

Ambassador

Mode of Instruction: Teamwork

Purpose: To have students share strategies

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To support productive struggle in the classroom, students share math authority in their learning by sharing strategies and multiple methods. The teacher can monitor the procedural development of conceptual understanding.

Students are eligible to be **Ambassadors** once the team has finished problem solving, and the teacher has assessed for understanding. An **Ambassador** is sent to work with other teams to support productive struggle. Ambassador asks the team questions to guide understanding during problem solving.

- Teacher appoints **Ambassador**
- Ambassadors help other teams

Board Report

Mode of Instruction: Teacher-led

Purpose: Self-assessment, Collaboration, Discourse

Standards for Mathematical Practice: Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Look for and make use of structure.

Objective: To facilitate meaningful mathematical discourse, students share and view others' solutions at the board. Teacher monitors learning through circulation and analysis of student work on board.

Teacher monitors student progress while students self-assess work and increase mathematical discourse. This is recommended for questions with short solutions, not for all questions from a lesson. If a problem requires choosing a tool and setting up an equation with many steps to solve, it is best if teams only report the end solution, or part of the solution.

- Teacher creates a space in the classroom to write a row of problem numbers from the lesson.
- When teams get to the problem listed on the board report, the team writes their answer on a sticky note.
- A student from the team goes to the board to place the sticky note and compare to other teams.
- Teacher monitors student work on board and through circulation. Based on work, teachers may ask specific teams to do a **Swapmeet**, or **I Spy**.
- Repeat this process for each problem listed on the board, with a new student placing the sticky note each time.

Carousel: Around the World

Mode of Instruction: Teamwork

Purpose: Brainstorm

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Look for and make use of structure.

Objective: To facilitate meaningful mathematical discourse, students share thinking and generate ideas by viewing multiple rounds of presentations. The teacher monitors learning through posing purposeful questions.

Teams explore topics or questions displayed on poster paper around the classroom. After a brief discussion—two or three minutes, teams agree on a written statement to add to the poster. Teams rotate several times to discuss additional topics or questions. Teams read the previous written statements before adding to the list. Teacher monitors and determines when to conclude the activity. A **Gallery Walk** closure provides students time to read all of the written statements.

- Display topics or questions around the classroom.
- Provide a different colored marker for each team.
- Assign one team to each topic or question to start.
- Teams discuss and agree on a written statement to include about the topic.
- Teams rotate to the next topic or question and repeat the process every few minutes.
- For closure, facilitate a **Gallery Walk** to view all topics or questions.

Carousel: Index Card

Mode of Instruction: Teamwork

Purpose: Brainstorm

Standard for Mathematical Practice: Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Look for and make use of structure.

Objective: To facilitate meaningful mathematical discourse, students share thinking and generate ideas by viewing multiple rounds of presentations. The teacher monitors learning through posing purposeful questions.

Teachers or students write one struggle about learning mathematics including time management, Review and Preview, partner work, teamwork, etc., on separate index cards. The index card rotates to other students that offer suggestions to support the struggles.

- Students record one struggle/question/comment/concern on an index card.
- Index card rotates within a team of students or to the next team.
- Students or teams write suggestions on the index card.
- Rotate the index card several times.
- Index card is returned to the original student or can be displayed in class for all to benefit from.

Carousel: Station Rotation

Mode of Instruction: Teamwork

Purpose: Review

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Look for and express regularity in repeated reasoning.

Objective: To facilitate meaningful mathematical discourse, students share thinking and generate ideas by viewing multiple rounds of presentations. Teacher monitors learning through posing purposeful questions.

Stations include review problems—possibly four to six—placed into a sheet protector. There should be more stations than teams. Teams record written explanations on a prepared sheet—in numerical order—to manage teacher review of work. After teams have completed a written explanation for a station, the paper is submitted to the teacher. Teams rotate to an available station.

- Stations include several review problems.
- Set up more stations than teams.
- Teams record written explanations on a prepared record sheet.
- Teams check in with the teacher.
- Teams rotate to an available station.
- Repeat until time is up or stations are complete.

Dyad

Mode of Instruction: Partner work

Purpose: Making connections

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To implement tasks that promote reasoning and problem solving, students share without interruption for a short period of time. Teacher monitors through circulation.

Student think-alouds are used in a variety of ways. For example, partners take turns talking about feelings of returning to school. Or, students express concern about math topics on upcoming assessments. A **Dyad** allows students time to talk without interruption. Each student receives equal time. The listener does not talk; a **Dyad** is not a conversation. Students maintain eye contact and positive body language.

- Students share—without interruption—with a partner.
- Each partner shares for an equal amount of time.
- Listening partner remains quiet and uses positive body language.

Elevator Talk

Mode of Instruction:

Partner/Teamwork/Teacher-led

Purpose: Summarize a topic

Standards for Mathematical Practice: Construct viable arguments and critique the reasoning of others.

Objective: To facilitate meaningful mathematical discourse, students summarize understanding of topics through brief conversations. Teachers monitor through circulation techniques.

Students summarize a concept or topic in a 30 second—relatively short—talk. Basically, if someone gets onto an elevator and asks about a problem, you have until the elevator gets to your floor to explain it. Use **Proximity Partners** or a **Whiparound** to share out the summaries.

- Each individual/partner/team is given a topic or concept.
- Students summarize the topic or concept into a brief presentation.
- Teacher facilitates a share out of presentations.

Fishbowl

Mode of Instruction: Teacher-led

Purpose: Modeling

Standards for Mathematical Practice: Model with mathematics. Look for and make use of structure.

Objective: To establish mathematics goals to focus learning, teams are tasked with modeling an activity for other teams. Teacher monitors the goals of the lesson to ensure that there is an appropriate learning progression.

Teacher facilitates one team modeling an activity for the whole class. Students watch the team collaborate on a task while the teacher highlights positive behaviors and team norms. Questions may be asked about the goals for the lesson.

- Classmates stand in a circle around one team that models an activity.
- Teacher highlights positive behaviors and team norms.
- Questions may be asked.
- Students return to teams and complete activity.

Fortune Cookie

Mode of Instruction: Teamwork

Purpose: Elicit responses to a prompt before discussion

Standards for Mathematical Practice: Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others.

Objective: To facilitate meaningful mathematical discourse, students share understanding of a topic to analyze and compare other student approaches to the same topic. Teacher monitors through effective circulation.

Teams receive five or six sentence starters (fortunes) related to topics/concepts/norms in an envelope. Team Member (1) draws a sentence starter from the envelope, reads it aloud, and shares a brief—30 second—explanation. Team Member (2) receives the same sentence starter, makes one comment about Team Member (1)'s explanation, and rotates to continue the process for each member.

Team member (2) draws a sentence starter from the envelope, reads it aloud, and shares. Team member (3) receives the same sentence starter, makes one comment about Team Member (2)'s explanation. Continue this rotation for each of the sentence starters in the envelope.

Fortune Cookie (continued)

Teacher circulates to make instructional decisions about team discussions. For closure, each sentence starter (fortune) is included on a separate poster—not previously mentioned to the students. Teams rotate through each poster location to add one comment/explanation about the sentence starter.

- Teams receive sentence starters (fortunes) in an envelope.
- Team Member (1) reads one sentence starter and shares a brief explanation.
- Team Member (2) receives the same sentence starter and comments on Team Member (1)'s explanation.
- Rotate to each team member.
- When complete, Team Member (2) reads one sentence starter and shares.
- Team Member (3) comments on Team Member (2)'s explanation.
- Continue the rotation through all sentence starters (fortunes).
- Posters with each fortune are displayed around the room after the activity is complete.
- Each team adds one comment to each poster for closure.

Gallery Walk

Mode of Instruction: Teamwork/Teacher-Led

Purpose: To share ideas

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To elicit and use evidence of student thinking, students share math authority by explaining understanding and critiquing the work of others. Teacher monitors through circulation and questioning.

Teams display posters or presentations. Students explain and critique as individuals/teams rotate about the classroom. Rotations are completed quietly—Museum Walk—or through discussion—Gallery Walk. If the teacher decides to allow feedback, students provide positive feedback **Two Stars and a Wish** or **Glow and Grow**.

- Teams display posters or presentations.
- Students explain and critique displayed work.
- Students rotate to each location.
- Feedback is given with **Two Stars and a Wish** or **Glow and Grow**.

Give One - Get One

Mode of Instruction: Partner Work

Purpose: Share ideas

Standards for Mathematical Practice: Make sense of problems and persevere in solving them.

Objective: To facilitate meaningful mathematical discourse, students give and receive information about a concept to build shared understanding. Teacher monitors through circulation.

Students explain and critique ideas with members of the class. For example, students write three ideas on separate note cards for creating positive team norms. Students circulate to give one idea to a classmate, while they get one idea. Student names are recorded next to the idea. For closure, a volunteer reads an idea from a classmate, and then the named person continues to share another idea. Allow many to share.

- Students record three ideas to share about a given topic.
- Students circulate and share ideas.
- For each idea the student gives, they get one in return to record on paper - including the name of the student who gives the idea.
- After many ideas are gathered, the teacher asks a volunteer to read an idea from a classmate and their name.
- Named classmate then shares the idea of another classmate and the sharing process continues.

Glow and Grow

Mode of Instruction: Independent/Teamwork

Purpose: Self/Peer assessment

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To establish goals to focus learning, students self-assess strengths and areas for growth. Teacher monitors the shared understanding to guide instructional decisions.

Students use think time to write one topic, team norm, or idea that is a strength and one topic, team norm, or idea where improvement is needed. Students use **Glow and Grow** to provide feedback team posters, topics, team roles, team norms, assessment, goals.

- Students share one topic, team norm, or idea that is a strength—Glow.
- Students share one topic, team norm, or idea where improvement is needed—Grow.

GPS

Mode of Instruction: Teamwork/Teacher-led

Purpose: Task Completion

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Reason abstractly and quantitatively.

Objective: To implement tasks that promote reasoning and problem solving, students move throughout the problem set to ensure multiple opportunities for learning conceptually. Teacher monitors through circulation and questioning.

To help teams navigate through a problem set, the GPS strategy is a visual road map of the tasks. Students know the final destination to achieve the goals for the lesson. One member of the team reports the progress on a one-quadrant grid displayed in the room, where the team travels along one axis and the problem numbers travel the other axis. Teachers adjust instruction throughout the lesson monitoring where each team is located. Teachers may send **Ambassadors** from teams that are further along in the lesson to deepen understanding, or they may utilize a **Swapmeet** with teams that are similarly located on the grid. If all teams land at one-point on the grid—unable to continue—the teacher may conduct a **Huddle** to progress teams past that point.

- A one-quadrant grid is displayed for the class—on whiteboard, reusable laminated grid, paper or electronic.
- Teams are informed of the goals of the lesson included within each problem.
- One team member checks off progress on the grid as each problem is completed.
- Teacher makes instructional decisions about STTS used to support teams and/or closure.

Hot Potato

Mode of Instruction: Teamwork

Purpose: Collaboration

Standards for Mathematical Practice: Construct viable arguments and critique the reasoning of others. Attend to precision. Look for and express regularity in repeated reasoning.

Objective: To support productive struggle in learning multiple step procedures, teams grapple with mathematical problems and explain their thinking. Teacher monitors through circulation and purposeful questioning.

Students practice concepts before mastery or review multiple step problems. Teams receive one sheet of paper. Each team member is provided a different colored writing utensil. Team Member (1) records the first step of the strategy, and rotates the paper to Team Member (2). Team Member (2) corrects mistakes, explains the step aloud, and records the second step. The rotation continues until the problem is completed. Teacher decides if each team member signs the paper agreeing to everything that was written down.

- Team uses one sheet of paper to solve a problem or practice a procedure.
- Each team member uses a different colored writing utensil.
- Team member (1) records the first step of the strategy.
- The paper rotates to the next team member to correct mistakes and explain and write the next step.
- Continue the rotation until the problem is completed.

Huddle

Mode of Instruction: Teamwork

Purpose: Deliver instruction; collect information on team progress

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Use appropriate tools strategically.

Objective: To facilitate meaningful mathematical discourse, one team member is provided with information that will allow teams to analyze and compare student approaches to problem solving. The teacher monitors which teams need support to facilitate discourse.

Teacher monitors the learning progression of teams, disseminates information, or seeks consensus on topics or concepts. Teacher calls one team member to a **Huddle** in the classroom. Teacher shares a piece of information or checks for understanding. Team member (1) returns from the **Huddle** to share with other team members.

- One team member is called to a location in the classroom.
- Teacher shares a piece of information or checks for understanding.
- Team member (1) returns to the team and shares information.

Hot Seat

Mode of Instruction: Teamwork

Purpose: Individual accountability during teamwork

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Reason abstractly and quantitatively. Attend to precision.

Objective: To build procedural fluency from conceptual understanding, students use opportunities to develop strategies for similar mathematical problems. Teacher monitors strategies for problems.

Students demonstrate individual accountability by working on a problem individually away from team members. While mastery of a concept is not yet expected when using this strategy, students have worked with similar problems through collaboration in teams.

Hot Seat (continued)

One chair is placed in the front of the classroom for each team. Team Member (1) sits in the chair to work on the same problem as other team members. Team Member (1) remains silent while teams discuss and record strategies. Teacher assesses both Team Member (1)'s work and teamwork. Two points are assigned for Team Member (1) and one point for correct team responses. Team Member (2) rotates to the **Hot Seat** to continue the strategy.

- One chair—**Hot Seat**—is placed in the front of the classroom for each team.
- Using **Numbered Heads**, Team Member (1) sits in the **Hot Seat**.
- Teacher gives everyone a problem to work on for a specified amount of time.
- **Hot Seat** team member (1) remains silent, but teams discuss and record strategies.
- Teacher assesses individual and team explanations.
- **Hot Seat** team member (1) receives two points for correct answers.
- Teams receive one point for correct answers.
- Team Member (2) rotates to the **Hot Seat** to continue the strategy.

I Have... Who Has...

Mode of Instruction: Teacher-led

Purpose: Elicit final reflective comment

Standards for Mathematical Practice: Attend to precision. Look for and make use of structure. Look for and express regularity in repeated reasoning.

Objective: To facilitate mathematical discourse, students share understanding of a concept/topic and critique the sharing of others. Teacher makes instructional decisions about the concept/topic based on sharing.

To review, build vocabulary, connect mathematical representations, or connect mathematical threads, Teacher leads **I Have...Who Has...** Student receives a card with one problem and one answer. Student (1)—starter card—states, "Who has...[problem]." Student (2)—with the solution—says, "I have...[answer]." This continues throughout the set of cards.

This strategy may be modified for independent practice, partners, or teams. Consider time restrictions and multiple rounds.

- Student receives a card with one problem and one answer to a different problem.
- Student (1) asks, "Who has..." and states the problem.
- Student (2)—with the solution—says, "I have..." and states the answer.
- Process continues until all problems have answers.

I Spy

Mode of Instruction: Independent/Teamwork

Purpose: Share ideas

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Look for and make use of structure.

Objective: To support productive struggle in learning mathematics, students visit other teams to generate ideas about a concept/topic. Teacher makes instructional decisions after posing purposeful questions.

A team becomes stuck while problem solving. The Resource Manager becomes a spy for the team and silently circulates to listen for ideas from other teams. The Resource Manager refrains from any team interactions while spying on other teams. The Resource manager reports back to the team to share information about the problem.

- Team becomes stuck at one point while problem solving.
- The Resource Manager circulates around the classroom, silently listening to, or spying on the teams' work.
- The Resource Manager reports back to the team to share information about the problem.

Jigsaw

Mode of Instruction: Teamwork

Purpose: Build understanding of information

Standards for Mathematical Practice: Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others.

Objective: To promote reasoning about a mathematical concept, team members share responsibility for learning different parts of a concept. Each member teaches other members about that part.

Each team member becomes an expert for one part of a topic or concept. Large reading assignments are broken into four parts, and each member of the team receives one part of the reading. Use **Numbered Heads** to assign a number to each team member. Team Member (1) learns about one part and prepares to share that learning. Team Members (2), (3), and (4) repeat this same process.

Jigsaw (Four Corners) - (Jigsaw variation)

Each team member becomes an expert for one part of the material presented. Each team member reports to the corner assigned, reads the assigned part, discusses with other students in that corner, decides on an explanation, and returns to the original team. Team members then take turns sharing with their team.

- Each team member is assigned a different part of a topic or concept.
- Team member (1) learns about the topic or concept.
- Team member (1) presents the information to the team.
- Team Members (2), (3), and (4) repeat this same process.

Listening Post

Mode of Instruction: Teamwork

Purpose: Focus attention

Standards for Mathematical Practice: Construct viable arguments and critique the reasoning of others. Attend to precision. Look for and make use of structure.

Objective: To establish mathematics goals to focus learning, specific roles situated actions to move through a learning progression. Teacher monitors each team role through circulation.

In teams, two team members are mathematicians and two team members are observers. Team Member (1) and Team Member (2) problem solve, sharing explanations aloud. Team Member (3) listens to Team Members (1) and (2) and asks clarifying questions, as needed. Team Member (4) records observations about explanations and attitudes of participants, but Team Member (4) remains silent throughout the activity. After the assigned time—15 minutes—Team Member (4) shares notes and observations. Team Members (1), (2), and (3) may share their perspectives, as well. Variations of this activity include multiple rounds with the roles rotated to other members.

- Team Member (1) and Team Member (2) work on a math problem, explaining aloud.
- Team Member (3) listens and may ask clarifying questions.
- Team Member (4) only records what is discussed and verbalized—observes body language, team norms, or another focus area.
- After 15 minutes, Team Member (4) shares notes and observations.

Math Chat

Mode of Instruction: Independent/Teacher-led

Purpose: Silent reflection

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To establish mathematics goals to focus learning, students silently contemplate topics that generate ideas within learning progressions. Teacher observes to make instructional decisions. Students participate in the silent activity to reflect, summarize ideas, generate ideas, assess learning, or solve problems. Display posters with one topic or concept on each poster.

Students use a writing utensil and circulate to each poster. Student (1) adds one brief note or explanation to the poster. Time for activity varies depending on the topic. You may want to consider using a timer to help pace the time at each poster.

- Display posters with one topic or concept per poster.
- Student has one writing utensil.
- Silently, Student (1) circulates to each poster, writing a brief note or explanation on each one.
- After rotation is complete, students return to seats.

Notice and Wonder

Mode of Instruction: Independent/Teamwork

Purpose: Introduce concepts

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others. Attend to precision.

Objective: To establish mathematics goals to focus learning, students respond to two prompts as a topic is introduced. Teacher monitors notices and wonders to make instructional decisions.

Students view a picture, math problem, peer work, favorite mistake. Students critique a team poster, observe a team for their teamwork, etc. Students are prompted with the questions—*What do you notice?* and *What do you wonder?*

- Student (1) receives a topic, picture, piece of work, math problem, sample student work, reading, etc.
- Complete the prompt: I notice...
- Complete the prompt: I wonder...

Numbered Heads

Mode of Instruction: Teamwork

Purpose: Individual accountability

Standards for Mathematical Practice: Use appropriate tools strategically.

Objective: To support productive struggle in learning mathematics, students collectively and individually support each other through building mathematical ideas and relationships. Teacher monitors the equitable participation of team members and poses purposeful questions.

Numbered Heads is an effective strategy for keeping all students involved and accountable during teamwork. Students number off in teams. Then they are given a problem to solve, a question to answer, or any task to complete. The team members work together making sure that each student in the team understands what they are doing, knows the answers, and can explain the team's work.

- Students number off 1 - 4 in their team.
- Each team member is assigned a team role, task, or problem number that they are responsible for.
- Teacher circulates, stops at a group, and asks a random number to answer a checking for understanding question.
- The Teacher can use a random number to have students share out at the end of class.

Pairs Check

Mode of Instruction: Partner Work

Purpose: Check for understanding

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others. Attend to precision.

Objective: To promote productive struggle with a topic before mastery is expected, two students share mathematical ideas with each other. Teacher monitors through circulation.

Use when practicing a new skill or procedure, or to pre-assess a topic that will soon be taught. Within each team of four, students work in pairs to solve problems and then check solutions with the other pair. Each set of partners has one sheet of paper and one pencil. While one student writes, the other student explains. If the student writing disagrees with the explanation, then a discussion happens before the step is recorded on the paper. When finished the role of writer is rotated to the other student, and the process continues. After problems are complete, the partners check the explanations of the other team members. If both pairs agree, a checkmark is added to the paper. If pairs disagree, teams conduct error analysis.

- Team Member (1) writes while Team Member (2) explains the first problem.
- Team Member (1) asks clarifying questions to Team Member (2).
- The partners check with the other partners from the team—if they agree, put a , if they disagree, find mistakes.
- Team Member (1) rotates the paper to Team Member (2), and roles are reversed for the next problem.

Participation Quiz

Mode of Instruction: Teamwork/Teacher-led

Purpose: Promote equitable team routines

Standards for Mathematical Practice: Make sense of problems and persevere in solving them.

Objective: To establish mathematics goals to focus learning, students practice equitable routines and team roles that progress throughout tasks and problem solving. Teacher monitors and records participation in expected routines and roles.

During a team worthy task, the teacher picks a class norm on which to focus and provide students with feedback. The teacher explains to students how the feedback will be presented (rubric, laminated feedback cards, overhead, posters, chalkboard, electronic, etc.). The teacher may want to pause to debrief in the middle and end of class, or just debrief at the end of the class period.

- Teacher displays the team norm that will be the focus of the lesson.
- Teacher explains to teams how they will monitor teamwork.
- Teacher records comments while students are working.
- Debrief together as a class.

Peer Edit

Mode of Instruction: Partner Work

Purpose: Collaboration

Standards for Mathematical Practice: Construct viable arguments and critique the reasoning of others. Attend to precision.

Objective: To elicit and use evidence of student thinking, pairs of students edit each other's work, by asking questions and improving evidence. Teacher adjusts instruction based on the edits.

This strategy allows peers to give each other feedback either orally or in writing. It can be used when writing Toolkit or Learning Log entries, or any problem that asks for an explanation or justification. Peers should be positive with their comments and specific with their feedback. They should highlight the things that they like about what was written. They should share ideas to improve their partner's writing.

- Students complete a rough draft of their writing entry.
- Students trade papers with a partner and read their partner's work.
- Students use another color to make edits, provide comments and suggestions, ask clarifying questions, or provide praise.
- Student (1) shares out to Student (2), what they like about the writing, and any additional notes or feedback.
- Student (2) shares out to Student (1), what they like about the writing, and any additional notes or feedback.
- Students make changes or additions to their rough draft thinking.

Pick Three

Mode of Instruction: Independent/Teamwork

Purpose: Collaboration

Standards for Mathematical Practice: Use appropriate tools strategically.

Objective: To establish mathematics goals to focus learning, students highlight strengths that will make the team stronger. The teacher monitors the equitable status of all team members.

The purpose of this activity is to provide a quick reminder at the beginning of class about the importance of having every team member contribute to the team's work, and of what is involved in good mathematics work. Examples of what the list of strengths may include are: Looking for patterns, Asking questions, Understanding vocabulary, Making a drawing or model, Acting out the problem, Helping others, Explaining my thinking and justifying answers, Noticing details, Organizing, Predicting, Writing equations from patterns, Looking at things in different ways, Reading aloud, Keeping people on task, Following directions, Learning from our mistakes, Remembering a similar problem, Encouraging your team members to persevere.

- Teacher posts a list of strengths.
- Each student selects and writes down three strengths they can contribute to their team.
- Students take turns sharing their strengths with their team.
- Students use strengths as they work on the lesson.

Players-Coach

Mode of Instruction: Teamwork

Purpose: Articulate understanding through mathematical discourse

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others. Look for and make use of structure. Look for and express regularity in repeated reasoning.

Objective: To build procedural fluency from conceptual understanding, students share self-generated, flexible strategies to team members. Teacher monitors the development of strategies over an extended period of time.

Team Member (1) acts as a coach to teach the other members about a topic or concept. Team member (1) shares self-generated strategies to build team comprehension. The team members acting in the role of player may ask clarifying questions.

- Team Member (1) assumes the role of coach.
- Team Members (2), (3), and (4) assume the role of player.
- Team Member explains a topic or concept.
- Team Members (2), (3), and (4) ask clarifying questions.

Proximity Partners

Mode of Instruction: Partner Work

Purpose: Build shared understanding

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To facilitate meaningful mathematical discourse, students build shared understanding through comparing approaches and arguments. Teacher monitors approaches through circulation.

To find proximity partners, students stand up, push in chairs, touch 2 tables/desks, three walls, and a chair. The two students closest together are proximity partners. Partners discuss a topic or concept for a period of time—one or two minutes. Partners thank each other and return to the teams.

Stand-Up Hand-Up Partner-Up (Proximity Partners variation)

To find a partner, students stand up, push in chairs, put a hand up, make eye contact, and put hand down. After all hands are down, partners move to meet and discuss a topic or concept.

- Students stand up and push in chairs.
- Students touch 3 walls, 2 tables/desks, and 1 chair.
- The two students closest to one another are proximity partners.
- Proximity partners briefly discuss a topic or concept.
- Proximity Partners return to teams.

Reciprocal Teaching

Mode of Instruction: Partner Work

Purpose: Articulate understanding

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To build procedural fluency from conceptual understanding, students share self-generated, flexible strategies to a partner. Teacher monitors the development of strategies over an extended period of time.

This is an activity that can be done at any time during the class period to check for understanding. At the beginning of the period, students could be asked to explain a concept or definition from the previous day or week. It would serve to remind them of what they have recently learned. Or this might be a way to introduce the topic of the day by remembering some of the parts from previous units which lead up to the new concept. If reciprocal teaching is used during the middle of class it can be used to check the comprehension of what is being learned in that day's lesson. The teacher listens to as many pairs as possible to formatively assess what they have learned and to identify questions and points of confusion.

- Students work in pairs.
- Partner (1) pretends that Partner (2) was absent and explains a concept.
- Switch roles and Partner (2) pretends that Partner (1) was absent and explains a second concept.
- Teacher circulates to listen to as many pairs as possible.

Red Light - Green Light

Mode of Instruction: Teamwork/Teacher-led

Purpose: Sequencing of lesson

Standards for Mathematical Practice: Make sense of problems and persevere in solving them.

Objective: To establish mathematics goals to focus learning, teams check in regularly to move through the learning progress in a way that promotes successful completion of tasks. Teacher monitors and adjusts instruction throughout the check-ins.

Teacher ensures that teams verify the correct solution to each problem before proceeding to the next problem. Each team indicates their status—red indicates finished and green indicates in progress. The teacher circulates to red light teams to pose purposeful questions to check for understanding. Students continue to the next problem as instructed by the teacher.

- Each team has a red cup and green cup, or laminated double-sided red/green card to indicate status.
- While the team works together on a problem or problems, status is set to a green light.
- When the team finishes a problem or gets stuck, status is set to red light.
- Teacher goes over to a red light and poses questions to check for understanding.
- After speaking with the teacher, teams go to the next problem or set of problems.

Silent Debate

Mode of Instruction: Partner

Purpose: Present logical arguments

Standards for Mathematical Practice: Construct viable arguments and critique the reasoning of others.

Objective: To use and connect mathematical representations, two students write about concepts and strategies while critiquing the understanding of others. The teacher monitors through circulation.

To improve writing and communications skills, students are prompted to write clear and concise statements about topics. The process is similar to oral debates, except that it is silent. Partners are assigned a topic and one partner writes pro statements while the other responds with con statements. One paper and pencil is shared by the partners. The pro partner begins and writes a statement in favor of the prompt. The con partner reads the statement and writes a statement against it or against the original prompt. The process continues.

- Students work in pairs.
- Partner (1) is assigned the pro (for) position, Partner (2) takes the con (against) position.
- Partners share a pencil and one sheet of paper. A prompt or topic is given by the teacher.
- Partner (1) makes a pro, or supportive statement in writing.
- Partner (2) reads the statement, and writes a comment against.
- Process continues—three or four times.

Swapmeet

Mode of Instruction: Teamwork

Purpose: Share ideas

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Attend to precision.

Objective: To facilitate meaningful mathematical discourse, teams swap two members with another team to compare and analyze approaches to problem solving. The teacher monitors through circulation and makes ongoing instructional decisions.

Teams work on problems where ideas are generated, strategies are formed, and solutions are developed. At times, teams reach a point of impasse. When this happens, this strategy can be used to allow team members to swap ideas with other teams. Two team members rotate to the next team to exchange strategies and ideas with that team. After sharing, students return to their original teams to share new understanding.

- When a team task is partially finished, one pair from each team rotates to the next team.
- Pairs from the two teams exchange ideas, solutions, thinking, etc.
- Pairs return to their original teams and each pair shares what they learned from other teams.
- Teams continue to work on problems.

Teammates Consult

Mode of Instruction: Teamwork

Purpose: Team discussion and decision making

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Use appropriate tools strategically. Look for and make use of structure.

Objective: To establish mathematics goals to focus learning, teams utilize an established routine to begin problem solving by making sure all members know the goals and learning progression.

Teammates Consult is an effective strategy to use for problem solving and concept development situations. It allows the students an opportunity to think and discuss the problem before actually writing anything down.

- All pencils and calculators are set aside (no writing).
- Students read the problem or question individually.
- Students get approximately 1 minute of individual think time.
- Students take turns sharing and discussing the problem for clarity.
- Students share possible strategies or next steps.
- Teacher gives okay for pencils to be picked up and written work to begin.

Think-Ink-Pair-Share

Mode of Instruction:

Independent/Partner/Teamwork

Purpose: Individual reflection prior to discussion

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Look for and make use of structure. Look for and express regularity in repeated reasoning.

Objective: To elicit and use evidence of student thinking, students utilize intentionally planned think time before responding to and sharing out understanding.

To emphasize the importance of think-time, the teacher poses a question/problem for students to silently think about. After a short period of time, students write an explanation to share. When the teacher indicates, partners share explanations. Partners may share within the team or the whole class.

Think-Pair-Share (**Think-Ink-Pair-Share** variation)

Students receive a question—possibly about concepts covered in a unit, Diamond Problems, or mental math—and silently think for a short period of time. Without writing, partners discuss explanations of the question. Partners may then share out with the rest of the team or class.

- Teacher poses a question/problem.
- Students think for a period of time—one or two minutes.
- Students silently prepare an explanation in writing to share.
- Partners take turns sharing written explanations.
- Partners may then share out with the rest of the team or class.

Traveling Salesperson

Mode of Instruction: Teamwork/Teacher-led

Purpose: Communicate mathematical ideas

Standards for Mathematical Practice: Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Attend to precision.

Objective: To implement tasks that promote reasoning, students solve a problem and decide on an effective strategy within a team. One team member shares that strategy with other teams.

Teams receive a topic or problem—same/different from other teams—and a presentation is prepared. Teams plan and practice within teams. Then one team member—**Traveling Salesperson**—rotates to another team to pitch the presentation. The team asks clarifying questions. Then the **Traveling Salesperson** returns to the team so that roles may rotate. The use of **Numbered Heads** allows all team members to rotate. The teacher circulates to make informed instructional decisions about which team member is assigned the role of Traveling Salesperson.

- Teams receive a topic or problem from the teacher.
- Teams complete the problem by planning a presentation.
- Team Member (1) shares the presentation with another team.
- The process continues with another topic or problem, and roles may rotate.

Tuning Protocol

Mode of Instruction: Teamwork

Purpose: Receive feedback

Standards for Mathematical Practice: Reason abstractly and quantitatively. Construct viable arguments and critique the reasoning of others. Attend to precision.

Objective: To promote meaningful mathematical discourse, students share, analyze, and compare teammates' approaches and arguments.

Team Member (1) presents an explanation to a problem to other team members in a short period of time—one or two minutes. The presentation may be a portfolio project, a report, a math problem, Learning Log, etc. When the time is up, team members ask Team Member (1) any questions or clarifications—about one minute. Then Team Member (1) turns away from the team while team members discuss the presentation and deepen understanding of the problem—five minutes—, while Team Member (1) listens and writes notes. Team Member (1) turns back and shares a reflection of the discussion. The role may rotate to Team Member (2) and the process continues. The teacher uses discretion for length of activity.

- Team Member (1) presents an explanation to a problem in teams.
- Team Members ask Team Member (1) questions or clarifications.
- Team Member (1) turns away from the team while listening and writing notes.
- Team Member (1) shares a reflection of the discussion.
- The role is rotated to Team Member (2) and the process continues.

Turn and Talk

Mode of Instruction: Partner Work

Purpose: Share understanding

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Look for and make use of structure. Look for and express regularity in repeated reasoning.

Objective: To promote productive struggle with a topic before mastery is expected, two students share mathematical ideas with each other. Teacher monitors through circulation.

To discuss a procedure or concept without writing, one team member explains while the other team member listens. If there is a disagreement, students continue to discuss the solution and agree on a single explanation. When partners have an explanation, they share with the rest of the team.

- Students work in pairs.
- Team Member (1) explains while Team Member (2) listens.
- Team Member (2) asks clarifying questions to Team Member (1).
- Partners agree on one explanation to share with other members of the team.
- Roles are reversed for the next problem.

Two Stars and a Wish

Mode of Instruction: Independent/Teamwork

Purpose: Reflection and feedback

Standards for Mathematical Practice: Construct viable arguments and critique the reasoning of others. Attend to precision. Look for and make use of structure.

Objective: To establish goals to focus learning, students identify strengths and areas for growth. Teacher monitors students' understanding to guide instructional decisions.

During any presentation, students record two things they really liked—Two Stars—and one suggestion that might improve the presentation—a Wish. At times, a team member may be present to explain or answer questions about the presentation.

- Students record two things they like about a presentation.
- Students record one thing that would improve the presentation.

Walk and Talk

Mode of Instruction: Partner

Purpose: Movement and Communication

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others.

Objective: To implement tasks that promote reasoning, students respond to questions or prompts about a topic while walking. The teacher monitors for multiple points of entry into a topic.

To promote movement during learning, partners receive a topic or concept to discuss while walking—about the classroom, in the hallway, or outside. Partners summarize learning, clarify ideas, or ask questions. Partners report any remaining questions to the teacher after returning to desks.

- Partners receive topics or concepts to discuss.
- Partners summarize, clarify ideas, or ask questions while walking.
- Partners share any remaining questions with the teacher after returning to their desks.

Whiparound

Mode of Instruction: Teamwork/Teacher-led

Purpose: Elicit final reflective comment

Standards for Mathematical Practice: Make sense of problems and persevere in solving them. Construct viable arguments and critique the reasoning of others. Look for and make use of structure.

Objective: To facilitate mathematical discourse, students share understanding of a concept/topic and critique the sharing of others. Teacher uses this time to make instructional decisions about the concept/topic.

Students participate in a teacher-led discussion to share a final comment on a topic, concept, or lesson. Students turn in the direction of the speaker—possibly forming a circle around the classroom. Teacher states the topic or problem, and students take turns sharing brief comments. Students have the option to pass on their turn to share.

Team Whiparound ([Whiparound](#) variation)

Teams participate in a teacher-led discussion to share a final comment. Teams share out only one agreed upon response per team.

- Teacher provides a prompt.
- Students take turns sharing brief comments.
- Students listen while others share.