



## A Balancing Act: Experience Florida Mathematics in Action

### Session Objectives

Participants will:

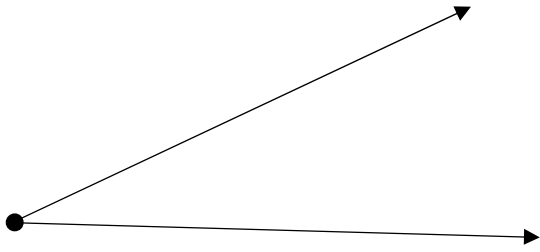
- Understand Florida's Mathematics Formula for Success.
- Engage in activities experiencing multiple instructional approaches and Mathematical Thinking and Reasoning Standards (MTRs).

### Communication Game | Reflection

What instructional approach(es) and MTRs did you experience in this activity?

### The Construction Challenge | Copy a Line Segment



**The Construction Challenge | Copy an Angle**



### The Construction Challenge | Reflection

What instructional approach(es) and MTRs did you experience in this activity?

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### Reflection

How could the instructional approach(es) and MTRs enhance instruction in your classroom?

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How could your students benefit from an activity like this?

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### Closing

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| Click here to give Feedback:                                                        | <b>Florida Department of Education (FDOE), Bureau of Standards and Instructional Support (BSIS)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
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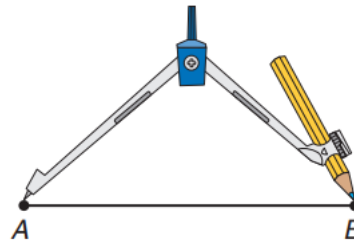
Using a straightedge, draw line segment  $AB$ .



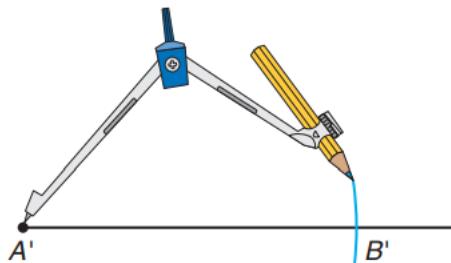
Draw a second line segment. It should be longer than segment  $AB$ .  
Label one of its endpoints as  $A'$  (read “A prime”).



Place the compass anchor at  $A$  and the pencil point at  $B$ .



Without changing the compass opening, place the compass anchor on  $A'$  and draw a small arc that crosses the line segment. Label the point where the arc crosses the line segment as  $B'$ .





## Florida K-12 Mathematical Thinking and Reasoning Standards

MTR: *Because Math Matters*

Florida students are expected to engage with mathematics through the Mathematical Thinking and Reasoning (MTR) Standards. These standards are written in clear language so all stakeholders can understand them and students can use them as self-monitoring tools. The MTR Standards promote deeper learning and understanding of mathematics. The clarifications are included to guide teachers in the integration of the MTR Standards within mathematics instruction.

### **MA.K12.MTR.1.1 Actively participate in effortful learning both individually and collectively.**

Mathematicians who participate in effortful learning both individually and with others:

- Analyze the problem in a way that makes sense given the task.
- Ask questions that will help with solving the task.
- Build perseverance by modifying methods as needed while solving a challenging task.
- Stay engaged and maintain a positive mindset when working to solve tasks.
- Help and support each other when attempting a new method or approach.

#### Clarifications:

Teachers who encourage students to participate actively in effortful learning both individually and with others:

- Cultivate a community of growth mindset learners.
- Foster perseverance in students by choosing tasks that are challenging.
- Develop students' ability to analyze and problem solve.
- Recognize students' effort when solving challenging problems.

**MA.K12.MTR.2.1 Demonstrate understanding by representing problems in multiple ways.**

Mathematicians who demonstrate understanding by representing problems in multiple ways:

- Build understanding through modeling and using manipulatives.
- Represent solutions to problems in multiple ways using objects, drawings, tables, graphs and equations.
- Progress from modeling problems with objects and drawings to using algorithms and equations.
- Express connections between concepts and representations.
- Choose a representation based on the given context or purpose.

Clarifications:

Teachers who encourage students to demonstrate understanding by representing problems in multiple ways:

- Help students make connections between concepts and representations.
- Provide opportunities for students to use manipulatives when investigating concepts.
- Guide students from concrete to pictorial to abstract representations as understanding progresses.
- Show students that various representations can have different purposes and can be useful in different situations.

**MA.K12.MTR.3.1 Complete tasks with mathematical fluency.**

Mathematicians who complete tasks with mathematical fluency:

- Select efficient and appropriate methods for solving problems within the given context.
- Maintain flexibility and accuracy while performing procedures and mental calculations.
- Complete tasks accurately and with confidence.
- Adapt procedures to apply them to a new context.
- Use feedback to improve efficiency when performing calculations.

Clarifications:

Teachers who encourage students to complete tasks with mathematical fluency:

- Provide students with the flexibility to solve problems by selecting a procedure that allows them to solve efficiently and accurately.
- Offer multiple opportunities for students to practice efficient and generalizable methods.
- Provide opportunities for students to reflect on the method they used and determine if a more efficient method could have been used.

**MA.K12.MTR.4.1 Engage in discussions that reflect on the mathematical thinking of self and others.**

Mathematicians who engage in discussions that reflect on the mathematical thinking of self and others:

- Communicate mathematical ideas, vocabulary and methods effectively.
- Analyze the mathematical thinking of others.
- Compare the efficiency of a method to those expressed by others.
- Recognize errors and suggest how to correctly solve the task.
- Justify results by explaining methods and processes.
- Construct possible arguments based on evidence.

Clarifications:

Teachers who encourage students to engage in discussions that reflect on the mathematical thinking of self and others:

- Establish a culture in which students ask questions of the teacher and their peers, and error is an opportunity for learning.
- Create opportunities for students to discuss their thinking with peers.
- Select, sequence and present student work to advance and deepen understanding of correct and increasingly efficient methods.
- Develop students' ability to justify methods and compare their responses to the responses of their peers.

**MA.K12.MTR.5.1 Use patterns and structure to help understand and connect mathematical concepts.**

Mathematicians who use patterns and structure to help understand and connect mathematical concepts:

- Focus on relevant details within a problem.
- Create plans and procedures to logically order events, steps or ideas to solve problems.
- Decompose a complex problem into manageable parts.
- Relate previously learned concepts to new concepts.
- Look for similarities among problems.
- Connect solutions of problems to more complicated large-scale situations.

Clarifications:

Teachers who encourage students to use patterns and structure to help understand and connect mathematical concepts:

- Help students recognize the patterns in the world around them and connect these patterns to mathematical concepts.
- Support students to develop generalizations based on the similarities found among problems.
- Provide opportunities for students to create plans and procedures to solve problems.
- Develop students' ability to construct relationships between their current understanding and more sophisticated ways of thinking.

**MA.K12.MTR.6.1 Assess the reasonableness of solutions.**

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Mathematicians who assess the reasonableness of solutions:

- Estimate to discover possible solutions.
- Use benchmark quantities to determine if a solution makes sense.
- Check calculations when solving problems.
- Verify possible solutions by explaining the methods used.
- Evaluate results based on the given context.

Clarifications:

Teachers who encourage students to assess the reasonableness of solutions:

- Have students estimate or predict solutions prior to solving.
- Prompt students to continually ask, “Does this solution make sense? How do you know?”
- Reinforce that students check their work as they progress within and after a task.
- Strengthen students’ ability to verify solutions through justifications.

**MA.K12.MTR.7.1 Apply mathematics to real-world contexts.**

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Mathematicians who apply mathematics to real-world contexts:

- Connect mathematical concepts to everyday experiences.
- Use models and methods to understand, represent and solve problems.
- Perform investigations to gather data or determine if a method is appropriate.
- Redesign models and methods to improve accuracy or efficiency.

Clarifications:

Teachers who encourage students to apply mathematics to real-world contexts:

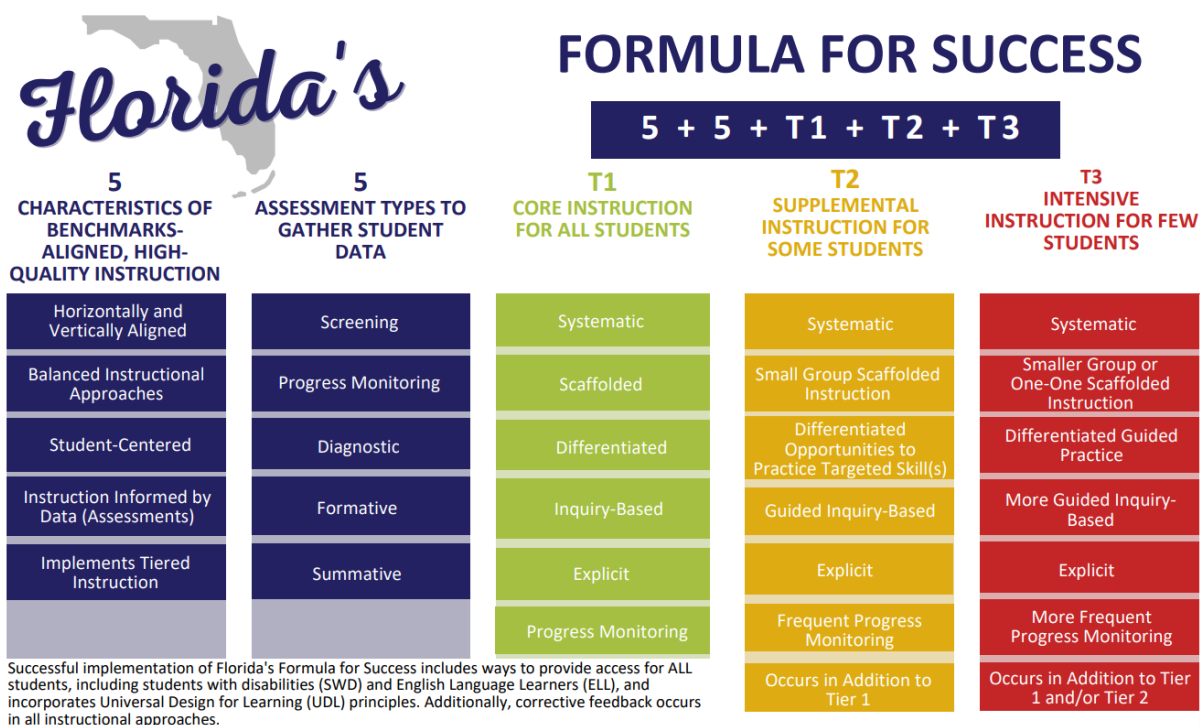
- Provide opportunities for students to create models, both concrete and abstract, and perform investigations.
- Challenge students to question the accuracy of their models and methods.
- Support students as they validate conclusions by comparing them to the given situation.
- Indicate how various concepts can be applied to other disciplines.

## Florida's Formula for Success

To support the implementation of Florida's state academic standards with fidelity, the Florida Department of Education developed Florida's Formula for Success, establishing the characteristics of benchmarks-aligned, high-quality instruction. Access to high-quality instruction is a fundamental value provided to Florida's students through the state academic standards. It is the responsibility of all educators to establish the necessary infrastructure to help students thrive. This infrastructure will be student-centered, for all learners, and incorporate Universal Design for Learning (UDL) Principles.

Benchmarks-aligned, high-quality instruction:

- builds upon student prior knowledge;
- develops a foundation for future learning;
- is guided by careful planning of appropriate instructional goals, content, methods, routines and use of materials;
- includes teachers consistently using the appropriate academic language within the state academic standards and guiding students to develop their own use of academic vocabulary; and
- results in deeper student understanding of concepts, strategies and skills; increased student engagement; and improved student learning outcomes.



The first column of the Formula for Success refers to benchmarks-aligned, high-quality instruction which is guided by careful planning and appropriate instructional goals, content, methods, routines and use of high-quality instructional materials. The characteristics of benchmarks-aligned, high-quality instruction include horizontal and vertical alignment, the use of balanced instructional approaches, student-centered instruction, instruction informed through data (assessments) and the implementation of tiered instruction.

- **The horizontal and vertical alignment of the state academic standards** provide intentional progressions, alignment and connections within and between strands of the grade level or course. Horizontal alignment is the intentional progression of content within a grade or course linking skills within and across strands. Vertical alignment is the intentional progression of content from one year to the next spanning across multiple grade levels.
- **Balanced instructional approaches** are evident in all tiers of instruction and interventions (Tier 1, Tier 2 and Tier 3) and are used intentionally as the context of the benchmark demands. Teachers encourage students to explore content-specific ideas using hands-on materials and different representations through challenging tasks. Additionally, teachers help students build fluency with procedures by summarizing steps and encouraging practice. Each instructional approach can be implemented as needed in whole groups, small groups or individually.
  - **Systematic Instruction** is a highly structured, organized sequence of teaching that uses appropriate academic vocabulary while introducing and reinforcing new concepts, strategies and skills over time, aiming to ensure a cumulative progression of learning from simple to complex. Systematic instruction contributes to the student's continuous acquisition of increasingly complex concepts, strategies and skills to become a confident learner. Systematic instruction decreases the possibility of a student developing a deficiency over time and builds a foundation for future learning.
  - **Scaffolded Instruction** is the intentional and strategic support provided by a teacher for students to carry out a task, solve a problem or achieve a goal that requires support. Support is planned, temporary and adjustable based on student understanding and need. The support fades as mastery of concepts, strategies and skills increases. Scaffolded instruction contributes to student learning by building upon student knowledge and experience. It bridges learning gaps and helps students deepen their understanding of concepts, strategies and skills at grade level or course. Scaffolded instruction also supports English Language Learners in communicating information, ideas and concepts necessary for academic success. The goal is to enable students to accomplish a grade- or course-level learning task independently.
  - **Differentiated Instruction** is adapting instruction in response to the distinctly assessed skills and needs of students to increase their access and opportunity to meet grade- or course-level learning goals or progress toward them. Differentiated instruction contributes to student learning by meeting student's needs in accessing and mastering grade- or course-level standards and benchmarks. Differentiated

instruction allows students to remediate, stay on task or accelerate their learning as needed.

- **Explicit Instruction** is highly structured, intentional teaching with clear explanations of the grade- or course-level benchmarks, while providing corrective feedback, until independent mastery has been achieved. Explicit instruction contributes to student learning by minimizing proximal gaps and misconceptions through teacher modeling and opportunities to master benchmark expectations. The goal of explicit instruction is to allow students to apply the content they learned in a variety of ways, not to simply provide content instruction for the entirety of a lesson.
- **Inquiry-based Instruction** is a discovery-based approach where teachers act as facilitators while students develop their understanding of concepts, strategies and skills through exploration. Inquiry-based instruction contributes to student learning by emphasizing critical thinking, creativity, curiosity, collaboration and problem-solving, allowing students to take ownership of their learning and develop a deeper understanding of concepts, strategies, skills and real-world connections. Inquiry-based instruction provides students the opportunity to justify their methods using appropriate academic language and compare their thinking to the thinking of their peers to advance and deepen their understanding of correct and increasingly efficient methods.

Across all instructional approaches and in all tiers of instruction and intervention, corrective feedback should be provided.

- **Corrective Feedback** is intentionally identifying misconception(s) or error(s) and addressing how it can be corrected, making sure students understand why an answer is either correct or incorrect. When addressing a misconception or error, a teacher may ask questions to help the student understand the mistake and reflect upon their learning. Timely, specific, individualized and ongoing corrective feedback contributes to student learning by providing opportunities to reflect and correct misconceptions or errors and reinforces expectations during lessons. Corrective feedback creates a collaborative process between teachers and students that supports continuous learning and improvement.
- **Student-centered instruction** occurs when teachers create both collaborative and independent classroom learning environments in which students are actively engaged in challenging tasks. Student-centered instruction includes the use of students' current understanding, skills and strategies to build on their continuum of learning. It places the needs, interests and abilities of students at the heart of the learning process. Instead of the teacher being the sole authority delivering knowledge, this method emphasizes engaged participation, collaboration and personalized learning experiences for students.
  - Key features of student-centered instruction include:
    - *Engaged Learning*: Students participate in hands-on activities, problem-solving, discussions and projects to deepen their understanding.
    - *Choice and Voice*: Students are given opportunities to make choices in their learning, empowering them to take ownership of their education.
    - *Differentiation*: Students have the opportunity to engage, access and demonstrate learning academic content in a variety of ways.

- *Collaboration*: Students work together to share ideas, learn from peers and build teamwork skills.
- *Teacher as a Facilitator*: The teacher guides and supports rather than directly controlling the learning process.

Student-centered instruction fosters critical thinking, creativity and independence while helping students connect their learning to real-world applications. It includes ways to provide access for ALL students, including students with disabilities (SWD) and English Language Learners (ELL) and incorporates UDL.

### **Universal Design for Learning (UDL)**

UDL is a “framework for designing curricula that enable all individuals to gain knowledge, skills, and enthusiasm for learning. UDL provides rich supports for learning and reduces barriers to the curriculum while maintaining high achievement standards for all to improve and optimize teaching and learning for all people based on scientific insights into how humans learn.” (Center for Applied Special Technology, CAST). The National Center on Universal Design for Learning has developed three evidence-based UDL principles for educators.

- **Principle I:** Provide Multiple Means of Engagement (the “why” of learning). Affect represents a crucial element to learning, and learners differ markedly in the ways in which they can be engaged or motivated to learn. Learning skills and strategies require sustained effort and persistence. Increasing relevance can help students sustain the effort and concentration needed to build self-regulation and self-determination skills.
- **Principle II:** Provide Multiple Means of Representation (the “what” of learning). Present information and content in a variety of media. Learners differ in the ways that they perceive and comprehend information presented to them. Instructional materials should be digital and flexible to support adjustments by the user (e.g., enlarging the text, converting text to speech, etc.). Curriculum content should be provided in text, graphic illustrations with descriptions, charts, captioned videos and immersive formats.
- **Principle III:** Provide Multiple Means of Action and Expression (the “how” of learning). Learners differ in the ways that they can navigate a learning environment and express what they know. Options in how students express what they know should be provided. Examples include choices in writing, presentations, storytelling and video production. During the planning process for addressing learning goals, UDL principles (options in engagement, representation and expression) should be an integral part of the lesson plans and should be made available to all students. Within a problem-solving framework, instruction and assessments based on UDL principles should be provided during any intensive interventions to identify focused, learner specific UDL supports and instructional scaffolds needed for rapid engagement, academic success and increased learner independence (release of responsibility). The resulting information on effective UDL supports and instructional scaffolds of these UDL assessments should then be incorporated to support all students as well as provide a focused and customized data-driven implementation of UDL.

- **Instruction is informed by teachers assessing student understanding in multiple ways.** Teachers use assessment data to identify the appropriate instructional approach, select appropriate scaffolds, guide differentiation of instruction and use corrective feedback. The second column of the Formula for Success refers to the “5 Assessment Types to Gather Student Data.” The department emphasizes the use of various data to inform instruction. These data can be derived from screening, progress monitoring, diagnostic, formative and summative assessments.
  - **Screening** identifies the probability of risk or success in skills needed for academic achievement. Educators can use screening as assessment tools designed to collect data for the purpose of measuring the effectiveness of Tier 1, or core, instruction and identifying students who would benefit from additional interventions and support.
  - **Progress monitoring** is used to determine whether students are learning the skills taught and/or meeting benchmarks throughout the school year. Progress monitoring can be done at the state, district, school and classroom level. Progress monitoring can also be referred to as interim or formative assessments. Educators can use progress monitoring as an ongoing assessment conducted for the purposes of guiding instruction, monitoring student progress and evaluating instruction and intervention effectiveness.
  - **Diagnostic** assessments identify a student’s strengths and weaknesses for students identified as at-risk on a screening assessment. Educators can use formal or informal diagnostic assessment tools that measure skill strengths and weaknesses, identify skills in need of improvement and assist in determining why a problem is occurring.
  - **Formative** assessments monitor student learning to provide ongoing feedback that can be used by educators to identify the current state of the learners’ knowledge and skills. More specifically, educators can use formative assessment on a regular basis to monitor student learning and adjust their current instruction to meet the needs of the learner. Formative assessments provide the opportunity for educators to improve their teaching, and for students to improve their learning. Educators can use formative ongoing assessment embedded within teaching to guide instructional decisions and provide indicators for scaffolding, accommodation and/or accessibility solutions.
  - **Summative**, or outcome, assessments are used to evaluate students’ performance relative to a set of content standards. Summative assessments can be done at the state, district, school and classroom level and are typically administered near the end of a unit or course to give an overall perspective of the effectiveness of the instruction.
- **Implementation of tiered instruction occurs when teachers deliver instruction and intervention** for all students through informed data practices. Teachers determine the level of support students need by utilizing a variety of assessment data. The third, fourth and fifth columns of the Formula for Success refer to a framework of tiered instruction and interventions that includes Tier 1 (T1), Tier 2 (T2) and Tier 3 (T3). Tiered instruction and intervention are critical components of an effective multi-tiered system of support (MTSS). A three-tiered model of intervention and instruction organizes instructional resources on a continuum of increasing intensity. Instruction can be intensified based on student need by increasing time, narrowing the focus to specific barrier skills, and/or reducing the size of the group. The three tiers of support are layered to align with each other, focused on progress

toward mastery of grade- or course-level benchmarks. The three levels of tiers do not occur as independent silos but rather work together fluidly as one moving unit. Students receive different levels of support at different times. We DO NOT tier students, but we DO tier the supports students receive, based on their individual needs at that time. The purpose of tiered support is to use data to ensure mastery of the benchmarks for ALL students.

- **Tier 1** includes instruction that is accessible to all students. A Tier 1 intervention is a change or adjustment made to core instruction for all students based on data. Tier 1 interventions are implemented when data indicate that the majority or a high percentage of students in a large group (e.g., class, grade level, school) are performing below expectations. Typically, classroom teachers implement Tier 1 interventions for their class by planning and implementing data-based changes to either whole group or differentiated instruction that impacts all students. The focus of Tier 1 is to provide high-quality, engaging instruction that aligns directly to Florida's state academic standards. Tier 1 instruction should result in the majority of students meeting benchmark expectations. Effective Tier 1 instruction includes continuous differentiations, as well as regular screening and intentional monitoring, to meet the needs of all students, including students with disabilities.
- **Tier 2**, or supplemental instruction and intervention, is provided when some students are not meeting expectations and is often delivered in small groups of students who will likely benefit from instruction focused on the same target skill(s). In addition to Tier 1 instruction, the focus of supplemental (Tier 2) support is to address gaps that pose barriers to learning and to improve student performance with Tier 1 expectations. This requires systematic, explicit, and interactive small group instruction targeted on foundational skills. Instruction is more intense (more time and narrow focus with explicit feedback) and may be provided by various professionals (e.g., general educator, special educator). Data are used to identify groups of students who need supplemental support and those that share the same academic needs. The frequency of progress monitoring within a tier varies depending on students' needs and assessment parameters. Effective Tier 2 instruction matches instruction to the need of the students in the group and provides multiple opportunities to practice the skill and receive feedback. The additional time allotted is in addition to Tier 1 instruction. Tier 2 interventions include materials and strategies designed to supplement Tier 1 instruction and are integrated and reciprocal within Tier 1. The expected outcome is for students to achieve Tier 1 proficiency levels
- **Tier 3**, or intensive intervention, is provided when few students are not meeting expectations or experiencing significant barriers to learning. Tier 3 can be provided one-on-one or in very small groups. Tier 2 and 3 interventions should be aligned with Tier 1 and include additional instructional time focused on critical skills. In addition to Tier 1 instruction, the focus of intensive (Tier 3) support is for students who demonstrate both intense (a large gap in expected versus current performance) and severe (unresponsive to intervention) learning problems. Effective implementation requires the support to be matched to student needs and is provided by the most experienced and/or specialized expert. Instruction is individualized and targeted to the skills that pose the greatest barrier to learning and is characterized by the greatest number of minutes of instruction with the narrowest focus for an individual or a very

small group of students. Individualized diagnostic data, as well as instructional time, are in addition to those provided in Tiers 1 and 2. Assessments occur more frequently and focus on the learning barriers to success at Tiers 1 and 2 and are based on intensity of needs. The larger the gap, the more frequent assessments should occur to monitor student progress. The expected outcome, along with Tiers 1 and 2, is for the student to achieve Tier 1 proficiency levels

Tier 2 and Tier 3 interventions should be provided in addition to Tier 1 instruction. When data indicate that a student needs more intensive support of Tier 2 and/or Tier 3, those interventions should be provided in addition to, not in place of, Tier 1. Data used to identify student support needs should be recent. While students may have performed well on past assessments, any student may need additional support at any time. When implemented with fidelity, differentiated instruction within Tier 1 can be a highly effective instructional strategy that helps address the unique needs of all learners, including those in need of intervention.

### **Specially Designed Instruction (SDI)**

If it is determined that the student is eligible and in need of Exceptional Student Education Services and Supports, they will benefit from Specially Designed Instruction (SDI). SDI refers to instruction that is provided to eligible students with disabilities (e.g., students that receive procedural safeguards by law and have an Individualized Education Program (IEP)). SDI is provided concurrently with tiered supports in collaboration between general and special education teachers and is applicable across all tiers of instruction. It enables students with disabilities to access the curriculum in the least restrictive environment. SDI provides unique instruction/intervention supports determined, designed, and delivered through a team approach, ensuring access to robust instruction through the adaptation of content, methodology or delivery of instruction.

*Tiered instruction and intervention should be provided within the general education classroom by the general education teacher. When needed, tiered support and SDI may also be provided by special educators/interventionists.*

$$4 \times 5 = 20$$

$$7 \times 6 = 42$$

A triangle with a scale factor of 3 from an original triangle.

$$(3x + 5)(x - 7(2x + 3))$$

$$4x + 2y = 10$$

$$y = -3x$$