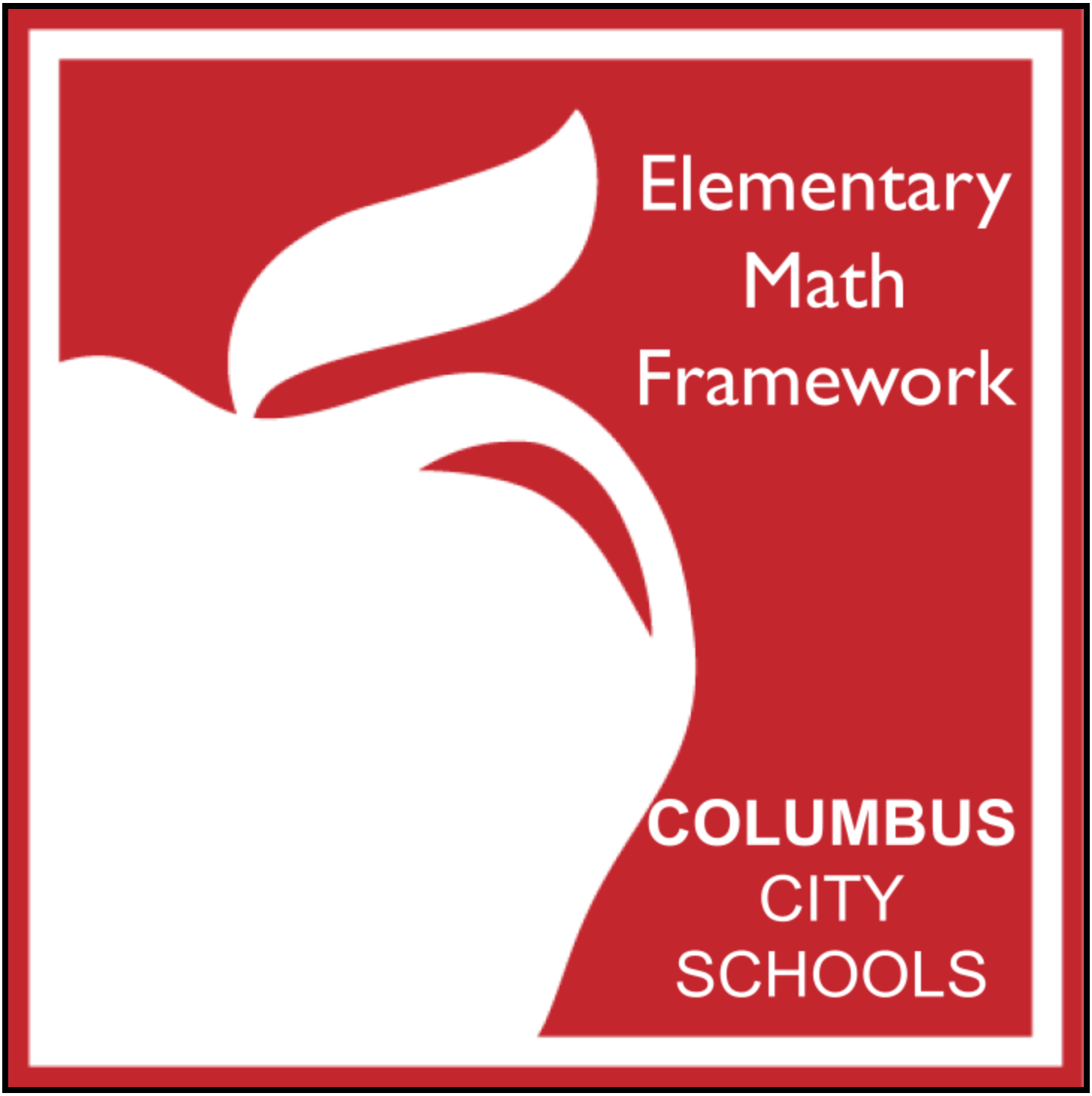

Department of Academic Services
Office of Teaching and Learning
Curriculum Division

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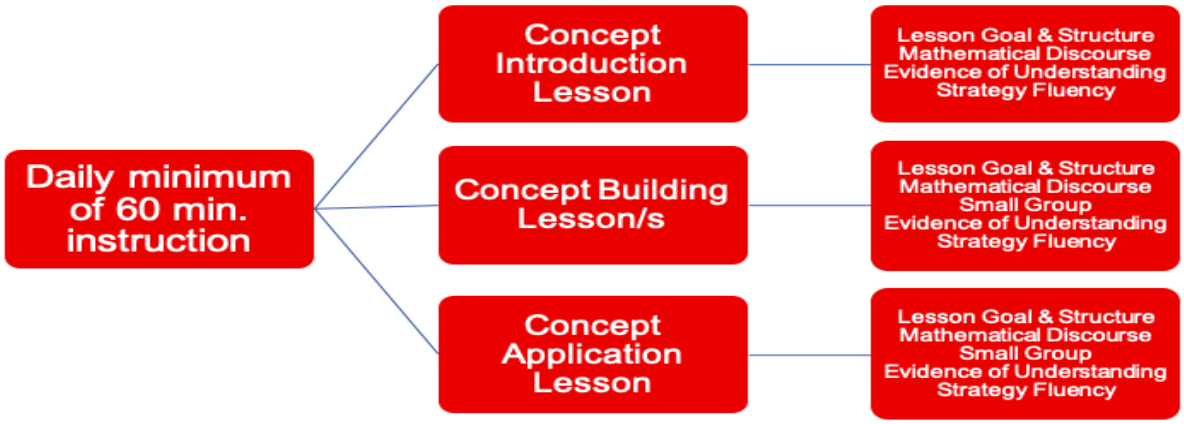
Framework Overview

The framework was developed by an Instructional Design Committee that was made up of directors, administrators, and teachers. The framework includes 3 types of lessons: Concept Introduction Lesson, Concept Building Lesson, and Concept Application Lesson. During the Concept Introduction Lessons, students engage with newly introduced concepts and make connections with prior knowledge. This prior knowledge will include connections made in multiple domains. When engaging in Concept Building Lessons, students are engaged in building knowledge and deep conceptual understanding of the concept. Students develop strategies and understanding through problem solving. In a Concept Application Lesson, students use the understanding of the new concept and are applying that new learning to other problems. Students are deepening their understanding and strengthening their skills. These lessons engage students in the Mathematical Practices that promote mathematical proficiency. Instruction is explained through Lesson Goal and Structure, Mathematical Discourse, Small Group Instruction, Evidence of Mathematical Understanding and Strategy Fluency. This framework is supported by both research based practices and the Core Instructional Framework that was created by CCS Academic Services Team. The Math Framework includes the best practices suggested by the National Council of Teachers of Mathematics Effective Mathematics Teaching Practices, the Gradual Release Method, Teacher Clarity, and the research of John Hattie, Doug Fisher, Nancy Frey, Margaret Smith, and Mary Kay Stein as well as other researchers whose work has contributed to these practices.

The framework consists of components that support the shifts in mathematics education that came about through Common Core Standards that are identified in Ohio's Learning Standards for Mathematics. These shifts narrow the focus of topics taught in each grade level to provide for deeper understanding of topics presented, provide the ability to see the coherence of the topics across the grade levels and support more rigorous instruction. The best practices in the framework support these shifts and are applied during all phases of conceptual development. The practices provide students with opportunities to make connections, communicate thinking , and demonstrate mathematical understanding.



Key Shifts for Teaching Mathematics

Ohio's Mathematics Standards are based on the foundation of the Common Core Standards established in 2010 with a 2017 state revision. The Content Standards along with the Standards for Mathematical Practices, reflect the skills and knowledge students need to succeed in college, career and life. With the introduction of Common Core Standards came key shifts in Mathematics Education. Understanding the key shifts is essential.

Keys shifts:

1) **Greater focus on fewer topics**
   Common Core called for greater focus in mathematics. Rather than racing to cover many topics, the standards ask math teachers to significantly narrow and deepen the way time and energy is spent in the classroom. This means focusing deeply on the major work of each grade as follows:

   - In grades K-2: concepts, skills, and problem solving relates to addition and subtraction
   - In grades 3-5: concepts, skills, and problem solving relates to multiplication and division of whole numbers and fractions

   This focus helps students gain strong foundations, including a solid understanding of concepts, a high degree of procedural skill and fluency, and the ability to apply the math they know to solve problems inside and outside of the classroom.

2) **Coherence: Linking topics and thinking across grades**
   Mathematics is not a list of disconnected topics, tricks, or mnemonics; it is a coherent body of knowledge made up of interconnected concepts. Therefore, the standards are designed around coherent progressions from grade to grade. Learning is carefully connected across grades so that students can build new understanding into foundations built in previous years.

   Coherence is also built into the standards in how they reinforce a major topic in a grade by utilizing supporting, complementary topics.

3) **Rigor: Pursue conceptual understanding, procedural skills and fluency, and application with equal intensity**
   Rigor refers to deep, authentic command of mathematical concepts, not making math harder or introducing topics at earlier grades. To help students meet the standards, educators will need to pursue, with equal intensity, three aspects of rigor in the major work of each grade: conceptual understanding, procedural skills and fluency, and application.

Conceptual understanding: The standards call for conceptual understanding of key concepts. Students must be able to access concepts from a number of perspectives in order to see math as more than a set of mnemonics or discrete procedures.

Procedural skills and fluency: The standards call for accuracy with calculations. Students must practice core functions in order to have access to more complex concepts and procedures. Fluency must be addressed in the classroom through supporting materials.

Application: The standards call for students to use math in situations that require mathematical knowledge. Correctly applying mathematical knowledge depends on students having a solid conceptual understanding and procedural fluency.

2020 Common Core State Standards Initiative

The Standards for Mathematical Practice describe the skills that mathematics educators should seek to develop in their students. The Mathematical Practices represent a picture of what it looks like for students to understand and do mathematics in the classroom and should be integrated into every mathematics lesson for all students. The Math framework was developed based on the Effective Mathematics Teaching Practices established by the National Council of Teachers of Mathematics. These practices represent a core set of high-leverage teacher actions that activate students' application of the Standards of Mathematical Practices.

NCTM Teaching Practices
Effective mathematics educators…

1. Establish mathematical goals to focus learning
2. Implement tasks that promote reasoning and problem solving
3. Use and connect mathematical representations
4. Facilitate meaningful mathematical discourse
5. Pose purposeful questions
6. Build procedural fluency from conceptual understanding
7. Support productive struggle in learning mathematics
8. Elicit and use evidence of student thinking

Standards for Mathematical Practice
Mathematically proficient students…

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Components of the Math Block

Lesson Goal & Structure

What is it?

Lessons should have a clear focus and goal. Lesson progressions should be determined so the sequence of the lessons builds on the students prior knowledge. The structure of the lesson should engage students and use strategies at just the right time that fit students needs. Mathematical practices should be evident during the lesson and data should be used to guide planning.

Why is it important?

Both teachers and students need to have a clear understanding of the expectation of learning. Learning intentions and success criteria for the lesson need to be communicated and understood so students and teachers are able to identify when they are met. Students understanding what success looks like has an effect size of 0.54, (Hattie, 2009). Having this understanding helps students make judgments about the progress of their work and take ownership of their learning. The lessons are based on grade level standards and are developed to support the Depth Of Knowledge (DOK) level required. Lessons are sequenced so students can make connections and build on prior knowledge.

Providing a lesson structure such as the Gradual Release Model, provides support for students. Planning for times when students work independently, when they are guided by questions, probes, or cues, when students work collaboratively, or when focused explicit instruction is provided allows for students needs to be met.

What does it look like?

Prior to the lesson:

The teacher determines the standard or standards that will be addressed and the Depth of Knowledge (DOK) that is required by the standard. Data collected from both formal and informal assessments are considered to gain an understanding of students' level of prior knowledge. Consideration is given to the type of lesson that will be provided. Will the lesson focus on concept introduction, concept building, or concept application. Learning progressions for lesson sequence is decided and learning intentions and success criteria are established. An instructional framework and strategies are determined for the lessons. Teachers plan rigorous lessons that meet or exceed the Depth of Knowledge (DOK) required by the standards. Tasks and questions are designed with entry points for all students and multiple ways to find solutions. Student learning and proficiency is deepened through the use of the mathematical practices. Required content vocabulary is considered. Engagement opportunities through whole and small group instruction and instructional support are determined. The teacher plans for instructional strategies that will have the greatest impact.

During the lesson:
Learning intentions and success criteria are communicated in appropriate language for the grade level so students can understand the learning requirements. Students are learning in cooperative whole groups as well as small groups. Instructional strategies may need to be adjusted to meet the needs of the learners as the lesson progresses. Teachers look for opportunities to deepen student's understanding of the concepts through engagement in the mathematical practices. The teacher provides scaffolding for students through questions, prompts, and cues. Teachers are helping students make connections with other mathematical concepts and leverage prior knowledge. Students are encouraged to create and use models to deepen conceptual understanding of new concepts.

After the lesson:
The teacher evaluates the impact of the lesson and students progress based on the success criteria and plans next steps for future lessons.

Mathematical Discourse

What is it?

Mathematical discourse are classroom discussions in which students communicate their mathematical thinking in a way that reveals the students' understanding of the concept. Students are given challenging questions or a problem to explore that have just the right level of challenge. Students are given time to reason about the task and time to share their thinking with small groups of classmates to compare strategies and thinking. The teacher then selects students to share their reasoning with the class and facilitates discussions. These purposeful discussions help students make connections to the lesson's mathematical goal and build a deeper conceptual understanding of mathematics.

Why is it important?

These mathematical discussions provide students with opportunities to share ideas, clarify their understanding, and develop convincing arguments. These discussions help advance the mathematical thinking of the whole class by talking and sharing aloud. Students are able to reflect on their understanding of mathematical concepts and make sense of and critique the reasoning of others which support the Standards for Mathematical Practice. The National Council of Teachers of Mathematics identifies the importance of engaging students in meaningful mathematical discussions as an essential component of students' mathematics learning. Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments, (*National Council of Teacher of Mathematics, Principles to Actions: Ensuring Mathematical Success for All, 2014).* Through discussion, students take ownership of their knowledge and students' learning is made visible to both the students and the teacher. In the book *Visible Learning* by John Hattie, he explains that Mathematical Discussions have a 0.82 effect size.

What does it look like?

Prior to the lesson:

For mathematical discussions to be successful, teachers need to establish a classroom environment that supports students so they will feel safe to take intellectual risk. Students should feel supported in their thinking and feel safe to make mistakes and ask questions. Students need to feel that they are listened to by the teacher and other students communicating a sense of respect for an interest in the student's contributions, *(Culturally Responsive Teaching and the Brain,* Hammond 2015*).* Classroom routines should be established so students and teachers understand their role. Students are expected to work independently as well as in small groups productively. Classroom discussion can be centered around questions or problems that are carefully created to engage students in problem-solving, reasoning, and communicating conjectures. Questions or problems should be created so students can explore several approaches for finding a solution to mathematical problems. The question or problem should provide the right level of challenge and be at the DOK level of the

standard so it promotes productive struggle **(see explanation on pg. 11)** but supports the mathematical goal of the lesson. The teacher should plan questions or problems that cognitively challenge students and provide several entry points with varied solution strategies. Cultural relevance of the students should be considered when creating a task. Teachers should anticipate students' responses, possible errors, and misconceptions and plan questions to move students toward lesson goals. Vocabulary building and support should be considered when planning. Plan the timing for when the question or problem will be presented during the lesson.

During the lesson:
The question or problem is posed and students are given time to productively struggle with the question. Students are encouraged to make connections to prior knowledge in order to support engagement with the new content. Students are given time to think and engage independently so they can formulate a plan or questions they may have. Allow time for students to interact with the task. Students are given an opportunity to share their thinking in a small group setting where they can compare their thinking and reasoning with others. This is a time for students to use error analysis to gain conceptual understanding of the concept. During these discussions, the teacher listens and monitors, takes notes about students' thinking, and supports students as they question both their reasoning and the reasoning of others. The teacher evaluates the strategies used to determine the sophistication of the solution or the use of visual models that supports understanding. As the teacher listens in on small group discussions, they make a plan for sequencing two or three students to share with the whole group. This sequence is planned so that meaningful classroom discussions support the mathematical goal of the lesson. The sequence of ideal sharing must move students' understanding to the important mathematical goal, not just finding multiple ways to answer questions or solve problems. Teachers need to attend to the integrity of the mathematics and promote mathematical reasoning and conceptual thinking by pressing for explanations and justifications, not just simply sharing strategies. This sequence helps students make connections between the different approaches. Communication support, such as vocabulary, might be needed. Kindergartners and 1st graders might require more support from the teacher. Teachers might need to support students' abilities to listen to and represent other students' ideas. Teachers might need to convey the students' thinking to others in a way that students at the early grades can understand what is being said. Teachers of younger students might also need to make suggestions for models that represent the math. Students can be supported by teachers questioning, prompting, and cueing. The teacher is the facilitator of the discussion when students are sharing. There are strategies that can be used to support student conversations. Kazemi and Hintz created a structure based on Chapin, O'Connor and Anderstons work called *Talk Moves* that is helpful when facilitating discussions.

Talk Moves to Support Classroom Discussions	
Revoicing *"So you're saying…"*	● Repeat some or all of what the student has said then ask the student to respond and verify whether or not the revoicing is correct. Revoicing can be used to clarify, amplify, or highlight an idea.
Repeating "*Can you repeat what was said in your own words?"*	● Ask a student to repeat or rephrase what another student said. ● Restate important parts of complex ideas in order to slow the conversation down and dwell on important ideas.
Reasoning *"Do you agree or disagree, and why?"* *"Why does that make sense?"*	● After students have had time to process a classmate's claim, ask students to compare their own reasoning to someone else's reasoning. ● Allow students to engage with each other's ideas. ● Student: "I respectfully disagree with that idea because…"; "This idea makes sense to me because…"
Adding On *"Would someone like to add on to this?"*	● Prompt students, inviting them to participate in the conversation or to clarify their own thinking. ● Student: "I'd like to add on …"
Wait Time *"Take your time…"*	● Wait after asking a question before calling on a student. ● Wait after a student has been called on to give the student time to organize his or her thoughts. ● Students: "I'd like more time…"
Turn and Talk *"Turn and talk to your neighbor…"*	● Circulate and listen to partner talk. Use this information to choose whom to call on. ● Allow students to clarify and share ideas. ● Allow students to orient themselves to each other's thinking.
Revise *"Has anyone's thinking changed?"* *"Would you like to revise your thinking?"*	● Allow students to revise their thinking as they have new insights. ● Student: "I thought…But now I think…because …" "I'd like to revise my thinking."

By Elham Kazemi & Allison Hintz *Intentional Talk How to Structure and Lead Productive Mathematical Discussions,* 2014 based on Talk Moves by Suzanne Chapin, Cahterine O'Connor and Nancy Ancerson 2009.

After the lesson:

Students can be given the opportunity to continue to explain their reasoning and understanding through mathematical writing. Targeted feedback to provide support for students' next steps should be provided.

Productive Struggle:

Students need to be given time to think and engage with tasks and questions that are posed before they are supported by the teacher or other students. Questions and problems that meet the DOK level of the standard, can prove to be challenging for students. Allowing students to engage in productive struggle helps to develop strong habits such as perseverance and flexible thinking. Students should not have the expectation that they will know how to solve a problem immediately. Productive struggle is the process of learning that develops a growth mindset and creative problem solving. Questions and problems need to be at just the right level of challenge so students have an opportunity for meaningful struggle.

Effective teaching of mathematics should consistently provide students, individually and collectively with opportunities and support to engage in productive struggle as they grapple with mathematical ideas and relationships, (National Council of Teachers of Mathematics. 2014 *Principles to actions: Ensuring mathematical success for all).* Research shows that learning is enhanced when students persist until successful. When students are doing the hard work of learning, they deepen their understanding of the concept. This struggle helps stretch students' thinking and performance just beyond the level they can do on their own, (Ermeling, Hiebert, and Gallimore, *Beyond Growth Mindset: Creating Classroom Opportunities for Meaningful Struggle, Dec. 2015).*

Engaging in challenging questions or problems helps students gain meaning and understanding beyond the correct answer. Students might feel stuck and lack the initiative to persevere. Teachers need to resist the feeling that they have to step in and help support students. Students need to engage in hard work. Teachers can provide a better approach by posing pointed questions that enable students to engage in the struggle that leads to real understanding, (Hintz, Gibbons, and Knapp, *Beyond the Right Answer,* 2015). Questions can help students make connections with what they already know or understand. Teachers need to pose questions that help make mathematical connections so mathematical concepts are more visible to students. When teachers facilitate mathematical discourse between students, they are encouraging students to question and build on student ideas.

Small Group Instruction

What is it?

Small group instruction is an opportunity for teachers to provide differentiated instruction based on student needs. This on level instruction provides support and scaffolds to students so they can better meet the level of rigor required by the grade level standard or extend their learning. Student groupings are flexible.

Why is it important?

Small group instruction gives the teacher time to provide support to students on concepts as well as provide enrichment. Teachers are able to tailor instruction to meet the needs of the students. Students' misconceptions and gaps may be addressed during instruction. Teachers are able to scaffold students' instruction so grade level concepts can be mastered.

What does it look like?

Prior to the lesson:

Determine learning intentions and success criteria for the lesson. Decide on the instructional scaffolds that will be needed to support the learners as they engage with grade level concepts. Determine instructional strategies for the lesson that will deepen students' understanding of the math concepts. Create groups based on similar instructional needs. Plan instructional resources and tools that will be used in the lesson including manipulatives and models.

During the lesson:

Learning intentions and success criteria should be communicated with the students in appropriate language for the grade level. Differentiated instruction with scaffolds should be provided for groups. Teachers should allow productive struggle to occur when students engage with the task and provide opportunities for mathematical discourse. Students should have access to manipulatives to construct models in order to deepen conceptual knowledge. Student misconceptions should be addressed. The teacher should collect evidence of student understanding.

After the lesson:

Students' individual progress should be evaluated based on students meeting the success criteria. Based on this evaluation, determine next steps for instruction.

Evidence of Mathematical Understanding

What is it?

Part of effective teaching is checking for student understanding after each lesson. It is most commonly done through asking questions, analyzing work, or through assessment. It is important to gather information about student progress. Through the communication of learning intentions and success criteria, students are also able to evaluate their level of understanding toward the instructional goal. The evidence of students' understanding is used to plan future instruction.

Why is it important?

Evidence of understanding provides teachers with a measurement of student progress. This information can be used to guide future lessons and instruction. It provides feedback to the students and the teachers. Feedback provided for the student should help them gauge their level of understanding and provide a guide for their next steps. For teachers, this feedback provides a guide for teaching practices. This evidence helps teachers consider what worked and what did not work in instruction as they carefully examine the evidence of student progress, (Teacher Clarity Playbook, A Hands-on Guided to Creating Learning Intentions & Success Criteria for Organized, Effective Instruction, Fisher, Frey, Amador, and Assof 2019).

What does it look like?

Prior to the lesson:

Teachers should plan for the assessment of student understanding. Plan checks that will be needed for students to demonstrate their progress toward conceptual understanding of the concept. Consideration should be made for what models can help students make connections with the concept. These models might be concrete, pictorial or in numeral form. Teachers should anticipate how they think students will respond and plan questions that will support students in achieving the goal of the lesson.

During the lesson:

Models are a way for students to demonstrate their understanding. Kindergarteners and 1st graders might need more support and explicit teaching of models. Help students make the connection between the representations and the concept. Questioning can also be a way to make students' learning visible. Formative assessment and checks for understanding can be used during the lesson to monitor students progress toward the intended learning intention and success criteria of the lesson. Student misconceptions should be addressed. Opportunities for writing can also demonstrate student understanding.

After the lesson:
Provide time for students to reflect on their progress toward success criteria. Opportunities for students to provide evidence of understanding can be demonstrated verbally or in writing, through exit tickets, checklists, written summaries, writing prompts, quizzes, or common assessments.

Strategy Fluency

What is it?

The Ohio Learning Standards for Mathematics defines fluency as “The ability to use efficient, accurate, and flexible methods for computing. Fluency does not imply timed tests.” Students need to be able to access their understanding of basic facts so they are able to focus on other more complex concepts when solving problems.

Why is it important?

Effective teaching of mathematics builds fluency with procedures based on a foundation of conceptual understanding so that students over time, become skillful in flexibly using procedures as they solve contextual and mathematical problems, (National Council of Teacher of Mathematics 2014). It is important that students are flexible with numbers and develop number sense so they are able to apply this knowledge to different concepts. Procedural fluency builds on a foundation of conceptual understanding, strategic reasoning, and problem solving, (NCTM 2014). Students need time to develop number sense strategies that they can use that are deeply rooted and can be applied to other situations. These number sense strategies include different strategies for figuring out facts. Students need to be flexible and accurate. It is important for students to see and understand patterns, not just the rote memorization of facts.

What does it look like?

Prior to the lesson:

Plan for fluency that builds conceptual understanding, strategic reasoning and problems solving. The learning needs to build students' number sense and flexibility with numbers. Have clear goals for the strategy that will be practiced. For K-1st grade, the focus should be on building the fundamental number and number sense for both counting and number relationships. For counting, plan for opportunities that include counting (numerical knowledge) such as number sequencing, one-to-one correspondence, cardinality, subitizing and number patterns. For number relationships, plan opportunities that develop spatial patterns (patterned arrangement recognition), one and two more/less relationships when counting, the role of benchmark numbers of 5 & 10, and part-part-whole relationships. For 2nd-5th grade, the focus should be on the development and strong understanding of number relationships and relationships between the operations of addition/subtraction and multiplication/division. Specific lessons to help students develop efficient strategies for fact fluency with all operations can be based on strategies including one-more-than and two-more-than facts, doubles, using the benchmark of 5 & 10, and patterns. For all grade levels, plan opportunities for composing and decomposing numbers that build number flexibility.

During the lesson:
Provide time for strategy fluency and number flexibility development. Make sure that students know the success criteria. Activities for Kindergarten and 1st graders may include numeracy builders such as Math Talks, Number Talks, Number of the Day, Visual Representation, Number Games, and Number Routines. For 2nd through 5th graders, activities may include Number Talks, Number of the Day and Number Games. Fact fluency strategy opportunities can involve planned story problems designed so that students are most likely to develop a specific strategy as they solve the problem as well as direct lessons that revolve around a specific collection of facts from which a particular type of strategy is appropriate. Students need to engage in activities that build a deep understanding of numerical principles and number patterns.

After the lesson:
Provide time for students to reflect on progress toward Success Criteria. Students should be given time to practice strategies independently.

Gradual Release Model

The Gradual Release of Responsibility Model was first developed by Pearson & Gallagher in 1993. It is a research based instructional model that promotes independent application of skills and understanding. The teacher gradually decreases support as students demonstrate success and if necessary, increase the level of support when students are struggling. The Gradual Release Model helps teachers identify where students are for future targeted instruction.

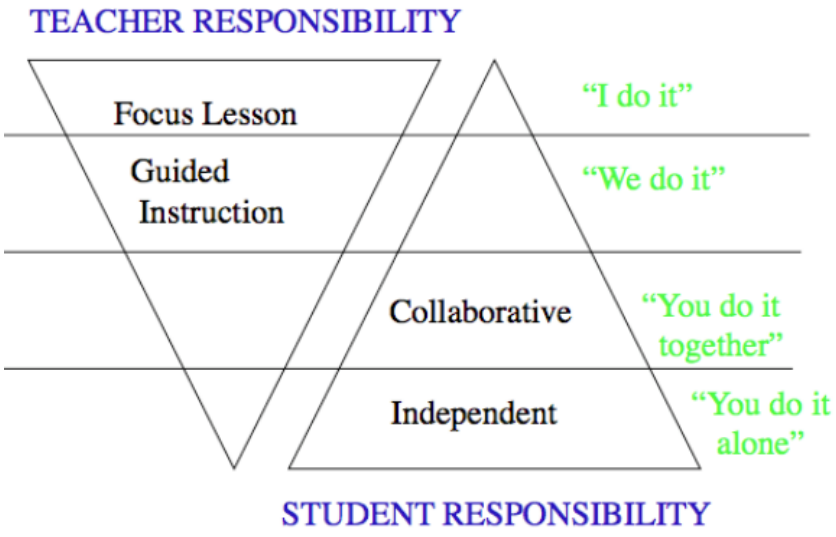
Learning requires interaction. The need for interaction with a teacher, the content, and peers is essential for learning. The Gradual Release Method is a systematic approach for shifting the cognitive work from the teacher to the learner. Important instructional moves occur during a lesson regardless of the content being taught. Lessons are organized to meet the learning needs of students so the components can be sequenced in any order.

Focused Lesson- Describes the way students are alerted to and primed for learning. This includes establishing purpose, modeling or demonstrating skills and concepts, and conducting think-alouds.

Guided Instruction- The teacher uses robust questions, prompts, and cues to scaffold when necessary as students put new knowledge into play.

Collaborative Learning- students work together to consolidate their understanding. It is a time for the teacher to gather information, make observations, and listen for evidence of problem solving and reasoning. Student learning begins as teachers take a step back. If a group stalls, the teacher can step in and offer further guided instruction, then step back again to monitor.

Independent Learning- students work independently. Tasks are designed to move students to mastery. Tasks may be fluency building, spiral review, application of skills and concepts, or extensions.



Roles & Responsibilities

	Teacher	Student
I do it Focused Lesson	● Provides direct instruction ● Establishes goals and purpose ● Models ● Think aloud	● Actively listens ● Takes notes ● Asks for clarification
We do it Guided Instruction	● Interactive instruction ● Works with students ● Checks, prompts, clues ● Provides additional modeling ● Meets with needs-based groups	● Asks and responds to questions ● Works with teacher and classmates ● Completes process alongside others
You do it independently Independent Practice	● Provides feedback ● Evaluates ● Determines level of understanding	● Works alone ● Relies on notes, activities, classroom learning to complete assignment ● Takes full responsibility for outcome
You do it together Collaborative Learning	● Moves among groups ● Clarifies confusion ● Provides support	● Works with classmates, shares outcome ● Collaborates on authentic task ● Consolidates learning ● Completes process in small group ● Looks to peers for clarification

Developed by Ellen Levy

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Depth of Knowledge

Depth of Knowledge is a scale of cognitive demand (thinking) to align standards with assessments, based on the research of Dr. Norman Webb, University of Wisconsin Center for Education Research and the National Institute for Science Education. The Depth of Knowledge is not determined by the verb, but by the context in which the verb is used and the depth of thinking required. DOK is about the intended learning outcome, not the difficulty.

Webb's DOK model describes four levels of complexity:

1. **Level 1: Recall & Reproduction -** basic tasks that require students to recall or reproduce knowledge and/or skills. Content at DOK 1 involves working with facts, terms, details, calculations, principles, and/or properties, with little or no transformation of the knowledge or skill required by the tasks at this level. Answering a DOK 1 item can involve following a simple, well known formula or procedure. "A student answering a Level 1 item either knows the answer or does not; that is, the answer does not need to be figured out or solved."
2. **Level 2: Skill/Concept -** the engagement of mental processing beyond recalling, reproducing, or locating an answer. Content at DOK 2 requires students to compare or differentiate, apply multiple concepts, classify or sort items into meaningful categories, describe or explain relationships such as cause and effect or relationships between characters, and provide and explain examples and non-examples. "At this level, students are asked to transform/process target knowledge before responding."
3. **Level 3: Strategic Thinking & Reasoning -** demands the use of planning, reasoning, and higher order thinking processes, such as analysis and evaluation, to solve real-world problems or explore questions with multiple possible outcomes. Content at DOK 3 requires an in-depth integration of conceptual knowledge and multiple skills to reach a solution or produce a final product. DOK 3 requires deep understanding, exhibited through planning, using evidence, and more demanding cognitive reasoning. At this level, students demonstrate an in-depth understanding of one text, one data set, one investigation, or one key source. Assessment items may have more than one possible answer and require students to justify their response.
4. **Level 4: Extended Thinking -** extended and integrated use of higher order process skills such as critical and creative-productive thinking, reflection, and adjustment of plans over time. Content at DOK 4 requires students to employ and sustain strategic thinking processes over a longer period of time to solve the problem or produce an authentic product. At this level, students engage with authentic problems and audiences, and collaboration within a project-based setting.

https://education.ohio.gov/getattachment/Topics/Teaching/Educator-Evaluation-System/How-to-Design-and-Select-Quality-Assessments/Webbs-DOK-Flip-Chart.pdf.aspx

Math Block Schedule

Determine if the daily instruction will be a concept introduction lesson, a concept building lesson, or a concept application lesson.

Lesson Type	Time Frames	Components
Concept Introduction Lesson	30-45 minutes	Lesson Goal & Structure
		Mathematical Discourse
	10 minutes	Evidence of Mathematical Understanding
	5 minutes	Strategy Fluency
or		
Concept Building Lesson/s (Number of days depends on lesson progressions)	25 minutes	Lesson Goal & Structure
		Mathematical Discourse
	20 minutes	Small Group
	10 minutes	Evidence of Mathematical Understanding
	5 minutes	Strategy Fluency
or		
Concept Application Lesson	25 minutes	Lesson Goal & Structure
		Mathematical Discourse
	20 minutes	Small Group
	10 minutes	Evidence of Mathematical Understanding
	5 minutes	Strategy Fluency
Intervention: 30 minutes - *in addition to* the Math Block		Intervention: Tier 2 and Tier 3 support aligned to the evidence-based core instruction and specific to the needs of the student

K-1 Math Block

Lesson Goal & Structure	Mathematical Discourse	Small Group	Evidence of Mathematical Understanding	Strategy Fluency
Weekly: Lessons are sequenced to provide a progression for learning the standard. Consider what lessons will focus on concept introduction, concept building, or concept application.	**Daily:** Problem solving opportunities that are engaging and rigorous for students to explore math concepts.	**Daily:** On level instruction that has a clear learning target and success criteria.	**Weekly:** Assessment either formal or informal to provide evidence of students' understanding.	**Weekly:** Fluency opportunities that have a clear learning intention and success criteria.
Always: Learning intentions and success criteria at the level of rigor of the grade level standard communicated to students.	**Daily:** Problems that allow students to productively struggle to solve using models and strategies of students choice.	**Daily:** Support students by scaffolding instruction to help students understand grade level content.	**Daily:** Provide opportunities for students to provide evidence of understanding.	**Daily:** Opportunities that build the fundamentals of number and number sense for both counting and number relationships.
Always: Plan instructional strategies that support learning.	**Daily:** Teachers guide students when sharing their thinking with others to support understanding.	**Daily:** Plan instructional strategies that support learning.	**Often:** Support student models/ provide explicit demonstration or make suggestions for models if needed.	**Daily:** Students engaged in fluency practice that supports the rigor of the grade level.
Daily: Provide 60 minutes of mathematical instruction.	**Daily:** Teacher facilitates discussion to help students make connections between different strategies and models to build conceptual understanding.			**Often:** Opportunities for students to compose and decompose numbers to build number flexibility.
Daily: Use mathematical practices that support students' conceptual understanding of the content.	**Daily**: Support the development of content vocabulary during discussions.			
Often: 30 minutes of intervention for students who need Tier 2 and Tier 3 support to reach grade level expectations.				

2-5 Math Block

Lesson Goal & Structure	Mathematical Discourse	Small Group	Evidence of Mathematical Understanding	Strategy Fluency
Weekly: Lessons are sequenced to provide a progression for learning the standard. Consider what lessons will focus on concept introduction, concept building, or concept application.	**Daily:** Problem solving opportunities that are engaging and rigorous for students to explore math concepts.	**Daily:** On level instruction that has a clear learning target and success criteria.	**Weekly:** Assessment either formal or informal to provide evidence of students' understanding.	**Weekly:** Fluency opportunities that have a clear learning intention and success criteria.
Always: Learning intentions and success criteria at the level of rigor of the grade level standard communicated to students.	**Daily:** Problems that allow students to productively struggle to solve using models and strategies of students choice.	**Daily:** Support students by scaffolding instruction to help students understand grade level content.	**Daily:** Provide opportunities for students to provide evidence of understanding.	**Daily:** Opportunities that develop a strong understanding of number relationships and relationships between operations.
Always: Plan instructional strategies that support learning.	**Daily:** Teachers guide students when sharing their thinking with others.	**Daily:** Plan instructional strategies that support learning.	**Often:** Models that represent the math that support students' understanding of the concept.	**Often:** Opportunities to compose and decompose numbers to build number flexibility.
Daily: Provide 60 minutes of mathematical instruction.	**Daily:** Teacher facilitates discussion to help students make connections between different strategies and models to build understanding.			**Daily:** Opportunities to develop fundamental math fact fluency strategies for addition/subtraction and multiplication/division.
Daily: Use mathematical practices that support students' conceptual understanding of the content.	**Daily:** Vocabulary development that supports students' language when explaining their thinking.			
Often: 30 minutes of intervention provided for students that need Tier 2 and Tier 3 support to reach grade level expectations.				

Teacher and Student Behaviors
During the lesson

Lesson Goal and Structure	
Teacher	**Student**
● Communicate learning intentions and success criteria for the lesson. ● Determine engagement level of support determined by the Gradual Release model. ● Support students through ○ Guided questioning ○ Cueing and prompting ○ Explicit instruction ○ Monitoring and documenting ● Determine timing to implement instructional strategies. ● Look for opportunities to engage students in the Mathematical Practices to support students mathematical proficiency. ● Facilitate whole and small group learning. ● Determine scaffolding that will support students' understanding during the lesson. ● Help students make connections with prior knowledge by questioning and prompting students. ● Listen and make observations of student understanding. ● Make ongoing adjustments in instructional approaches. ● Provide feedback to students that will help move students toward a deeper understanding. ● Encourage the use of models and manipulatives to deepen student understanding.	● Identify what is needed to be successful with the intended learning. ● Actively engage in lesson through discussions and questioning. ● Persevere with question or task. ● Take risks by engaging in questions or tasks. ● Explain thinking and reasoning. ● Work cooperatively with groups. ● Use number sense strategies to solve problems. ● Apply previous understanding to new concepts. ● Use feedback to adjust thinking. ● Use models and manipulatives to build an understanding of mathematical concepts.

Mathematical Discourse

Teacher	Student
• Pose question or task at just the right DOK level. • Encourage students to persevere when engaging in a question or task. • Allow students to struggle and make mistakes. • Encourage students to try multiple strategies when working independently. • Facilitate whole and small group learning. • Circulate the room to select strategies and sequences for sharing. • Facilitate discussions and use Talk Moves to support students. • Clarify student reasoning and justifications. • Help students see connections between different strategies. • Incorporate Mathematical Practices in the lesson. • Support discussion that involves error analysis to deepen students' understanding. • Address misconceptions. • Monitor and record evidence of students' understanding. • Monitor to see that students retain key lesson ideas. • Support student development of vocabulary. • Provide feedback that is prompt and actionable.	• Actively engage in the task. • Persevere with question or task. • Take risks when engaging in questions or tasks. • Work independently to solve questions or tasks. • Use models to represent mathematical concepts. • Work cooperatively with other students in small groups. • Share strategies for answering questions or tasks. • Provide reasoning and justification for the solution to questions or tasks. • Apply number sense and fluency strategies. • Apply previous knowledge when working on questions or tasks. • Engage in class discussion by sharing and questioning. • Work to see connections between personal strategies and reasoning and the strategies and reasoning of others. • Use mathematical vocabulary. • Use feedback to make adjustments in learning.

Small Group

Teacher	Students
• Communicate learning intentions and success criteria for the lesson. • Provide differentiated instruction and scaffolds for students that support grade level standards.	• Identify what is needed to be successful with the intended learning. • Actively engage in the lesson. • Persevere with the question or task. • Take risks by engaging in questions or

• Allow students time to struggle and make mistakes. • Facilitate mathematical discussions. • Provide manipulatives and models that support the mathematical concept. • Address student misconceptions. • Collect evidence of student understanding.	tasks. • Provide reasoning and justifications for the solution to the question or task. • Use models and manipulatives to show mathematical concepts.
Evidence of Mathematical Understanding	
Teacher	**Student**
• Support student models. For K-1 students, provide explicit demonstration or make suggestions for models if needed. • Support students by helping to make connections between the model and mathematical responsentations. • Use questions to make student understanding visible. • Check for student understanding through formative assessment. • Provide opportunities for writing in math to make learning visible. • Address student misconceptions.	• Use models to show understanding of the mathematical concepts. • Make connections between models and mathematical concepts. • Answer and ask questions to show understanding of concepts. • Show reasoning and justification verbally and/or through writing.
Strategy Fluency	
Teacher	**Student**
• Plan opportunities for explicit strategy lessons. • Determine success criteria for lessons. • Provide opportunities for building number sense. • Question, cue, and prompt to make number sense visible. • Provide independent practice of the strategy. • Monitor student progress. • Provide feedback that is prompt and actionable.	• Identify what is needed to be successful with the intended learning. • Actively engage in the lesson. • Use flexibility when thinking about numbers. • Practice strategies.

After the Lesson

Lesson Goal and Structure

Teacher	Student
• Look for evidence of student learning. • Evaluate student progress toward the lesson goals. • Provide actionable and timely feedback to students. • Use evidence of understanding to group students for small group instruction. • Document student progress that was provided through formal and informal assessment. • Look for evidence of lesson impact. • Determine next steps for instruction.	• Use feedback to evaluate progress toward success criteria. • Use new knowledge with future learning.

Mathematical Discourse

Teacher	Student
• Look for evidence of student learning. • Evaluate student progress toward the lesson goals. • Use evidence of student understanding to plan Concept Development lessons. • Use evidence of understanding to group students for small group instruction. • Provide actionable and timely feedback to students.	• Provide evidence of mathematical understanding through mathematical writing. • Use feedback to evaluate progress toward success criteria. • Use new knowledge with future learning.

Small Group

Teacher	Student
• Evaluate individual progress in meeting the success criteria for the lesson. • Document students progress. • Consider current grouping. • Provide actionable and timely feedback to students. • Determine next steps for instruction.	• Use feedback to evaluate progress toward success criteria. • Use new knowledge with future learning.

Evidence of Mathematical Understanding.	
Teacher	**Student**
● Evaluate individual progress in meeting the success criteria for the lesson. ● Provide a check for student understanding of concepts either verbally or in written form through ○ Exit tickets ○ Checklists ○ Projects ○ Quizzes ○ Common Assessment ● Provide time for students to practice new concepts. ● Support students as they reflect on new learning and making connections to prior knowledge. ● Support opportunities that give students an opportunity to write in order to clarify mathematical understanding. ● Organize student responses to guide next steps for instruction.	● Reflect on progress toward success criteria. ● Practice to build conceptual understanding of concepts. ● Demonstrate mastery of concepts by completing exit tickets, checklists, written summaries, writing prompts, projects, quizzes, or common assessments verbally or in written form.
Strategy Fluency	
Teacher	**Student**
● Evaluate individuals' progress in meeting the success criteria for the lesson. ● Provide time for students to practice strategies. ● Plan next steps for instruction.	● Reflect on progress toward success criteria. ● Apply strategies to other work. ● Practice independently.

	K-1 Math Framework					
	Teacher Planning	Lesson Goal & Structure	Mathematical Discourse	Small Group	Evidence of Mathematical Understanding	Strategy Fluency
Prior to Lesson	Determine standards for lesson.	Set learning intentions and success criteria for student learning based on the standards.	Plan mathematical problems that engages students in problem solving and classroom discussion. Plan problems that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies. Consider cultural relevance of the students when determining a task.	Plan Learning Intentions and Success Criteria for lesson.	Plan for assessment of student learning.	Plan Learning Intention and Success Criteria.
	Explore student prior knowledge that supports the standards that will be the focus for the lesson.	Determine how to make learning visible so students have an understanding of learning success.	Anticipate how students will respond and plan questions to support and move students toward lesson goal.	Plan for scaffolded instruction to support grade level concepts.	Plan checks for understanding.	Plan fluency opportunities that build the fundamentals of number and number sense for both counting and number relationships.
	Consider students misconceptions	Determine sequencing of lessons for the concepts being taught. Consider what lessons will focus on concept introduction, concept building, or concept application.	Plan mathematical problems that provide productive struggle for students engagement. Problems need to stretch students' thinking and performance just beyond the level they can do on their own. Problems must align with the learning intention for the lesson at the DOK level required by the standard.	Plan instructional strategies that will support students.	Plan for mathematical models that will make connections among mathematical representations that are concrete, pictorial, or numerical so that it deepens students understanding.	Plan opportunities that include counting (numerical knowledge) such as number sequence, one-to one correspondence, cardinality, subitizing and number patterns.
	Consider level of rigor required by the standard.	Plan engagement opportunities for lesson through systematic instruction that supports student level. Consider Focused Instruction, Guided Instruction, Collaborative Learning, and Independent Learning.	Plan instructional approach and strategy that will be used during mathematical discourse.	Group students with similar needs for instruction.	Anticipate how students will respond and plan questions to support students toward lesson goal.	Plan number relationships opportunities that develop spatial patterns (patterned set recognition), one and two more/less, benchmark number of 5 & 10, and part-part-whole relationships.
	Identify any standards that will support the focus standard.	Determine instructional requirements of the teacher and students.	Plan timing when task will be given.	Plan resources that will be used for instruction including manipulatives and models.		Plan for fluency that builds conceptual understanding, strategic reasoning and problem solving.
	Use data from Benchmark assessments, Formal Assessments, and Formative Assessments to guide instruction.	Plan for vocabulary development.	Plan vocabulary support during students discussion.			Plan fluency opportunities for composing and decomposing numbers to build number flexibility.
	Create a learning environment that fosters a growth mindset and provides students a safe place to take risks.	Plan whole and small group lesson structure and goal.				Have a clear goal of the strategy that will be practiced.
	Plan for student engagement.					
	Consider assessment criteria.					
During the Lesson	Consider the data from assessments.	Communicate learning intentions and success criteria in appropriate language for grade level so students understand the learning requirement.	Pose a task that provides the right DOK level of challenge that promotes productive struggle and supports the learning intention of the lesson.	Communicate learning intentions and success criteria in appropriate language for grade level so students understand the learning requirement.	Support student models/ provide explicit demonstration or make suggestions for models if needed.	Provide time for strategy fluency development.
	Collect data as evidence of students level of understanding of lesson and concept.	Provide engagement opportunities for lesson through systematic instruction that supports student level. Such as Focused Instruction, Guided Instruction, Collaborative Learning, and Independent Learning.	Monitor students progress and purposefully plan sequence of strategy discussions. Support independent learning, collaborative learning, and guided question as needed.	Provide differentiated instruction that scaffolds to meet students needs.	Support students so they make connections between models and mathematical representations.	Provide feedback to help students monitor progress based on Success Criteria.
	Plan feedback to help students monitor progress based on Success Criteria.	Consider what instructional strategy will have the greatest impact on students reaching the learning goal.	Students present strategies for solving problems. Sequence students presentations to build on one another to develop mathematical ideas.	Lessons should promote productive struggle and students should engage in mathematical discourse.	Question students to make learning visible.	Number Sense building opportunities of counting and number relationships.
		Whole group cooperative learning and/or small group instruction that involves the use of instructional strategies presented at the "right time" to support student learning.	Support students discussion by using **Talk Moves** to help guide and deepen students connections and understanding.	Make sure students have access to manipulatives to deepen conceptual knowledge.	Formative Assessment/checks for understanding to monitor students progress toward related learning intentions and success criteria.	Numeracy builders such as Math Talks, Number Talks, Number of the Day, Visual Representation, Number Games and Number Routines could be used to build flexibility and number sense.
		Provide Scaffolding for students as needed such as questioning, prompts, and cues.	Support students in making connections between mathematical concepts.	Address students misconceptions.	Opportunity for writing in math at students grade level expectation..	Provide independent practice.
		Make connections to leverage students prior knowledge.	Incorporate mathematical practices.	Collect evidence of students understanding.	Address students misconceptions.	
		Make adjustments in instructional approach based on observations and feedback gathered from students.	Provide opportunities for productive struggle to promote meaningful learning where students can make mistake and engage in error analysis to gain conceptual understanding.			
		Students have access to manipulatives to deepen conceptual knowledge by creating models.	Monitor to see that students retain key lesson ideas.			
			Support the development of content vocabulary during discussions.			
			Provide feedback through questioning, prompting and cueing to support students towards concept understanding.			

After the Lesson	Evaluate the impact of lesson.	Evaluate students progress toward learning goal.	Provide opportunities for mathematical writing to explain learning.	Evaluate individuals progress in meeting success criteria of the lesson.	Provide reflection for students to monitor progress toward Success Criteria.	Provide time for students to reflect on progression toward Success Criteria.
	Based on information gathered from formative assessment and checking for understanding, determine next steps for instruction.		Provide targeted feedback that provides students support toward next steps in learning.	Determine next steps for instruction.	Provide practice to build conceptual understanding.	Provide opportunities for independent practice.
					Provide opportunities to demonstrate mastery through verbal or written opportunities, exit tickets, checklists, written summaries, writing prompts, quizzes, or common assessments.	
					Provide opportunities for students to write to communicate and clarify students mathematical understanding. The writing should be at the appropriate level of the student. It might be pictures, letters or words.	

	2-5 Math Framework					
	Teacher Planning	Lesson Goal & Structure	Mathematical Discourse	Small Group	Evidence of Mathematical Understanding	Strategy Fluency
Prior to the Lesson	Determine standards for lesson.	Set learning intentions and success criteria for student learning based on the standards.	Plan mathematical problems that engages students in problem solving and classroom discussion. Plan problems that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies. Consider cultural relevance of the students when determining a task.	Plan Learning Intentions and Success Criteria for lesson.	Plan for assessment of student learning.	Plan Learning Intention and Success Criteria.
	Explore student prior knowledge that supports the standards that will be the focus for the lesson.	Determine how to make learning visible so students have an understanding of learning success.	Anticipate how students will respond and plan questions to support and move students toward lesson goal.	Plan for scaffolded instruction to support grade level concepts.	Plan checks for understanding.	Plan for opportunities that develop a strong understanding of number relationships and relationships between the operations.
	Consider students misconceptions	Determine sequencing of lessons for the concepts being taught. Consider what lessons will focus on concept introduction, concept building, or concept application.	Plan mathematical problems that provide productive struggle for students engagement. Problems need to stretch students' thinking and performance just beyond the level they can do on their own. Problems must align with the learning intention for the lesson at the DOK level required by the standard.	Plan instructional strategies that will support students.	Plan for mathematical models that will make connections among mathematical representations that are concrete, pictorial, or numerical so that it deepens students understanding.	Plan specific lessons that develop the fundamental math fact fluency strategies for addition/subtraction and multiplication/division.
	Consider level of rigor required by the standard.	Plan engagement opportunities for lesson through systematic instruction that supports student level. Consider Focused Instruction, Guided Instruction, Collaborative Learning, and Independent Learning.	Plan instructional approach and strategy that will be used during mathematical discourse.	Group students with similar needs for instruction.	Anticipate how students will respond and plan questions to support students toward lesson goal.	Plan for fluency that builds conceptual understanding, strategic reasoning and problem solving.
	Identify any standards that will support the focus standard.	Determine instructional requirements of the teacher and students.	Plan timing when task will be given.	Plan resources that will be used for instruction including manipulatives and models.		Plan fluency opportunities for composing and decomposing numbers to build number flexibility.
	Use data from Benchmark assessments, Formal Assessments, and Formative Assessments to guide instruction.	Plan for vocabulary development.	Support students vocabulary development during discussions.			Have a clear goal of the strategy that will be practiced.
	Create a learning environment that fosters a growth mindset and provides students a safe place to take risks.	Plan whole and small group lesson structure and goal.				
	Plan for student engagement.					
	Consider assessment criteria.					
During the Lesson	Consider the data from assessments.	Communicate learning intentions and success criteria in appropriate language for grade level so students understand the learning requirement.	Pose a task that provides the right DOK level of challenge that promotes productive struggle and supports the learning intention of the lesson.	Communicate learning intentions and success criteria in appropriate language for grade level so students understand the learning requirement.	Support student models/ provide explicit demonstration or make suggestions for models if needed.	Provide time for strategy fluency development.
	Collect data as evidence of students level of understanding of lesson and concept.	Provide engagement opportunities for lesson through systematic instruction that supports student level. Such as Focused Instruction, Guided Instruction, Collaborative Learning, and Independent Learning.	Monitor students progress and purposefully plan sequence of strategy discussions. Support independent learning, collaborative learning, and guided question as needed.	Provide differentiated instruction that scaffolds to meet students needs.	Provide opportunities for students to make connections between models and mathematical representations.	Provide feedback to help students monitor progress based on Success Criteria.
	Plan feedback to help students monitor progress based on Success Criteria.	Consider what instructional strategy will have the greatest impact on students reaching the learning goal.	Students present strategies for solving problems. Sequence students presentations to build on one another to develop mathematical ideas.	Lessons should promote productive struggle and students should engage in mathematical discourse.	Question students to make learning visible.	Opportunities for developing fluency strategies through problem solving that support specific strategies or explicit instruction on a strategy.
		Whole group cooperative learning and/or small group instruction that involves the use of instructional strategies presented at the "right time" to support student learning.	Support students discussion by using **Talk Moves** to help guide and deepen students connections and understanding.	Make sure students have access to manipulatives to deepen conceptual knowledge.	Formative Assessment/checks for understanding to monitor students progress toward related learning intentions and success criteria.	Provide independent practice.
		Provide Scaffolding for students as needed such as questioning, prompts, and cues.	Support students in making connections between mathematical concepts.	Address students misconceptions.	Provide opportunities for students to write in math to communicate and clarify students mathematical understanding.	Numeracy builders such as Number Talks, Number Games and Number Routines could be used to build flexibility and number sense.
		Make connections to leverage students prior knowledge.	Incorporate mathematical practices.	Collect evidence of students understanding.	Address students misconceptions.	
		Make adjustments in instructional approach based on observations and feedback gathered from students.	Provide opportunities for productive struggle to promote meaningful learning where students can make mistake and engage in error analysis to gain conceptual understanding.			
		Students have access to manipulatives to deepen conceptual knowledge by creating models.	Monitor to see that students retain key lesson ideas.			
			Support the development of content vocabulary during discussions.			
			Provide feedback through questioning, prompting and cueing to support students towards concept understanding.			
			Students have access to manipulatives to deepen conceptual knowledge.			

After the Lesson	Evaluate the impact of lesson.	Evaluate students progress toward learning goal.	Provide opportunities for mathematical writing to explain learning.	Evaluate individuals progress in meeting success criteria of the lesson.	Provide reflection for students to monitor progress toward Success Criteria.	Provide time for students to reflect on progression toward Success Criteria.
	Based on information gathered from formative assessment and checking for understanding, determine next steps for instruction.		Provide targeted feedback that provides students support toward next steps in learning.	Determine next steps for instruction.	Provide practice to build conceptual understanding.	Provide opportunities for independent practice.
					Provide opportunities to demonstrate mastery through verbal or written opportunities, exit tickets, checklists, written summaries, writing prompts, projects, quizzes, or common assessments.	
					Provide opportunities for students to write to communicate and clarify students mathematical understanding.	

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