take Action on Recommendations</i> -Explore possible core curriculum materials for adoption and/or curriculum revisions with stakeholder feedback and analysis -Present potential core curriculum material options to school board 2024

Science 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. The science program review was consolidated into a one year process with the first semester culminating with recommendations for action and in the second semester seeking 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 science in Noblesville Schools occurred in 2016. The following report outlines a systematic review that is aligned with the vision and mission of the district and provides pathways for action based on the committee's findings and recommendations.

PLC Foundation Principle #1: A Collaborative Culture

Shared Science Belief Statements

The science program review committee, composed of various stakeholders, first sought to form and establish a strong foundation around what they currently believed about sound science instruction K-12. The committee reflected on current practices needed for success for all learners both within and beyond schooling in Noblesville Schools. Science belief statements were last curated during the 2016 science program review. Through a collaborative process, each committee member had ownership and a voice in the revision of current science belief statements formed around the guiding question of, "What do we, as a science program review committee, believe about sound science instruction?". This process highlighted the various beliefs uncovered by each member, yet through ongoing revisions throughout the program review, provided pathways for reflection of practice and constant evolvment of thinking as new learning, reading, and research were acquired. These science belief statements evolved throughout the course of the semester and were continually referred to for alignment and noticeable trends when analyzing various data sets and other evidence (see Appendix A).

Shared Science Experiences

Building collective efficacy surrounding the science program review involved honoring the previous science experiences that were brought to the committee. Committee members reflected on previous science experiences (both success and challenges) and what those experiences might tell us about ways of teaching and learning science. This provided open discussion around high-quality teaching and learning, teachers and staff

who promoted a positive learning environment and science identity, and the transfer of science 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 science experiences upon graduation from high school. The committee was also supported by outside consultants who provided experiences to engage in learning and expand upon science experiences around the world.

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 Dr. Catherine Pangan and Dr. Lynn Bryan, the committee read an excerpt from *Ambitious Science Teaching* (2023) to launch the discussion (*see bibliography of reviewed research*). Readings and learning experiences provided within committee meetings were set with the intention to continue to grow the committee's common goals and beliefs or to grow understanding of challenges and possibilities specific to science program improvement.

Each committee meeting included hands-on learning experiences with our outside consultants to engage the committee in thinking as scientists and applying the learning experiences to the ongoing work of the committee.

Indiana Academic Standards for Science

Developing a continued understanding of the foundation of our Indiana Academic Standards and Science and Engineering Practices supported the work of the committee. The science standards for Grades K-12 Science are based on *A Framework for K-12 Science Education* (NRC, 2012) and the Next Generation Science Standards (NGSS Lead States, 2013). Standards are statements of what students should know, understand, and be able to do at grade level. The standards build logically from kindergarten to grade twelve and provide a foundation for curriculum materials used within the district. The 2022 Indiana Academic Standards for science reflect science as it is practiced in the real world, focus on deeper understanding as well as application of content, and integrate practices, crosscutting concepts, and core ideas.

PLC Foundation Principle #3: A Results Orientation

Data Review

Committee members reviewed overall ILEARN science proficiency in grades 4 and 6 and ILEARN science proficiency in biology from the past three years. These data sets were also disaggregated by demographics and reviewed by the team for areas of strength, opportunity, and next steps.

Classroom Learning Walks

Over 70 classrooms representative of K-12 across all ten buildings in Noblesville Schools were visited as a part of the program review. The committee formed three teams of committee members including elementary, secondary, and school board representation for these learning walks to gather data aligned with the walkthrough rubric. 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 science programming in Noblesville Schools K-12. A representative sample of K-5 elementary students were interviewed in focus groups, and 6-12 students, staff, and K-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, 3,145 grade 6-12 students, 42 staff members, and 330 parents/guardians responded (see Appendices B-D)

Performance Data

Our state performance measure was analyzed using a common protocol. Below is a summary of the findings.

ILEARN (Grades 4, 6, and Biology)

ILEARN science is administered to all grade 4, 6, and Biology students in the district. The summary below captures trends and noticings from the last three years, 2021-2023. The committee reviewed overall proficiency rates and proficiency rates from various student demographics.

Strengths:

- Overall proficiency rates of Noblesville students in grades 4, 6, and Biology on ILEARN science from 2021-23 were higher than the state proficiency rates on ILEARN science.
- Proficiency scores were above the state averages for all three grade levels (grade 4, 6, and Biology). Most recently in spring 2023, 48.4% of grade 4 students were proficient; 59.6% of grade 6 students were proficient; and 37.6% of Biology students were proficient.
- Student demographics across various subgroups saw proficiency rates consistently above the state averages in grades 4, 6, and Biology on ILEARN science from 2021-23.

Areas of Opportunity

- Most recently in spring 2023, Biology students had the overall lowest level of proficiency across the district, with 37.6% of students proficient. While percentages in 6th grade had the highest proficiency rates at 59.6%, in 4th grade, 48.4% of students were proficient. Overall, proficiency levels in science

are well above the state average yet an area of continued focus.

- While overall, all of Noblesville's subgroups performed above state averages, there is still an opportunity gap between female and male proficiency rates in grades 4 and 6 ILEARN science compared to the male and female proficiency rates in ILEARN Biology.

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 on the teaching and learning of science. 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-5 and were located at all of our seven elementary schools (four Title I buildings and three non-Title I buildings).

Strengths:

- Students have a high level of enjoyment for learning about science topics.
- Students have a high level of comfort discussing science topics with both their teacher and classmates.
- Teachers and staff provide learning experiences that include hands-on learning, videos about current science topics in the world, classroom discussions (3rd-5th grade), and reading articles about current science topics (3rd-5th grade).
- The majority of students K-5 were able to name at least one career field that would be supported through science.

Areas of Opportunity:

- Continued opportunities to connect science learning to science career fields and real-world experiences.
- Incorporate more science learning at the elementary level to include increasing hands-on activities, collaborative experiences, and learning outside the classroom.

6-12 Student Survey Summary

Over 3,000 students in grades 6-12 completed a survey during their regular science course. Students were complimentary of their science teachers, particularly of their helpfulness and willingness to explain concepts and provide additional support and learning opportunities if necessary to better understand important learning. Students were asked both closed and open-ended questions. A full discussion of the themes and exemplary comments within each theme can be found in the appendix of this report.

Strengths:

- Overall, secondary students like learning about science and feel that their teachers create learning experiences connected to the real world. The majority have heard about ways that science can help them in future careers.
- Students feel that teachers are helpful, supportive, and provide useful explanations; teachers make science interesting and fun.
- Students specified notes, videos, and demonstrations as helpful for learning.

Areas of Opportunity:

- More career connections may be necessary—while students have heard how science can help them, 34.9% of students said they have not heard how science can be an asset to their future careers.
- Students indicated that more experiments, labs, and hands-on activities are desirable for learning and engagement
- Students also indicated that more interaction with peers, such as group work, partners, and other means of collaboration, are all helpful ways of learning that they would like to see increase in the science classroom
- Students also requested more study support, such as a slower pace at times, or additional learning resources (study guides, practice problems, reviews).

K-12 Teacher, Staff, and Administrator Surveys

Over 40 staff responded to the survey. The majority of teachers who responded were secondary (6-12) science teachers, but nine elementary teachers also responded. Also responding were seven support staff, including an instructional coach, special education teachers, and one EL teacher.

Note: This data was originally presented to the committee as K-12 findings, but the team requested that it be broken down into K-5 and 6-12 findings instead. That is how they are represented here. It is important to note that the representative size of the K-5 teacher data is very small—only nine teachers, but these nine teachers also chose to complete the survey and may still represent the opinions of a larger group.

K-5 Staff-Identified Strengths

- Staff enjoy teaching science (average score of “agree,” with most within the agree-to-strongly agree range)
- Staff appear to genuinely want more time and resources to teach science and recognize the importance of teaching and learning science
- Staff feels they have a general understanding of the new science standards for the grade levels they teach or support

K-5 Staff-Identified Areas of Opportunity

- Staff consistently feels a need for more professional learning and support to effectively teach science (average score of 3/10)
- Staff consistently feels a need for more resources to effectively teach science (average score of 3/10)

6-12 Staff-Identified Areas of Strength

- Staff enjoy teaching science (average score of “agree,” with most within the agree-to-strongly agree) and feel they have a general understanding of the new science standards for the grade levels they teach or support.
- Staff feel they have some professional learning and resources to effectively teach science, though these responses included a mix of neutral, agree, and disagree, indicating that more staff see resources and professional learning as areas of need.

6-12 Staff-Identified Areas of Opportunity

- Staff expressed a strong need for updated authentic learning experiences for students.
- Staff also expressed the need for updated resources and lab funding (including both yearly funding for consumable costs and fixed lab equipment, such as replacing outdated or missing equipment), and a need for additional opportunities to grow as science educators (e.g. possibilities for memberships, conferences, collaboration with other districts)

PreK-12 Parent and Guardian Surveys

A Google Form survey was provided in both English and Spanish and 336 parents/guardians responded. The responses showed a mix of all grade levels K-12, with a slight emphasis on parents of secondary aged students.

Strengths:

The majority of parents/guardians feel that Noblesville Schools provides....

- an effective learning environment for science.
- skills and knowledge necessary to pursue science-based careers
- opportunities for upper-level science coursework.
- overall strong programming, especially at the secondary level (when science is a state required and scheduled course).

Areas of Opportunity:

- Increased parent communication from the district and from schools
- More time in elementary for science
- Increased discussion and understanding of high-quality science education in

different modes rather than relying too much on one model of delivery, such as lecture format or technology-focused lessons)

While the most notable themes are shared here, seven major themes were found in the open-ended comments, with specific areas of note within each category. Parents shared accolades for Noblesville teachers, concerns for consistent and robust programming that includes hands-on learning for all students, requests for consistent science programming for K-5 students, and also shared concerns about assessment and grading practices in the secondary schools. Parents also asked that more communication be provided about curriculum and learning materials for science units of study across grades. A full discussion of the themes and exemplary comments within each theme can be found in the appendix of this report.

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 exemplary models of instruction and the K-12 Indiana Academic Standards for Science and Computer Science. Teams composed of staff, Board members, and outside consultants completed learning walks in all ten schools and in over 70 classrooms PK-12. At the conclusion of the learning walks, each team synthesized findings into areas of strength (powerful practices), challenge, and remaining wonderings. All members then discussed learning walks at a data review committee meeting in November, recording initial reactions, deeper reflections, and possible recommendations as a result of these findings.

K-5 Learning Walk Summary

Strengths:

- Students are engaged in opportunities for discourse, collaboration, and meaningful science experiences.
- Engaging and supportive teachers and staff are evident throughout the district.
- Teachers and staff connect science learning experiences to real world contexts.
- Students are provided ongoing opportunities for inquiry and curiosity through hands on learning experiences, use of models and objects, and integration of resources.
- Learning environment conditions are established for flexibility and collaborative practice.
- Evidence of teachers and staff using questioning strategies and interdisciplinary connections to further support student learning.

Areas of Opportunity:

- Established instructional time within the general classroom setting that is outside of the STEAM related arts class.

- Access to and consistent use of common core curriculum materials, physical materials, and supplemental materials across all elementary classrooms.
- Increased use of academic vocabulary (unity of use of cross-cutting concepts & SEPS) that supports vertical articulation across grade levels and considers the various learning needs of students.

6-12 Learning Walk Summary

Strengths:

- Established instructional time vertically aligned courses
- Many opportunities for students to talk together and collaborate in flexible spaces
- Teachers clearly work and plan together across the grade level
- Evidence of student-created models, evidence of student-generated data or student-analysis of data sets

Areas of Opportunity:

- Balance of learning modalities (not over-relying on any one way of doing labs, or technology)
- Shift to student-centered explanations and inquiry rather than teacher-directed
- More emphasis on generating models and using models to explain

Synthesis of Findings K-12

Across all stakeholder groups, there is a strong foundation of positive feedback from students, parents, and staff to support the current practices of our science programming **and** acknowledge the necessary shifts to align to the new frameworks for science education required from the newly revised and adopted 3-dimensional K-12 Indiana Science Standards.

This positive feedback includes support in and trust of our teachers from our families, acknowledgment of the helpfulness and engaging nature of our teachers from our students and willingness to grow and learn in science education from our teachers and staff.

Areas of K-12 opportunity include updated resources, curriculum, and resource/lab equipment, training and professional learning opportunities, alignment across core content ideas, and increased communication with families around science curriculum and topics.

Recommendations with Actions K-12

As a result of the science program review committee's systematic process, the following recommendations stem from a strong foundation of science programming and provide continued areas of action. Below is a list of the K-12 recommendations with corresponding action items by grade bands.

Recommendation 1: *Provide gradual, differentiated professional learning for all staff to increase knowledge, application, and assessment of the 3-dimensions within the Indiana Academic Standards for science: disciplinary core ideas, cross-cutting concepts, and science and engineering practices.*

- **Action Steps (K-12)**

- Provide professional learning opportunities to develop knowledge of the Indiana Academic Standards (IAS) for science that:
 - Reflect science as it is practiced and experienced in the real world;
 - Build logically from kindergarten through grade 12;
 - Focus on deeper understanding as well as application of content;
 - Integrate practices, crosscutting concepts, and core ideas
- Support the teaching and learning of science with collaborative teams (including teachers, staff, and administrators) at the building and district level as part of the PLC process.

- **Action Steps (K-5)**

- Classroom teachers and STEAM teachers share responsibility in the design of learning experiences that reflect the IAS for science.
- Apply and assess science learning through engineering design tasks based on an agreed upon elementary scope and sequence across all grade levels that support vertical alignment K-12.
- Create opportunities for cross-building collaboration to support the teaching and learning of science.

- **Action Steps (6-12)**

- To acknowledge the identified interest in increased “hands-on learning,” it is recommended that the first area of professional learning for middle school and high school science be the [eight science and engineering practices](#), in effort to both take note of where these practices currently exist in curriculum and where these practices may be utilized.
- [Cross-cutting concepts](#) should be utilized intentionally within collaboration with each grade level and in vertical conversations across grade levels.

Recommendation 2: *Ensure all teachers and staff have support and training in using evidence-based instructional practices to support all students' learning needs.*

- **Action Steps (K-12)**

- Define pathways for equitable interest and success among all subgroups of students and continue to closely monitor student performance.
- Engage collaborative teams in learning opportunities to support the specific needs of student subgroups.
- Ensure equitable access to science learning experiences across all buildings.
- Provide professional learning to support utilizing technology as a tool to engage students in authentic learning experiences and empower collaborative learning and creation.

Recommendation 3: *Update physical and core curricular materials to support meaningful learning experiences.*

- **Action Steps (K-12)**

- Review and gain feedback on various curricular material options against an evaluation tool that is aligned with science program review recommendations.
- Consider additional physical materials needed to support student-centered learning experiences aligned with the Indiana Academic Standards.
- Ensure the material evaluation process includes universal access considerations for all groups of students (e.g. multilingual students, accessibility options, etc.).
- Conduct classroom and department inventory of lab equipment in order to replace what is damaged, missing, outdated, or newly needed (6-12 only).
- Determine necessary professional learning for successful use of core curriculum and supplemental materials in science.
- Communicate consistency in expectations with curriculum and instruction, curriculum materials, and supplemental materials with all teachers and staff.

Recommendation 4: *Increase the level of science engagement through communication, community connection, and professional learning opportunities.*

- **Action Steps (K-12)**

- Encourage additional communication of science activities, clubs, and other opportunities for K-12 students at both the school and district level
- Partner with department chairs, K-12 science teachers, and building administrators to increase internal and external communication regarding science learning experiences.
- Establish additional community partnerships to support science and engineering learning experiences outside of the classroom and develop student understanding of STEM career opportunities.
- Provide opportunities for teachers to engage in a wider community of practice in the field of science education, and increase district efforts to showcase the learning from these experiences.

Next Steps for Science Programming in Noblesville Schools

Part one of the science program review in Noblesville Schools concludes with final recommendations for action. Part two of this one-year review entails making potential curricular revisions to the 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 second semester of the 2023-24 school year. A deeper analysis of the current curriculum and supplemental materials will be conducted with opportunities for feedback and evaluation from various stakeholders.

Bibliography of Reviewed Research

Indiana Department of Education. (2023, November 6). *Science & Computer Science*

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Windschitl M. Thompson J. J. & Braaten M. L. (2018). *Ambitious science teaching*.

Harvard Education Press.

Appendix A: Science Belief Statements

This is a list of the core science instruction beliefs composed and revised over the course of the semester during committee meetings by the science program review committee.

PK - 12 Science Program Beliefs (Updated Oct. 2023)

We believe that sound science instruction...

- Is a phenomena-based activity that involves asking questions, performing investigations, making observations, analyzing data, developing and using models, and engaging in arguments based on evidence.
- Involves interactive (physical or digital) challenges; is phenomena-based; and is integrated across the curriculum.
- Should engage and inspire learners beyond the school setting, and student scientists will apply their learning to impact the community and the world at large.
- Occurs through collaboration and problem-solving; learners listen and understand multiple perspectives on the same topic.
- Promotes challenging and collaborative situations that encourage risk-taking, engaging in debate from evidence, demonstrating understanding, and reflecting on many possible answers or solutions.
- Is a progression in which students develop a deeper understanding, re-evaluating and questioning prior knowledge from year to year, and recognize that solutions may change with our ever-evolving world.
- Gives students access to tools and discipline-specific techniques to develop skills.
- Provides students with a consistent vertical articulation of academic vocabulary.

Appendix B: 6-12 Student Survey Data

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

Figure 1

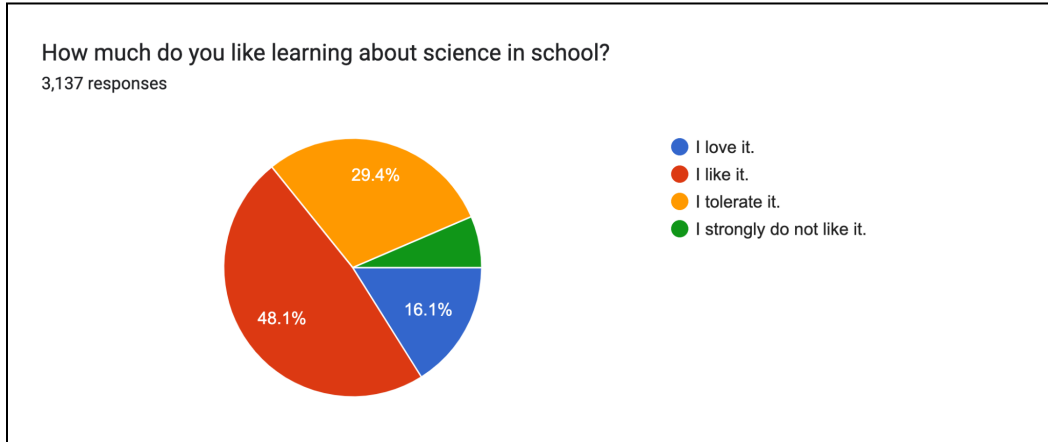
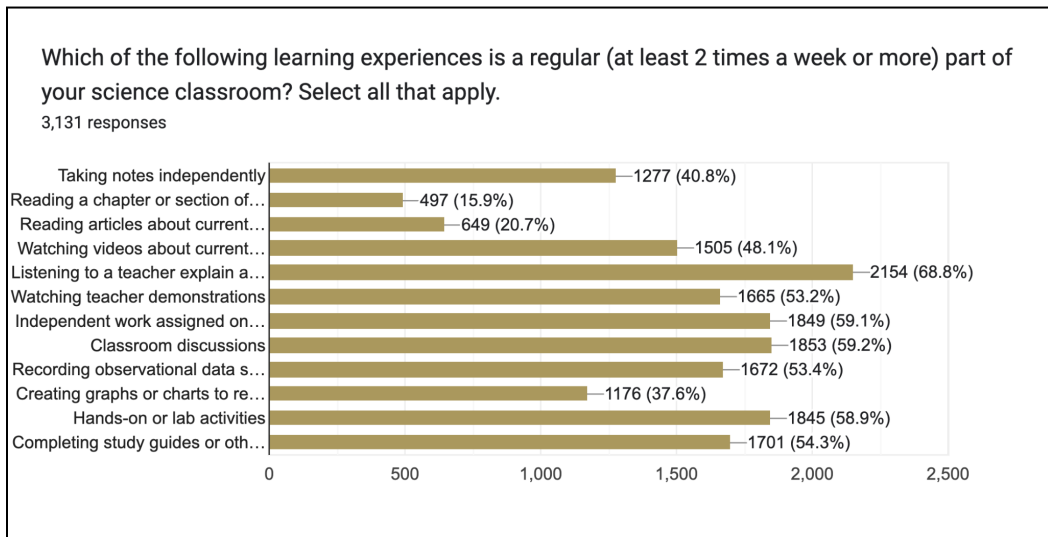


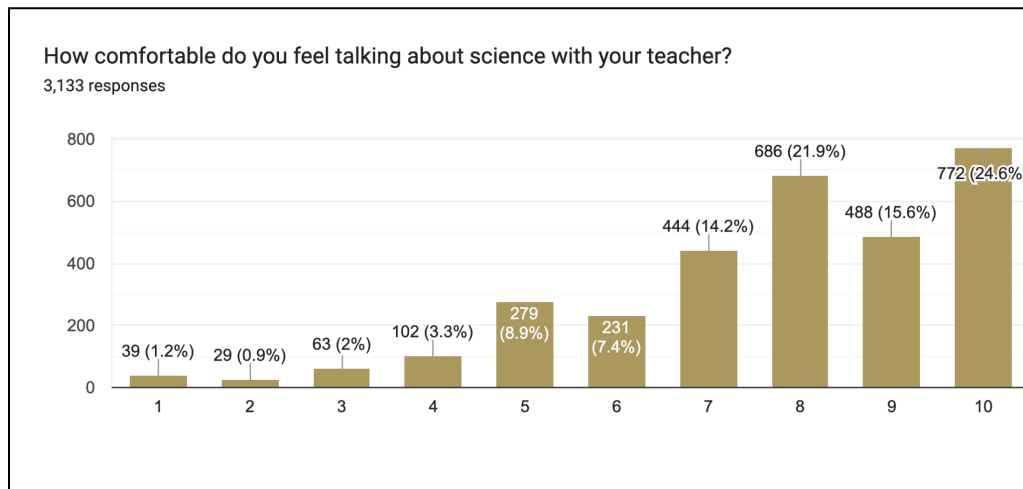
Figure 2



*Options for the question in Figure 2:

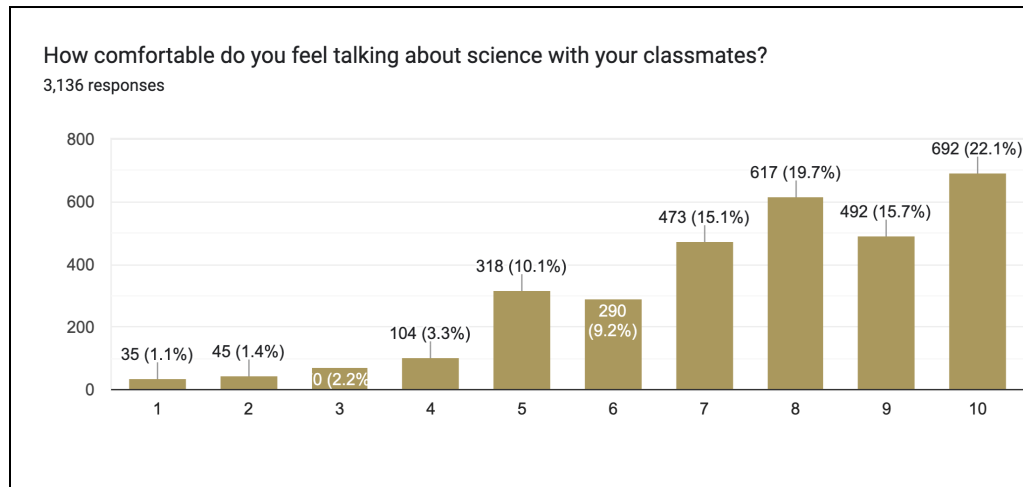
- Taking notes independently
- Reading a chapter or section of a textbook and answering questions
- Reading articles about current science topics
- Watching videos about current science topics in the world
- Listening to a teacher explain a big concept or idea and taking notes
- Watching teacher demonstrations
- Independent work assigned on Canvas
- Classroom discussions
- Recording observational data such as notes, drawings, models
- Creating graphs or charts to record data
- Hands-on lab activities
- Completing study guides or other assignments to help prepare for tests and quizzes

Figure 3



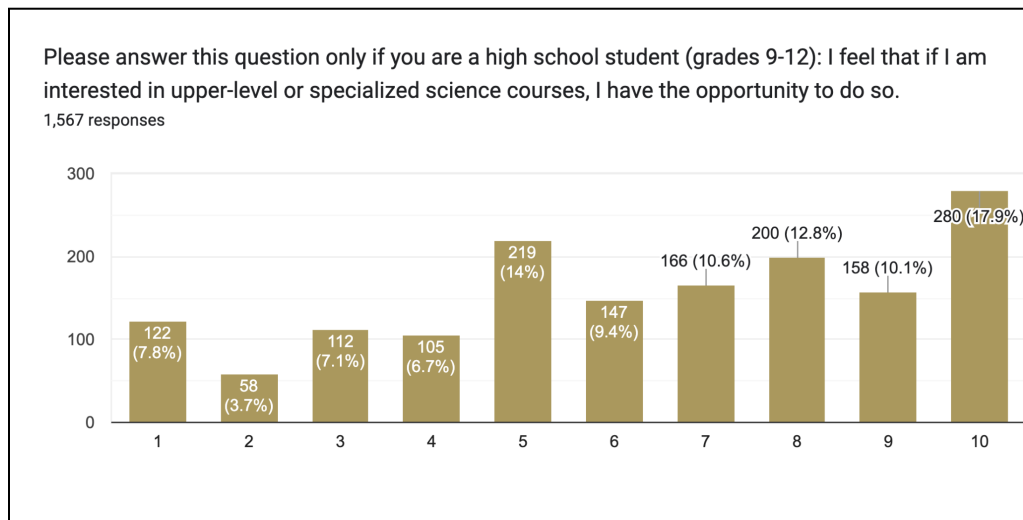
*1 = not at all, 10 = very comfortable

Figure 4



*1 = not at all, 10 = very comfortable

Figure 5



*1 = strongly disagree, 10 = strongly agree

Figure 6

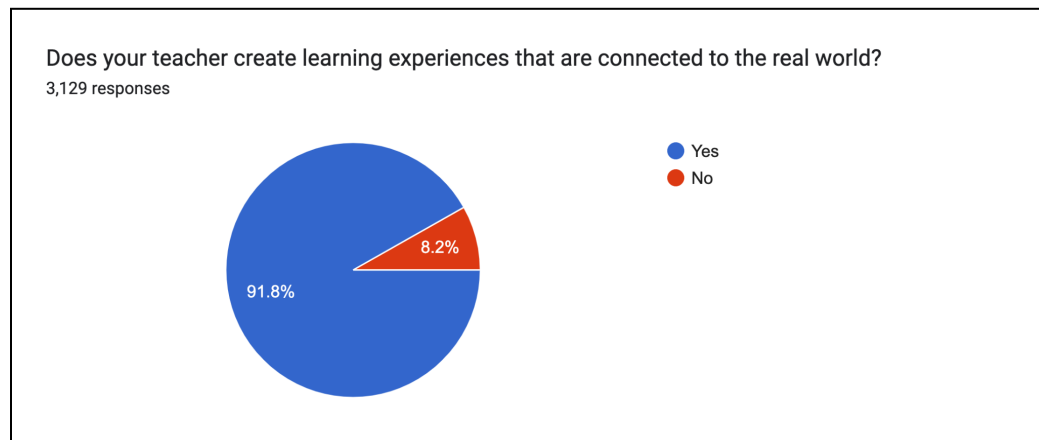
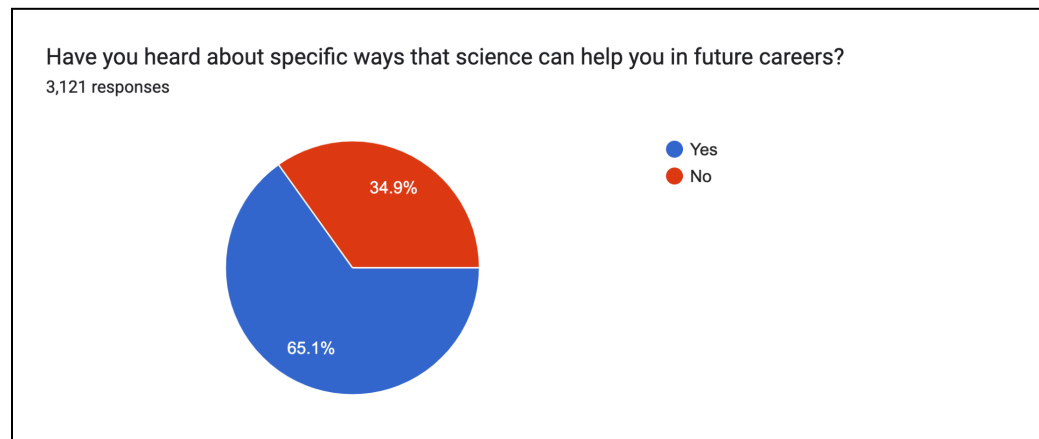


Figure 7



Summary of qualitative data:

What do you like about the ways your school helps students learn science?

The following are a mix of representative student survey comments from the most frequent appearing topics

Experiments, Labs, Hands-On Activities.

- *Experiments help students understand concepts*
- *Hands-on learning helps connect to the real world*

Teachers Help, Answer Questions, Provide Explanations.

- *Teachers provide opportunities for students to learn problem solving skills that are applicable both in science and in life*
- *Teachers are helpful and responsive to students*
- *Teachers encourage questions*

Taking Notes

- *Taking notes is helpful for students to remember important concepts learned*
- *Students appreciate having notes available on Canvas*

Science is Fun/Interesting/Teachers Make Science Fun/Interesting

- *Students discussed their teachers having passion and joy for science, which carries over to their learning and engagement*
- *Students identify interactive science as more effective for learning than lecture formats*
- *Students at all levels enjoy discovering things through learning science*

Demonstrations/Videos

- *Videos and demonstrations connect to the real-world.*
- *Videos, visuals, and demonstrations support student transfer of learning*
- *Demonstrations are very hands-on which allows for student practice and application of learning*

What do you wish you did more of in science class?

Experiments, Labs, Hands-on Activities

- *More labs and hands-on work*
- *More learning how the world works*
- *More data analysis and observation*

More Interactions Among Peers (e.g. groupwork, partners, collaboration)

- *Collaborate with other students*
- *Group work*

More Study Support (e.g. study guides, Kahoot, practice problems, reviews)

- *More time to go over learning*
- *Study guides, Kahoot, practice problems, reviews*

Appendix C: PK-12 Teacher/Staff Survey Data

Summary of the quantitative survey data for the staff responses. This does not include the open-ended response questions.

The data represented includes the following breakdown and range of staff:

- Two primary (grades K-2) classroom teachers
- Seven intermediate (grades 3-5) classroom teachers
- Seven high school science classroom teachers
- Sixteen middle school science classroom teachers
- One middle school instructional assistant
- One middle school instructional coach
- Four middle school special education teachers
- One middle school EL teacher

Figure 1

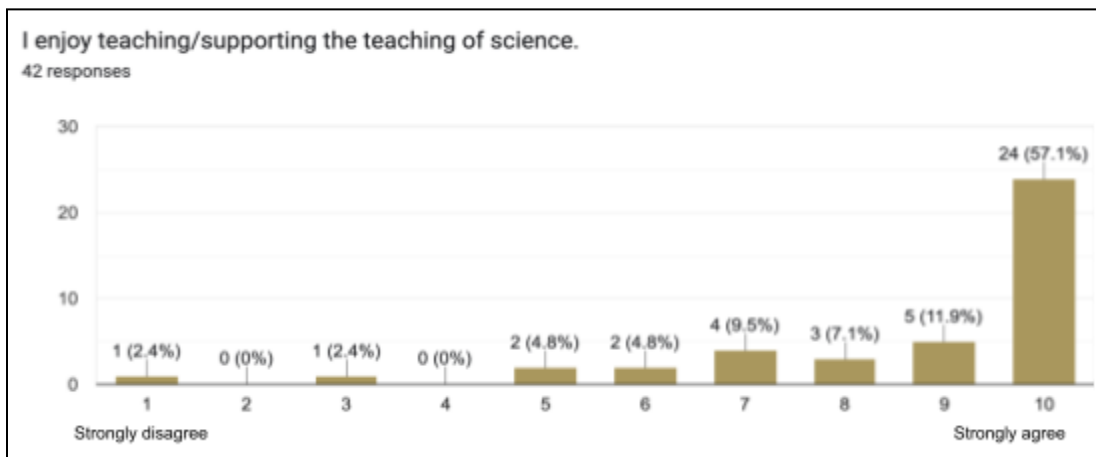


Figure 2

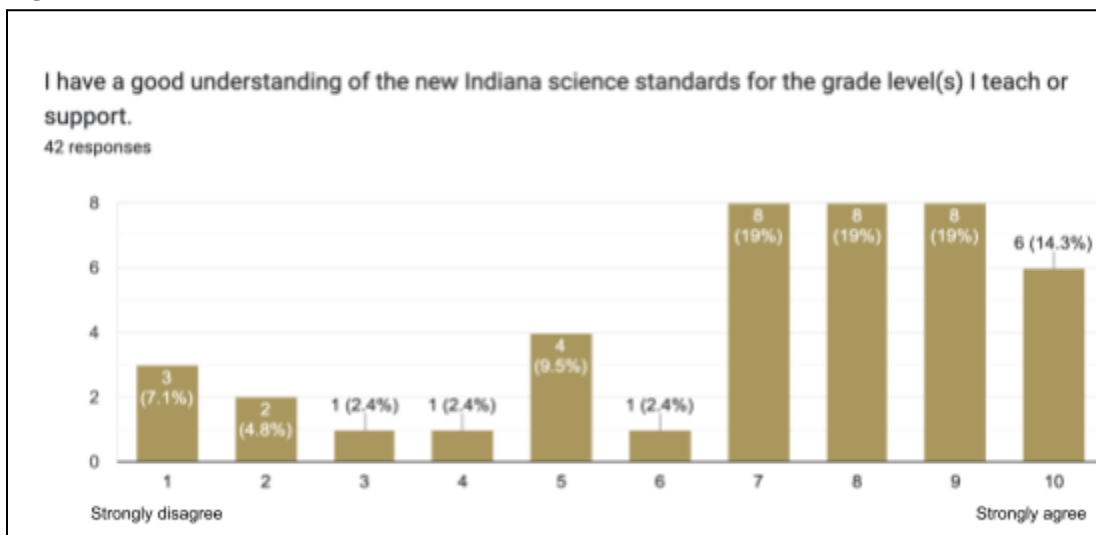


Figure 3

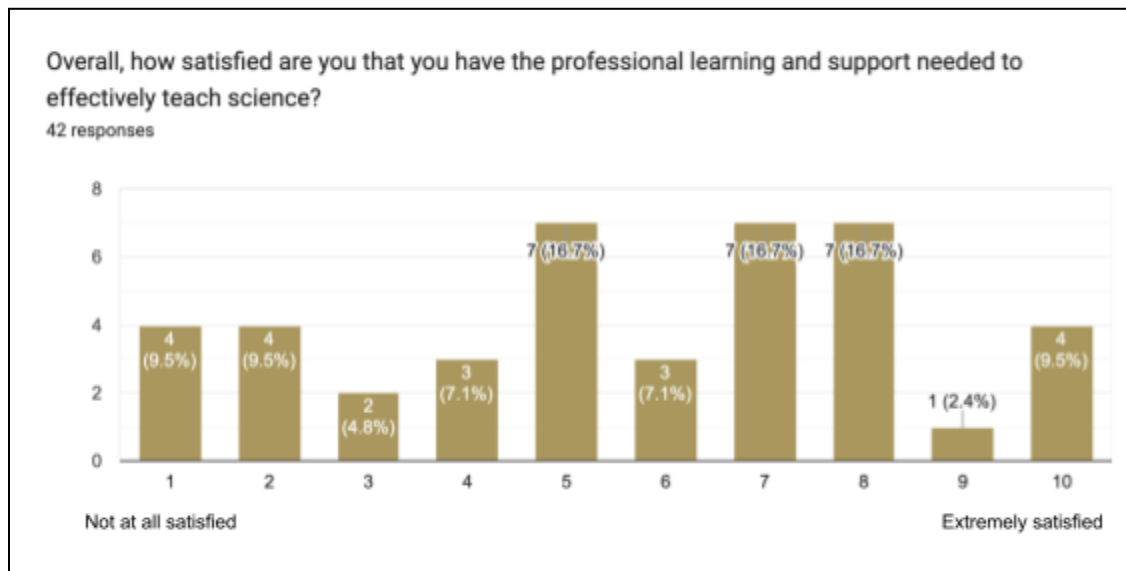


Figure 4

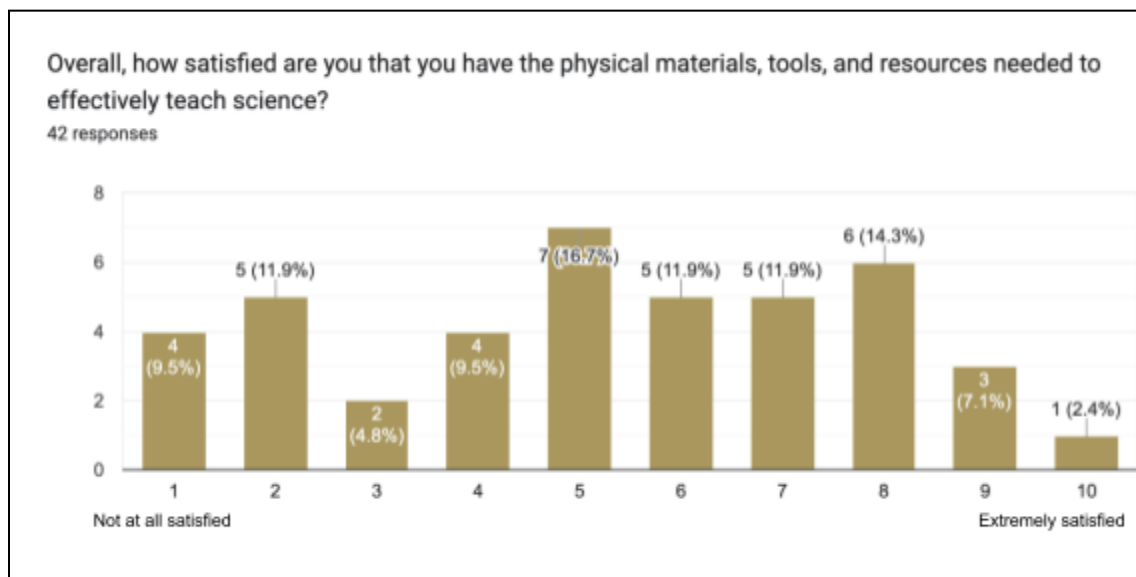


Figure 5

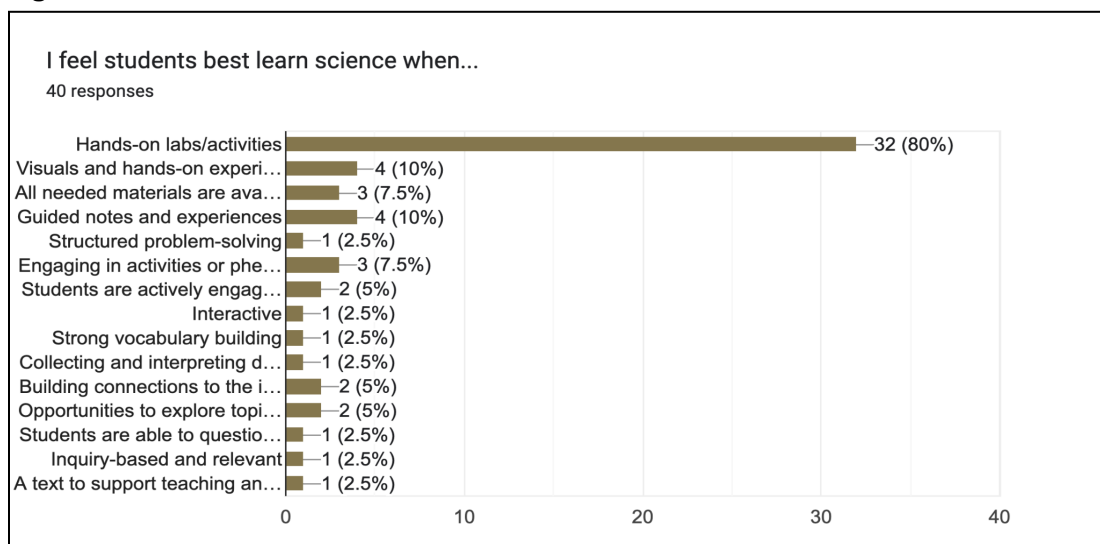
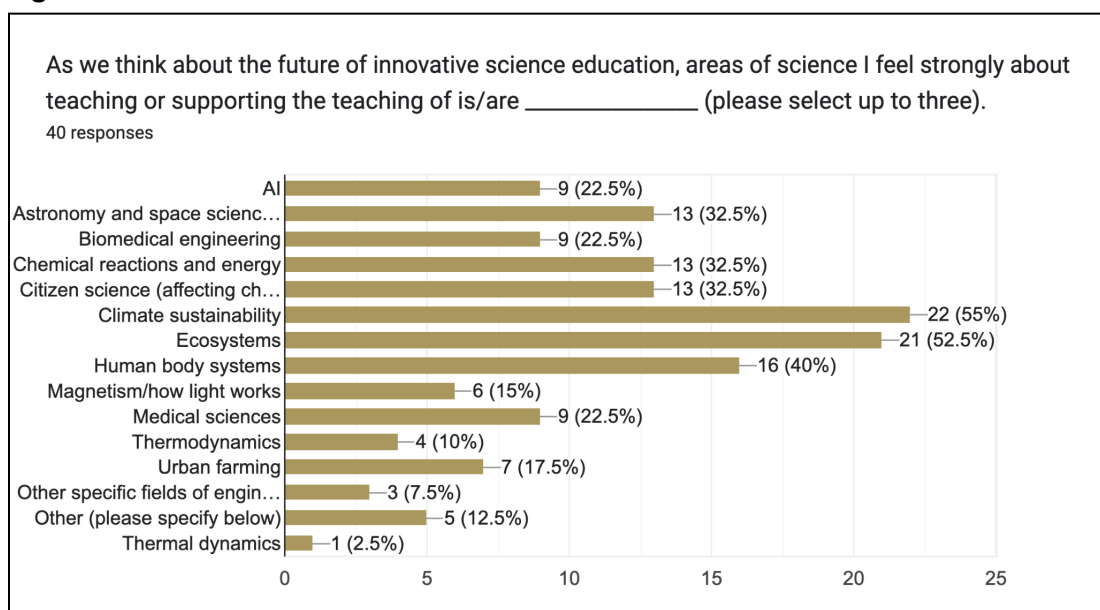


Figure 6



In figure 6, the following topics were shared in the "other" category:

- 8th grade science topics- weather, genetics, global warming, etc.
- Middle school students need to build foundational knowledge in biological, physical, and earth sciences
- Sustainable resource use, geology, evolution
- Physical Science (Physics), Earth Science (Geology), Life Science (Biology)
- I don't feel very comfortable teaching any of them really

Summary of Qualitative Data:

The first open-ended question, ***When considering possible curriculum materials to review for adoption, what are your top THREE priorities or “must-haves?”*** had the following themes:

1. Emphasis on hands-on, inquiry-based learning and labs (N=12)
2. Comes with physical materials needed or has a way of ordering needed lab equipment (N=10)
3. Vetted alignment to NGSS/Indiana Standards (N=7)
4. Robust and engaging digital resources, digital resources compatible with our current platforms (N=8)
5. Visual representations of and supports for ML students and students from a variety of backgrounds (N=4)
6. Real-world relevance and application (N=4)
7. Teacher support for fully implementing the program (N=4)
8. Leveled reading supports for students with reading comprehension (N=2)

The second open-ended question, ***Is there anything you wish Noblesville Schools would do more of within its science program?*** had the following themes:

1. **Emphasize innovative STEM projects; encourage authentic, student-driven labs (N=7)**
(e.g. using design and engineering practices in larger, immersive projects such as bridge building, greenhouse building, and outdoor classroom projects)
(e.g. “Students developing the experiment, collecting authentic data, and communicating results.”)
2. **Provide science resources and funding (N=5)**
(e.g. updated lab equipment and resources)
3. **Provide updated science teaching spaces (N=4)**
(e.g. Lab classroom spaces for all students, outdoor classroom spaces)
4. **Continued work of vertical alignment and coherence (N=2)**
5. **Offer opportunities to grow as a science educator (N=2)**
(e.g. professional development, attending conferences, membership to organizations, encouragement to continue our love of science education and collaboration—Indiana has many such organizations)

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.

Out of approximately 330 responses received

Figure 1

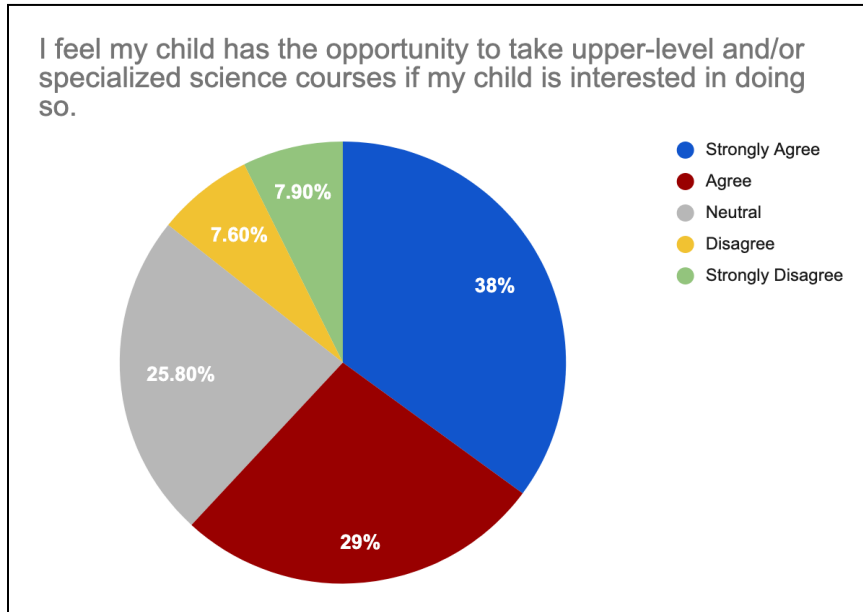


Figure 2

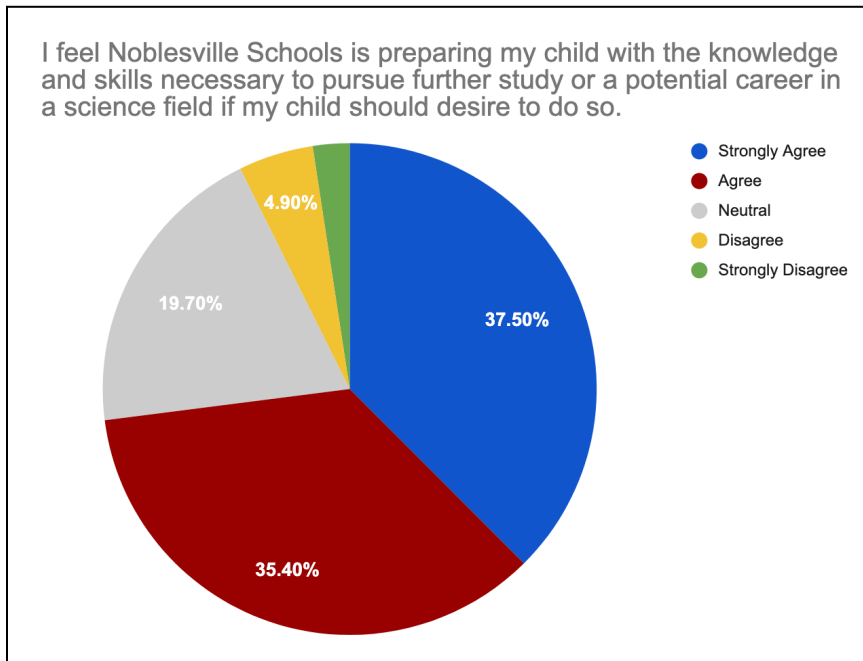
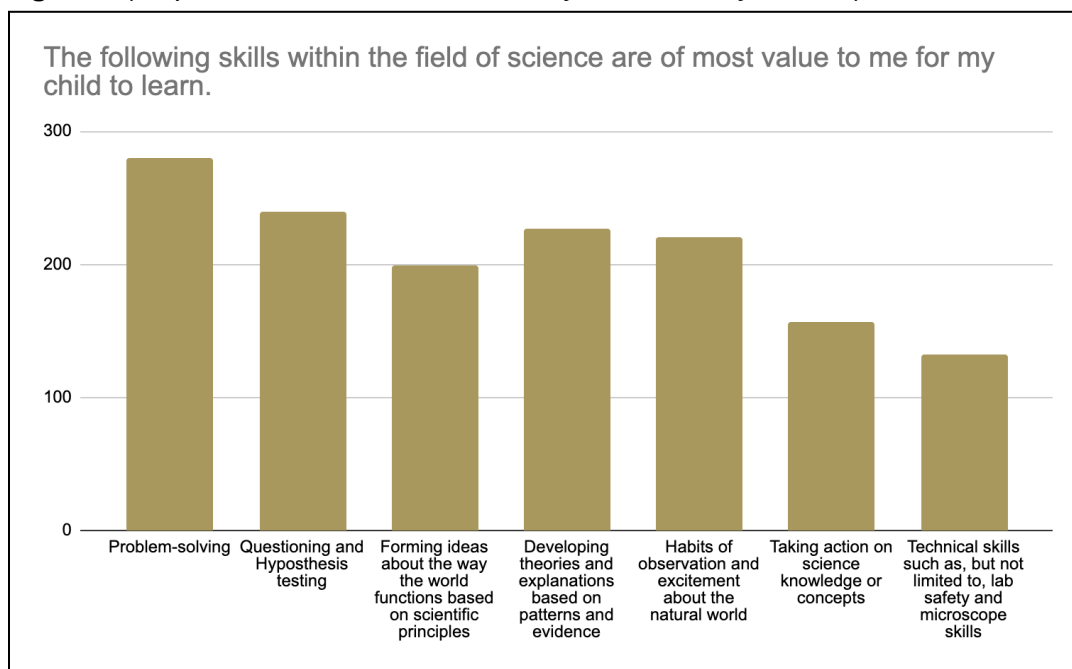


Figure 3 (respondents could check as many skills as they wanted)

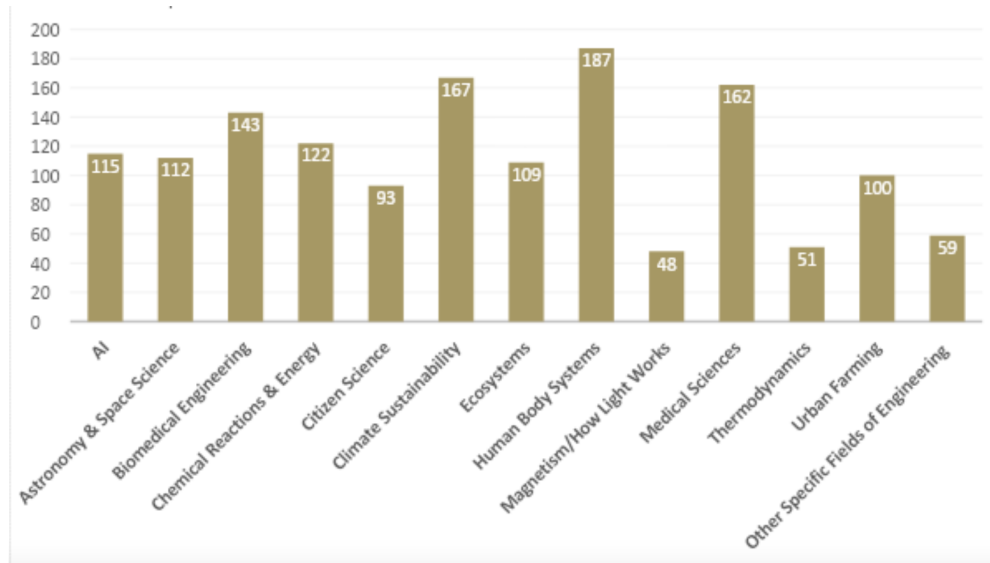


Additional skills noted in the comment section:

- More hands on and labs
- Being exposed to a variety of science concepts at a young age
- Logical skills/coding
- Learning about current science
- Logic skills, coding, excel, critical thinking
- More hands on lab skill/opportunities less book learning. Science needs to be applied and not just read about

Figure 4

As we think about the future of innovative science education, areas of science education I feel strongly about my child learning are _____.



Summary of Qualitative Data:

Is there anything you wish Noblesville Schools would do more of within its science program? If so, please share your thoughts here.

Is there anything else related to the topics in the survey that you'd like to share with us? If so, please share your thoughts here.

The open-ended comments for the last two questions on the survey (listed above) from families were reviewed by Dr. Lynn Bryan and her research assistant at Purdue University. The following themes or sub-themes occurred in the data.

Accolades for Noblesville Science Programs (N=10)

- *Keep up the great work! I trust those in charge of making these decisions!*
- *All science programs offered up to this year have been excellent.*
- *I think Noblesville Schools does an excellent job with its science program. I encourage NS to continue to provide CTE, engineering (project lead the way), and AP courses in science that will prepare students for the world, the workforce, and college (academic rigor).*
- *I think Noblesville Schools are providing appropriate science lessons for my child's age and stage of development right now.*
- *Continuing to improve how we teach science is an awesome thing, and I'm glad you are continuing to enhance and strengthen science as a curriculum.*
- *Establishing critical thinking abilities and a positive relationship with scientific fields is critical for children at my child's age. I think Noblesville Schools are doing well in their approach and I look forward to seeing what lies ahead for my children as they grow and develop.*

Theme 1: Pedagogical Concerns (N=38)

- *Labs, Experiments, Hands-on Learning*
- *Assessment*
- *Varying Student Needs*
- *Applicability of Science*
- *Less on iPads*

Theme 2: More and Robust Science Instruction in Elementary Schools (N=24)

- *More emphasis on science at the elementary level*
- *Consistent science programming at the elementary level*
- *Increase instructional minutes for science at the elementary level*

Theme 3: Out-of-School Science Experiences (N= 16)

- *Increase capacity for STEM-related clubs*
- *More opportunities for STEM-related field trips*
- *Increased opportunities for science fairs and events*

Theme 4: Communication with Parents/Families (N=10)

- *When alignment of programming is solidified, communicate scope and sequence of materials and related-science information on website and through school-based communication tools*

Theme 5: Need for Resources (N=5)

- *Review and adopt updated resources and science equipment*
- *Continue to engage with outside speakers and partnerships in science-related fields*