Mathematics - PERKS

Program **E**ffectiveness **R**eview for **K**entucky **S**chools

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Academic Performance Standard 1 – Curriculum

The school develops and implements an effective, responsive curriculum that is rigorous, intentional, articulated, integrated, and aligned to state standards.

Code	Indicator Description	Observed	Comments
1.01	The mathematics curriculum is aligned with current Kentucky Learning Goals and Academic Expectations and Kentucky Core Academic Standards and the National Council of Teachers of Mathematics (NCTM) current expectations of content standards. (SISI 1.1a)		
1.02	The mathematics curriculum is aligned horizontally and vertically and is articulated within the school and with schools in the district in order to eliminate unnecessary overlaps and close gaps in mathematics with special emphasis on key transition points within and between grade configurations (primary to intermediate, intermediate to middle, middle to high and high school to adult life, college or career related). (SISI 1.1b, 1.1c, 1.1d)		
1.03	The school's mathematics curriculum provides connections to mathematics-related careers and is relevant to students' lives. (SISI 1.1e)		
1.04	All stakeholders developed the mathematics curriculum cooperatively.		
1.05	The mathematics curriculum is research-based and periodically evaluated and redesigned. (SISI 1.1f)		
1.06	The curriculum develops students' understanding of numeracy.		
1.07	The school mathematics curriculum is used in planning the instruction program.		
1.08	Problem solving is the focus of the mathematics program and is an integral part of all mathematical activities. See Mathematical Practices in Kentucky Core Academic Standards.		
1.09	Teachers select mathematics curriculum materials that address the diversity of learners and provide access to a common academic core for all students. (SISI 1.1g)		

Academic Performance Standard 2 – Classroom Evaluation/Assessment

The school utilizes multiple evaluation and assessment strategies to continuously monitor and modify instruction to meet and support proficient student work.

Code	Indicator Description	Observed	Comments
2.01	Classroom assessments **of** student learning are frequent, rigorous, and aligned with Kentucky Core Academic Standards. (SISI 2.1a)		
2.02	Assessments and evaluations are directly related to the goals and objectives of the mathematics program. (SISI 2.1a)		
2.03	Teachers collaborate in the design of authentic assessment tasks. (SISI 2.1b)		
2.04	Students understand and can communicate mathematics course objectives and learning expectations, and know what is required to be proficient. (SISI 2.1c)		
2.05	The school staff analyzes the results of multiple assessments to identify gaps in the mathematics curriculum. (SISI 2.1d)		
2.06	Multiple assessments are specifically designed to provide meaningful, descriptive feedback to students, parents and teachers on student learning of mathematics for instructional purposes. (SISI 2.1e)		
2.07	Scoring guides for mathematics assessments, including clearly identified criteria, are distributed and followed. (SISI 2.1f)		
2.08	Teachers monitor student performance in mathematics and provide feedback in a timely fashion. (SISI 2.1f)		
2.09	Teachers use various forms of documentation to report student progress, achievement, and participation in mathematics. (SISI 2.1f)		
2.10	The results of evaluations and assessments in mathematics are communicated to parents/guardians and other stakeholders in a timely fashion. (SISI 2.1f)		
2.11	Students have adequate and varied opportunities directly related to mathematical practices outlined in the Kentucky Core Academic Standards to demonstrate their understanding and skills in mathematics and how mathematical ideas are connected and integrated across content areas. (SISI 2.1f)		
2.12	Assessments provide opportunities for students to communicate mathematically, represent mathematics, reason mathematically, solve problems and connect mathematics to the world around them. See Mathematical Practices in Kentucky Core Academic Standards (SISI 2.1f, 2.1g)		
2.13	Samples of student work are analyzed to inform instruction and to revise curriculum and pedagogy. Mathematics instruction objectives (targets) are measurable and instruction is adjusted based on an analysis of what students are learning, state and local assessment results, students' dispositions towards mathematics, and other pertinent data. (SISI 2.1h)		
2.14	Students monitor their own progress in mathematics.		
2.15	Mathematics assessments have entry levels for all students.		

Academic Performance Standard 3 – Instruction

The school's instructional program actively engages all students by employing effective, varied, and research-based practices to improve student academic performance.

Code	Indicator Description	Observed	Comments
3.01	Effective and varied instructional strategies are used in all mathematics classrooms. (SISI 3.1a)		
3.02	Teachers use a variety of appropriate instructional grouping patterns ranging from whole class, cooperatives groups, to one-on-one instruction. (SISI 3.1a)		
3.03	Instructional strategies and learning activities are aligned with the district, school, and state learning goals and assessment expectations for student learning. (SISI 3.1b)		
3.04	Instructional strategies are varied, consistent with research-based instructional practices and developmentally appropriate and the instructional strategies address learning styles and are responsive to the needs of all students. (SISI 3.1c)		
3.05	The mathematics instructional materials are bias free, avoid stereotypes, and address diverse student needs including those of special education students and gifted education students. (SISI 3.1c)		
3.06	Teachers demonstrate the content knowledge necessary to challenge and motivate students to high levels of learning. (SISI 3.1d)		
3.07	Teachers provide mathematics instruction that promotes the development of problem solving, connections among mathematical ideas and to students' lives, communicating mathematically, mathematical reasoning, and using multiple representations of numbers. (SISI 3.1d)		
3.08	Technology is integrated into mathematics instruction to enhance learning (e.g., data collection, interpretation, communication). (SISI 3.1e)		
3.09	Appropriate and relevant materials are available to each student/team. (SISI 3.1f)		
3.10	Teachers have opportunities to analyze their own teaching, deliberate with colleagues about their teaching, and confer with supervisors about their teaching. (SISI 3.1g)		
3.11	Homework in mathematics is frequent, monitored and tied to instructional practice. (SISI 3.1h)		
3.12	Students have opportunities to demonstrate their mathematical reasoning – draw conclusions, make predictions, prove hypothesis, think logically.		
3.13	Students have frequent opportunities to investigate mathematics career topics and to solve authentic problems.		
3.14	Students understand that communicating mathematically – representing, discussing, thinking creatively, reading, writing, and listening – is a vital part of learning and using mathematics.		
3.15	Students use multiple representations of numbers such as diagrams, symbols, equations, and manipulatives to model mathematics.		

Learning Environment Standard 4 – School Culture

The school functions as an effective community and supports a climate conducive to performance excellence.

Code	Indicator Description	Observed	Comments
4.01	The school staff (teachers, administrators, counselors, etc.) actively promotes the mathematics program and supports for a safe, orderly and equitable learning environment. (SISI 4.1a)		
4.02	All teachers and administrators believe all students are capable of high achievement in mathematics and hold high expectations for all students. (SISI 4.1a)		
4.03	All teachers demonstrate positive attitudes and are committed to improving numeracy. (SISI 4.1b)		
4.04	All teachers hold high expectations for all students academically and behaviorally and this is evidenced in their practice. (SISI 4.1c)		
4.05	Teachers recognize and accept their professional role in student success and lack of progress. (SISI 4.1e)		
4.06	Staff has been intentionally assigned to maximize opportunities for all students to have access to the staff's instructional strengths. (SISI 4.1f)		
4.07	Teachers are properly certified for the mathematics classes they teach.(SISI 4.1f)		
4.08	Teachers communicate regularly with families about individual student progress in mathematics. (SISI 4.1g)		
4.09	Learning expectations related to mathematics are communicated to students, parents/guardians, and other stakeholders. (SISI 4.1g)		
4.10	All teachers and staff care about the students and inspire their best efforts. (SISI 4.1h)		
4.11	The school recognizes and rewards the mathematics achievements of all students. (SISI 4.1j)		
4.12	Originality, accuracy, personal initiative, and creativity in mathematics are rewarded and publicly displayed. (SISI 4.1j)		
4.13	Teachers provides support for the physical, cultural, socio-economic, and intellectual needs of all students, which reflects a commitment to equity and an appreciation of diversity. (SISI 4.1k)		
4.14	Students understand that they share the responsibility for successful learning in mathematics.		
4.15	Students are held accountable for doing quality work in mathematics.		
4.16	Students feel free to make mistakes and are encouraged to take risks.		

Learning Environment Standard 5 – Student, Family, and Community Support

The school works with families and community groups to remove barriers to learning in an effort to meet the intellectual, social, career, and developmental needs of students.

Code	Indicator Description	Observed	Comments
5.01	Teachers work with families and community groups to promote mathematics programs and services for all students. (SISI 5.1a)		
5.02	Stakeholders are provided opportunities to assist with improving curriculum. (SISI 5.1a)		
5.03	Structures are in place to ensure that all students have access to the entire mathematics curriculum required by the school, district and state. (SISI 5.1b)		
5.04	The teachers provide supports instructional practices to reduce barriers to learning. (SISI 5.1c)		
5.05	The school encourages families to expect and support mathematics achievement by all students. (SISI 5.1c)		
5.06	Parents and students are informed of specialized support and instructional assistance in mathematics and of students' curricular options including their future education and career.		
5.07	Students are provided with opportunities to receive additional assistance to support their mathematical learning beyond the initial classroom instruction. (SISI 5.1d)		
5.08	Supplementary programs include remediation and enrichment activities, based on communication with teachers that extend mathematics instruction beyond the classroom into the school and the community. (SISI 5.1d)		
5.09	Joint school/community activities related to the mathematics instructional program take place regularly.		
5.10	The school maintains an accurate student record system that provides timely information pertinent to the students' academic and educational development. (SISI 5.1e)		

Learning Environment Standard 6 – Professional Development

The school/district provides research-based, results-driven professional development opportunities for staff and implements performance evaluation procedures in order to improve teaching and learning.

Code	Indicator Description	Observed	Comments
6.01	Teachers participate in intentional, sustainable, classroom-focused professional development that updates their content knowledge and professional practice to challenge and motivate students to achieve at higher levels. (SISI 6.1a and 6.1b)		
6.02	A variety of professional development strategies (e.g. workshops, action research, study groups, demonstration lessons, peer coaching, mentoring) are used to improve mathematics instruction and student achievement.		
6.03	Mathematics teachers have been trained in the use of materials and resources that support the curriculum program adopted for mathematics instruction.		
6.04	Mathematics teachers actively participate in professional organizations and district and/or school communities.		
6.05	The mathematics professional development program is differentiated so that learning experiences build on teachers' current mathematics knowledge, skills, and attitudes. (SISI 6.1c)		
6.06	Professional development in mathematics is on-going and job-embedded. (SISI 6.1e)		
6.07	The mathematics professional development program shows a direct connection to an analysis of student achievement data which includes making personal sense of data, and/or investigating research-based practices in mathematics to improve student achievement. (SISI 6.1f)		

Efficiency Standard 7 – Leadership

School/district instructional decisions focus on support for teaching and learning, organizational direction, high performance expectations, creating a learning culture, developing leadership capacity.

Code	Indicator Description	Observed	Comments
7.01	The principal can articulate his/her beliefs about effective instruction in mathematics. (SISI 7.1a)		
7.02	Leadership decisions are focused on student academic performance, data-driven, and are developed in collaboration with the mathematics faculty. (SISI 7.1b)		
7.03	Teachers have access to curriculum related materials and training necessary to use curricular and data resources relating to the learning goals. (SISI 7.1e)		
7.04	Leadership ensures that time is protected and allocated to focus on curricular and instructional issues. (SISI 7.1f)		
7.05	Interruptions within the school day are kept to a minimum. (SISI 7.1f)		
7.06	Non-teaching responsibilities and extra duties are equitable and kept to a minimum. (SISI 7.1f)		
7.07	Leadership plans and allocates resources, monitors progress, provides the organizational infrastructure and removes barriers in order to sustain continuous school improvement. (SISI 7.1g)		
7.08	Classroom teachers are assigned classes that are at or under recommended cap size. (SISI 7.1h)		
7.09	The principal assists teachers in implementing the mathematics curriculum, facilitates research-based practices in mathematics, and observes mathematics classes on a regular basis. (SISI 7.1k)		
7.10	Administrators (e.g. principal, central office personnel) encourage and fund active involvement in local, regional, and national professional mathematics associations, societies, and research activities. (SISI 7.1k)		
7.11	The principal confers with teachers immediately following observations, reinforcing effective practices and providing guidance to improve ineffective ones. (SISI 7.1k)		

Efficiency Standard 8 – Organizational Structure and Resources

There is evidence that the school is organized to maximize use of all available resources to support high student and staff performance.

Code	Indicator Description	Observed	Comments
8.01	Classrooms have adequate space and furnishings to facilitate a standards-based investigative program. (SISI 8.1a)		
8.02	A variety of curriculum materials is readily available and is used to meet the objectives of the mathematics curriculum. (SISI 8.1a)		
8.03	At every grade level, an appropriate amount of time is devoted regularly to mathematics instruction. (SISI 8.1b)		
8.04	The master class schedule reflects that all students have access to all mathematics classes. (SISI 8.1b)		
8.05	An appropriate amount of time is scheduled for instruction in mathematics. (SISI 8.1d)		
8.06	Teachers make efficient use of instructional time to maximize student learning. (SISI 8.1d)		
8.07	Schedules allow collaborative planning and teaching of mathematics across subject and/or grades. (SISI 8.1e)		
8.08	Budget allocations are sufficient to meet the needs generated by mathematics curriculum (e.g. Eisenhower funds, district fee monies, grants, other funding sources). (SISI 8.2a and 8.2b)		
8.09	The principal, school council, and mathematics staff reach consensus on determining the expenditure of funds available to accomplish the mathematics goals. (SISI 8.2 a and 8.2b)		

Efficiency Standard 9 – Comprehensive and Effective Planning

The school/district develops, implements, and evaluates a comprehensive school improvement plan that communicates a clear purpose, direction, and action plan focused on teaching and learning.

Code	Indicator Description	Observed	Comments
9.01	Student achievement in mathematics is addressed in the school's Comprehensive School Improvement Plan (CSIP) and other plans such as School Improvement Grants (SIG), if applicable.		
9.02	Teachers work collaboratively to define desired results for student learning. (SISI 9.3a and 9.3c)		
9.03	Teachers analyze their students' unique needs in order that timely interventions can be provided to the students. (SISI 9.3b)		
9.04	The mathematics faculty and leadership implement the activities listed in the Comprehensive School Improvement Plan and use systematic strategy to evaluate the effectiveness. (SISI 9.5c, 9.6a and 9.6b)		
9.05	Teachers continuously evaluate and modify the activities listed in the CSIP and other school/district plans to determine their impact on student achievement and instructional classroom practices. (SISI 9.6c)		
9.06	Teachers make effort to sustain the commitment to continuous improvement. (SISI 9.6d)		

Teacher Interview

Curriculum:	
1. Mathematics curriculum—How was it developed, do teachers teach it, what content does it include, and for what reasons is it revised? (Standard 1, 1.1-1.4, 1.6-1.12)	
2. How does your mathematics curriculum relate to other mathematics classes in your school and to other schools (e.g., feeder schools) in your district? (1.5)	
3. How is your professional development related to the mathematics curriculum? What kind of experiences do you engage in for professional development and who plans it? Are these included in the school's Consolidated Plan? (3.7-3.10, and 3.12)	
4. What materials, resources, and supplies do you use to teach mathematics? What do you need to teach mathematics better? (1.14, 1.17, 1.18, 3.22, 3.23)	
5. How are mathematics materials budgeted and what other financial resources are used to support the mathematics curriculum? (1.15-1.16)	
6. How are at-risk students served, e.g., ESS, and do you have input into that activity? What other ways is the mathematics curriculum extended beyond the classroom? (1.19)	

Instruction:	
1. How do you determine instructional strategies for any particular lesson or unit? If those strategies do not work, what do you do? (3.1, 3.3, 3.4)	
2. How do you include problem solving in your teaching? Connecting with the real world? Mathematical reasoning? Communicating mathematically? (3.2)	
3. Time/Scheduling—Elementary—Do all teachers teach mathematics or is there a specialized teacher of mathematics? How often and for how long is mathematics taught? Middle/High—How long are the mathematics class periods and what type of schedule do students follow? (3.6)	
4. How are you involved in professional organizations? Which professional mathematics journals do you have access to? Are you on any math-related committees? (3.11)	
5. How do you plan with other mathematics teachers? How do you collaborate with special education teachers? (3.5, 3.23)	
6. How do your administrators support the mathematics program? (3.13-3.15)	
7. What is your area of certification? (3.16)	

8. How do you communicate your expectations for learning to students and parents? (3.17- 3.21)	
9. What adaptations are made to meet the needs of your students? How is diversity addressed in your classroom? How are students grouped for mathematics classes? (3.23-3.27)	
10. How do students use technology as a learning tool in your mathematics class? (3.28)	
11. What is your preferred strategy for teaching mathematics? What are the benefits for your students? (3.24-3.28)	
12. How do you communicate with parents and students about mathematics activities? How do you know that your students believe they can learn mathematics? (3.29-3.31)	
Assessment:	
1. What types of assessment strategies do you use in mathematics? (2.1-2.7, 2.10-2.11)	

2. How do you communicate assessment results to students and how often? How can they know what is expected of them and how can they monitor their own progress?(2.3, 2.8-2.9)	
3. How do you communicate assessment results to parents and how often? (2.4-2.5)	

Other:	
1. What do you see as the major strengths of the mathematics program? What are the areas most in need of improvement in the mathematics program?	
2. Which do you believe comes first—skills or understanding? Why? Do you believe students need to know basic skills before they can solve problems?	

Principal Interview

1. How would you describe your school's mathematics program? (Standard 1 and 3)	
2. What do you think is the strongest feature of the mathematics program? The weakest feature of the program?	
3. How would you describe "good mathematics teaching"? Does your school have good mathematics teaching? (Characteristics of Highly Effective Teaching and Learning – Mathematics)	
4. How does your mathematics curriculum relate to other schools in your district? If so, how? How often do you and/or the teachers meet with feeder schools to coordinate the mathematics program? (1.5)	
5. How are parents and the community involved in the mathematics program? (1.1, 1.16)	
6. How are you involved in the mathematics program? (3.3-3.15)	
7. What specialized training and experiences have the mathematics teachers in your school had to help them teach mathematics? How do you support the mathematics teachers in their professional development? Are needs reflected in your school's Consolidated Plan? (3.7-3.12)	

8. Are there mathematics teachers who are not properly certified in mathematics? What support provided to those teachers to assist them with teaching mathematics? (3.16)	
9. Describe the diversity in your school. How are the diverse needs of students met in the mathematics classes? (1.18, 3.22, 3.23)	
10. How do mathematics and special education teachers collaborate? How often does this occur? (3.23, 3.29)	
11. How do you use assessment data to determine needs of the mathematics program? (Standard 2)	
12. How do you insure that all students have equal access to grade-level mathematics content and mathematics instruction?	
13. How do you convey expectations for high achievement of students in mathematics? (3.15)	

Student Interview

1. Describe your mathematics class? What do you do in math class each day? What topics are you studying? (Standard 1 and 3)	
2. How often do you go to mathematics class? (3.6)	
3. Does the mathematics you learn help you connect it to everyday life? What types of homework do you do? (1.10, 1.11, 1.13)	
4. How often do you use computers and calculators in mathematics class? How are they used in class (answer getting, investigation/discovery etc. (3.28)	
5. How often do you use hands-on materials (manipulatives) like pattern blocks, algebra tiles, and color tiles? (1.2, 1.17-1.18, 3.22, 3.23, 3.26)	
6. Do you know what your teacher expects from you? How does he/she communicate that to you? How is your grade determined? (3.17-3.21, 2.8-2.10)	
7. What do the mathematics teachers or guidance counselors tell you about curricular or career options related to mathematics? What about any special support that may be available? (3.29)	

8. What school activities do you participate in that are focused on mathematics? Do you go on field trips or participate in mathematics competitions? (1.19, 3.31)	
9. How do you and your teacher know that you are learning mathematics? (2.2-2.4, 2.7, 2.9)	
10. What kind of assessments do you take in mathematics—do you ever do projects? Investigations? Open-Response? (2.2, 2.7, 2.11)	
11. How are test results and your progress in mathematics reported to you and your parents? (2.5)	
12. How do you know that you are good at mathematics? Does your teacher believe that? (3.21, 3.27, 3.30)	
13. Do you believe that you have to know your basic math skills before you can solve problems?	
14. How often do you work in groups with other students in the classroom to do mathematics or work on a project? (Elementary: Are you in a special group for mathematics? Do all students in your class do the same math?) (3.24, 3.25, 3.26)	

Parent Interview

1. Describe the mathematics program in this school. (Standard 1 and 3)	
2. How are you involved in the mathematics program? (1.1, 1.16, 1.19, 3.29)	
3. Does your child's mathematics homework help him/her understand mathematics and connect mathematics to everyday life? If so, how? (1.13)	
4. How do the mathematics teachers communicate with you? How often does this occur? What do they typically communicate to you about? (3.17, 3.29, 2.5)	
5. Do the mathematics teachers believe that your child can learn mathematics? How does he/she convey a positive attitude towards mathematics? (3.27, 3.30, 3.21)	
6. How are your child's needs met in the mathematics class? (1.18, 1.19, 3.23)	
7. How do the mathematics teachers or guidance counselors let you know about curricular or career options for students? Do they let you know about any special support that may be available? (3.29)	

8. Does your child participate in extracurricular mathematics activities? Which ones? (3.31)	
9. How is student progress in mathematics monitored? How do you know if your child is successful in mathematics? (2.2, 2.3, 2.9)	
10. How are test results and student progress in mathematics reported to you? (2.5)	
11. Which mathematics projects or investigations does your child participate in? (1.8- 1.12, 3.2, 3.24, 3.25)	
12. How does your child use a calculator and/or computer to learn mathematics? (3.28)	
13. What is the strongest feature of the mathematics program? The weakest feature of the program?	
14. Does your child receive good mathematics instruction? Why do you feel this way?	