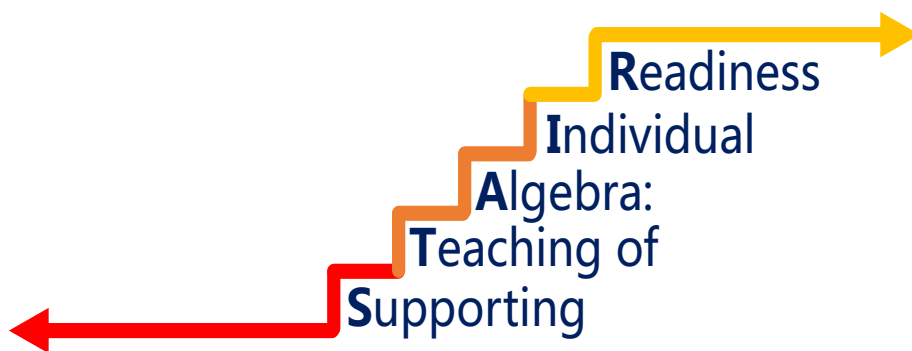


PROJECT STAIR INTERVENTION INTENSIFICATION GUIDE



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Project STAIR is a federally-funded research project that supports middle-school mathematics teachers in implementing data-based individualization (DBI). STAIR coaches work with teachers to help support students who experience difficulty with math to develop algebra readiness skills needed to be successful in high school and beyond. Project STAIR is supported by the Office of Special Education Programs (OSEP) under grant H326M170006. The project is housed at the University of Missouri, Southern Methodist University, and the University of Texas at Austin.

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Project STAIR

Supporting Teaching of Algebra: Individual Readiness

Project STAIR Intervention Intensification Guide

In this guide, we provide suggestions for intensifying mathematics (math) intervention. We suggest you design an instructional platform and intensify the platform based on student needs.

WHAT IS AN INSTRUCTIONAL PLATFORM?

A key component of effective intervention intensification is working from a solid Tier 2 (i.e., targeted intervention) foundation. That is, before considering whether an intervention requires intensification, you should confirm a validated Tier 2 intervention program is in place and implemented with fidelity.

WHAT IS AN INTENSIFICATION?

Once you have determined a validated Tier 2 intervention is being implemented with fidelity and you identify a student who is not making adequate progress in their math learning, you can adapt or intensify the intervention.

Project STAIR

Supporting Teaching of Algebra: Individual Readiness

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How to Use this Guide

Intensifying Intervention

We highlight 6 ways to intensify math interventions (Fuchs et al., 2017; NCII, 2019).

IMPLEMENT WITH GREATER FIDELITY

New interventions and strategies are only as good as how well they are implemented. You should implement your interventions and strategies with your students with fidelity. This may involve keeping checklists of the steps required to successfully implement the intervention. Implementing with fidelity ensures the level of success of an intervention is not a factor of how the intervention is used, but possibly a reflection of the appropriateness of the intervention or strategy itself.

EMBED BEHAVIORAL SUPPORTS

While classroom management is an important task for every teacher, student self-regulation should be used and built-upon to decrease nonproductive behavior. Embedding behavioral supports may be a necessary adaptation because many students experiencing math difficulty tend to struggle with paying attention and may not be focused on the math to the extent of the teacher's preference. Utilizing behavioral support strategies will assist students with remaining on task and fully participating in the math intervention.

INCREASE DOSAGE

Sometimes students require more time working on an intervention. Many students experiencing difficulty with math are in need of foundational math support. In order to assist these students with learning the foundations of math, teachers may need to develop strategies to increase the amount of math practice.

ADAPT MATH CONTENT

Teachers can change the math content students receive. Students experiencing difficulty in math may require the content to be received in a certain sequence or with a focus on student strengths. Teachers can inject additional lessons to fill in gaps in math knowledge. Additionally, teachers can rearrange the scope and sequence or break it down to smaller steps.

UTILIZE EXPLICIT INSTRUCTION

Explicit instruction includes proper modeling, practice, and support of math learning. Teachers should be purposeful in their explanations and interventions to ensure student participation and reflection.

TEACH FOR TRANSFER

Explicitly teaching for transfer ensures students take examples worked in class and utilize the knowledge in more complex problems. Teachers should teach beyond the memorization of concepts and procedures and ensure students have rich understanding of math to apply the content knowledge to other scenarios.

How to Use this Guide

Which intensification strategy should I choose?

I am a DBI coach.

To choose the best strategy or strategies, examine your teacher's strengths, goals, and target intervention.

Assess your teacher's resources, including time, physical resources, and support on campus. Decide which intensification would be most beneficial as well as feasible.

If your teacher is struggling to implement the intervention with fidelity, then a focus on fidelity is a good place to start.

I am a middle-school math teacher.

Before choosing an intensification strategy or strategies, we recommend reading through this guide to determine which strategy(ies) you may already have in place and which would be feasible to implement in your current setting.

We recommend starting with one intensification strategy at a time, and use data to determine whether there are changes in student learning.

Once you choose an intensification strategy, be consistent and implement it regularly to determine the results.

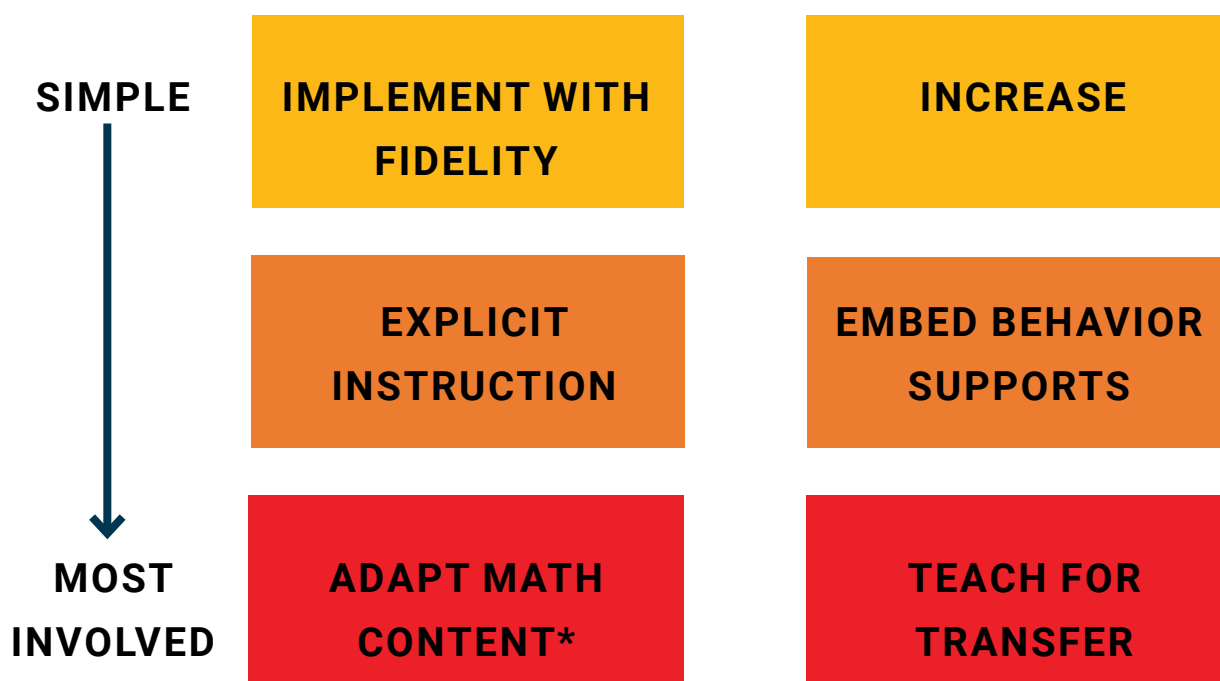
Track your students' progress for several weeks. If the intensification strategy is implemented consistently and a student does not demonstrate adequate progress, select a second intensification strategy to try.

Remember, every student is different and not all of these strategies will work for every student. It is important to stay flexible, and collecting data to make informed decisions is key!

How to Use this Guide

Which intensification strategy should I choose?

EASE OF IMPLICATION: SIMPLEST TO MOST COMPLICATED



*Adapting math content includes many different suggestions, some of which are easier to implement than others.

Implement with Fidelity

DEFINITION

The purpose of implementing an intervention with fidelity is to ensure the intervention is carried out as designed. Some interventions may allow for greater flexibility in terms of secondary components, such as awards or examples during practice, but all interventions include key components that have been researched and found to positively impact student outcomes. If these key components are not implemented, or carried out, as designed, teachers may not see the promised benefits of the intervention. Examples of key components may include the sequence of activities, mastery criteria, or the delivery of the intervention.

PROCEDURES

- To ensure high fidelity to an intervention, it is helpful to create a checklist of key components. This list may be provided in the intervention's manual, or it may need to be created. If a checklist needs to be created, the original research team can be contacted to help, or the teacher can create one by identifying the key components of the intervention.
- Invite another teacher or instructional coach to observe an intervention session. Ask her to complete the checklist and provide honest feedback about which parts of the intervention you are implementing well and which parts you are not including.
- After class, debrief with your observer about how you can improve your implementation of the intervention. If a colleague is not available, video record yourself teaching and review the fidelity checklist afterwards.
- If needed, keep the checklist on your desk or in sight when you implement the intervention next. Be sure to ask questions and be receptive to critical feedback.

EVIDENCE OF EFFECTIVENESS

ROLE OF FIDELITY IN IMPLEMENTING INTERVENTIONS

[National Institutes of Health](#)

[What Works Clearinghouse](#)

Implement with Fidelity

EXAMPLE CHECKLIST



ADDITIONAL RESOURCES

[National Implementation Research Network](#)

[Project STAIR Tailored YouTube Video](#)

Embed Behavioral Supports

DEFINITION

EMBED BEHAVIORAL SUPPORTS

The purpose of embedding behavioral supports is to decrease nonproductive behavior and assist students with remaining on task during math intervention. Embedding behavior supports may be a necessary adaptation because many students experiencing math difficulty tend to struggle with paying attention and may not be focused on the math to the extent needed to learn and be successful.

PROCEDURES

- Reinforce the behavior you want to see by defining the behavior and then finding a reinforcer the student is willing to work towards achieving.
- For example, if a student is struggling to stay focused during math, the behavior you want to see is focus. But, what does that look like and sound like?
- Focus needs to be operationally defined so the teacher knows what to look for and the student knows what is expected.
- Once the expected behavior is defined and communicated with the student, a reinforcer will need to be decided upon.
- There is no such thing as a universal reinforcer. For this reason, it is important to find out what the student finds reinforcing. The reinforcement can be tangible (e.g., prize) or intangible (e.g., extra time).
- Once the reinforcer is decided upon, the intensification can begin.

EVIDENCE OF EFFECTIVENESS

[Introduction to Effective Classroom Practices](#)

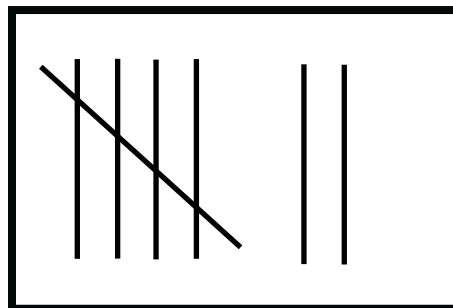
[Eight Effective Classroom Practices](#)

Embed Behavioral Supports

EXAMPLE STRATEGIES

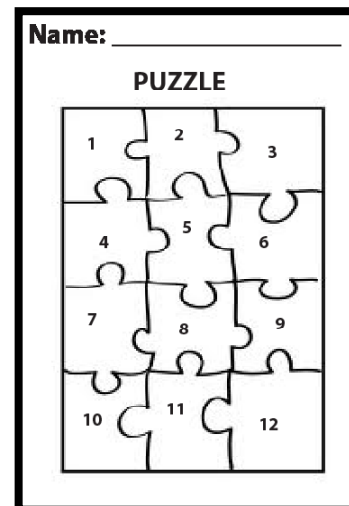
KEEPING TALLY

Students can earn tally marks for desirable behaviors and completing tasks and are rewarded after a period of time based on the number of points.



PUZZLE PIECES

Students can earn puzzle pieces for following expectations and completing tasks and are rewarded when the puzzle is complete.



ADDITIONAL RESOURCES

[STAIR Tailored: Classroom Management](#)

[Behavior Strategies to Support Intensifying Interventions](#)

[Behavior Support for Intensive Intervention Online Modules](#)

[Evidenced Based Intervention Network](#)

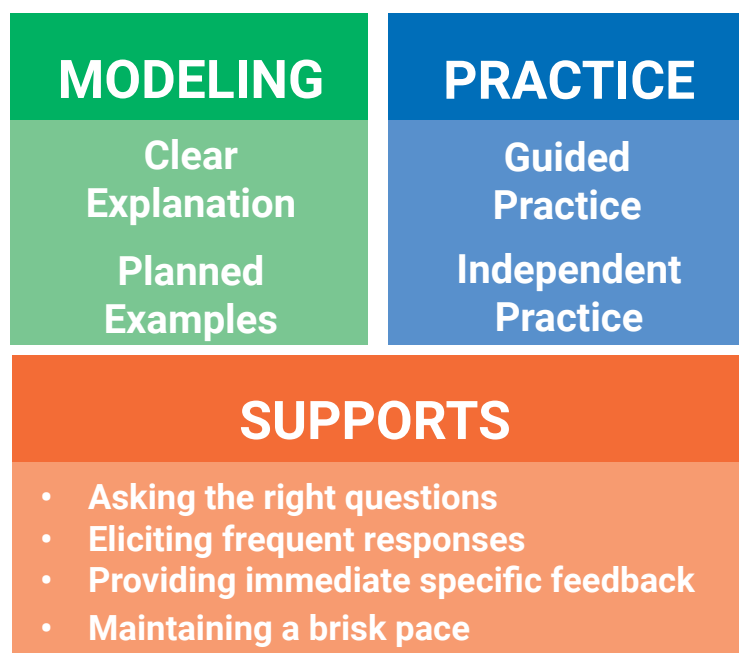
[Center on Positive Behavioral Interventions and Supports](#)

Utilize Explicit Instruction

DEFINITION

Teachers should be explicit in the modeling and practicing of math. In the figure below, interventions should be divided between modeling and practice. Modeling includes a step-by-step explanation and clarity in the language used during explanations. Practice includes practice with the teacher as well as independent practice. During modeling and practice, you should use supports, such as asking a variety of question types, eliciting student responses and providing immediate corrective feedback while maintaining a brisk pace.

KEY COMPONENTS AND CONSIDERATIONS



EVIDENCE OF EFFECTIVENESS

[Explicit Instruction: Historical and Contemporary Contexts](#)

[Explicit Math Instruction: What Teachers Can Do for Teaching Students With Math Difficulties](#)

ADDITIONAL RESOURCES

[STAIR Tailored: Explicit Instruction](#)

[NCII Intensive Intervention in Math Course: Explicit Instruction](#)

Utilize Explicit Instruction

PROCEDURES

Clear Explanation & Precise Language	When modeling, start with a clear explanation about why the math is important. For example, say, "Today, we are learning about division. This is important because sometimes you have to share objects or things with your friends." This will help students start to make the connection between math and real life. Precise language includes the formal language of math. For example, say "numerator" instead of "top number" or "product" instead of "answer."
Model Steps	While modeling, model the steps to solve a problem. Involve your students in the process by asking questions and giving them opportunities to respond. Modeling should feel like a dialogue between you and your students.
Planned Examples & Non-Examples	Plan the examples you choose for your interventions. For example, when modeling a division problem, think about the different ways to show division and how you want to represent the problems. Include non-examples to help students understand when to apply the strategy you have modeled.
Guided Practice	You and the student practice problems together. Provide scaffolding so students can start to see how they can solve these problems on their own.
Independent Practice	Students practice independently while you provide feedback.
Supports: Questions	During both modeling and practice, ask a mix of low-level and high-level questions.
Supports: Responses	During both modeling and practice, provide opportunities for students to respond. Typically students should respond at least every 30 to 60 seconds.
Supports: Feedback	During both modeling and practice, provide affirmative feedback. Provide corrective feedback when necessary.
Supports: Brisk Pace	During both modeling and practice, maintain a brisk pace by being prepared, organized, and ready to teach in order to maximize time spent learning.

Increase Dosage

DEFINITION

Dosage is the amount of an intervention a student receives, which can include the number of opportunities to respond within a session, the number of sessions, the number of days per week, or the number of weeks overall. The purpose of intensifying dosage is to determine the appropriate combination of intervention frequency (i.e., how often) and duration (i.e., for how long) for a particular student.

INCREASING DOSAGE

If schedules permit, you can meet students more frequently for interventions. For example, instead of only meeting twice a week, you can meet four times a week.

Sun	Mon	Tue	Wed	Thu	Fri	Sat
	★	★		★	★	
	★	★		★	★	
	★	★		★	★	
	★	★		★	★	
	★	★		★	★	

EVIDENCE OF EFFECTIVENESS

[The Taxonomy of Intervention Intensity](#)

[Opportunities to Respond: A Key Component of Effective Intervention](#)

Increase Dosage

KEY COMPONENTS AND CONSIDERATIONS

WHERE DOES THIS INTENSIFICATION TAKE PLACE?

Increased dosage often (but not always) means increased time. Therefore, when trying to intensify either the frequency or the duration of an intervention, maximize resources in the classroom by utilizing peers, paraprofessionals, related service providers, or configurations (e.g., station teaching) that allow for increased engagement with the intervention.

WHAT MATERIALS DO I NEED TO INTENSIFY INTERVENTION DOSAGE?

1. If you are using a validated intervention, consult the manual on what the recommended dosage is and note whether the authors make recommendations for intensification in this area.
2. If this information is not available or if you are not currently using a validated intervention, consider the following procedures to intensify the dosage of the intervention.

HOW DO I INTENSIFY INTERVENTION DOSAGE?

What do I do?	What might it look like?
Increase intervention session length	15 min twice per week → 30 min twice per week
Increase the number of sessions per day	15 min in the a.m. → 15 min in the a.m. and p.m.
Increase the number of sessions per week	2 times per week → 4 times per week
Increase the number of weeks overall	6-week intervention → 10-week intervention

You can also maintain the intervention structure and instead focus on increasing the number of opportunities a student has to respond, such as using response cards or choral responding.

ADDITIONAL RESOURCES

[How Can School Personnel Intensify and Individualize Intervention?](#)

[Tracking Intervention Dosage to Inform Instructional Decision Making](#)

Adapt Math Content

DEFINITION

The purpose of adapting the math content is to ensure that students are able to access the core math concepts. This can include adapting the way the material is presented; teachers can focus on using precise language, scaffolding activities, or teaching strategies such as word-problem attack strategies. Some students may require more intensive support, and teachers can adapt the scope and sequence of units to ensure that critical content is targeted and builds upon students' understandings. If you are modifying the curriculum, it is important that the IEP team together makes this determination.

KEY COMPONENTS AND CONSIDERATIONS

Adjusting teacher practices may be helpful for whole-class intervention or small groups.

Adjusting the scope and sequence for a student's needs will be feasible for intensive interventions, either during small group or one-on-one tutoring.

WHOLE-CLASS ADAPTATIONS

ENGAGE STUDENTS IN DISCOURSE

"Tell me how you solved this problem."
 "What were you thinking about when you regrouped?"
 "How would you teach this problem to another student?"
 "Describe the word problem in 10 words or less."

PROVIDE WORKED EXAMPLES

"Talk through this problem with me."
 "Which is correct and why?"

$$\begin{array}{r} 405 \\ + 16 \\ \hline 411 \end{array} \qquad \begin{array}{r} 405 \\ + 16 \\ \hline 421 \end{array}$$

TEACH PROBLEM-SOLVING STRATEGIES



Don't tie **key words** to **operations**



Have an **attack strategy**



Teach word-problem **schemas**

Adapt Math Content

WHOLE-CLASS ADAPTATIONS

CHUNK PROBLEMS INTO SMALLER STEPS

Break larger problems into smaller tasks, or chunks, for students to manage. For example, to solve a word problem, break the process into several steps.

Read the problem.

Underline labels and label graph.

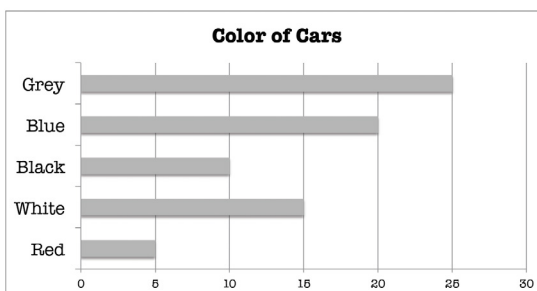
Identify schema.

Draw a picture.

Write an equation.

Solve.

C. Mila counted cars on her walk home from school. Here is Mila's graph.



How many white and grey cars did Mila see?

USE APPROPRIATE MATH LANGUAGE

precise

concise

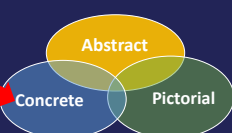
TEACH MATH VOCABULARY

<p>Definition</p> <p>When a shape is flipped across a line of reflection</p>	<p>Illustration</p>
<p>Reflection</p>	
<p>Example</p>	<p>Non-example</p>

Adapt Math Content

WHOLE-CLASS ADAPTATIONS

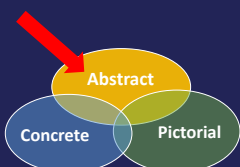
USE MULTIPLE REPRESENTATIONS



Hands-on
manipulatives
or tools



Virtual
manipulatives,
drawings, or graphic
organizers.



Math with the
numbers, symbols,
and words of math.

TEACH ALTERNATE ALGORITHMS

$$\begin{array}{r} 34 \\ \times 27 \\ \hline \end{array}$$

$$\begin{array}{r} 34 \\ \times 27 \\ \hline 238 \\ + 680 \\ \hline 918 \end{array}$$

$$\begin{array}{r} 34 \\ \times 27 \\ \hline 600 \\ 80 \\ \hline 210 \\ + 28 \\ \hline 918 \end{array}$$

	30	4
20	600	80
7	210	28

PRACTICE FACT FLUENCY

Addition

Subtraction

Multiplication

Division

EVIDENCE OF EFFECTIVENESS

[Assisting Students Struggling with Math](#)

[Effective Word-Problem Intervention](#)

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Adapt Math Content

INDIVIDUALIZED ADJUSTMENT

ALTER SCOPE AND SEQUENCE

Some students may require individualized adjustments to master critical content. Teachers, working with interventionists or researchers, can identify which skills the student has mastered, where the student needs to be by the end of the term or year, and what is essential for the student to master those end-of-year goals.



Modifying a curriculum requires in depth understanding of math standards, common math progressions, and the individual student's IEP goals. Therefore, we recommend teachers only alter the scope of sequence as a last resort and always with the knowledge and support of administration and interventionists.

If students continue to struggle after intensive interventions have been put in place and intensified, it may be time to examine the students' IEP goals and determine if they are appropriate.

ADDITIONAL RESOURCES

There are a variety of supports to help teachers adapt their math interventions. Check out these:

[NCII Intensive Intervention in Math Modules](#)

[Project STAIR Videos](#)

- [Math Language](#)
- [Multiple Representations](#)
- [Fluency Practice](#)
- [Differentiating in Whole-Class Math](#)
- [Word-Problem Attack Strategies](#)
- [Addition with Alternate Algorithms](#)
- [Subtraction with Alternate Algorithms](#)
- [Multiplication with Alternate Algorithms](#)
- [Division with Alternate Algorithms](#)
- [Fraction Fundamentals](#)
- [Creating Cognitively Demanding Tasks](#)

Explicitly Teach for Transfer

DEFINITION

Transfer is a student's ability to recognize and apply features of previous learning to a novel problem or context. The purpose of explicitly teaching for transfer is to intensify the conceptual connections students are making between math content.

KEY COMPONENTS AND CONSIDERATIONS

WHAT MATERIALS DO I NEED TO EXPLICITLY TEACH TRANSFER?

Examining the scope and sequence across multiple instructional units can reveal opportunities for students to draw on prior knowledge and apply similar skills or concepts to new situations or with more complex content (e.g., principles for solving one-step equations applied to solving two-step equations).

HOW DO I EXPLICITLY TEACH TRANSFER?

1. Explicitly name the similar characteristics of the old and new problems or contexts.
2. For example, you could pose these problems:
Morgan spent \$42 for shoes. This was \$14 less than twice what they spent for a shirt. How much was the shirt?

Pat wanted to organize their button collection. There were 42 buttons in the collection. 14 buttons were lost from a container that had twice as many than what were originally in the container. How many buttons were in the container?
3. Next, ask students to identify the relationships in these two problems—how are they similar? How can solving the first problem help them solve the second problem?
4. To extend this transfer, ask students to represent either problem in abstract notation.
5. Continue drawing students' attention to how the skills and relationships in one problem can support their understanding or approach to another problem in a unique context.

EVIDENCE OF EFFECTIVENESS

[Explicitly Teaching for Transfer](#)

Additional Instructional Resources

Check out these Project STAIR YouTube videos on intensifying interventions and the NCII modules on math interventions. Be sure to check out the channel for even more math-related videos, and follow us on Twitter @ProjectSTAIR.

BEST TEACHING PRACTICES

INTRO TO EXPLICIT INSTRUCTION



INTRO TO MULTIPLE REPRESENTATIONS



MATH LANGUAGE



FLUENCY PRACTICE



DATA-BASED INDIVIDUALIZATION



NCII MATH INTERVENTIONS



INTENSIFICATION STRATEGIES

IMPLEMENT WITH FIDELITY



EMBED BEHAVIORAL SUPPORTS



USE EXPLICIT INSTRUCTION



INCREASE DOSAGE

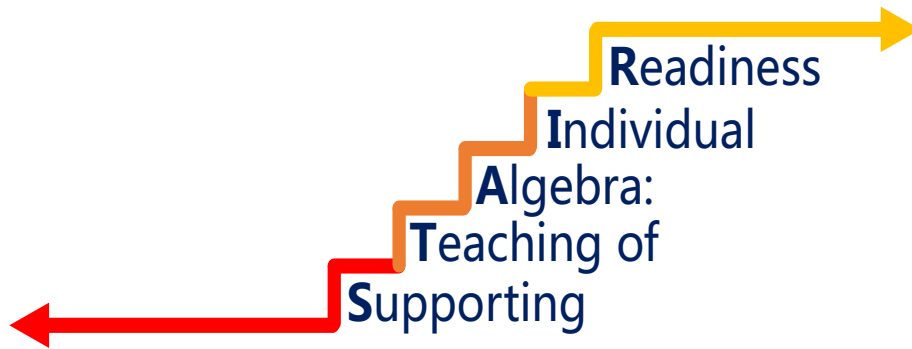


ADAPT MATH CONTENT



TEACH TRANSFER





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