ONE YEAR MATHEMATICS PLAN

Program Year:

July 1, 2018 – June 2019

DEPARTMENT OF CURRICULUM & INSTRUCTION

What any person in the world can learn, almost all persons can learn, if provided with the appropriate prior and current conditions of learning. Remember, test scores and measures of achievement tell you where a student is, but they don't tell you where a student could end up.

Dr. Carol Dweck, Mindset: The New Psychology of Success

Mission Statement

The Office of Mathematics exists to provide the students it serves with a mathematical 'lens'-- allowing them to better access the world with improved decisiveness, precision, and dexterity; facilities attained as students develop a broad and deep understanding of mathematical content. Achieving this goal defines our work - ensuring that students are exposed to excellence via a rigorous, standards-driven mathematics curriculum, knowledgeable and effective teachers, and policies that enhance and support learning.

Executive Summary

The One Year Mathematics Plan outlines the activities which will be undertaken during the program year beginning July 1, 2018 and ending June 29, 2019 using district funds granted for use during the 2018-2019 school year. Programs and activities in this plan are intended to provide support and direction to schools in alignment to the Orange Public School district's vision, the Office of Mathematics and Science philosophy for Mathematics, and the district-wide school mathematics goals for SY2018-19. Given the number of challenges facing a district having only 21% of its students in grades 3-12 meeting expectations on the statewide mathematics assessment (a growth of +4% points over last year), it is imperative to focus interventions on content and performance standards, human capital strategies, and assessment and data analysis systems. **While the district will employ five broad goals for improving student performance in the area of Mathematics, these goals will be distilled into 3 concentrated areas: FOCUS, COHERENCE, & RIGOR.** To support this overall plan, it is imperative that district leadership align organizational structures and resources to make sure teachers have what they need to be effective, including access to high-quality curricula, ongoing professional development, and allocated time to learn, work, and plan with other educators.

Districtwide Student Achievement and Growth Goals

a. By June 2019, for all 3-11 grades, the Orange Board of Education will enhance and improve student achievement for all students, as measured by a minimum increase of 10 percentage points, either by grade band or cohort, on the PARCC assessments in mathematics and English Language Arts over the 2018 baseline scores.

b. By June 2019, **80%** of all **K-2** students will demonstrate improved academic achievement as measured by scoring at or above end of year growth norms/expectations as measured by performance on content-related assessments in ELA and Mathematics (e.g. iRead, Reading Inventory, iReady).

Our 2018 – 2019 Districtwide Performance Targets

PERFORMANCE GOALS

Performance Goal 1: Reasoning Abstractly and Quantitatively

Based on the Spring 2018 PARCC data in grades 3- 11, it is noted that there is an average of a 16 percentage point difference between students meeting or exceeding expectations in reasoning between the state and district performance. Therefore ***Goal 1*** is….

To decrease the average difference between the state and district performance in Reasoning by 4% this year by strengthening mathematical reasoning districtwide. Strategies include engaging students in learning experiences that allow the judging of reasonableness of numerical results, developing number sense and an understanding or numerical operations, communicating mathematical ideas and procedures, exploring the meaning and role of mathematical concepts, and applying mathematics in contexts outside of mathematics. The 5 Practices for Orchestrating Productive Mathematics Discussion, TQE, and/or the implementation of daily use of Mathematics Content Routines will be a focus of the 2018-2019 school year.

Performance Goal 2: Geometry, Measurement, and Data

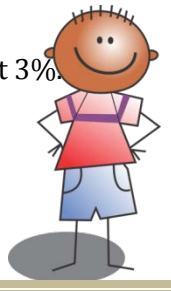
Based on the Spring 2018 PARCC data, it is noted that the district fell below state performance within the Geometry and/or Measurement & Data Domains for grades 4 and 5. Therefore ***Goal 2*** is…

To increase proficiency within the Geometry and Measurement & Data Domains in Grades 3-5 as measured by an average score increase of 20% on iReady Standards Mastery Assessments (Fall to Spring). These domains will be reinforced through center instruction, after school programming and the overall reinforcement of procedural fluency, conceptual understanding, and problem solving

Performance Goal 3: Grade 8

Grade 8 math has been identified as a struggling area for two consecutive years. Although progress was made from 2017 to 2018, when compared to the state, the achievement gains are subpar. In effort to close the achievement gap over a 4-5 year period, we will aim at closing the achievement gap one year at a time using small group intervention strategies to target the individual student deficiencies. The department will support teachers and administration in analyzing data quarterly to chunk/sequence content materials specific to student needs to promote student learning. Therefore ***Goal 3*** is:

Goal: By June 2018, the district-state achievement gap in PARCC mathematic proficiency results for Grade 8 will decrease by at least 3%.



Performance Goal 4: Algebra I

Algebra I is a foundation course of all high school math courses. Improving Algebra I proficient rate will help students to success in the future math courses and increase student college readiness. In addition, passing Algebra I PARCC is one of NJ state high school graduation requirements. Based on 2018 Spring PARCC assessment, there is a 20% proficient rate difference between state and district. A 4% points higher than state Algebra I student growth on PARCC per year will lead district to close Algebra I student achievement gap in 5 years. Therefore ***Goal 4*** is…

To increase the % of 9th grade students meeting expectations on the 209 PARCC assessment in Algebra I by 4 percentage points

Performance Goal 5: Students with Disabilities

Results show that while the difference in 2017 and 2018 average scale score of non-students with disabilities showed a statistically significant increase, there was no significant change in performance from 2017 – 2018 of students with disabilities. The 2017mean scale score of students with disabilities is 699.39 and the mean scale score in 2018 is 699.39. Therefore ***Goal 5*** is…

By June 2019, the district will increase the mean scale score for special needs students taking the 2019 PARCC Assessments in Mathematics by .5 standard deviation, which equated to a mean scale score 710.

		Mean	N	Std. Deviation
Student w/ Disabilities	2017_TestScaleScore	699.38	322	21.887
	2018_TestScaleScore	699.39	322	22.102
Non Sw/D's	2017_TestScaleScore	725.60	1992	30.539
	2018_TestScaleScore	728.82	1992	29.956

Important Dates

2018-2019 Marking Period Dates (Note: Corresponds to End-Dates for Quarterly Assessments)

9/10/18 – 11/14/18	**11/15/18 – 01/30/19**	**01/31/19 – 04/10/19**	**04/11/19 – 06/26/19**

2018-2019 Interim Marking Period Dates (Note: Corresponds to End-Dates for Quarterly Assessments)

9/10/18 – 10/10/18	**11/15/18 – 12/18/18**	**01/31/19 – 03/08/19**	**04/11/19 – 05/22/19**

2018-2019 State Quarterly Dates

11/15/18	**2/15/19**	**4/15/19**	**6/15/19**

2018-2019 SGO Dates

October 31 Completed SGO's due	**February 5** Due date for adjusted SGOs	**April 25** Final SGOs due for non-ten'd	**May 24** Final SGOs due for ten'd

2018-2019 iReady Testing Windows

September 10 – 21 Fall (Diagnostic 1)	**January 7 - 18** Winter (Diagnostic 2)	**April 8 - 18** Spring (Diagnostic 3)

2018-2019 NWEA Testing Windows

September 10 – 21 Fall (Diagnostic 1)	**January 7 - 18** Winter (Diagnostic 2)	**April 8 - 18** Spring (Diagnostic 3)

2018 PARCC Performance Level Comparison (by School)

	Test Code	N	1	2	3	4	5	% Proficient (2018)	% Proficient (2017)	Gain		Test Code	Mean	
CLE	ELA03	37	6	10	12	6	3	24.3%	30%	-5.7%		ELA03	734.22	
	ELA04	40	8	10	10	12	0	30.0%	23%	7.0%		ELA04	727.30	
	ELA05	34	3	11	10	10	0	29.4%	26%	3.4%		ELA05	730.85	
	ELA06	26	1	7	7	10	1	42.3%	38%	4.3%		ELA06	743.69	
	ELA07	36	4	8	10	11	3	38.9%	32%	6.9%		ELA07	740.31	
	MAT03	36	4	8	10	12	2	38.9%	0.27	11.9%	*	MAT03	741.42	
	MAT04	40	7	7	16	10	0	25.0%	31%	-6.0%		MAT04	731.33	
	MAT05	34	9	9	8	8	0	23.5%	16%	7.5%		MAT05	724.85	
	MAT06	26	2	7	7	9	1	38.5%	21%	17.5%	*	MAT06	739.50	
	MAT07	36	6	12	9	8	1	25.0%	17%	8.0%		MAT07	730.17	
FOR	ELA03	54	7	7	19	20	1	38.9%	48%	-9.1%		ELA03	742.85	
	ELA04	42	0	8	14	17	3	47.6%	35%	12.6%	*	ELA04	751.07	*
	ELA05	36	3	4	6	20	3	63.9%	40%	23.9%	*	ELA05	756.81	*
	ELA06	46	0	3	20	18	5	50.0%	45%	5.0%		ELA06	754.70	*
	ELA07	38	2	1	8	19	8	71.1%	65%	6.1%		ELA07	759.87	*
	MAT03	54	5	11	22	13	3	29.6%	25%	4.6%		MAT03	740.22	
	MAT04	42	5	9	17	11	0	26.2%	24%	2.2%		MAT04	733.60	
	MAT05	36	8	8	8	12	0	33.3%	20%	13.3%	*	MAT05	730.42	
	MAT06	49	7	17	16	9	0	18.4%	17%	1.4%		MAT06	726.06	
	MAT07	38	2	17	12	7	0	18.4%	27%	-8.6%		MAT07	731.53	

	Test Code	N	1	2	3	4	5	% Proficient (2018)	% Proficient (2017)	Gain		Test Code	Mean	
HEY	ELA03	38	10	10	5	12	1	34.2%	34%	0.2%		ELA03	726.79	
	ELA04	42	4	6	8	23	1	57.1%	45%	12.1%	*	ELA04	748.36	
	ELA05	43	4	6	16	15	2	39.5%	35%	4.5%		ELA05	742.07	
	ELA06	46	3	6	15	17	5	47.8%	38%	9.8%	*	ELA06	748.93	
	ELA07	36	7	5	6	8	10	50.0%	40%	10.0%	*	ELA07	748.47	
	MAT03	39	6	7	14	9	3	30.8%	29%	1.8%		MAT03	736.41	
	MAT04	43	3	15	5	20	0	46.5%	36%	10.5%	*	MAT04	738.47	
	MAT05	43	4	12	18	9	0	20.9%	29%	-8.1%		MAT05	729.88	
	MAT06	47	11	11	14	10	1	23.4%	21%	2.4%		MAT06	728.23	
	MAT07	36	5	16	9	5	1	16.7%	13%	3.7%		MAT07	722.28	
LAS	ELA03	107	38	19	18	32	0	29.9%	21%	8.9%		ELA03	720.21	
	ELA04	80	24	28	16	12	0	15.0%	24%	-9.0%		ELA04	714.65	
	ELA05	84	17	22	27	18	0	21.4%	36%	-14.6%		ELA05	725.52	
	ELA06	93	6	30	27	27	3	32.3%	46%	-13.7%		ELA06	735.95	
	ELA07	69	5	8	7	30	19	71.0%	36%	35.0%	*	ELA07	762.65	*
	MAT03	117	25	31	32	26	3	24.8%	11%	13.8%	*	MAT03	726.10	
	MAT04	85	38	22	14	11	0	12.9%	10%	2.9%		MAT04	710.22	
	MAT05	89	26	31	18	14	0	15.7%	16%	-0.3%		MAT05	715.71	
	MAT06	97	25	31	23	16	2	18.6%	15%	3.6%		MAT06	719.74	
	MAT07	74	10	15	28	17	4	28.4%	14%	14.4%	*	MAT07	733.78	

ROSA

Test Code	N	1	2	3	4	5	% Proficient (2018)	% Proficient (2017)	Gain		Test Code	Mean
ELA03	131	37	25	44	22	3	19.1%	25%	-5.9%		ELA03	723.59
ELA04	91	8	21	32	27	3	33.0%	29%	4.0%		ELA04	739.47
ELA05	104	12	26	31	32	3	33.7%	26%	7.7%		ELA05	738.00
ELA06	103	10	22	32	34	5	37.9%	28%	9.9%	*	ELA06	739.63
ELA07	84	13	12	14	36	9	53.6%	37%	16.6%	*	ELA07	743.55
MAT03	132	16	39	43	30	4	25.8%	32%	-6.2%		MAT03	731.91
MAT04	92	7	20	35	29	1	32.6%	28%	4.6%		MAT04	737.98
MAT05	106	20	23	36	25	2	25.5%	16%	9.5%	*	MAT05	730.88
MAT06	105	13	29	36	26	1	25.7%	21%	4.7%		MAT06	732.04
MAT07	84	4	21	26	29	4	39.3%	19%	20.3%	*	MAT07	741.26

OAK

ELA03	24	4	5	6	9		37.5%	27%	10.5%	*	ELA03	735.50	
ELA04	15	0	1	6	8		53.3%	27%	26.3%	*	ELA04	752.47	*
ELA05	22	5	9	5	3		13.6%	26%	-12.4%		ELA05	720.50	
ELA06	18	0	6	7	5		27.8%	15%	12.8%	*	ELA06	741.06	
ELA07	16	1	2	7	6		37.5%	22%	15.5%	*	ELA07	740.56	
MAT03	24	7	1	7	9		37.5%	35%	2.5%		MAT03	731.17	
MAT04	15	1	2	9	3		20.0%	12%	8.0%		MAT04	734.53	
MAT05	22	7	9	4	2		9.1%	11%	-1.9%		MAT05	711.32	
MAT06	18	2	9	4	3		16.7%	0%	16.7%	*	MAT06	721.61	
MAT07	16	3	9	3	1		6.3%	7%	-0.8%		MAT07	714.69	

PAS

ELA03	52	7	10	11	23	1	46.2%	21%	25.2%	*	ELA03	744.62
ELA04	57	6	17	13	18	3	36.8%	35%	1.8%		ELA04	737.12
ELA05	56	11	11	18	15	1	28.6%	24%	4.6%		ELA05	731.00
ELA06	56	9	12	16	19	0	33.9%	34%	-0.1%		ELA06	734.02
ELA07	46	6	4	13	17	6	50.0%	30%	20.0%	*	ELA07	748.30
MAT03	53	12	11	10	16	4	37.7%	27%	10.7%	*	MAT03	731.79
MAT04	57	10	17	13	17	0	29.8%	24%	5.8%		MAT04	727.70
MAT05	57	10	22	13	11	1	21.1%	19%	2.1%		MAT05	726.53
MAT06	56	16	20	10	10	0	17.9%	20%	-2.1%		MAT06	718.02
MAT07	45	9	14	11	10	1	24.4%	21%	3.4%		MAT07	728.11

	Test Code	N	1	2	3	4	5	% Proficient (2018)	% Proficient (2017)	Gain
OPA	ELA08	314	50	58	97	89	20	34.7%	36%	-1.3%
	ELA09	208	67	46	61	34	0	16.3%	25%	-8.7%
	MAT08	282	103	75	73	31	0	11.0%	9%	2.0%
	ALG01	224	46	69	51	52	6	25.9%	18%	7.9%
	ALG02	2	0	0	1	1	0	50.0%	79%	-29.0%
STEM	ELA09	45	0	3	4	26	12	84.4%	84.4%	0.0%
	ALG01	23	0	0	7	18	2	87.0%	52.2%	34.8%
	GEO01	22	0	0	2	19	1	90.9%	100%	-9.1%
OHS	ELA09	11	10	1	0	0	0	0.0%	n/a	n/a
	ELA10	304	99	62	67	63	13	25.0%	21%	4.0%
	ELA11	282	61	54	73	76	18	33.3%	29%	4.3%
	ALG01	37	24	11	2	0	0	0.0%	0%	0.0%
	ALG02	294	153	88	42	11	0	3.7%	5%	-1.3%
	GEO01	275	42	126	64	42	1	15.6%	10%	5.6%
CIAO	ELA09	1	0	1	0			0.0%	suppressed	n/a
	ELA10	4	3	1	0			0.0%	suppressed	n/a
	ELA11	2	1	0	1			0.0%	suppressed	n/a
	ALG01	3	2	1	0			0.0%	suppressed	n/a
	ALG02	6	6	0	0			0.0%	suppressed	n/a
	GEO01	6	1	5	0			0.0%	suppressed	n/a

Test Code	Mean	
ELA08	738.15	
ELA09	716.92	
MAT08	712.61	
ALG01	729.45	
ALG02	757.50	*
ELA09	773.09	*
ALG01	765.13	*
GEO01	765.36	*
ELA09	679.00	
ELA10	721.66	
ELA11	732.56	
ALG01	696.08	
ALG02	699.80	
GEO01	723.36	
ELA09	721.00	
ELA10	671.25	
ELA11	708.00	
ALG01	686.33	
ALG02	681.17	
GEO01	709.83	

2018-2019 DEPARTMENT GOALS

GOAL I
Strengthen and align curriculum to the Common Core State Standards for Mathematics, ensuring that it is engaging, challenging, and consistently implemented.

GOAL 2
Improve the quality of mathematics instructional programs in grades K-12; thereby maintaining the mutually reinforcing balance between procedural skill and fluency, conceptual understanding, and problem solving.

GOAL 3
Advance the use, and management of assessment; understanding assessment (e.g. diagnostic, formative, summative, authentic) as a continuous thread of instructional practice, rather than a series of isolated events.

GOAL 4
Create a highly effective professional development system for teachers and administrators that is more focused on delivering quality instruction and aligned to the learning needs of teachers and students.

GOAL 5
Empower parents to be more effectively engaged in their child's instruction through the creation of a highly-accessible, web-based system for parents and students that increases exposure to and the availability of the districts' instructional resources.

To effectively teach math, all teachers must develop and maintain skills that enable them to help students understand the complex concepts that underpin mathematical formulas and computation.

OBJECTIVE 1.1: CREATE PACING CALENDARS FOR ALL DISTRICT CURRICULUM (K-12)

1.1a Develop new pacing calendars for newly adopted curriculum (K-8)
1.1b Redesign district curriculum to address curricular gaps and/or misalignments (K-2)
1.1c Develop pacing calendars to accommodate the needs of subgroups such as SPED, ELL and 4th year math course (9-12)
1.1d Align 4th year math course with state mandated Portfolio Appeals criteria (HS)
1.1e Introduce ALEKS adaptive program at OPA, OHS, CIAO, STEM as a strategy for standards mastery (remediation, practice, and enrichment).

Objective 2.1: Align instructional materials, programs, and expectations for practice to support the shared belief that all students can learn and succeed.

2.1a Redesign and rearticulate the Ideal Math Block to dedicate 60 minutes to core instruction and 30 minutes to the specific needs of students based upon data (5 days per week). Everything is organized to evoke and support this effort, to send the message that effort is expected and that tough problems yield to sustained work. High minimum standards are set and assessments are geared to the standards. All students are taught a rigorous curriculum, matched to the standards. They receive as much time and expert instruction as they need to meet or exceed expectations.
2.1b Institute the daily use of Mathematics Content Routines (ex: Number Talks, Noticing & Wonderings, Which One Doesn't Belong) and Mathematics Language Routines (ex: Info Gaps, Think Alouds, etc.) in place of Do Nows and across all Mathematics classrooms to make mathematical thinking VISIBLE, EXPECTED, & VALUED.
2.1c Institute the daily use of the 5 Practices for Orchestrating Productive Mathematics Discussions (Anticipating, Monitoring, Selecting, Sequencing, Connecting) as the approach to Anchor Tasks and across all Mathematics classrooms to make mathematical thinking VISIBLE, EXPECTED, & VALUED.
2.1d Continue to focus teaching around the Big "C" – Reasoning which highlights MPs 1, 2, 3, and 6 and
Additional areas of focus include:

- □ Content and Language Routines
- □ The 5 Practices for Orchestrating Productive Mathematics Discussions
- □ Task Analysis and Rubric Norming via the Mathematics Problem Solving Guide
- □ TQE Model (High School)

OBJECTIVE 2.2: ESTABLISH OPPORTUNITIES TO ADVANCE HIGH ACHIEVING STUDENTS (3-8)

2.1a Identify potential high performing math students in grades 3-8
2.1b Institute extracurricular opportunities for students to showcase their math talents in grades 3-10 (i.e. competitions, inside and outside of school math events)
2.1c Expand Accelerated 7th grade course opportunity to all schools (i.e. zero period or after school)
2.1 d Enroll and participate in Essex County Consortium

OBJECTIVE 2.3: SUPPORT THE STRATEGIC INTERVENTION FOR TARGETED GROUPS OF STUDENTS

2.2a Incorporate Intervention Periods into the school day
2.2b Provide support to teachers and administration on intervention strategies and data analysis to chunk/sequence content materials
2.2c Monitor implementation of student progress in the intervention plan
2.2d Use Math180 as a 'separate' intervention (either during a separately allotted time during the school day or in an after school or zero period setting) The target populations should be students performing at PLDs of 1 or 2
2.2e Via the Mathematics coaches, provide intervention support to targeted schools.
2.2i Begin identifying an intermediary course occurring prior to students' taking Algebra II for all students not successful on the Algebra I PARCC exam
2.2j AFTER SCHOOL PROGRAMMING:

- In grades K – 5, introduce a supplemental mini course designed to address applications of geometric concepts.
- In grades 6 – 8, introduce a supplemental mini course designed to address algebraic thinking and applied geometry topics.

2.2k Develop a summer refresher/retake strategy for students not successfully passing PARCC Algebra I.

2.2l Incorporate a 'formal' strategy for addressing our pathways towards Honors and AP offerings (starting as early as grade 7).

2.2. SPECIAL EDUCATION
f - h

HLP 11, Identify and prioritize lone- and short-term learning goals.

- Teachers must prioritize what is most important for students to learn by providing meaningful access to and success in the general education and other contextually relevant curricula.
- Teachers must use grade-level standards, assessment data and learning progressions, students' prior knowledge, and IEP goals and benchmarks to make decisions about what is most crucial to emphasize, and develop long- and short-term goals accordingly.
- Teachers must, understand essential curriculum components (arrow doc), identify essential prerequisites (progressions) and foundations, and assess students' performance in relation to these components.
- Alignment to IEP goals in a span of 3 to 4 grade levels up to current grade based on the NWEA and iReady Performance.

HLP 12, Systematically design instruction toward a specific learning goal.

- Teachers must, help students to develop important concepts and skills that provide the foundation for more complex learning.
- Teachers must, sequence lessons that build on each other and make connections explicit, in both planning and delivery.
- Teachers must, activate students' prior knowledge and show how each lesson "fits" with previous ones.
- Teachers planning must, involve careful consideration of learning goals, what is involved in reaching the goals, and allocation time accordingly.
- Teachers must, allow for ongoing changes (e.g., pacing) that occur throughout the sequence based on student performance.
- District: Will target select DOMAINS for Algebra Readiness (Major Work standards); …Connecting to Chapters and Lessons

HLP 13, Adapt curriculum task and materials for specific learning goals.

- Teachers must, assess individual students needs and adapt curriculum materials and tasks so that students can meet instructional goals.
- Teachers must, select materials and tasks based on student needs; use relevant technology; and make modifications by highlighting relevant information, changing task directions, and decreasing amounts of materials.
- Teachers must, make strategic decisions on content coverage (i.e. essential curriculum elements), meaningfulness of tasks to meet stated goals, and criteria for student success.
    - *Planning Lessons with Go Math*
    - *Determining Instructional Groups based on NWEA data*
    - *Utilization of digital components through My Personal Math component supporting relations/alignment through the iReady program.*

OBJECTIVE 3.1: ESTABLISH YEARLONG DISTRICT MATH ASSESSMENT CALENDARS (K-12)

3.1a Create grade level specific yea long district math assessment calendars including but not limited to iReady, NWEA. Unit Assessment, End of Course, Midterm/Final testing windows

OBJECTIVE 3.2: REDESIGN DISTRICT BENCHMARKS (K-12)

3.2a Revise current assessments to reflect curriculum adjustments/curriculum adoptions (K-12)
3.2b Develop midterm and/or final assessments for identified courses (6-12)
3.2c Implement performance based assessments by developing student portfolios (K-2)
3.2d Develop and institute a formal testing protocol to standardize testing conditions during the administration of all districtwide assessments.
3.2e Implement the usage of iReady diagnostic assessment across the district (K-8)
3.2f Redesign SGOs to reflect changes in the districtwide areas of focus and improve the use of standards-based measures that are rigorous and comparable across classrooms of similar content areas and levels.
3.2g Redesign SGOs to reflect progress toward academic and functional goals included in an individualized education program and/or progress made towards student academic growth objectives.

OBJECTIVE 4.1: DISTRIBUTE LEADERSHIP AMONG SELECT TEACHERS TO PROMOTE AND SUPPORT A SHARED VISION FOR INSTRUCTION AND PERFORMANCE. (K-12)

4.1a Identify and develop teacher facilitators to provide support to peers. (i.e. sharing instructional strategies and peer observations)
4.1b Utilize teacher leaders to facilitate or conduct CPT and professional development sessions. (i.e. data analysis, unpacking content, instructional materials, and common anchor tasks)
4.1c Identify teacher leaders to participate in out of district professional development opportunities.
4.1d Provide content based professional development by Curriculum Providers. (k-8)
4.1e Identify teachers to participate in SIOP training.

APPENDIX

BIG ROCKS

Focus is critical to ensure that students learn the most important content completely, rather than succumb to an overly broad survey of content. The idea is that when students are taught with understanding, there will be less need to reteach concepts from year to year. Instead, content is revisited as connections are made to new content-- first with concepts and then with procedures. This is accomplished through a focused curriculum. When fewer topics are addressed in a given grade or course, those topics can be taught coherently and with rigor.

In grades K–5, the focus is on the addition, subtraction, multiplication and division of whole numbers, fractions and decimals, with a balance of concepts, skills and problem solving. Arithmetic is viewed as an important set of skills and also as a thinking subject that, done thoughtfully, prepares students for algebra. Measurement and geometry develop alongside number and operations and are tied specifically to arithmetic along the way.

In middle school, multiplication and division develop into powerful forms of ratio and proportional reasoning. The properties of operations take on prominence as arithmetic matures into algebra. The theme of quantitative relationships also becomes explicit in grades 6–8, developing into the formal notion of a function by grade 8. Meanwhile, the foundations of high school deductive geometry are laid in the middle grades. Finally, the gradual development of data representations in grades K–5 leads to statistics in middle school: the study of shape, center and spread of data distributions; possible associations between two variables; and the use of sampling in making statistical decisions.

In high school, algebra, functions, geometry and statistics develop with an emphasis on modeling. Students continue to take a thinking approach to algebra, learning to see and make use of structure in algebraic expressions of growing complexity. As this description suggests, mathematical content in all grades is best approached in the ways envisioned by the Standards for Mathematical Practice.

K	1	2	3	4
REQUIRED FLUENCIES FOR GRADES K THROUGH 4				
K.OA.A.5 Add/Subtract within 5	**1.OA.C.6** Add/Subtract within 10	**2.OA.B.2** Single digit sums and differences (sums from memory) **2.NBT.B.5** Add/Subtract within 100	**3.OA.C.7** Single-digit products and quotients (Products from memory by end of Grade 3) **3.NBT.A.2** Add/Subtract within 1000	**4.NBT.B.4** Add/Subtract with 1,000,000
AREAS OF FOCUS				
K.CC.A Know number names and the count sequence (3)	**1.OA.A** Represent and solve problems involving addition and subtraction (2)	**2.OA.A** Represent and solve problems involving addition and subtraction*	**3.OA.A** Represent & solve problems involving multiplication and division	**4.OA.A** Use the four operations with whole numbers to solve problems
K.CC.B Count to tell the number of objects (2)	**1.OA.B** Understand and apply properties of operations and the relationship between addition and subtraction	**2.OA.B** Add and subtract within 20*	**3.OA.B** Understand properties of multiplication and the relationship between multiplication and division*	**4.NBT.A** Generalize place value understanding for multi-digit whole numbers
K.CC.C Compare numbers* (2)	**1.OA.C** Add and subtraction within 20 *	**2.NBT.A** Understand place value*	**3.OA.C** Multiply & divide within 100*	**4.NBT.B** Use place value understanding and properties of operations to perform multi-digit arithmetic*
K.OA.A Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from (5)	**1.OA.D** Work with addition and subtraction equations	**2.NBT.B** Use place value understanding and properties of operations to add and subtract*	**3.OA.D** Solve problems involving the four operations, and identify & explain patterns in arithmetic	**4.NF.A** Extend understanding of fraction equivalence and ordering*
K.NBT.A Work with numbers 11-19 to gain foundations for place value (1)	**1.NBT.A** Extend the counting sequence	**2.MD.A** Measure and estimate lengths in standard units*	**3.NF.A** Develop understanding of fractions as numbers*	**4.NF.B** Build fractions from unit fraction by applying and extending previous understanding of operations*

K.G.A Identify and describe shapes (squares, circles, triangles, rectangles, hexagons, cubes, cones, cylinders, and spheres)*	**1.NBT.B** Understand Place Value*	**2.MD.B** Relate addition and subtract to length	**3.MD.A** Solve problems involving measurement and estimation of intervals of time, liquid, volumes, & masses of objects.	**4.NF.C** Understand decimal notation for fractions and compare decimal fractions
	1.NBT.C Use place value understanding and properties of operations to add and subtract.	2.G.A Reason with shapes and their attributes*	**3.MD.C** Geometric measurement: understand concepts of area and relate area to multiplication and addition.*	4.G.A Draw and identify lines and angles, and classify shapes by properties of their lines and angles.*
	1.MD.A Measure lengths indirectly and by iterating length units*		3.G.A Reason with shapes and their attributes	
	1.G.A Reason with shapes and their attributes*			
68%**	86%**	73%**	68%**	73%**

*Critical areas of the grade

**Percent of represented CCSS for given grade level

OPPORTUNITIES FOR IN-DEPTH FOCUS				
Kindergarten	**1st Grade**	**2nd Grade**	**3rd Grade**	**4th Grade**
K.CC.B.5	1.NBT.B.2	2.OA.A.1	3.OA.A.3	4.NBT.B.5
K.OA.A.2	1.NBT.C.4	2.NBT.B.7	3.OA.C.7	4.NBT.B.6
K.OA.A.3	1.OA.A.1		3.NF.A.2	4.NF.A.1
K.OA.A.4			3.MD.A.2	4.NF.B.3
K.NBT.A.1			3.MD.C.7	4.NF.B.4
FLUENCY or CULMINATING STANDARDS				
K.CC.A.1	1.OA.C.6	2.OA.B.2	3.OA.C7	4.NBT.4
K.CC.A.3	1.OA.D.7	2.NBT.B.5	3.NBT.A.2	
K.CC.B.5	1.OA.D.8	2.NBT.A.2		
K.CC.C.7	1.NBT.C.5	2.NBT.A.3		

K.OA.A.5		2.NBT.B.8		
		2.MD.A.4		

Grade 5	Grade 6	Grade 7	Grade 8
REQUIRED FLUENCIES FOR GRADES 5 THROUGH 8			
5.NBT.B.5 Multi-digit multiplication	6.NS.B.2 Multi-digit division 6.NS.B.3 Add, subtract, multiply and divide multi-digit decimals		
5.NBT.A Understand the place value system	6.NS.A Apply and extend previous understandings of multiplication and division to divide fractions by fractions*	**7.NS.A** Apply and extend previous understandings of operations with fractions	**8.EE.A** Work with radicals and integer exponents
5.NBT.B Perform operations with multi-digit whole numbers and decimals to hundredths	6.NS.C Apply and extend previous understandings of numbers to the system of rational numbers*	**7.RP.A** Analyze proportional relationships and use them to solve real-world and mathematical problems*	**8.EE.B** Understand the connections between proportional relationships, lines, and linear equations
5.NF.A Use equivalent fractions as a strategy to add and subtract fractions	6.RP.A Understand ratio concepts and use ratio reasoning to solve problems*	**7.EE.A** Use properties of operations to generate equivalent expressions*	**8.EE.C** Analyze and solve linear equations and pairs of simultaneous linear equations*
5.NF.B Apply and extend previous understandings of multiplication and division to multiply and divide fractions	6.EE.A Apply and extend previous understandings of arithmetic to algebraic expressions*	**7.EE.B** Solve real-life and mathematical problems using numerical and algebraic expressions and equations*	**8.F.A** Define, evaluate, and compare functions*
5.MD.C Geometric measurement: understand concepts of volume and relate volume to multiplication and to addition	6.EE.B Reason about and solve one-variable equations and inequalities	**7.G.B** Solve real-life and mathematical problems involving angle measure, area, surface area, and volume*	**8.F.B** Use functions to model relationships between quantities*
5.G.A Graph points in the coordinate plane to solve real-world and mathematical problems	6.EE.C Represent and analyze quantitative relationships between dependent and independent variables		**8.G.A** Understand congruence and similarity using physical models, transparencies, or geometry software*
			8.G.B Understand and apply the Pythagorean Theorem*

			8.G.C Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres
73%**	65%**	**62%****	**83%****

*Critical areas of the grade
**Percent of represented CCSS for given grade level

Grade 5	Grade 6	Grade 7	Grade 8
Opportunities for In-Depth Focus			
5.NBT.A.1	6.RP.A.3	7.RP.A.2	8.EE.B.5
5.NBT.B.6	6.NS.A.1	7.NS.A.3	8.EE.C.7
5.NF.A.2	6.NS.C.8	7.EE.B.3	8.EE.C.8
5.NF.B.4	6.EE.A.3	7.EE.B.4	8.F.A.2
5.MD.C.5	6.EE.B.7	7.G.B.6	8.G.B.7
Fluency or Culminating Standards			
5.NBT.B.5	6.NS.B.2	7.EE.B.3	8.EE.C.7
	6.NS.B.3	7.EE.B.4	8.G.C.9
	6.NS.A.1	7.NS.A.1	
		7.NS.A.2	

High School focused Big Rocks Standards

	Algebra I	Algebra II	Geometry
Major	**Create Equation (L, Q, E)** A.CED.1, A.CED.2, ACED.3, A.CED.4 **Reasoning with equation and Inequality (L,Q,E)** A.REI.1, A.REI.3, A.REI.4, A.REI.10, A.REI.11, A.REI.12 **Seeing structure in expression(I, Q, and E)** A.SSE.1, A.SSE.2 **Interpreting Functions(L, Q, E)** F.IF.1, F.IF.2, F.IF.4, F.IF.5, F.IF.6 **Polynomial Operation (L, Q)** A.APR.1 **Interpreting categorical and Quantative Data:** S.ID.7, SID.8	**Real Number System (E)** N.RN.B.1 N.RN.B.2 **Reasoning with equation and Inequality (L,Q,E)** A.REI.1, A.REI.2, A.REI.4, A.RE.I.11 **Seeing Structure in Expression (Q, and E)** A.SSE.2, A.SSE.3c, A.SSE.4 **Interpreting Functions(L, Q, E)** F.IF.4, F.IF.6 **Polynomial Operation (L, Q)** A.APR.2, A.APR.3, A.APR.6. **Making Inferences and Justifying Conclusion** S.IC.3, S.IC.4, S.IC.5, S.IC.6	**Congruence** G.CO.6, G.CO.7, G.CO.8, G.CO.9, G.CO.10, G.CO.11 **Similarity, Right Triangle, and Geometry** G.SRT.1, G.SRT.2, , G.SRT.3, G.SRT.4, G.SRT.5, G.SRT.6, G.SRT.7, G.SRT.8 **Expressing Geometric Properties with Equation** G.GPE.4, G.GPE.5, G.GPE.6, G.GPE.7 **Modeling with Geometry** G.MG.1, G.MG.2, G.MG3
Additional	**Reasoning with equation and Inequality** A.REI.5, A.REI.6 **Seeing structure in expression(Q: Completing Square)** A.SSE.3b **Building Function(L, Q and E)** F.BF.3	**Reasoning with equation and Inequality (L)** A.REI.6, A.RE.7 **Polynomial Operation (L, Q)** A.APR.4 **Complex Number System** N.CN.1, N.CN.2, N.CN.7 **Trigonometric Function** F.TF.1, F.TF.2, F.TF.5, F.TF.8	**Expressing Geometric properties with Equation** G.GPE.1 **Circles** G.C.1, G.C.2, G.C.3, G.C.5 **Geometric Measurement and Dimension** G.GMD.1, G.GMD.3, G.GMD4

	Real Number System N.RN.B.3 **Interpreting categorical and Quantative Data:** S.ID.1, S.ID.2, S.ID.3	**Linear, Quadratic, Exponential** F.LE.5, **Expressing Geometric properties with Equation** G.GPE.2 **Interpreting categorical and Quantative Data:** S.SID.4	

L = LINEAR EQUATION

Q = QUADRATICS EQUATION

E = EXPONENTIAL EQUATION

EFFECTIVE TEACHERS

- act on the belief that all students can learn and succeed.
- have deep content knowledge and knowledge of best practices in their content area.
- apprentice students to read, write, think, talk, inquire, and
- reason like experts in each content area—like scientists, mathematicians, historians, readers, and writers.
- consistently provide all students with opportunities to gain knowledge and develop conceptual understanding of core, content-specific concepts.
- consistently provide all students with opportunities to engage with cognitively demanding texts, tasks, problems, and projects. They scaffold students' learning without doing the cognitive heavy lifting for them.
- encourage students to take risks, seek and offer help, ask questions, reflect on their learning, and learn from one another.
- understand that talking through problems is a core act of learning. They make student talk and collaboration key learning routines.
- make assessment part of teaching. They consistently check for student understanding and use data to guide instruction.
- value the diversity of their students and work hard to make their classrooms safe and inclusive spaces where all students can learn and succeed.
- work hard and consistently to improve their own teaching.
- learn, work, and plan with other educators in professional learning communities.

Whole Group Instruction	55min	INSTRUCTION (Grades 3 – 8) Daily Routine: Mathematical Content or Language Routine Anchor/Instructional Task: Anticipate, Monitor, Select, Sequence, Connect And Collaborative Work Practice Collaborative Independent Work (Demonstration of Student Thinking)		
Rotation Stations (Student Notebooks & Chromebooks Needed)	1-2X 30 min	STATION 1: Focus on current Grade Level Content STUDENT EXPLORATION* Independent or groups of 2-3 Emphasis on MP's 3, 6 (Reasoning and Precision) And MP's 1 & 4 (Problem Solving and Application) TOOLS/RESOURCES Extra Practice/Enrichment Math Journal Let's Explore Put Your Thinking Cap On	STATION 2: Focus on Student Needs TECH STATION Independent TOOLS/ RESOURCES iReady TenMarks Khan Academy Dreambox Moby Max Approved Digital Provider Fluency Practice	TEACHER STATION: Focus on Grade Level Content; heavily scaffolded to connect deficiencies TARGETED INSTRUCTION 4 – 5 Students TOOLS/ RESOURCES Homework Manipulatives Reteach Workbook Transition Guide
Closure	5 min	INSTRUCTION Exit Ticket (Demonstration of Student Thinking) TOOLS/RESOURCES Notebooks or Exit Ticket Slips		

* Promotes discourse and collaboration

Whole Group Instruction	50 min	INSTRUCTION (Grades 9 – 12) Daily Routine: Mathematical Content or Language Routine Anchor Task: Anticipate, Monitor, Select, Sequence, Connect Collaborative Work* Guided Practice Independent Work (Demonstration of Student Thinking)		TOOLS Manipulatives RESOURCES Agile Mind
Rotation Stations (Student Notebooks & Chromebooks Needed)	1-2X 25 min	STATION 1: Focus on current Grade Level Content STUDENT EXPLORATION* Independent or groups of 2-3 Emphasis on MP's 3, 6 (Reasoning and Precision) And MP's 1 & 4 (Problem Solving and Application) TOOLS/RESOURCES Agile Mind Math Journals	STATION 2: Focus on Student Needs TECH STATION Independent TOOLS/ RESOURCES Khan Academy Dreambox Approved Digital Provider Fluency Practice	TEACHER STATION: Focus on Grade Level Content; heavily scaffolded to connect deficiencies TARGETED INSTRUCTION 4 – 5 Students TOOLS/ RESOURCES Agile Homework Manipulatives
Closure	5 min	INSTRUCTION Exit Ticket (Demonstration of Student Thinking) TOOLS/RESOURCES Notebooks or Exit Ticket Slips		

* Promotes discourse and collaboration

STRUGGLING LEARNERS

Many of our struggling learners will never be able to be proficient in mathematics unless we address their skill deficits. For example, a student who struggles with beginning multiplication will not be able to use that skill to multiply fractions or solve algebraic equations in later grades. Focusing all our energy on the grade level curriculum is a losing proposition, because study after study has shown that students who fail to master foundational skills will have severe difficulty when they encounter the secondary curriculum. In other words, not only do we need to help students master their current grade level content, but we also need to remediate specific skill deficits. Central to an effective RtI program is the idea that struggling students need a powerful combination of additional time, a challenging curriculum, cohesive, targeted supports and interventions, and teachers who are well equipped for helping them make up for lost learning. With these tools and teaching supports in place, students can stay on track, graduate on time, and gain passage to advanced learning.

In the Response to Intervention (RtI) framework, students who fall below the proficient level also receive Tier 2 support in addition to the core instruction provided in the general classroom. The content of this supplemental instruction is targeted to address gaps in the students' knowledge, which means it is often focused on content that students should have mastered several years earlier. Seldom will all students who experience difficulty at a given grade level have identical skill deficits, so Tier 2 instruction is given in small homogenous groups of two to five students who typically meet for approximately thirty minutes per day to receive instruction targeted to address their particular skill deficits.

Tier 2 instruction is designed to be provided by trained personnel, such as a mathematics coach, general education teacher, or another professional who has received special training. While computer programs can be used to provide supplemental practice, these students first need direct teacher instruction targeted on foundational content they missed in previous years.

GOAL SETTING

SGO Framework

K-2 STUDENT GROWTH OBJECTIVES		FOCUS	PROGRESS MONITORING	FINAL ASSESSMENT
GRADE K	SGO1	Major Work	iReady Fall, Winter Diagnostic	iReady Spring Diagnostic
GRADE 1	SGO1	Major Work	iReady Fall, Winter Diagnostic	iReady Spring Diagnostic
GRADE 2	SGO1	Major Work	iReady Fall, Winter Diagnostic	iReady Spring Diagnostic
3-5 STUDENT GROWTH OBJECTIVES				
GRADE 3	SGO1*	Major Work	iReady Fall, Winter Diagnostic	iReady Spring Diagnostic
GRADE 3	SGO2*	Reasoning & Modeling	Task Analysis	Assessment Portfolio
GRADE 4, 5	SGO1	Major Work	iReady Fall, Winter Diagnostic	iReady Spring Diagnostic
6-8 STUDENT GROWTH OBJECTIVES				
GRADE 6, 7	SGO1	Major Work	iReady Fall, Winter Diagnostic	iReady Spring Diagnostic
GRADE 8	SGO1	Major Work	iReady Fall, Winter Diagnostic	iReady Spring Diagnostic
GRADE 8	SGO2*	Reasoning & Modeling	Task Analysis	Assessment Portfolio
9 – 12 STUDENT GROWTH OBJECTIVES				
Algebra I, Intensive	SGO1	Major Work	Fall, Winter NWEA	Spring NWEA
Algebra I, Intensive	SGO2*	Reasoning & Modeling	Task Analysis	Portfolio Assessment
Algebra I	SGO1	Major Work	Fall, Winter NWEA	Spring NWEA
Algebra I	SGO2*	Reasoning & Modeling	Task Analysis	Portfolio Assessment
Algebra II	SGO1	Major Work	Fall, Winter NWEA	Spring NWEA
Algebra II	SGO2*	Reasoning & Modeling	Task Analysis	Portfolio Assessment
Geometry	SGO1	Major Work	Fall, Winter NWEA	Spring NWEA
Geometry	SGO2*	Reasoning & Modeling	Task Analysis	Portfolio Assessment
Pre-Calculus	SGO1	Content	Pre Test	Post Assessment
Functions & Modeling	SGO2	Reasoning & Modeling/	Task Analysis	Post Assessment
AP Calculus		Content	Pre Test	Pre-AP Assessment Results

Growth Goal 1 : By June 2019, **80%** of all **K - 12** students will demonstrate improved academic achievement as measured by scoring at or above end of year growth norms/expectations as measured by performance on either the Spring iReady Assessment or the Spring NWEA MAP Assessment.

Growth Goal 2: Will be related to a performance based assessments.

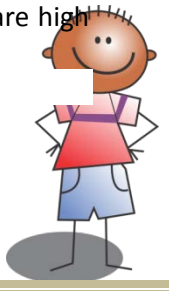
Growth Goal 1													
Tiers	**Percentiles**	**Gr. K**	**Gr. 1**	**Gr. 2**	**Gr. 3**	**Gr. 4**	**Gr. 5**	**Gr. 6**	**Gr. 7**	**Gr. 8**	**Alg I**	**Alg II**	**Geo**
3+ Levels Below	< 21	---	---	---	55	47	51	35	33	31	4+	3+	2+
2 Levels Below	21 – 40	---	57	48	43	41	35	30	25	23	3+	2+	2+
1 Level Below	41 - 60	39	37	36	35	34	31	26	23	22	3+	2+	2+
On Levels, Early	61 - 80	38	36	35	34	33	29	25	22	21	3+	2+	2+
On Level, Mid. Late, Above	>80	35	32	31	30	24	20	20	20	19	3+	2+	2+

Growth Goal 2		
Tiers	**Percentiles**	**Expected Growth**
LEVEL 1	< 21	PLD 2
LEVEL 2	21 – 40	PLD 3
LEVEL 3	41 - 60	PLD 4
LEVEL 4	61 - 80	PLD 4 or PLD 5
LEVEL 5	>80	PLD 5

CONCORDANCE OF PERFORMANCE LEVELS BETWEEN THE PARCC MATH AND SPRING NWEA MAP *(R=71% - 77%)*

ALGEBRA I		**ALGEBRA II**	
PARCC	**NWEA**	**PARCC**	**NWEA**
PLD 1	207	PLD 1	231
PLD 2	224	PLD 2	238
PLD 3	232	PLD 3	243
PLD 4	240	PLD 4	247
PLD 5	257	PLD 5	260

The consistency rate provided in this report can be calculated as, for the "proficient" performance category concordant scores, the percentage of examinees who score at or above both concordant scores plus the percentage of examinees who score below both concordant scores on each test. Higher consistency rate indicates stronger congruence between PARCC and MAP scores. The results in Table 9 demonstrate that on average, MAP reading scores can consistently classify students' proficiency (Level 4 or higher) status on PARCC ELA test approximately 83% of the time and MAP math scores can consistently classify students on PARCC math test approximately 88% of the time. Those numbers are high suggesting that both MAP reading and math tests are great predictors of the students' proficiency status on the PARCC tests.



Mathematics Problem Solving Scoring Guide

Apply mathematics in a variety of settings. Build new mathematical knowledge through problem solving. Solve problems that arise in mathematics and in other contexts. Apply and adapt a variety of appropriate strategies to solve problems. Monitor and reflect on the process of mathematical problem solving.

Process Dimensions	5	4	3	*2 / 1
CCSS.MATH.PRACTICE.MP1: Making Sense of the Task *Interpret the concepts of the task and translate them into mathematics.*	The interpretation and/or translation of the task are ☐thoroughly developed and/or ☐enhanced through connections and/or extensions to other mathematical ideas or other contexts.	The interpretation and translation of the task are ☐adequately developed and ☐adequately displayed.	The interpretation and/or translation of the task are ☐partially developed, and/or ☐partially displayed.	The interpretation and/or translation of the task are ☐underdeveloped, ☐sketchy, ☐using inappropriate concepts, ☐minimal, and/or ☐not evident.
CCSS.MATH.PRACTICE.MP4: Representing and Solving the Task *Use models, pictures, diagrams, and/or symbols to represent and solve the task situation and select an effective strategy to solve the task.*	The strategy and representations used are ☐elegant (insightful), ☐complex, ☐enhanced through comparisons to other representations and/or generalizations.	The strategy that has been selected and applied and the representations used are • effective and • complete.	The strategy that has been selected and applied and the representations used are ☐partially effective and/or ☐partially complete.	The strategy selected and representations used are • underdeveloped, ☐sketchy, ☐not useful, ☐minimal, ☐not evident, and/or ☐in conflict w/ the Solution/outcome.
CCSS.MATH.PRACTICE.MP2: Communicating Reasoning *Coherently communicate mathematical reasoning and clearly use mathematical language.*	The use of mathematical language and communication of the reasoning are ☐elegant (insightful) and/or ☐enhanced with graphics or examples to allow the reader to move easily from one thought to another.	The use of mathematical language and communication of the reasoning ☐follow a clear and coherent path throughout the entire work sample and ☐lead to a clearly identified solution/outcome.	The use of mathematical language and communication of the reasoning ☐are partially displayed with significant gaps and/or ☐do not clearly lead to a solution/outcome.	The use of mathematical language and communication of the reasoning are • underdeveloped, • sketchy, • inappropriate, • minimal, and/or • not evident.
CCSS.MATH.PRACTICE.MP6: Accuracy *Support the solution/outcome.*	The solution/outcome is correct and enhanced by ☐extensions, ☐connections, ☐generalizations, and/or ☐asking new questions leading to new problems.	The solution/outcome given is ☐correct, ☐mathematically justified, and ☐supported by the work.	The solution/outcome given is ☐incorrect due to minor error(s), or ☐a correct answer but work contains minor error(s) ☐partially complete, and/or ☐partially correct	The solution/outcome given is ☐incorrect and/or ☐incomplete, or ☐correct, but o conflicts with the work, or o not supported by the work.
CCSS.MATH.PRACTICE.MP3: Reflecting and Evaluating *State the solution/outcome in the context of the task.* *Defend the process, evaluate and interpret the reasonableness of the solution/outcome.*	Justifying the solution/outcome completely, the student reflection also includes ☐reworking the task using a different method, ☐evaluating the relative effectiveness and/or efficiency of different approaches taken, and/or ☐providing evidence of considering other possible solution/outcomes and/or interpretations.	The solution/outcome is stated within the context of the task, and the reflection justifies the solution/outcome completely by reviewing • the interpretation of the task • concepts, • strategies, • calculations, and • reasonableness.	The solution/outcome is not stated clearly within the context of the task, and/or the reflection only partially justifies the solution/outcome by reviewing ☐the task situation, ☐concepts, ☐strategies, ☐calculations, and/or ☐reasonableness.	The solution/outcome is not clearly identified and/or the justification is • underdeveloped, • sketchy, • ineffective, • minimal, • not evident, and/or • inappropriate.

PROFESSIONAL DEVELOPMENT

Our intention with professional development is to create a highly effective professional development system for teachers and administrators that is more focused on delivering quality instruction and aligned to the learning needs of teachers and students.

A particular target for criticism is the prevalence of single-shot, one-day workshops that often make teacher professional development "intellectually superficial, disconnected from deep issues of curriculum and learning, fragmented, and noncumulative" (Ball & Cohen, 1999, pp. 3–4). And because often there is no coherent infrastructure for professional development, professional development represents a "patchwork of opportunities—formal and informal, mandatory and voluntary, serendipitous and planned" (Wilson & Berne, 1999, p.174).

Recognizing the short supply of high quality professional development for teachers, the No Child Left Behind Act of 2001 mandated that teachers receive such learning opportunities. No Child Left Behind sets five criteria for professional development to be considered high quality:

- It is sustained, intensive, and content-focused—to have a positive and lasting impact on classroom instruction and teacher performance
- It is aligned with and directly related to state academic content standards, student achievement standards, and assessments
- It improves and increases teachers' knowledge of the subjects they teach
- It advances teachers' understanding of effective instructional strategies founded on scientifically based research
- It is regularly evaluated for effects on teacher effectiveness and student achievement

Studies that had more than 14 hours of professional development showed a positive and significant effect on student achievement from professional development.

This goal will only occur if teachers have sufficient content knowledge for teaching so that they are able to select appropriate tasks to address the standards, support those tasks with productive and effective questioning, and collect meaningful evidence of students' conceptual understandings and misunderstandings to guide their instruction. This focus on tasks, questions, and evidence the TQE Process (Nolan, et al, 2016).

Effective Teachers…

- Teach a curriculum aligned to standards
- Set goals for students
- Determine the needs of students using several methods including a variety of assessments

- Differentiate instruction based on the needs of students
- Use high quality assessments to measure student performance
- Work in collaborative groups to improve student achievement

PLC Expectations …

All members

- engage as learners
- work on substantive issues that will impact teaching and learning; studying how students learn particular content and concepts, analyze evidence of student learning, plan and revise lessons based on student work, and discuss best teaching practices in particular content areas
- seek opportunities to extend their content knowledge and knowledge of best teaching practices in their content areas
- work from curriculum, standards, data, and best practices in the content areas
- promote inquiry, collaboration, and collegiality
- meet regularly and have short and long term goals

KEEP THE DATA

SIMPLE

&

THE ANALYSIS COMPLEX…

TASK AND ASSESSMENT RESOURCES

Illustrative Math
http://illustrativemathematics.org/

PARCC Released Items
https://prc.parcconline.org/assessments/parcc-released-items (Log in required)

Coherence Map
http://achievethecore.org/coherence-map/ (See tasks sections)

NJDOE
http://www.state.nj.us/education/modelcurriculum/math/ (username: model; password: curriculum)

DANA Center
http://www.ccsstoolbox.com/parcc/PARCCPrototype_main.html

New York
https://www.engageny.org/resource/released-2015-3-8-ela-and-mathematics-state-test-questions

Delaware
http://www.doe.k12.de.us/Page/512

TIMSS Released Assessment Items for Grades 4 & 8
https://nces.ed.gov/timss/educators.asp

Department Walk though protocol: Thinking is visible, expected, and valued.

Teacher encourages all students to learn and succeed.

1	2	3	4	5

Teacher consistently provides all students with opportunities to engage with cognitively demanding tasks, problems, and projects. They scaffold students' learning without doing the cognitive heavy lifting for them.

1	2	3	4	5

Teacher consistently provides all students with opportunities to gain knowledge and develop conceptual understanding of core, content-specific concepts.

1	2	3	4	5

Teacher encourages students to take risks, seek and offer help, ask questions, reflect on their learning, and learn from one another.

1	2	3	4	5

Teacher understands that talking through problems is a core act of learning. They make student talk and collaboration key learning routines.

1	2	3	4	5

Teacher makes assessment part of teaching. They consistently check for student understanding and use data to guide instruction.

1	2	3	4	5

Teacher apprentices students to read, write, think, talk, inquire, and reason like mathematicians.

1	2	3	4	5

Evidence Statements:

- □ Routines
- □ Anchor Task done via the 5 practices
- □ Small Group Instruction (Teacher Led)
- □ Checks for Understanding
- □ Use of Digital Content
- □ Independent Practice

Artifacts:

- □ Notebooks and Journals
- □ Lesson Plans
- □ Portfolios
- □ Student Work/Student Work Folders

PARCC POINTS TABLE

	Possible Points	Points Needed to Score a 750	Major Work	Reasoning	Modeling
Grade 3	66	33	30	14	12
Grade 4	66	37	31	14	12
Grade 5	66	34	30	14	12
Grade 6	66	37	26	14	12
Grade 7	66	26	29	14	12
Grade 8	66	26	27	14	12
Algebra I	81	22	28	14	18
Algebra II	81	28	30	14	18
Geometry	81	27	29	14	18
Integrated Math I	81	28	31	14	18
Integrated Math II	81	26	32	14	18
Integrated Math III	81	28	26	14	18

Long Term Planning

Offer a wider range of high-level course options to increase students' chances for math success; expanding the number, levels, and variety of math courses available to students while eliminating the most basic courses.

Audit all existing courses (grades 8 – Pre Calculus) to ensure alignment and that all students are prepared for rigorous math courses that will bring them at least to the pre-Calculus level.

Introduce additional options for extra-curricular support

- Algebra I Bridge for Grade 8 students
- Office Hours (Daily and Open Tutoring from 3pm – 4pm daily
- Advisory (40 min additional time for academic support)

Cultivate mathematics support teams. In addition to meeting as a department, teachers meet in subject-specific teams that work together to plan units, develop lesson plans, and evaluate student data. Teams discuss student needs and develop extra academic supports as needed. Teachers each other's work intimately and are therefore able to hold each other accountable for teaching all of their students to a higher standard.

Establish partnerships with colleges/universities whereby students can take college-level math courses and earn college credit.

Eureka Look Fors

Fluency:

- Sprints
- Grade level appropriate Counting: Can start at numbers other than 0 or 1 and might include supportive concrete materials or visual models (Ex: Happy Counting, Red Light/Green Light. Beep Counting, Ten and Tuck, etc.)
- Whiteboard Exchange

Application Problem:

- Engage students in using the RDW Process (Read, Draw, Write a Sentence)
- Sequence problems from simple to complex and adjust based on students' responses
- Facilitate share and critique of various explanations, representations, and/or examples.

Concept Development: (largest chunk of time)

Instruction:

- Maintain overall alignment with the objectives and suggested pacing and structure.
- Use of tools, chromebooks, precise mathematical language (vocab and units), and/or models
- Balance teacher talk with opportunities for peer share and/or collaboration

Problem Set: (Individual, partner, or group)

- Allow for independent practice and productive struggle
- Assign problems strategically to differentiate practice as needed
- Create and assign remedial sequences as needed

Student Debrief:

- Elicit students' thinking, prompt reflection, and promote metacognition through student centered discussion
- Culminate with students' verbal articulation of their learning for the day
- Close with completion of the daily Exit Ticket (opportunity for informal assessment that guides effective preparation of subsequent lessons) as needed.

i-Ready:

- Monitor student progress and alerts to adjust schedules and instruction.
- Review and analyze data from assessments to prioritize and adjust instruction.

Workstations: (Pairs/Small Group/Individual)

- Differentiated activities designed to reteach, remediate, and enrich student's understanding of concepts
- Small Group Instruction: Technology (Chromebooks), Problem Solving, Fluency, Math Journal

Math in Focus Looks Fors:

Illustrative Mathematics Look Fors
Routines: • Implementation of daily routines   o Routines may include Number Talks, Notice & Wonder, Pole the Class, True or False, Which One Does Not Belong?, Gallery Walk, Matching/Sorting, Stronger & Clearer, Collect & Display, Collect, Critique, & Clarify, Info Gap, CoCraft Questions & Problems, Three Reads, Compare & Connect, Discussion Supports • Ensure discourse and instruction align to the focus of the routine
Activity: Planning: • Plan with the 5 Practices for Orchestrating Productive Math Discourse in mind (Anticipating, Monitoring, Selecting, Sequencing, Connecting) • Make deliberate instructional decisions based on students' needs and major work standards • Review imbedded resources and strategies designed to support the needs of the students Instruction: • Promote effective mathematical discourse through the utilization of the 5 practices • Ensure discourse and instruction align to the learning goals of the lesson • Incorporate use of chromebooks
Stations: (Small group activities such as technology, teacher targeted group, hands on, and application) Planning: • Analyze student data to identify the individual needs of the students • Group students based on data analysis and student need • Use district approved resources to prepare targeted instruction that meet the individual needs of students Instruction: • Lead small group instruction • Monitor student progress on i-Ready and intervene when necessary • Provide appropriate interventions for struggling learners and enrichment materials for high performing students
Closure: • Elicit student thinking, prompt reflection, and promote metacognition through student centered discussion • Close with completion of the Cool Downs where students are able to demonstrate their thinking (additional opportunity for informal assessment that may guide the preparation of subsequent lessons)

Fluency- Daily Math Fluency :

- Number Strings: A set of related math problems designed to teach strategies based on number relationships
- Math Talk: An activity designed to elicit multiple strategies and provide opportunities for students to reason about the relationships in numbers and make connections in mathematics.

Application Problem- Anchor Tasks:

- Task that allows students to engage in an inquiry based learning experience that will be taught in the upcoming lesson(s)
- Students making connections with prior knowledge, reasoning and thinking logically to apply what they know to solve a problem with a partner or small group.
- All students will be given time to work in the concrete phase to develop and hone their conceptual understanding.
- As students are ready, they will naturally explore the representational or abstract phases of learning and discover strategies, or methods, for solving the given problem. (gallery walks, anchor chart creation)
- Sharing methods that allow students to communicate mathematically to explain and defend their thinking and consolidate their learning.
- 5 Practices for Orchestrating Productive Mathematics Discussion

Practice:

- Maintain overall alignment with the objectives and suggested pacing and structure.
- Use of tools, manipulatives, chromebooks, precise mathematical language, and/or models
- Balance teacher talk with opportunities for peer share and/or collaboration
- Generate next steps by watching and listening for understanding
- Allow for independent and/ or small group practice and productive struggle
- Create and assign remedial sequences as needed (Reteach/ Remediate/ Enrich)

Workstations:

- Small group activities such as technology, teacher targeted group, hands on, and application)
- Use of chromebooks

Closure:

- Exit Tickets that are brief and intentional to assess student performance for the day

i-Ready

- Analysis of diagnostic assessment data
- Monitoring student performance
- Monitoring student alerts to intervene as necessary

9-12th Grade Math Class Look Fors:

Lesson Planning

- Lesson design is based on district approved curriculum and Big Rock initiative
- Lesson activities focused on specific concepts and skills which is aligned to course level NJSLS
- The sequence of lesson activities is coherent and aligned to lesson objectives
- High level rich tasks are selected to build on student prior knowledge and deepen learning
- District approved programs (Agile Mind, Carnegie, CPM) are used as primary teaching resource
- Intervention and Enrichment activities are planned to meet individual student needs

Instruction

Ideal Math Block:

Core Curriculum Learning:

- Implement TQE process to build student conceptual understanding and develop problem solving skills
  - Use carefully selected rich tasks (**T**)
  - Use productive questions (**Q**) to promote student thinking
  - Seek evidence (**E**) of student learning through the formative assessment
- Conceptual development should occur before the procedural skill is addressed
- Develop mathematical understanding through multiple representations
- Mathematical discourse occurs during whole group or small group activities

Intervention/Enrichment Station (MTSS)

- Small group instruction (Teacher station) must be provided for targeted group students while other students are in their personal learning path (Tech station) such as ALEKS, Khan Academy, and Carnegie Mathia
- Meaningful grouping is based on the data analysis results

Closure/Exit Ticket:

- DOL is aligned to lesson goals
- Exit ticket should be an independent work to get individual valid data used to modify next day lesson

Overall:

- Effectively using technology (smartboard, document camera, chromebooks, graphing calculus..etc) to support student learning activities.
- Lesson activities should be aligned to daily lesson plan
- Math department assessment protocol should be implemented during any test period

Digital Learning:

- ALEKS:
  - Administer pre-assessment
  - Create student personal learning pat
  - Monitor student's progress
- Carnegie Mathia:
  - Use curriculum plan to assign student assignment accordingly
  - Monitor student's progress

Student Learning Environment

- Appropriate student seating is arranged to maximum student learning achievement
- Relevant anchor charts are displayed in the classroom to enhance student learning
- An ongoing and meaningful Word Wall is displayed to maintain student mathematic vocabulary knowledge and retention
- An updated Data Wall is designed to help students to track their learning progress

Go Math Look Fors:

Lesson Planning

Lessons must prioritize long- and short-term learning goals:

- Lessons must prioritize what is most important for students to learn by providing meaningful access to relevant curricula.
- Lessons must reflect grade-level standards, assessment data and learning progressions, students' prior knowledge, and IEP goals and benchmarks to develop long- and short-term goals.
- Lessons must reflect essential curriculum components (arrow doc) and identified essential prerequisites (progressions).
- Plans should reflect district approved programs (Go Math) as the primary teaching resource
- Intervention and Enrichment activities should be planned such to meet individual student needs

Note: Lessons may reflect alignment to IEP goals in a span of 3 to 4 grade levels up to current grade based on the NWEA and iReady Performance

Instruction

Introduction/Warm Up : To focus students and engage them in learning
Purpose: To Recall pre-requisite skills

Resources:
Problem of the Day (used as the Anchor Task)
Vocabulary Builder
Fluency Builder

Small Group Instruction/Rotations: On level instruction using 5E lesson plan/Promotes discussion
Purpose: To provide direct instructional support
and intervention where needed (Engage, Explore, Explain and Elaborate of the 5E's)

Resources: Manipulatives
Online Student Edition (e-book)
iTools (digital manipulatives)
Manipulatives
5E lesson

Note: Assign the students **Quick Check** problems within the student TEXTBOOK for the EXPLAIN portion of the lesson to ensure understanding (see below). Use **Math on the Spot** to ELABORATE (w/in PMT). Finally, make an instructional determination for Intervention

RTI activities
Reteach pdf
Strategic Intervention resources
Intensive Intervention resources

Independent/ Collaborative Stations: Lesson Reinforcement
Purpose: Practice and reinforcement of new and pre-requisite skills; Independent reteach (Evaluate of the 5E's)

Resources: Personal Math Trainer (evaluate) or

Textbook

Resources to Promote Collaboration:
Grab and Go Kit (games & activities)

Resources to Promote Independent Thinking:
Animated Math Models
Mega Math
Concept Readers
Homework

- and **iReady**

Closure : To summarize and solidify learning (Exit Ticket, Essential Question Check-in)

Resources: Math Journal (teacher's edition)
Essential Question check in
Lesson Summary

Classroom Environment

- Students are modeling, drawing, listening in groups and on their own
- Students articulate their understandings through Math Talk
- Participation strategies are used: Turn and talk; pair share, wait time, guided practice
- Relevant anchor charts are displayed in the classroom to enhance student learning
- An ongoing and meaningful Word Wall is displayed to maintain student mathematic vocabulary knowledge and retention
- Student learning goals are posted
- Charts are posted that dynamically display daily student grouping and rotations
- All students have access to Chromebooks to engage in lessons
- Teacher uses the Document Camera to share student approaches to problem solving