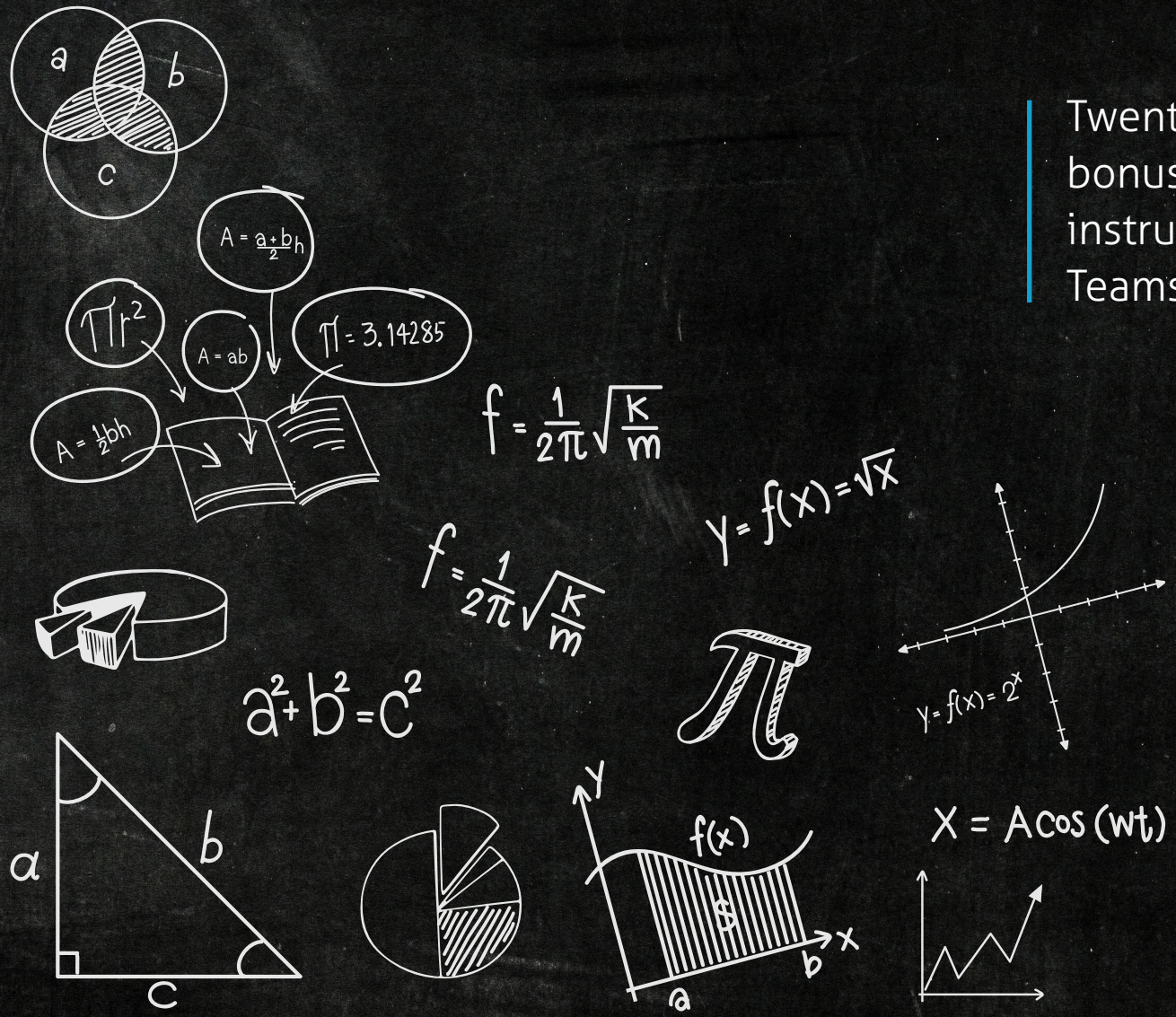
INSTRUCTIONAL STRATEGY FLIP BOOK

for Mathematics

Twenty instructional strategies and bonus resources to elevate math instruction through Achievement Teams implementation



ADVANCED
COLLABORATIVE SOLUTIONS

High-Impact Instructional Strategies for Math Classrooms

The Achievement Teams Instructional Flip Book for Math is a research-based resource designed to elevate student engagement, deepen mathematical understanding, and strengthen critical thinking skills. Rooted in the principles of Visible Learning by John Hattie and modeled after Jim Knight's High-impact instruction: A framework for great teaching, these evidence-based strategies help teachers move students from surface-level comprehension to deep learning in mathematics.

Effective instruction is intentional. The strategies in this flip book empower teachers and collaborative teams to make data-driven instructional choices, cultivating independent, reflective learners who take ownership of their progress.

Aligned with the Achievement Teams framework, this resource equips educators with high-impact techniques to bridge achievement gaps and drive measurable student growth. Collaborative teams are encouraged to collectively identify high-impact strategies that directly address their unique students' needs, being intentional to implement selected strategies with fidelity in order to bridge achievement gaps and maximize student growth.

By implementing these strategies with fidelity, teachers create dynamic math classrooms where all students can thrive.

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Tips for Selecting Instructional Strategies

Selecting the right instructional strategies is essential for guiding students through the phases of learning—**Surface, Deep, and Transfer.** Each phase plays a crucial role in knowledge acquisition and application, and intentional strategy selection ensures that students build, connect, and apply their learning effectively.

Effective mathematics instruction relies on selecting strategies that meet students' learning needs. This flip book provides a quick reference to help teachers align strategies with their instructional goals. Each page includes callouts indicating the learning phase—Surface, Deep, or Transfer—at which each strategy is most effective.

To optimize learning, educators should:

- **Balance Across Learning Phases:** Use a mix of strategies to guide students from foundational understanding to application.
- **Select Strategies Intentionally:** Choose strategies based on student data and discussions to align with learning goals.
- **Foster Metacognition:** Encourage reflection to build independence and self-regulation.

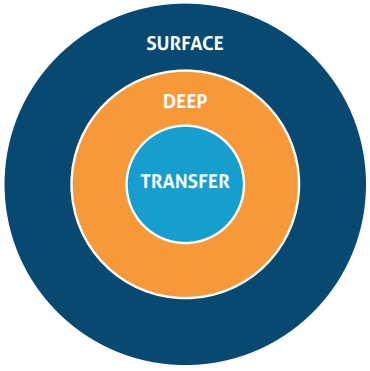
These guidelines are general, and teachers may adjust strategies based on intent and context.

Definitions:

Surface Learning: Focuses on foundational knowledge and skills, such as recall, explanation, and procedural fluency. These strategies are necessary prerequisites to deeper learning.

Deep Learning: Extends surface knowledge by encouraging students to make connections, analyze information, and apply concepts in more complex ways.

Transfer Learning: Enables students to use what they've learned in new and unfamiliar situations, fostering critical thinking and problem-solving skills across different contexts.



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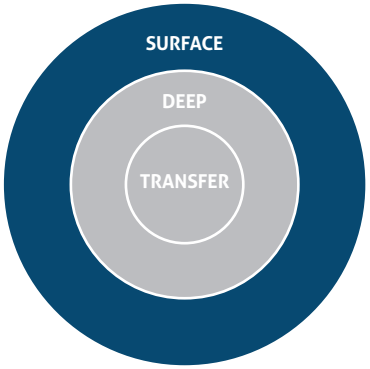
Two Things (Energizing Direct Instruction)

Description: The Two Things strategy helps students focus on the key concepts of a lesson, encouraging them to actively recall and internalize the most important aspects of what they've learned. The strategy can be used during direct instruction to help students focus on key concepts and actively engage with the material.

Teacher Led

What's the point?

Two Things is a retrieval practice strategy that aligns with cognitive science research. It involves regularly asking students to recall two things they've learned during a lesson or from prior lessons. This interspersed retrieval helps reinforce learning, promotes spaced repetition, and benefits students even when feedback is not immediately provided.



Set-up

1. Write Two Things: Ask students to write two key takeaways from the lesson based on a prompt.
2. Share and Build: Students pass their papers to a classmate, who adds one more point, then passes it back.
3. Alternative – Think, Pair, Share: Students think individually, then discuss with a partner before sharing with the class.
4. Return to the Lesson: Conclude by revisiting the lesson to reinforce key points and clarify as needed.

How is this strategy used by students?

The Two Things strategy ensures that all students are actively engaged in retrieval. By asking for two specific takeaways, students can quickly contribute without needing additional clarification, promoting efficient participation and reinforcing their learning.

Benefit: Builds foundational knowledge

How is this strategy used by teachers?

This helps students reflect on the material, reinforces important concepts, and allows teachers to assess understanding and address misconceptions. It keeps students engaged and promotes retention through active participation.

https://www.retrievalpractice.org/strategies/2018/two-things

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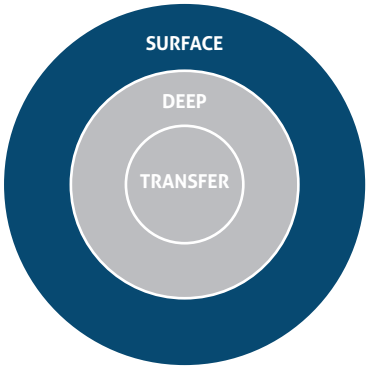
Three-Column Note-Taking

Description: Three-Column Note-Taking in mathematics includes clear explanations of logical steps, worked examples, and problem-solving strategies. This practice helps students build a deeper understanding of mathematical processes, enabling them to solve problems independently.

Teacher Led

What's the point?

Three-Column Note-Taking with collaboration and processing time can lead to deep learning in math because it involves students actively engaging with the material by summarizing key concepts, asking clarifying questions, and making connections between ideas. This strategy bridges the worked example with key vocabulary and processing the information.



Set-up

1. Have students work in groups of 2-4. Each member will divide their paper into three columns: Key Words or Topics or Definition / Problem & Work / Explanation or Notes
   - Column 1: All member will discuss and write down key vocabulary, concepts, or formulas (e.g., "distributive property").
   - Column 2: Write the problem and show all steps to solve it. Work with a partner or group to solve the problem together showing all the steps.-Students can work out problems together on a white board or large sheet of paper.
   - Column 3: Explain the reasoning, key observations, or strategies used.
2. Each student should review and refine notes, adding any missing details, insights, or questions.
3. Review and Reflect: Partners or team members compare notes within the group, focusing on Column 3 to ensure everyone understands the logic and key takeaways.

Benefit: Supports comprehension and retention

How is this strategy used by students?

Students actively engage with math problems, breaking them into manageable parts to reinforce concepts and build deeper understanding. Peer discussions enhance understanding and helps them to identify areas of strength and areas needing clarification.

How is this strategy used by teachers?

Teachers can use this method for direct instruction, formative assessment to assess understanding, feedback, and differentiation by providing partners or small groups with scaffolding support or varied problems.

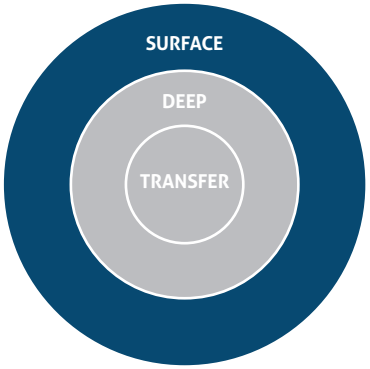
Which One Doesn't Belong?

Description: Which One Doesn't Belong? (WODB) is a strategy that engages students to deepen mathematical thinking and express mathematical reasoning while promoting multiple perspectives and collaborative learning.

Teacher Led

What's the point?

WODB is a collaborative strategy that builds mathematical reasoning, problem solving through communication with peers. It helps students connect ideas in a fun way to build mathematical understanding and confidence.



Set-up

1. Students can work independently to solve first and share out.
2. Teacher: Divide a square into four equal sections. In each section, place a math image, number, equation, or concept. Ensure they are related in some way but have distinct features.
3. Ask students, "Which one doesn't belong? Why?" Encourage students to think critically about the characteristics of each item.
4. Teacher should encourage discussion and highlight the fact that there isn't one right answer. The goal is to justify reasoning clearly and explore multiple perspectives.
5. Discuss mathematical connections, such as properties, patterns, or operations, to deepen understanding.

How is this strategy used by students?

Students use this strategy to develop their critical thinking skills, collaborate and listen to multiple perspectives, justify thinking, deepen understanding of mathematical concepts and use mathematical vocabulary.

How is this strategy used by teachers?

Teachers use the WODB strategy as a tool for fostering discussion, assessing understanding, and guiding deeper learning.

Benefit: Encourages critical thinking at an entry level

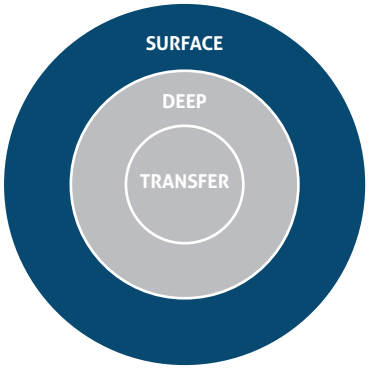
Priority Review

Description: Priority Review is a teaching strategy used to identify and address students' misunderstandings in math.

Teacher Led

What's the point?

The Priority Review strategy can be particularly effective in two key scenarios: Going over difficult assessment questions and increasing engagement during review.



Set-up

1. Distribute Problems Around the Room: Place individual review or assignment problems around the room for easy access.
2. Allow Time for Independent Work: Students work through the problems independently, noting areas of difficulty.
3. Sticky Dots for Prioritization: Students place 3 sticky dots on the problems they want to review as a class.
4. Review by Priority: The teacher reviews problems in order of the highest to lowest dot count.
5. Debrief and Reflect: After the review, ask students, "What new knowledge have you gained today?" to reflect on the learning.

How is this strategy used by students?

The Priority Review strategy is used by students to identify and prioritize the problems or concepts they need the most help with. Students are more engaged in the review because students felt more buy-in to the problem being discussed.

Benefit: Helps with recall and prioritization of key ideas

How is this strategy used by teachers?

This approach keeps the review focused, interactive, and reflective. Teachers can easily pinpoint the needs of the class. For the problems that only have a few dots, the teacher could have students write reminders of common mistakes or how to get standardent.

Adapted from Lead4ward, Collaboration with Ashley Taplin and Erica Silva.

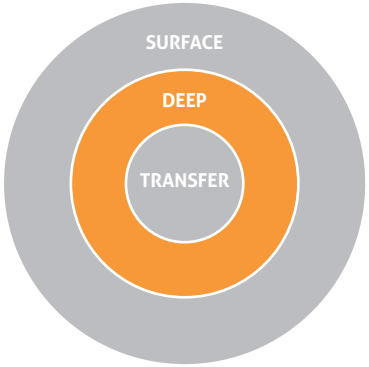
Accountable Talk

Description: Accountable Talk is a discussion strategy that encourages students to share their thinking, listen to others, and build on ideas to deepen understanding.

Connect or Introduce

What's the point?

This is a structured approach with language frames to deepen understanding, build critical thinking, foster collaboration, and encourage student ownership of learning. It helps students clarify their reasoning, use evidence, and communicate effectively, improving both their math skills and confidence.



Set-up

1. Teacher should set norms for discussion by teaching students how to listen actively, take turns, and respond respectfully. The teacher should model effective talk daily and demonstrate how to articulate reasoning, ask questions, and respond constructively.
2. Provide specific sentence stems to guide conversations, such as:
   "I think ___ because ___."
   "Can you explain how you got that?"
   "I agree/disagree with ___ because ___."
   "What if we tried ___ instead?"
3. Design tasks with that encourage multiple approaches and solutions. Tasks should require reasoning, justification, and explanation to solve.
4. Debrief as a class to reflect on the discussion process.
   "What worked well in our conversations today?"
   "How could we improve our discussions next time?"

Benefit: Promotes discussion, justification, and reasoning

How is this strategy used by students?

Students use this collaborative strategy to share ideas, and deepen their understanding of math concepts. This strategy helps them explain their thinking, ask questions, build on others' ideas, and using evidence to support their reasoning.

How is this strategy used by teachers?

Teachers use Accountable Talk by setting discussion norms, introducing sentence stems, and facilitating student conversations. They guide students to explain their reasoning, ask questions, and connect ideas, fostering deeper understanding and collaborative learning.

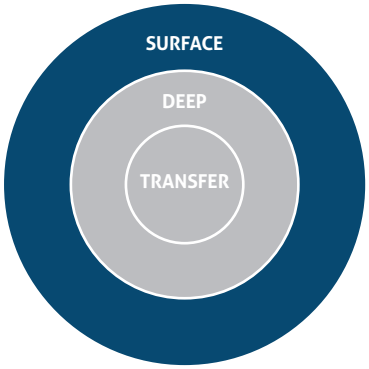
Yes-No Sorting Game

Description: The Yes-No Sorting Game helps students deepen their understanding of a concept by categorizing items as examples or non-examples of a specific concept. Students work collaboratively to increase problem-solving, reasoning, and critical thinking.

Connect or Introduce

What's the point?

The Yes-No Sorting Game gets students actively involved in their learning. They work together in a safe place to solve problems, use math talk and vocabulary, and justify their thinking,



Set-up

1. Create a mix of cards with examples and non-examples of the target math concept
2. Introduce the concept and the criteria for identifying examples and non-examples.
3. Group students into small groups 3-4 students to sort the items into "Yes" (examples) and "No" (non-examples) based on the criteria.
4. Students take turns choosing a card and explain their reasoning as to weather it is a "Yes" (examples) and "No" (non-examples) to the group.
5. The group comes to a consensus before placing the card under the heading.
6. Whole class review. Groups share their reasoning for one or two items. Address misconceptions and clarify key features of the concept.

* Have students design their own examples and non-examples to challenge their peers.
* "Mystery Rule" - Show only examples initially and have students deduce the rule.

Benefit: Reinforces conceptual understanding through categorization

How is this strategy used by students?

The collaborative Yes-No Sorting Game actively engages students by analyzing and categorizing examples and non-examples, which deepens their understanding, clarifies misconceptions, and deepens critical thinking.

How is this strategy used by teachers?

Teachers use this strategy to help students actively explore and classify math concepts. They facilitate and guide discussions, provide feedback as students to explain their reasoning, reinforcing understanding and addressing misconceptions.

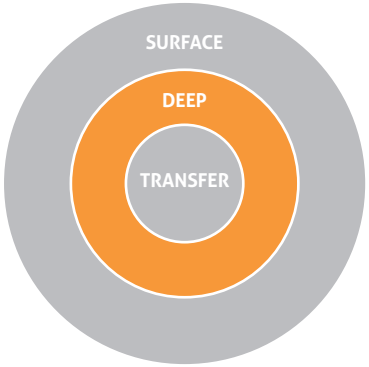
Four Corners

Description: The Four Corners strategy is an interactive method where students move to one of four designated corners of the room based on their stance or opinion on a given statement or question.

Connect or Introduce

What's the point?

This strategy encourages active participation, critical thinking, and discussion, as students justify their choices and engage with diverse perspectives.



Set-up

1. Prepare a Question: Craft a math problem with four possible answers. These answers will be assigned to the corners of the room.
2. Assign Corners: Label each of the four corners with one of the answer choices. Make sure the answers are spread out across the room.
3. Pose the Question: Present the math question to the students and give them time to think about it.
4. Students Choose and Move: After solving the problem individually, students move to the corner that corresponds to their chosen answer.
5. Small Group Discussion: Once in their corners, students form small groups (2-3 students) to discuss their reasoning and why they chose that particular answer.
6. Call on each corner to share.
7. After each corner shares, engage in a class-wide discussion about the different methods and why some are more effective than others.

Benefit: Encourages decision-making and critical thinking through discussion

How is this strategy used by students?

This strategy engages students in collaborative learning, helping them explore different mathematical methods while providing an opportunity for them to correct errors and refine their understanding.

How is this strategy used by teachers?

The Four Corners strategy allows teachers hear student reasoning and explanation. The teacher can facilitate conversation and correct any misconceptions.

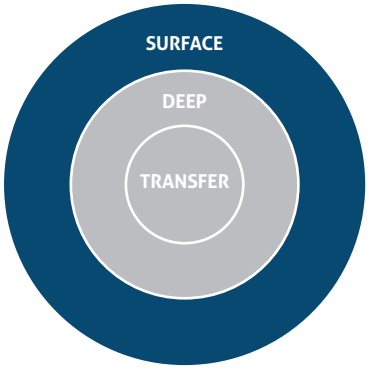
Card Sort

Description: Card Sorts are an engaging activity that help students make meaning and connections to identify, categorize, and practice math problem-solving strategies. They can be done independently or in pairs or groups and can be used as a way to preview content or reinforce learning.

Connect or Introduce

What's the point?

The Card Sort strategy is a collaborative and engaging way to help students think critically, communicate effectively, and connect math concepts to problem-solving strategies, all while making learning fun and interactive.



Set-up

1. Teacher: Create a set of cards with math problems and corresponding strategy cards. Include multiple problems that can be solved using different strategies.
2. Divide students into small groups of 3–4. Provide each group with a set of problem cards and strategy cards.
3. Sort the cards.
   - Step 1: Students read a problem card aloud as a group.
   - Step 2: Discuss and choose which strategy card best fits the problem.
   - Step 3: Place the strategy card next to the problem card.
4. After sorting, students solve each problem using the selected strategy. Write the solution and explain why the chosen strategy worked.
5. As a group, review the matched cards and solutions.

How is this strategy used by students?

The Card Sort strategy encourages active learning, collaboration, and application of strategies to solve math problems.

Benefit: Helps recognize patterns and relationships between concepts

How is this strategy used by teachers?

The Card Sort strategy provides opportunities to facilitate critical thinking, monitor student progress, provide feedback, and guide instruction based on observed understanding.

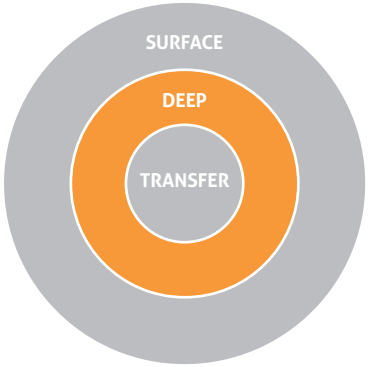
Post Then Prove, Square Then Compare

Description: Post Then Prove, Square Then Compare is an engaging strategy that promotes a collaborative learning approach designed to enhance critical thinking, problem-solving, and peer discussion.

Collaborative Learning

What's the point?

This strategy has a high degree of engagement because it includes kinesthetic movement with collaborative discussion. It encourages critical thinking, peer discussion, feedback, and error detection in a low stakes environment.



Set-up

1. Post math problems related to what you are teaching on chart paper or white boards around the room (problems to solve, justify, correct, or prove).
2. Direct students to work with independently (or with a partner) to stand next to the problem of their choice.
3. Students work independently (or in pairs) to solve, justify, correct, or prove the solution.
4. Students form groups of four with other students working on the same problem. Students share their answers, and discuss if their reasoning matches. If disagreements arise, they revisit the calculations together.
5. Teacher circulates to provide feedback and check for understanding.
6. For differentiation or challenge, teachers can assign students to specific problems.

How is this strategy used by students?

This strategy gets students actively engaged in both independent and collaborative learning, leveraging their reasoning skills while benefiting from peer insights. This combination deepens understanding and provides a supportive environment.

Benefit: Enhances reasoning through justification

How is this strategy used by teachers?

Post Then Prove, Square Then Compare is a collaborative strategy that encourages critical thinking and mathematical discussion. Teachers are able to identify misconceptions in the moment, provide feedback, and assess where students are in the learning process.

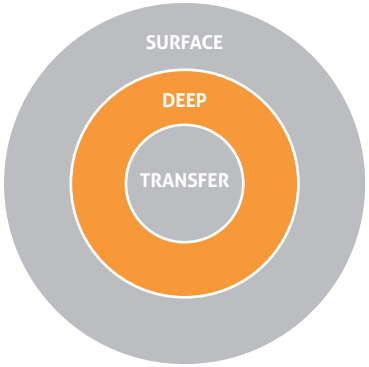
Jigsaw Meets Reciprocal Teaching

Description: Use this as a wrap up activity for students to do one role and then combine it through Jigsaw. This combination encourages collaboration, active learning, and critical thinking.

Collaborative Learning

What's the point?

Jigsaw Meets Reciprocal Teaching strategy helps students summarize their learning by dividing the content into sections, with each student or group becoming an expert on a specific part. After discussing their section, students come together to teach their peers, using reciprocal teaching techniques like summarizing, questioning, clarifying, and predicting.



Set-up

1. Form Groups of Four: Have students sit in small groups and assign each person a different role.
2. Work Individually: Each student works on their assigned section of the content.
3. Meet With Experts: Students join others with the same role to compare notes and add insights.
4. Return to Home Team: Students go back to their original group to share and discuss their findings, summarizing their section using the roles of reciprocal teaching.

How is this strategy used by students?

This approach encourages active engagement, reinforces understanding, and helps students synthesize and communicate key points from the lesson.

Benefit: Fosters peer teaching and comprehension

How is this strategy used by teachers?

Jigsaw and Reciprocal Teaching both have a very high effect size meaning this combined strategy will considerably accelerate student achievement.

Inspiration after listening to Micuel Gulhin's podcast on Reciprocal Teaching.

Try It–Talk It–Color It–Check It

Description: Try It–Talk It–Color It–Check It is an interactive approach that promotes active learning and collaboration.

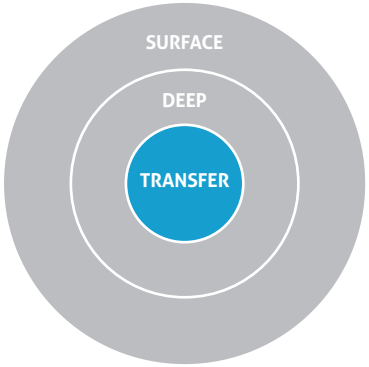
Collaborative Learning

What's the point?

This strategy encourages hands-on practice, peer collaboration, and reflection, helping reinforce learning and improve retention.

Set-up

1. Group Formation: Divide the students into small groups of 2, 3, or 4.
2. Individual Work: Ask students to work on the problem individually for 2 minutes to give them time to think independently.
3. Collaborative Discussion: After the individual work, instruct students to work together as a group for 2 minutes, discussing the problem and coming to a consensus on the solution.
4. Confidence Check With Color Cups: Have each group decide on the color of cup they will display. The color choice should reflect their confidence level:
   - Green for groups who are confident their answer is correct.
   - Yellow for groups who are a bit unsure.
   - Red for groups who are still uncertain or confused.
5. Whiteboard Check: Each group holds up ONE whiteboard with their answer for the teacher to check. If any misconceptions are identified, the teacher (or a student) will review and clarify the solution with the class.



Benefit: Encourages self-regulation and synthesis

How is this strategy used by students?

Students are engaged by talking and debating, they are engaged with this structure, and excited to see their answers correct.

How is this strategy used by teachers?

When teachers see more green or yellow cups they are able to continue on instead of spending time explaining what students already know. Teachers are able to meet students where they are at.

Source: Ashley Taplin and Kathleen Janysek
Edutopia

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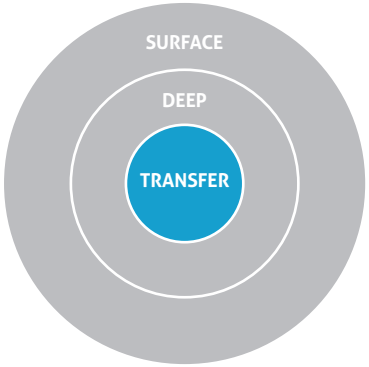
Debate Math

Description: Debate Math is an approach that encourages students to actively engage with math by defending and discussing their reasoning behind problem-solving strategies.

Collaborative Learning

What's the point?

Debate Math incorporates structured debates, students practice explaining their thought processes, listening to others, and responding to different mathematical perspectives.



Set-up

1. Start a Debate Math process with a low stakes question such as, "Which is better—tacos or pizza?"
2. Ask students to independently respond on paper.
3. Ask students to go to one side or the other labeled with the two opinions.
4. Group students in groups of 2-3 and give them two minutes to come up with reasons for debate.
5. Ask one side to share their justification, then have the next group share back and forth.
6. After a few minutes, ask students if they would like to change sides.
7. Instruct students to have a seat and follow up by instructing students to independently write a summary of their opinion.

How is this strategy used by students?

This strategy helps students have an informal conversation followed by mathematically justified debate. Using it in a mathematical context fosters critical thinking, communication skills, and encourages students to evaluate and articulate their reasoning, all while keeping the atmosphere light and engaging.

How is this strategy used by teachers?

This approach enables teachers to guide discussions that encourage critical reasoning and support the development of vocabulary and logical justification.

Benefit: Engages students in defending and applying mathematical reasoning

https://www.luzniak.com/

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Think-Ink, Combine & Refine

Description: Think-Ink, Combine & Refine is a collaborative learning method where students begin by independently thinking about a topic and writing down their ideas ("Think-Ink"). Next, they partner up to share and discuss their thoughts ("Combine"), and finally, they work together to improve and merge their ideas into a stronger, clearer version ("Refine").

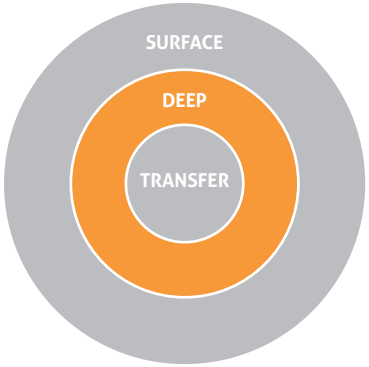
Reflect on Learning

What's the point?

This strategy deepens understanding, promotes critical thinking, enhances communication, and allows for formative

Set-up

1. Present a Prompt: Provide students with a clear question, topic, or learning objective to focus their thinking on.
2. Individual "Think-Ink" Time: Give students a few minutes to independently write down their ideas and key points.
3. Partner Sharing: Have students pair up and share their written responses with each other, discussing and clarifying their thoughts.
4. Combine and Refine: Guide students to collaboratively create a consolidated response that incorporates the best aspects of both individual perspectives.



How is this strategy used by students?

By using this strategy, students engage in active, reflective, and collaborative learning, which helps deepen their understanding of the content and improve their communication skills.

How is this strategy used by teachers?

Teachers use the Think-Ink, Combine & Refine strategy to guide students through a structured process that promotes independent thinking, collaboration, and idea refinement.

Benefit: Develops metacognitive processing and articulation of ideas

ADVANCED COLLABORATIVE SOLUTIONS

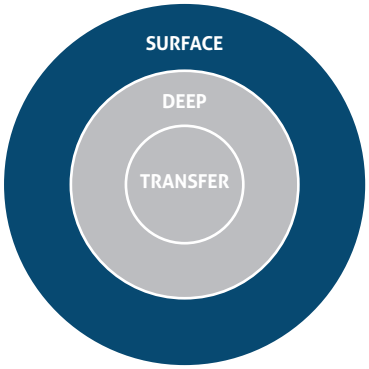
Know-Wonder-Learned (K-W-L)

Description: The Know-Wonder-Learned (KWL) strategy is a simple yet effective graphic organizer used in math to support student engagement and metacognition. It allows students to make connections and reflect on what they have learned.

Reflect on Learning

What's the point?

Using the Know-Wonder-Learned strategy in math helps students activate their prior knowledge, spark curiosity by identifying what they wonder about, and then reflect on their learning as they work through new concepts. It fosters engagement and deeper critical thinking.



Set-up

1. Introduce the Organizer: Explain the three columns—Know, Wonder, and Learned—and describe the purpose of each.
2. Record What Students Know: Have students list what they already know about the math topic in the "Know" column.
3. Capture Student Curiosities: Ask students to write down questions or curiosities about the topic in the "Wonder" column.
4. Engage With the Lesson: Teach or explore the math concept through activities, discussions, or instruction.
5. Reflect on New Learning: After the lesson, have students fill in the "Learned" column with key insights and new information, then discuss their reflections as a class.

Benefit: Activates prior knowledge, encourages inquiry, and tracks learning progress

How is this strategy used by students?

Students use the Know-Wonder-Learned strategy as a learning roadmap in math. They begin by listing what they already know about a topic, then note down questions or curiosities in the "Wonder" column, and finally summarize what they've learned after the lesson. This concise process helps them actively engage with new concepts and reflect on their progress.

How is this strategy used by teachers?

Teachers use the Know-Wonder-Learned strategy to assess students' background knowledge and curiosity before a lesson and then to evaluate understanding afterward. The insights gathered from students' entries guide lesson planning, stimulate class discussions, and inform targeted instructional support.

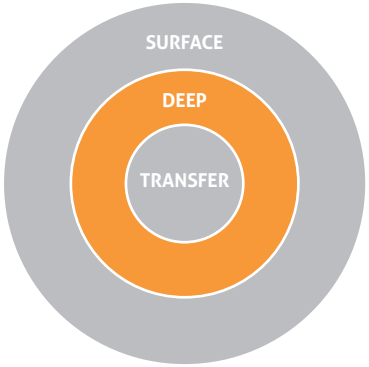
Error Analysis

Description: Error Analysis in math refers to the process of examining and identifying the specific mistakes students make when solving math problems.

Reflect on Learning

What's the point?

By carefully examining where and why errors occur, students can identify misconceptions, clarify their understanding of concepts, and strengthen their problem-solving skills.



Set-up

1. Collect Student Work: Gather a sample of student solutions to analyze patterns.
2. Identify Error Types: Categorize errors as conceptual (misunderstanding a core concept), procedural (incorrect steps), or computational (basic calculation mistakes).
3. Analyze Patterns: Look for recurring errors across different problems or student responses.
4. Interpret Findings: Use the error analysis to inform instruction and provide targeted feedback to students.

How is this strategy used by students?

Students can work independently or in groups to analyze a math mistake, discuss why it happened, and figure out the correct solution. They explain their thinking clearly and write both the error and correction on a poster or sticky note.

How is this strategy used by teachers?

The teacher focuses on creating an environment where students can explore, collaborate, and take ownership of their learning, rather than simply providing answers. Teacher use this to gain insight on what types of errors students commonly make.

Benefit: Encourages self-reflection and conceptual understanding

ADVANCED COLLABORATIVE SOLUTIONS

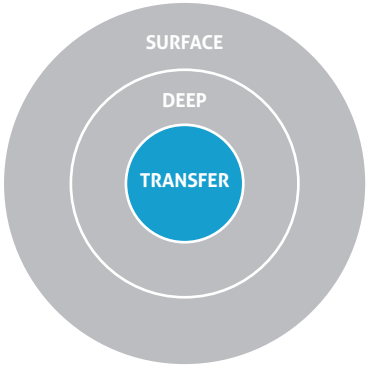
Metacognition Through 3 Questions

Description: Metacognition Through 3 Questions is a math strategy that builds group discussion by collaborating and verifying their answers. This approach deepens understanding, refines problem-solving techniques, and fosters a more mindful learning experience.

Reflect on Learning

What's the point?

This low-prep strategy helps students rely on each other before turning to the teacher for questions. Metacognition helps students reflect on their thinking during problem-solving, identify strengths and weaknesses, and improve their learning strategies.



Set-up

1. Put students in groups of 3-4
2. Pass out 3 sticky notes for each group
3. During work time tell students they are allowed to ask you 3 questions
4. Answer up to 3 questions from student groups and then take the post-it note after answering each

How is this strategy used by students?

The 3-question strategy helps students build confidence in their prior knowledge while emphasizing the value of group collaboration over solely relying on independent problem-solving. Ex. Students explain their reasoning, check each other's steps, and make sure everyone understands how they got the answer. The teacher circulates, listens in, and asks clarifying questions if needed.

Benefit: Develops reflective thinking

How is this strategy used by teachers?

Teachers use this strategy by teaching the three questions, modeling how to apply them, and guiding students through group discussions. They support students in reflecting on their problem-solving process and encourage collaboration to build deeper understanding. The teacher moves from being a source of instruction to a facilitator of learning.

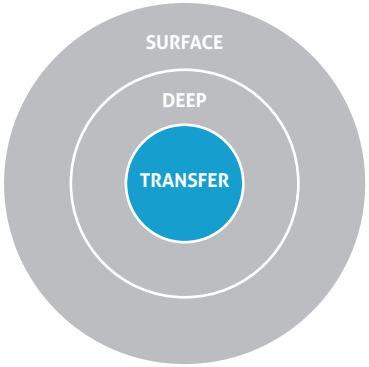
Success Criteria

Description: Success Criteria in a math classroom are specific, measurable statements that act as a roadmap for both students and teachers, outlining what students should know, understand, or be able to do by the end of a lesson or unit.

Build Independence

What's the point?

Success Criteria can be used to assess students' progress through formative assessments, self-reflections, or feedback during lessons, helping both students and teachers adjust as needed to ensure learning goals are met. This strategy works because it taps into principles of human motivation.



Set-up

1. Determine the key concepts or skills students should master by the end of the lesson or unit.
2. Clarify what students are to do to reach proficiency using "I can" language.
3. Use words, terms and/or language from the standard to ensure accurate rigor/ complexity.
4. Avoid subjective language (i.e., some, few, little, many, elaborate, etc.). Use only objective phrasing and criteria.
5. Think of other criteria that is necessary, but not specifically listed in the standard.
6. Include different ways students might show their understanding (e.g., solving problems, using diagrams, or engaging in discussions).
7. Refer to success criteria often to ensure students know where they are in the learning process.
8. Make sure the success criteria can be observed and assessed through student actions or outcomes.
9. Adjust the criteria as needed based on student progress and feedback.

Benefit: Encourages self-monitoring and goal setting

How is this strategy used by students?

Success Criteria allows students to take ownership of their learning, set goals, monitor their progress, and make more informed decisions about how to improve their learning.

How is this strategy used by teachers?

Teachers use success criteria to maintain focus on learning goals, provide targeted instruction, give students targeted feedback, and ensure that students are progressing toward desired outcomes.

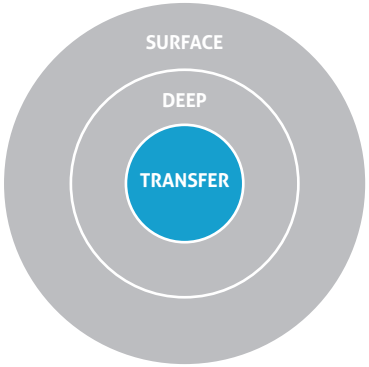
Link & Learn

Description: Link & Learn (also known as "Compare and Contrast New With Old Problems") is a strategy that involves examining a previously solved problem alongside a new, similar problem.

Build Independence

What's the point?

This strategy helps students bridge the gap between familiar and new math problems, deepening their understanding by highlighting similarities and differences. Students begin to transfer problem-solving techniques from known scenarios to unfamiliar challenges, fostering independence and confidence in their mathematical reasoning.



Set-up

1. Select Problems: Choose an "old" problem students have previously solved and a new problem that shares similar concepts or structures.
2. Review Prior Learning: Have students briefly review the solution to the old problem, refreshing their understanding of the key steps and strategies used.
3. Present the New Problem: Introduce the new problem, highlighting any differences in context or details, but noting its connection to the previous problem.
4. Individual or Group Work: Allow students time to work on the new problem individually or in small groups, encouraging them to draw on strategies from the old problem.
5. Compare and Contrast: Guide students through a discussion where they identify similarities and differences in the problems' structures, solution methods, and underlying concepts.
6. Reflect and Conclude: Wrap up the activity with a reflection session where students articulate how comparing the problems deepened their understanding and how they can apply this approach to future challenges.

Benefit:
Helps students recognize patterns, make connections, and apply prior knowledge to novel situations

How is this strategy used by students?

This strategy has students identify both similarities and differences in structure and strategy, allowing them to adapt their prior knowledge to solve the new challenge.

How is this strategy used by teachers?

By highlighting key concepts and facilitating discussion, teachers strengthen students' understanding, confidence, and adaptability as they approach new challenges.

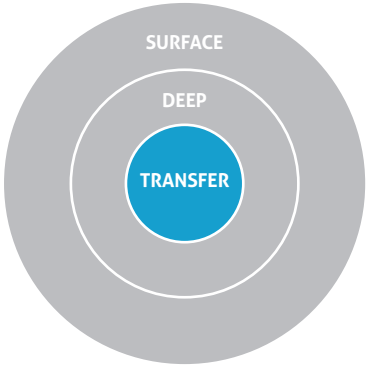
Chalk Talk

Description: A Chalk Talk in the math classroom is a silent, collaborative activity where students write their ideas, solutions, and questions on the board to explore and solve mathematical problems.

Build Independence

What's the point?

The silent nature of a chalk talk encourages students to take ownership of their thinking, as they rely on their own understanding of the concepts rather than waiting for external help.



Set-up

1. Prepare a space for an a question, prompt, or strategy
2. Explain the rules of the chalk talk to students. Emphasize that this is a silent activity where students will write or draw their responses on the board instead of talking.
3. Students will respond by writing their ideas, solutions, or questions on the board. The response can include text, equations, diagrams, or graphs.
4. Students will build on other responses and create a silent dialogue.
5. Teacher will close the chalk talk with synthesizing the ideas and share key takeaways.

How is this strategy used by students?

Students will reflect on the prompt given by the teacher and collaborate in the learning process with silent dialogue.

Benefit: Promotes independent problem-solving and application

How is this strategy used by teachers?

Chalk Talks in math classrooms are an effective way to promote independence by allowing students to engage in a reflective, self-directed, and collaborative learning process.

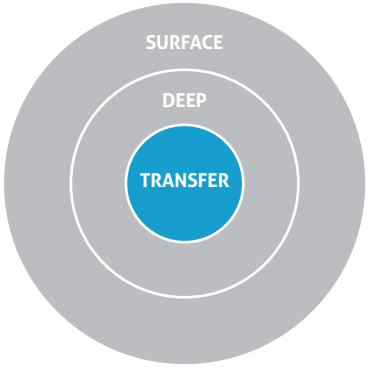
Problem-Solving Teaching

Description: Problem-Solving Teaching focuses on helping students apply their prior knowledge, critical thinking, and reasoning skills to analyze and solve meaningful, non-routine problems. It emphasizes the transfer of learning by encouraging students to connect abstract concepts to real-world contexts

Build Independence

What's the point?

Problem-Solving Teaching encourages students to tackle challenging, real-world problems by emphasizing exploration, collaboration, and reasoning. It focuses on the process over the answer, fostering engagement, critical thinking, and reflection to build resilience and adaptable problem-solving skills.



Set-up

1. Select a meaningful, challenging problem relevant to the students.
2. Clearly explain the problem without giving away the solution.
3. Facilitate and let students work individually or in groups to explore strategies.
4. Provide guiding questions to steer thinking (e.g., "What do you know?" or "What could you try next?") without giving away the solution.
5. Have students present their solutions and reasoning, then discuss different approaches to solving the problem, connecting the problem to broader concepts and skills.

How is this strategy used by students?

Students use problem-solving teaching by actively exploring different strategies, collaborating with peers, reflecting on their thought processes, and applying their knowledge to solve challenging, real-world problems.

Examples:

- Elementary School: Designing a more efficient way to recycle at school.
- Middle School: Creating a community garden to help feed people in the community with food insecurities.
- High School: Designing a safer playground for younger children

Benefit: Encourages strategic thinking and multiple solution pathways

How is this strategy used by teachers?

Teachers select meaningful problems aligned to the curriculum, guide student exploration with open-ended questions, facilitate collaboration, and encourage reflection to deepen understanding and promote critical thinking.

Strategy Templates

Try It-Talk It-Color It-Check It

Try It	Talk It
Color It • Green: We are confident our answer is correct and we can teach others. • Yellow: We are a bit unsure, but we can explain how to get started. • Red: We are still uncertain or confused.	Check It

Jigsaw Meets Reciprocal Teaching

The Clarifier

Your task is to clarify how the vocabulary of a graph connects to the linear equation (use at least 4 vocabulary terms).

The Predictor

Your task is to make predictions or reason through a prediction about what you learned. Choose one of the sentences stems below:

- I think we will learn _____ next because….
- I thought…, but now I know…

The Questioner

Your task is to write an additional question the teacher might ask you about any of the problems you did today. Use a question like *why, how, when, can you justify, etc.*

The Summarizer

Your task is to write a summary of what you learned today. Use the sentence stem below:

- 3 key things I learned were…

Three-Column Note-Taking

Topic:		
Key Words / Definitions	Problem & Work	Explanation or Notes

Think-Ink, Combine & Refine

 Think-Ink	 Combine *and* Refine

Strategy Templates

3-2-1

3 things I learned...	2 things I found interesting...	1 questions I still have...

K-W-L

Know	Wonder	Learned
What do you think you already know about this topic?	What do you wonder about this topic? Write your questions below.	After you complete the lesson, write/model what you learned?

Success Criteria

Subject		
Step 1	Identify a single standard for instructional focus.	
Step 2 *The What*	Restate the standard in *student-friendly* wording. This is the learning intention.	
Step 3 *The How*	Success Criteria	

Accountable Talk

Discussion Stem Card

"I think ___ because ___."
"Can you explain how you got that?"
"I agree/disagree with ___ because ___."
"What if we tried ___ instead?"
"I have a question about ___."
"I noticed that ___."
"The first thing I did was ___."
"I would like to revise my answer because ___."
"So you are saying ___."
"I chose this strategy because ___."

Strategy Templates

Post Then Prove, Square Then Compare

Student Question Stems:

- How is your solution similar to or different from mine?
- Why do you think our answers are different?
- Could both answers be correct? Why or why not?
- Can you show me where this part came from?
- Can you prove that your solution works?
- Can we test your solution another way?
- What part of the problem was tricky for you?
- How did you figure out *[specific part of the problem]*?
- What's another strategy we could try?
- What would you do differently next time?

Teacher Question Stems:

- Why did you choose this strategy or formula?
- How do you know your answer is correct?
- Can you connect this problem to something we've learned before?
- What would happen if we changed this part of the problem?
- Is there more than one correct answer? Why or why not?
- What patterns do you notice here?
- Why do you think this method is the most efficient?
- How would you explain this to someone who doesn't understand?
- Can you explain your group's reasoning to the class?
- What's one thing you learned from someone else's explanation?
- What was the most challenging part of this problem?
- What new ideas or approaches did you learn today?

Asking Engaging Questions

	From this...	To that...
In the Classroom	Are there any questions?	What questions do you have? Who has the first question? Ask me two questions about...
	What did you get?	How did you start? Talk through your thinking.
	Can someone in your group explain what you did?	Can someone *not* in this group explain what they did?
	Where were you?	We missed you. Is everything okay?
	What didn't you get?	What do you know? Explain the parts you do understand. What do you wish you knew?
	What are you doing? (during learning walks or talking with students)	What are you learning?
	Show your work.	Share your thinking.
	Here's what I need you to do for this project...	Here are your three challenges for this project... Here are three things to help your work be high quality...
	Some groups were off task today. Tomorrow I need to see you work better.	What problems did you come across today? How did you solve them? What will you do differently tomorrow?
	What did I just say?	Can someone say what I just said better than I said it?
In Coaching	What do you want to talk about?	What's on your mind?
	How are you?	What are your top 3 feelings today? What's going well?
Anytime	What do you have to do today?	What do you *get* to do today?

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A Note on the Instructional Strategy Play Card

Inspired by Coaching, Designed for Teaching

The inspiration for the instructional strategy play card on page 4 originated with Ashley Taplin, who witnessed her husband use play cards to call out basketball plays for his team. This resource adapts a simple yet powerful concept to real-time instruction. Just as coaches call strategic plays, teachers can use this play card to make on-the-spot instructional decisions that enhance student voice, purposeful movement, and higher-order thinking—without extra prep.

Organized into five key domains—Teacher-Led, Connect or Introduce, Collaborative Learning, Reflect on Learning, and Build Independence—this card streamlines strategy selection, helping teachers align methods with lesson goals. The result? More engaging, dynamic, and effective instruction.

Scan to read more about Ashley's play card story!