Program Evaluation of Professional Development

Several instruments were used by the Professional Development Committee to provide information on the effectiveness and quality of the professional development opportunities provided by the district. The data sources were used to evaluate the district's progress towards meeting the standards for high quality of professional development from the Massachusetts Department for Elementary and Secondary Education. Professional development was also evaluated in its effectiveness in supporting the implementation of district core instructional practices.

Survey of Administrators

Nineteen administrators responded to a district survey. Administrators were asked to rate current professional development offerings in relation to the qualities of effective professional development as stated by DESE. For all indicators, respondents agree or strongly agree that current offerings meet the indicators of quality professional development. However, in resources available for professional development, all respondents disagreed that the resources for district and school professional development are adequate to meet the needs.

The five areas identified by administrators as areas of need for their staff was differentiation, meeting the needs of special education students, working with struggling readers and writers, using technology in the classroom, data collection and analysis, and cultural proficiency. The professional development that has had the most impact on instruction has been writing, math, and literacy across the content areas. The formats for professional development that would best meet the need of staff include workshops or seminars and early release time.

The following represents the responses of administrators to the question of resources. The question stated, "If given more resources, where would resources be most effective for your department/school? Please also indicate the impact of those resources on district/school goals."

- Exposing staff to new ideas that are not presented by district planned professional development can be both empowering to staff and invigorating to staff. We rely on district professional development that is carefully planned for the most leverage and those that will help us achieve district priorities. We do not have the resources to send staff out to PD to explore ideas and approaches that are not presented by the district. As we get more consistent and better with the basics of the core practices the district has identified, it will be important to support new ideas from teachers who are exposed to them outside of the district.
- A five day "teaching all students" institute. Two days of special education, one day of ELL and two days of electives such as teaching academically advanced students, differentiated instruction, using technology to differentiate, from CP to AP: helping students advance, content literacy, etc. Would also love to see a TTT model here. In which teachers develop, market, and teach workshops of 10-20 hours and are compensated at the tutoring rate. This might be pie in the sky but worth a mention!
- Resources would be most effective in bringing groups from other contexts (schools, districts, etc.) together to discuss best practices and to build a nexus of support.

- Technology needs constant upgrades, more and faster computers. The Smartboards are aging, bulbs blowing, projectors fading. We need to stay current with the world around us.
- Summer workshops with no-cost PDPs and graduate credits. Funding better materials (that reflects the Common Core) and professional development on how to use them.
- Lesson Studies/Design. This is in all school Improvement plans
- Having the opportunity for staff to observe colleagues is powerful. This could be done with lesson study groups or learning walkthroughs. Have a secondary teacher observing an elementary classroom and an elementary teacher observing a secondary classroom. There is always a need for technology training. Data team meetings at the secondary level similar to the elementary model.
- I would support adding additional staff to the Office of Curriculum and Instruction in either the form of coaches or administrator to work specifically at the elementary level.
- The professional development workshops have been great. More modeling and coaching would be a resource that I think would be effective for my school.
- STAFFING
- Test taking strategies using technology in correcting writing
- Training for special education staff in specific programming relative to reading, writing and math; as well as formal/informal assessment and data collection.
- It would be beneficial to have a coach whose focus is on meeting the needs of special education students. He/she could provide one on one or small group coaching to this end. He/she could be shared between the elementary schools.
- The greatest need currently is access to technology equipment and the supports required to use and maintain the equipment. Focusing resources toward technology would not only have a positive impact on our teaching and learning goals but also on continued focus on our parent/family outreach and communication.
- I think having an instructional coach assigned to a building and allowing the coach to develop a stronger relationship with a specific building would allow for greater improvement in instruction.

Staff Professional Development Survey

At grades PreK-12, 171 teachers and staff responded to the professional development survey. A survey specific to PreK-5 was used as well as second focused on grades 6-12. A majority of staff indicates they agree or strongly agree that the indicators for quality professional development are being met. Most teachers identify after school and summer as the best times for professional development.

Areas of strength identified in the survey:

- Offerings in math PreK-12 that supported implementation of the Massachusetts Curriculum Frameworks.

- Staff indicates the effectiveness of having professional development offerings that are then embedded back in the classroom through either the support of an instructional coach or content director, academic facilitator, or an outside facilitator.
- Workshops that have been hands on and practical have supported the most integration into the classroom.

Areas of need identified in the survey:

- Specialists indicate the need for professional development in their disciplines. This can include art, music, physical education, OT/PT, speech/language, and guidance.
- For Grades PreK-12, staff identifies the topics of differentiating instruction and meeting the needs of students with disabilities as needs. At grades PreK-5, staff additionally identifies meeting the needs of struggling readers and writers and writing instruction as areas of need.
- For topics relating to technology, the majority of staff Prek-12 identifies the topics of Google Apps for Education as their greatest interest and need.
- The Professional Development Committee needs to communicate more on its process for looking at the data and discussions that result from the meeting. Staff are not always sure how we use the data that is collected.

Individual Professional Development Sessions

Every professional development session that is held is evaluated using a survey completed at the end of the workshop. The forms are reviewed by the Professional Development Committee to evaluate the effectiveness of offerings, presenters, and support the development of further offering and sessions. The sessions for the summer and full day professional development sessions were reviewed by the committee.

In summary, the offerings that provided resources for teachers to use immediately were the most well received by staff, for example, the elementary social studies focused on primary sources and the science with actual examples. The hands-on aspect of the science workshops in the summer and during the year was appreciated. Time to make use of the resources with colleagues was also appreciated by staff. Staff requested the time to make use of the resources when it was not offered in the session. Some offerings felt rushed in that there was too much information presented for the time allotted.

Walk-Throughs

Elementary

At the elementary level, core instructional practices have been identified in English Language Arts, Mathematics, and Science. These practices have been the focus of past professional development. Principal walk-throughs focus on the identification of these core instructional practices in buildings. The instructional practices are strongest in mathematics where teachers have curriculum, materials, professional development, and assessment. With all of these pieces in place, implementation of the core instructional practices are embedded within daily instruction.

In English language arts, the core instructional practices are evident. However, strategies that rely on use of a variety of texts such as text based questions and close reading do vary significantly dependent on the teachers' resources. Some teachers have created materials or have located their own resources. Because the materials vary, as does the quality, implementation of the strategies can be more variable.

Secondary

At the secondary level, the implementation of core instructional practices is evident almost all of the time including objectives posted/shared with students, Do Now, agenda posted/shared with students, 10-2, think pair share, two column notes, summaries, students notebooks and annotating texts.

New teachers in their first three years of employment who have had the training embedded into the first and second year teaching programs have the highest level of implementation of the core instructional practices. They also would have had more opportunities for direct feedback from their evaluators on the use of the strategies. The areas staff still struggled with are having students effectively summarize their notes**.**

Conclusions

- The most effective professional development was accompanied not only with training but also provided opportunities for embedded coaching supports for the implementation of the practices. The supports could include the elementary instructional coaches, content area director, opportunities for more frequent feedback from evaluators, or the secondary academic facilitator. There are not sufficient embedded professional development supports to meet all the needs especially at the elementary level.
- In the case of math and writing instruction, the use of professional development training, coaching support and curriculum materials that were aligned has had the most impact on the classroom.
- Resources available do not allow the district to meet the needs of all staff. Specialists such as in the arts, physical education, and therapists in special education do not feel there are enough opportunities for their own professional development needs.
- Staff indicated needs in technology specific to the implementation of Google Apps for Education. In addition, staff indicates desire for professional development offerings in the areas of differentiation, meeting the needs of students with social and emotional needs, English language learners, and students with disabilities.

Elementary Literacy Core Instructional Practices

Core Instructional Practice	What Is It?	Why Is It Important?
Partner Reading	Students sit with a partner and take turns reading a passage or book. Students can take turns reading sentence by sentence, paragraph by paragraph, or page by page. The goal is for 30 minutes of partner reading everyday, which means students are reading 15 each day. Students can also engage in talk about their reading and also support in modeling fluency for each other.	Partner reading adds accountability to reading. Students are less likely to be off task when two students are reading. Partner reading is an excellent intervention to develop reading fluency.
Writing in Response to Text	Students write a response to what they have read. The response could be persuasive, narrative, or informational. The response could be open ended or be text-based requiring use of the text and evidence.	Writing is thinking down on paper. Writing requires the student to formulate their thinking. It is also a means to support the assessment of comprehension.
Text Based Questioning	Text based questions are questions that focus on gathering evidence from the text. Students look at the main idea and details, author's purpose, vocabulary, and forming opinions.	Text based questions require a close reading. They require students to gather evidence from the text to support and defend their answers. Text based questions support students in meeting multiple standards in the ELA Curriculum Frameworks.
Reciprocal Teaching	Reciprocal teaching consists of four key comprehension strategies that are used with a passage. Students read and apply the strategies of predicting, summarizing, clarifying, and asking questions. It can be used within small groups to support comprehension and as an intervention. It should be used as a grouping structure for literature circles also.	Reciprocal teaching has a strong research base and has been shown to increase reading comprehension. Students focus on four key comprehension strategies applied to a variety of different tasks.

Small Group Instruction	Teacher meets with small groups of students based upon their needs. Data from benchmarks and progress monitoring and teacher assessments are used to form the groups. Instruction in the small group is based upon student need and revolves around direct phonics/phonemic awareness, fluency, comprehension, and vocabulary instruction.	Small group instruction has the most impact on students who are struggling. Students receive immediate feedback on their progress. Teachers are also able to differentiate based upon student need.
Turn and Talk or Think Pair Share	Students turn to a partner to share their thinking. In a think, pair, share, students are given think time before turning to a partner to share. After sharing, the teacher selects a few students to share their responses with the whole group.	Student talk is important for helping students to explain their thinking, use vocabulary, generate questions, make predictions, and summarize new learning.
Anchor Charts	Key ideas or class thinking are recording on a chart for students and the teacher to refer to as needed during a unit or over several lessons. In order for students to take ownership of the concepts presented in an anchor chart, the chart should be created with students.	As the name implies, it is an "anchor" to which students and teachers can use a reference tool.
Comprehension Focus Wall	A focus wall highlights key comprehension strategies that the class is working on. The focus wall names the comprehension strategy, define it, and give sentence frames to help students use the strategy.	A focus wall is a dedicated anchor chart to focus on comprehension strategies presented and spiraled through the year.
Writer's Workshop	A writer's workshop is organized to begin with a mini-lesson, time for independent writing while the teacher conferences with students, and an opportunity to share at the end. The focus of mini-lessons is one topic that will support improvement of students' writing.	A writer's workshop allows for a dedicated time to teach writing. Students are able to develop their understanding of the genres represented in the ELA Curriculum Frameworks and write extensively across the genres.

Elementary Math Core Instructional Practices

Core Instructional Practice	What Is It?	Why Is It Important?
Number Talks	Number talks are short 5-10 minute discussion where the focus is on mental math. A problem or series of problems is presented to the students and they are asked to solve using mental math. Hand signals can be used by the teacher to help engage all students. Three to four student strategies are shared with the whole class.	Number talks allow children the opportunity to engage in rich meaningful conversations. Students have a chance to share and explain strategies. They justify answers while thinking and acting like mathematicians. They develop mental math skills.
Talk Moves	Talk moves are used by the teacher and students to help create student centered discussions. The moves include revoicing, say more, repeat, press for reasoning agree/disagree, wait time, and partner talk.	Student talk reveals understanding and misunderstanding. Student talk supports academic language development and supports deeper reasoning. Student talk supports social development and perspective taking.
Visual Models with Problem Solving	Students represent their understanding of the relationship between the numbers represented in a problem. A bar diagram can be used to model the relationship between the numbers and help students see which problem structure is being used.	Students can model with mathematics using a visual model and they can reason abstractly and quantitatively.
Problem Solving Approach	Teacher leads the class in understanding the problem and explains expectations for solving the program. While students work on the problem, the teacher provides hints but no solutions. The teacher asks questions to facilitate student thinking. Observe and assess as students work. In the end, conduct a discussion where students justify and explain strategies for solving the problem. Accept student solutions without evaluation.	Students are provided an opportunity to engage in real world problems and the standards for mathematical practices.

Math Journals	Math journals provide a means for students to write about math. Writing is thinking down on paper.	Students are provided with an opportunity to use multiple standards for mathematical practices. Students construct viable arguments and critique the reasoning of others in writing and also model with mathematics. All of the mathematical practices might be evidenced in a math journal dependent on the problem.
Anchor Charts	Key ideas or class thinking are recording on a chart for students and the teacher to refer to as needed during a unit or over several lessons. In order for students to take ownership of the concepts presented in an anchor chart, the chart should be created with students.	As the name implies, it is an "anchor" to which students and teachers can use a reference tool.
DICE	Students approach a problem by first dissecting which asks them to make sense of the problem. Students then illustrate the problems focused on seeing the relationships between the ideas. The problem is then represented in numbers. Students explain their thinking in words and/or orally.	The mathematical practices ask students to develop their arguments including critique the arguments of others.
Small Group Instruction	Teacher meets with small groups of students based upon their needs. Data from benchmarks and progress monitoring and teacher assessments are used to form the groups. Instruction in the small group is based upon student need and revolves around conceptual understanding, procedural fluency, strategic competency, productive disposition, and adaptive reasoning.	Small group instruction has the most impact on students who are struggling. Students receive immediate feedback on their progress. Teachers are also able to differentiate based upon student need.

Math Focus Wall	A focus wall highlights the math strategies and skills that the class is working on.	A focus wall is a dedicated anchor chart to focus on the math strategies presented in a unit or topic.
Mixed Review	Mixed reviews include concept and skills previously taught. They should be consistently administered and might be used as warm-ups, homework, or for independent practice.	Students' retention of the mathematical concepts is improved with cumulative review. Providing a mixed review ensures mastery and allows one's working memory to absorb more challenging concepts. The review also provides assessment information to the teacher to use for instruction and forming small groups.

Elementary Science Core Instructional Practices

Core Instructional Practice	What Is It?	Why Is It Important?
Inquiry Learning Cycle in Science	**Engage:** Students explore, notice, wonder, and speculate about the topic they will learn about. **Design and Conduct Investigations:** Students determine a question, predict, and plan an investigation. They collect and record data. The data is organized, interpreted, and analyzed. **Draw Conclusions:** Based upon analyze and synthesis of the data, students make claims based on the evidence. **Communicate:** Students write, present, defend or debate their results.	Scientific inquiry reflects how scientists come to understand the natural world, and it is at the heart of how students learn. Students learn how to ask questions and use evidence to answer them. In the process of learning the strategies of scientific inquiry, students learn to conduct an investigation and collect evidence from a variety of sources, develop an explanation from the data, and communicate and defend their conclusions.
Engineering Design Process **Define** **Propose** **Design** **Test** **Evaluate**	The Engineering Design process involves articulating a problem and investigating possible solutions to the problem (leading to a better solution to the problem). In other words, engineering design is a way to put science to work to solve problems. The Engineering Design process is not a rigid set of rules for solving every problem but more of a tool to focus and direct the process of problem solving and ways of thinking. Each problem is different and the solution may or may not go through each step in the process.	Professional engineers use a variety of processes to solve problems. By the very nature of engineering design, students will be required to read and comprehend a variety of text, write clearly and accurately, and to apply mathematics to projects outside of their math textbook. Engineering design requires students to listen actively, speak clearly and coherently (team-based projects), think critically and analytically, and often to use technology such as a computer and computer software to help solve a problem. If students focus on solving problems to make a better world, they will also be developing the essential skills of demonstrating civic and community engagement and global literacy.

Science Talk	Talk moves in science are used by the teacher and students to help create student-centered discussions. The moves include revoicing, say more, repeat, press for reasoning agree/disagree, wait time, and partner talk.	Student talk reveals understanding and misunderstanding in science. Student talk supports academic language development and supports deeper reasoning. Student talk supports social development and perspective taking.
Scientific Writing **Claim** **Evidence** **Reasoning**	Students make a claim, state their evidence, and link the claim and evidence with reasoning. **Claim**: a conclusion about a problem **Evidence**: scientific data that supports the claim **Reasoning**: a justification that shows why the data counts as evidence to support the claim and includes appropriate scientific principles.	Reading, interpreting, and producing text are fundamental practices of science in particular, and they constitute at least half of engineers and scientists total working time. Writing requires scientists to describe, clarify their thinking, and justify their arguments.
Science Journals	Science journals provide a means for students to write about science. Writing is thinking down on paper.	Students are provided with an opportunity to use multiple science practices. Students construct viable arguments and critique the reasoning of others in writing and also create models.

ELA Middle School Core Instructional Practices

Core Instructional Practice	What Is It?	Why Is It Important?
Literature Circles	Students select a text. The group reads the text either independently or in groups. Students discuss the text based upon specific roles to support comprehension of the text.	Students have some element of choice in selecting a text and taking on roles in the group while engaging in student led discussions and using comprehension strategies.
Writing in Response to Text	Students write a response to what they have read. The response could be persuasive, narrative, or informational. The response could be open ended or be text-based requiring use of the text and evidence.	Writing is thinking down on paper. Writing requires the student to formulate their thinking. It is also a means to support the assessment of comprehension.
Independent Reading	Students select their own text, plan to complete the reading, read in a variety of environments and monitor their own comprehension.	Students increase the amount and frequency of reading while developing stamina and comprehension.
Dialectical Journals	Students select or are assigned a quotation from a text. Students respond analyzing and evaluating the relevance and importance of the quote.	Students engage in the close reading of a portion of text. They analyze, evaluate, apply and synthesize their learning in relation to the text.
Text Based Questioning	Text based questions are questions that focus on gathering evidence from the text. Students look at the main idea and details, author's purpose, vocabulary, and forming opinions.	Text based questions require a close reading. They require students to gather evidence from the text to support and defend their answers. Text based questions support students in meeting multiple standards in the ELA Curriculum Frameworks.

Reciprocal Teaching	Reciprocal teaching consists of four key comprehension strategies that are used with a passage. Students read and apply the strategies of predicting, summarizing, clarifying, and asking questions. It can be used within small groups to support comprehension and as an intervention. It should be used as a grouping structure for literature circles also.	Reciprocal teaching has a strong research base and has been shown to increase reading comprehension. Students focus on four key comprehension strategies applied to a variety of different tasks.
Turn and Talk or Think Pair Share	Students turn to a partner to share their thinking. In a think, pair, share, students are given think time before turning to a partner to share. After sharing, the teacher selects a few students to share their responses with the whole group.	Student talk is important for helping students to explain their thinking, use vocabulary, and
Writer's Workshop	A writer's workshop is organized to begin with a mini-lesson, time for independent writing while the teacher conferences with students, and an opportunity to share at the end. The focus of mini-lessons is one topic that will support improvement of students' writing.	A writer's workshop allows for a dedicated time to teach writing. Students are able to develop their understanding of the genres represented in the ELA Curriculum Frameworks and write extensively across the genres.

Math Core Instructional Practices Grades 6-8

Core Instructional Practice	What Is It?	Why Is It Important?
Type One Writing/Questions (Open Questions)	Type One Writing is used to capture students' ideas on paper. It is timed, and has a quota. The quota is the minimum number of lines or number of things students know or notice. Type 1Writing can take the form of written lines, a list, a drawing, or labeled diagram. It is simple to evaluate (√ or -) based on evidence of thoughtful effort.	It is used to draw out and shape background knowledge of students. It gives all students an entry point into the content. Students are given the opportunity to brainstorm what they notice, wonder, and identify as similar/different as well as practice using mathematical vocabulary and complete error analysis. Students may turn and talk to compare responses to Type One questions and check what they have in common, add something new, or agree on and star the best ideas.
Type Two Writing/Questions (Exit Tickets)	Type Two Writing is a short quiz that is designed to be quick and easy to correct in order to give immediate feedback to both the teacher and the students. It has a specific limit and it is graded for correctness based on required criteria.	It is used to measure student understanding to see if students met the objectives. It shows what the student knows about the topic. Students and teachers get immediate, formative feedback. Grading it as a quiz holds students accountable for the content as they are learning it. Students can learn from their mistakes with these low stakes assessments in preparation for their cumulative exams. Teachers use this data to adapt instruction, identify misconceptions, and common errors. Students use this data to determine what they know.
Pepper Cards	A pepper card is a prepared card organized in two columns. The card has questions with answers about a problem or image that is on the top of the card. The left column has the questions and right column has the answers.	It provides students with model responses and practice with conceptual questions. The pepper cards can be saved and used later as review. They can be used as a study tool. Students can quiz themselves or their peers by covering one side of the pepper card. Family members can quiz their student. Students can also make their own pepper cards to use as a reference.

One Penny or Mini Whiteboards	A one penny whiteboard is made with a sheet protector that students can write on with dry erase markers. A template such as a number line or coordinate grid is slipped into the sheet protector. Students display their work or answer on the penny whiteboards or the mini whiteboard and hold them up.	Teachers use whiteboards as a means to check for understanding. Teachers are able to quickly view all student responses to several questions as students hold up their whiteboards. The teacher and student receive timely, immediate feedback on student progress with the content. The use of the whiteboards provides a lot of practice and repetition in a short period of time. Also, students have an opportunity to learn from each other and help their peers when they check answers with a partner.
Talk Moves	Talk moves are strategies used to enhance class discussion. The main talk moves are: revoicing, repeating/rephrasing, agreeing/disagreeing, adding on, wait time, and partner talk. For example, students are asked if they can add anything to another student's response or if they agree or disagree with the response and why.	Students need to be able to discuss and share ideas during class time. In order for students to make viable arguments and critique each other's reasoning they need to practice in class. Talk moves help frame classroom discussion and give students some useful guidelines to engage in respectful and productive discourse. They also promote class discussion amongst students, an effective alternative to the typical back and forth from teacher to one student.
Sorting Cards and Stand and Sort	Multiple representations of a concept are written on different cards. Students work collaboratively to sort, organize, or group cards. There can be more than one way to group the cards depending on the goal. Sorting can be done in small groups or students can be assigned a card and sort while standing.	This activity promotes focused student talk. Students collaborate agreeing and disagreeing about why certain cards match. This gives students an opportunity to explain their reasoning and critique each other's reasoning which is one of the important math practices. Additionally, there are many ways to adapt the activity to meet students at all levels. For example, cards can be added or subtraction from a set. Also, students can be challenged to create a new card that would fit into a group or sort cards another way that makes sense.
Think Aloud	Teachers or students say aloud what they are thinking as they solve a problem.	The student has a model for the mathematical thinking and concepts as they are applied to problem solving. Students

		can then apply the model to their own problem solving.
Quiz-Quiz-Trade	Each student has a problem that has an answer on the back. Students become masters of their initial problem and then they find a peer to quiz. They quiz their peer and then trade their card so they are now a master of the new problem. This strategy can be used in whole or small group.	Students are provided with an engaging way to review concepts with each other. Students make sense of problems, explain their reasoning, and ask and answer questions with their peers. Students can review many problems in a short period of time.
Parallel Tasks	Sets of related tasks that explore the same big idea but are designed to suit the needs of students at different developmental levels. You can give students all the tasks and allow them to choose which to complete.	Students are able to work on problems at their own pace. A range of difficulty in the tasks will allow all students to work through problems based upon their current level of understanding of the concept.
Vocabulary (word wall, name game, 10,000 pyramid)	A word wall is a list of vocabulary terms displayed on a wall in the classroom. The name game and 10,000 pyramid game are both vocabulary games that allow students to describe the meaning of words in multiple ways while other students guess the word or phrase. Games could be played in both small and whole groups.	These games allow students to assess how well they understand the meaning of a word by whether they can describe it in their own words, make connections, and give examples. The students will learn to be more precise with their use of vocabulary and communication.
I do, We do, You do **Graduał Release of Responsibilty**	This is a gradual release structure that teachers use to build procedural skills. The teacher demonstrates how to do a problem, the class completes a problem together with the facilitation of the teacher, and then the students try a problem independently.	Students learn by observing the teacher modeling how to solve a problem and practicing with peer and/or teacher feedback before proceeding to completing tasks independently. Some students will need a little modeling while others will need more. The amount of modeling or teacher feedback can also vary depending on the content.
Write About It/Writing to Explain	Students explain their thinking on paper. They can explain why a rule works, how they found an answer, which of two answers is correct and why. This may take the form of a Type One or Type Two writing. Students may complete writing as a whole group, small group, or	One of the mathematical practice standards asks students to be able to give explanations and provide arguments for their reasoning. Writing is often considered thinking on paper. Writing also provides another means for students to demonstrate their knowledge.

	as a homework assignment.	
Cumulative Review-Think Back	Mixed reviews include concept and skills previously taught. They should be consistently administered and might be used as warm-ups, homework, or for independent practice.	Students' retention of the mathematical concepts is improved with cumulative review. Providing a mixed review ensures mastery and allows one's working memory to absorb more challenging concepts. The review also provides assessment information to the teacher to use for instruction and forming small groups.
Link sheets/Rule of Four	The primary goal is to present multiple representations in math: symbolic, numerical, graphical, and verbal. Typically, these are used to represent mathematical functions with graphs, tables, equations, and words. They can be used to represent any mathematical idea in four different forms.	This helps students make connections and understand how a concept can be represented in multiple ways. This helps students to develop a deeper understanding of math as they start seeing the connections and do not just look at each topic in isolation.
Stations/Centers	Students work through a series of different tasks in small groups or independently. Teachers may work with a small group during that time to provide remediation or challenge.	Students receive feedback from their peers or by other means as they work. Students are able to work on a range of tasks at their level. This structure provides teachers an opportunity to meet with smaller groups.
D.I.C.E	Students approach a problem by first making sense of the problem. Students then illustrate the problems focused on seeing the relationships between the ideas. Students then perform calculations to solve the problem and explain their thinking in words and/or orally.	This approach gives students a strategy for problem solving. Students learn to identify the important information and the specific question(s). The mathematical practices ask students to develop their arguments, justify their reasoning, and critique the arguments of others.
Small Group Instruction	The teacher meets with small groups of students based upon their needs. Data from benchmarks, progress monitoring, and teacher assessments are used to form the groups. Instruction in the small group is based upon student need and revolves around conceptual understanding, procedural fluency, strategic competency, productive disposition, and adaptive reasoning. Groups	Students receive immediate feedback on their progress. Teachers are also able to differentiate based upon student need and provide more individualized instruction, as need. Students are able to move at their own pace.

	are flexible changing based upon review of assessment.	

Middle School/High School Core Instructional Practices

Core Instructional Practice	What Is It?	Why Is It Important?
Mastery Objectives	A mastery objective is what the students should know and be able to do in terms of the academic curriculum. Mastery objectives should be appropriate, i.e. linked to standards, indicators, worth knowing, matched to students (challenging and attainable), assessable, and time-bound.	Objectives (goals) are the reason classroom activities are designed. Without clear objectives (goals), classroom activities are without direction. The research strongly implies that the more specific objectives are, the better they are. That is, objectives that are specific in nature are more strongly related to student achievement than objectives that are not.
Posted Agenda	The "Agenda" highlights at a glance the topics or activities that will be completed in the class period. Post an agenda at the beginning of each class. After reviewing the objective at the beginning of class, review the agenda highlighting the sequence of the lesson for students.	Students want to know what to expect, so they can be ready for the activities and procedures in the lesson. Routines and procedures for sharing the agenda with students will support its use by students.
"Do Now"	The "Do Now" is a 3-4 minute pen to paper task related to the instructional aims of the lesson that requires critical thinking, involves no interaction and no movement. The "Do Now" lasts approximately 5 minutes for student completion and teacher debriefing at the beginning of the class session.	The purpose of the "Do Now" is the following: • to get students in an active, focused, accountable learning mode. • to help students transition from one class to the next. • to get students actively engaged in reviewing, reflecting and writing about focal lesson content. • to provide the teacher with an efficient formative assessment of students' grasp of critical lesson content.
10-2 or Chunk and Chew	The purpose is to ensure that students are not inundated with input from the teacher without being given appropriate time to process the information. Teachers deliver their lessons is small "chunks" and then give students time to "chew" the information either individually, with partners, or in small groups. Teachers should follow this simple rule: for every 10 minutes of teacher input, students should be given 2 minutes to	Chunk and Chew is backed by brain research indicating that all learners at all ages need time to process new learning and move new ideas from short/working memory to long term memory.

	process the information.	
Turn and Talk or Think Pair Share	Students turn to a partner to share their thinking. In a think, pair, share, students are given think time before turning to a partner to share. After sharing, the teacher selects a few students to share their responses with the whole group.	Student talk is important for helping students to explain their thinking, use vocabulary, ask questions, make predictions, and summarize new learning.
Annotating Texts	Annotating text means to analyse and write notes in the margins or in any space you have around the text. It requires students to look deeper into the text and applying extra knowledge by making different connections to it. Students annotate by noting questions, descriptions, observations, connections, opinions, or vocabulary words they do not know.	Comprehending text involves thinking about it and responding to it in some way. Annotating texts supports students in producing evidence that supports their knowledge. It requires students to interact with the text to understand the author's meaning and intent.
Two-Column Notes	As the student reads or listens, major headings or concepts are recorded in the space to the left, supporting details in the space to the right. At the end of the page, students write a summary of the main ideas and details	Two-column note taking requires active reading. Students must process the information as they take notes. The act of separating main ideas from details strengthens the understanding and memory of the content area.
Summaries	Summaries are a way to distill the essence of a reading to its most important points. A summary is a potent statement of the essential ideas from any given text packed into a "paragraph shell" about 15% the size of the original text. The writer and reader need to find the main ideas of a text and to capture the original author's conclusions without using his/her exact words.	Strong readers summarize during and after reading. Summarizing helps students learn to determine essential ideas and consolidate important details that support them. It enables students to focus on keywords and phrases of an assigned text that are worth noting and remembering. It teaches students how to take a large selection of text and reduce it to the main points for more concise understanding.

THE MASSACHUSETTS STANDARDS FOR PROFESSIONAL DEVELOPMENT

	Standards	Indicators
CONTENT STANDARDS	**1. HQPD has clear goals and objectives relevant to desired student outcomes.**	1.1 Professional development goals specify intended student outcomes. 1.2 Educator learning objectives specify changes in knowledge, skills, and practices necessary to achieve the intended student outcomes. 1.3 Learning objectives are written in **SMART** format. • **S**pecific &**S**trategic • **M**easureable • **A**ction-Oriented • **R**igorous/**R**ealistic/**R**esults-focused • **T**imed/**T**racked
	2. HQPD aligns with state, district, school, and/or educator goals or priorities.	2.1 Professional development goals align with educator performance standards, individual professional growth goals, and/or state, district, or school improvement priorities. 2.2 Professional development prepares educators to address state, district, school, and individual goals or priorities.
PROCESS	**3. HQPD is designed based on the analysis of data relevant to the identified goals, objectives, and audience.**	3.1 Student data from multiple sources inform decisions about professional development goals and learning objectives for the intended audience. 3.2 Educator data from multiple sources inform decisions about professional development goals and learning objectives for the intended audience.
	4. HQPD is assessed to ensure that it is meeting the targeted goals and objectives.	4.1 Formative assessment using multiple sources of data measures progress toward professional development goals and learning objectives. 4.2 Summative evaluation measures the attainment of professional development goals and learning objectives. 4.3 Data from formative assessment and summative evaluations inform efforts to improve the quality and results of professional development.
	5. HQPD promotes collaboration among educators to encourage sharing of ideas and working together to achieve the identified goals and objectives.	5.1 Professional development includes collaboration among educators to generate relevant, role-specific applications of their learning. 5.2 Skillful, prepared facilitators use protocols, processes, and strategies to facilitate collaboration during and after professional development to support implementation of learning.
PROCESS STANDARDS	**6. HQPD advances an educator's ability to apply learnings from the professional development to his or her particular content and/or context.**	6.1 Professional development includes multiple opportunities for educators to practice their learning and receive feedback. 6.2 Professional development supports educators to identify multiple applications of their learning within their everyday workplace responsibilities.
	7. HQPD models good pedagogical practice and applies knowledge of adult learning theory to engage educators	7.1 Professional development uses effective, research-based, adult learning strategies. 7.2 Professional development incorporates strategies for active engagement of learners. 7.3 Professional development facilitators model the practices needed to attain goals and learning objectives. 7.4 Professional development includes personalization and differentiation to meet unique learning needs of educators.

CONTEXT STANDARDS	**8. HQPD makes use of relevant resources to ensure that the identified goals and objectives are met.**	8.1 Sufficient resources (time, funding, staff, materials, technology, etc.) are available to provide sustained support over time for full implementation of learning to attain goals and learning objectives. 8.2 Professional development resources are allocated equitably to address high-priority needs.
	9. HQPD is taught or facilitated by a professional who is knowledgeable about the identified objectives	9.1 Skillful, prepared facilitators with content expertise lead professional development. 9.2 Facilitators of professional development seek and use feedback, coaching, and other supports to improve their knowledge, skills, and practice as leaders of learning.
	10. HQPD sessions connect and build upon each other to provide a coherent and useful learning experience for educators.	10.1 Professional development incorporates strategies to connect new learning with learners' past learning and experiences. 10.2 Individual professional development sessions or meetings link together in a logical and sequential manner to promote attainment of the goals and learning objectives.