

Carousel

Purpose: Brainstorm

Several small teams can brainstorm at once with this idea by Pam Robbins. Divide the participants into teams of two or four. Topics or questions are written on large poster paper and either hung up around the room or placed one at each table. Teams gather and discuss the topic and make a decision about what to write on the chart. After two or three minutes the teams move on to the next topic; either the teams move physically if the charts are on the wall or the charts move physically from table to table. The teams read what the previous teams have written, have a discussion, and then add to the list.

This continues for as long as you have time. You do not have to have every team respond to every chart. Stop when you feel that the teams have exhausted most ideas. Then have a “gallery walk” where the teams can go around and read all of the charts.

Some teachers have the problems posted on each poster but the students DO NOT write on the posters. This can be done at the end of the chapter with review problems. Even though the students can sit at their desks and work on the problem this gives them the opportunity to move around.

Carousel: Around the World

- Write a different problem/topic/question on large poster sheets hung on the walls or on each table.
- Each team is given a different colored marker.
- Each team goes to a different poster, discusses the topic and decides what to write.
- Teams rotate to all of the posters, adding to what was written by previous teams (have a time limit).
- When done, each team does a “gallery walk.”
- A large class discussion/debrief can then be held.

Carousel: Index Card

- Have the participants write one thing that they really need help with in their classroom - management, homework, getting kids to work, etc.
- The card gets passed around with the other participants offering suggestions on how to solve the problem.

Carousel: Station Rotation

- Have one or two more stations than the number of student groups.
- Place a sheet of review problems (4 - 6) at each station. (Good idea to use a sheet protector).
- Have a blank answer sheet at each station for each team. (Good idea to have the exact number of spaces needed to answer the questions at each station. All of the spaces are in numerical order even though the team may not solve them in that order. This will make it easier to grade the papers, if you elect to do so.)
- The students work the problems as a team. When they finish they turn in

the station paper to the teacher and move to the next available station.

Dyad

Purpose: Individual think-aloud

Dyads can be used in many ways. The first day of school is an opportunity for students to get some of their excitement out. They pair up and have each person take their turn talking about “How it feels to be back in school.”

If students have concern about a math topic or test or project that is due, this would be a chance for the students each to be able to talk about it. This could also be a time to discuss everything they know about a topic. Then the second person can say everything they know about the same topic. The key to remember is that it is not a conversation.

- Each person is given equal time to talk.
- The listener does not talk; a dyad is not a conversation.
- Confidentiality is maintained.
- Maintain eye contact and good body language.

Elevator Talk

Purpose: Summarize a topic

An Elevator Talk asks students to summarize a concept or topic into a 30 second (maybe a minute) talk. Basically, if someone got on an elevator with you and asked what an equation is, for example, you have until the elevator gets to your floor to explain it. This can be done with Proximity Partners or where the whole team presents to the class.

- Each person/team is given a topic.
- They summarize the topic into a quick presentation.

Fishbowl

Purpose: Model an aspect of teamwork; structured observation

Many times in class there is a need to model a team activity for the whole class. Sometimes it is important to model team norms. A way to do this could be through a Fishbowl activity. This way the students can watch a team as they perform the task. The teacher can point out behaviors that are important to notice. Questions can be handed to the teacher or the team silently and answered when appropriate.

- Used to model to whole class expected behaviors/norms.
- One or two teams sit in the middle of the class and work on the math problem.
- Rest of class stands near the team and observes or takes notes on how the team works, questions that are asked, etc.
- After five to ten minutes, the teams return to their own tables and work on the math problem.

Fortune Cookie

Purpose: Elicit responses from each student to a prompt before discussion

Develop a list of five or six sentence starters to use as “fortunes” for this activity. The topics should center around chapter topics or general ideas or norms that need to be discussed. The sentence starters will need to be

copied, cut apart and one set of each of the sentence starters put into envelopes. Each table gets an envelope.

The **first person** draws a piece of paper, reads it aloud and then makes one statement about it or responds to it appropriately (30 sec). After making his/her **one** statement, the next person rereads the statement and makes one statement **or** makes one comment about what the first person said. Continue the process. After each person has had his/her chance to speak, then the whole team can take part in a discussion if they still have issues to discuss. If needed, place a time limit on this open discussion. (You can tell how the discussion is going as you walk around.)

The **second person** pulls a new sheet of paper out of the envelope and the process is repeated. Everyone will have a chance to begin the discussion by drawing a “fortune.”

You should model this activity the first time it is used. If you have a large team you may want to appoint a time-keeper and limit the “open” discussion to one minute. This activity also provides a good opportunity to model appropriate behavior in dealing with teams. Circulate and respond accordingly.

Option: For each of the “fortunes” of this activity, have a poster with the scenario written across the top already made. Have each team quickly put their best response/comment **on a sticky note** to be placed on the poster.

Note: The focus of the Fortune Cookie activity is the discussion, so do not mention the posters ahead of time, nor make them a big, time-consuming activity. They should be used to wrap up the discussion.

- Choose five or six questions and put them in an envelope.
- Each team receives an envelope.
- One person draws a question, and makes one statement about the topic, then passes it on.
- The next person adds their own statement or responds to the previous statement.
- When everyone has responded to the first statement, another person draws from the envelope and repeats the process.

Gallery or Museum Walk

Purpose: To share ideas with a presentation or poster or give feedback about other teams' presentations or posters

This activity allows students to share ideas with or about posters or presentations. After the posters or presentations are displayed, students walk around the room in teams or individually; quietly (Museum Walk) or talking (Gallery Walk) in their team.

After students have posted their presentations either at their desks/tables or on the walls, students walk around and look at/read the presentations giving feedback (if the teacher desires this). Otherwise they go around to see what

the other teams are presenting.

The Gallery Walk can be done in teams where the teams review the presentation, discuss it with their teammates and then write their comments on post-its to share with the team who prepared the presentation. Typically, they do something like 'two stars and a wish': Two things they really liked about the presentation and one thing that they feel the team could do to improve their poster/presentation. Sometimes the team leaves a representative with their presentation to answer questions.

A Museum Walk is like a Gallery Walk except there is no talking. If feedback is to be given, it is done individually and on post-its or a sheet of paper left with the presentation.

- Students post their presentations around the room.
- Students, individually or in teams, walk around and look at the presentations.
- Students give feedback.

Give One – Get One

Purpose: Share ideas

This is an activity to use to get people to share a lot of ideas or suggestions. An idea for adults could be to share ideas for correcting homework. For students you could ask the students to write three ideas for being successful in class. Or they could do this activity at the end of the chapter and write down three things that they learned in the chapter.

Record three ideas to share related to a certain topic on separate pieces of paper or index cards.

Circulate and share ideas; for every idea given they receive one in return and record these on a piece of paper – including the name of the author.

Begin team sharing by inviting a volunteer to share one idea received citing the author. The named person then continues the sharing process.

- Record three ideas to share related to a certain topic.
- Circulate and share ideas; for every idea given they receive one in return and record these on a piece of paper – including the name of the author.
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Hot Potato (Round Table)

Purpose: Each student participates in constructing an answer/response

A Hot Potato is a way to pre-assess or review multi-step problems. Every team needs one paper and one pencil or one paper and a different color of pencil for each team member. A different color of pencil for each team member differentiates who did which part of the problem.

The paper should be placed in the center of the team/table. The first person writes down the first step, simplification, or answer while

explaining their thinking aloud. The next person corrects the first person's work, if necessary, and then puts the next step down, while explaining their thinking out loud. The third team member corrects anything that is incorrect and then does their writing and explaining. And so on, until the problem is completed and checked.

At the end you could have the students each sign off that they understand and agree with everything that was written down.

Another way of doing this is with a timer. The first person works on the problem doing as much as they can in 30 seconds, explaining aloud everything that is being written. Then the next person has to pick up where the first person left off (so they need to pay attention), for another 30 seconds and so on. They keep going around until all the problems are finished.

- Every team has one sheet of paper and each student has a different colored pencil.
- A problem is given to the group.
- The first person writes the first step of the solution process, explaining aloud, and passes the paper on to the next person.
- The second person makes any corrections and adds the next step, explaining aloud, and passes the paper on.
- Process continues until the problem is completed.

Hot Seat

Purpose: Individual accountability during teamwork

Because individual accountability is so important, a Hot Seat is a good way to emphasize this. After the teams have been working on a set of problems, have one member from each team come to the front of the classroom to work individually. A problem (similar to the ones they have been working on) is put on the overhead with a two minute time limit. The team members left in their team, work quietly together to solve the problem. The team member in the front works without talking, independently, on the same problem. At the end of two minutes, the teacher checks the solutions. Two points are awarded to each team if the individual member at the front gets it correct. One point is awarded to each team if the team gets the solution. Continue with a new team member going to the front.

- One chair/desk per team is set up in the front of the room.
- Using Numbered Heads, Person #1 from each team comes to the front of the room and sits.
- Teacher gives everyone a problem to work on in a specified amount of time.
- Teams can talk, but not the individuals in front.
- Check individual and team answers; two points for correct individual

answers and one point for correct team answers.

- Person #2 from each team is up next and repeat.

Huddle

Purpose: Deliver information to teams; collect information on team progress

If you want to check on the progress of the teams, give additional information or ask for a consensus on something to do with the problem everyone is working on, you could call a “huddle.”

Have one person from each team come to a meeting (at the front of the room or just outside the door). You give that person the information and they return to the team and share it. This is a great way to give status to a low status team member. It gives them something important to share with the team. It is also a way to communicate with all the teams without having to call the whole class together.

This strategy can bring an isolated student into the conversation as an important part of the team. Sometimes it is a good idea to let a student who has a perceived low status to be the person chosen to go to the Huddle. This way they will have something important to bring back to the team.

- One person from each team (teacher’s choice) is called to the front of the room.
- Teacher gives a piece of information, checks for understanding....
- Student goes back to team to share.

I Spy

(Send a Spy)

Purpose: Share ideas between teams

If a team is stuck on a problem, one way to get unstuck is to send a spy to another team. The spy can walk up and listen (no talking allowed) to another team until they get ideas to help them continue with their problem. The spy then goes back and reports to their team. No one in the team that the spy visits should be distracted by or talking to the spy.

Sometimes it is a good idea to let a student who has a perceived low status to be the person chosen to be the Spy. This way they will have something important to bring back to the team.

Another way to do a spy mission is with Helpline. Have a place in the classroom where hints are posted. Could be a table with index cards with hints. Could be a sheet of paper on a bulletin board. The Spy is the only one allowed to access the hints. S/he may not remove the hints but can take the information back to the team.

- When the team is stuck, one student (i.e., the Resource Manager) can go around to another team and listen in.
- No talking.
- Student reports back to the team what was learned.

Jigsaw

Purpose: Build understanding of a large quantity of information

This cooperative learning activity asks students to become experts in a particular area and then share their newly found knowledge. There are various ways to organize the jigsaw activity, but the central concept is that teams of people are assigned or select topics that they teach to others. The teams decide collectively and cooperatively how they are going to share what they know.

One way to acquire knowledge from a large amount of material is to break it into smaller pieces. Each team of students becomes an expert for a part of the material and then shares their knowledge in their team. For example, if a large part of a reading assignment is broken into four parts, then each member of the team takes one part to become an expert on. Each team numbers off from one to four. All the ones become expert on the same material and discuss it in one section of the room. All the twos do the same with their part, as do the threes and fours. Then they return to their original teams and each shares their information.

- Each study team member is assigned a different part of a task/topic.
- Each member researches/learns about the task/topic (possibly with others with same topic).
- Each member then presents the information to the others in his/her study team.

Listening Post Purpose: Focus attention on questions and problem-solving process

In a team of four students, two of them, A and B, are the “mathematicians” who vocalize their thinking as they work together on a problem. Solving the problem is not the main focus of the “mathematicians;” rather, they concentrate on vocalizing their thoughts as they work toward a solution.

Another person, C, listens to the “mathematicians” as they work and asks for clarification when needed. As an active listener, C seeks to understand the mathematicians’ thinking.

The fourth team member, D, silently observes A, B, and C, and records what happens. As a silent observer, D may only take notes about what goes on, and may not join in or interfere in any way.

After five minutes, the work stops and the team processes what occurred for 10-15 minutes: First, C explains what A and B were talking about and doing; then A and B respond to C’s interpretation; and lastly, D shares notes and observations.

After processing one round, roles are rotated among team members and the process starts again, with the new “mathematicians” selecting a new problem. The exercise continues until all team members have played and processed each role.

A modified Listening Post would be where one person is selected to be the Listening Post. For 10 minutes or so, the Listening Post is to record questions that are being asked by the other team members. Or the Listening

Post could record what the team members are saying to each other, or who is doing the talking or any other norm that needs to be observed. The Listening Post is not allowed to talk, only record. At the end of the 10 minutes, the Listening Post reports to the team his/her observations. This can also be used when you want to make sure that vocabulary is being used. Give the person designated as the Listening Post a list of 5-6 vocabulary words. S/he records each time a team member uses the vocabulary word(s) correctly.

It can be used when one member of the team seems to be dominating the conversation. It can also be used when a team member needs to be aware of what dynamics are going on in the team. Another purpose is when you need to raise the status of a team member.

- Students #1 and #2 work on a math problem aloud in their team.
- Student #3 listens to the discussion and can ask clarifying math questions.
- Student #4 only records what is discussed and verbalized (looks for attitudes) and may not talk.
- After 15 minutes, work stops and student #4 shares notes and observations.
- A variation is Students #1, #2, and #3 work and #4 observes and then shares.

Math Chat (Chalk Talk)

Purpose: Silent reflection or idea summarizing

A Math Chat is a silent way to do a reflection, summarize ideas, generate ideas, check on learning, develop projects and solve problems. Because it is done completely in silence, it gives students a change of pace and encourages thoughtful contemplation.

Cut four large pieces of butcher paper and put one on each of the four walls. You can do 3 if you want. Pick four topics and place one topic in the middle of each piece of butcher paper. These topics can reflect what was learned in the chapter or could be general topics about classroom behaviors or norms. The students will work silently and individually. Each student will need a poster marker.

To start, count off #1-4 in the teams using Numbered Heads (or if you use Team Roles, you can sort by those). All the #1s go to one topic, the #2s to another topic and so on. For the first few minutes the students are to stay at the topic where they are assigned. After that, they can wander randomly to any of the topics. Their task is to write anything they know about the topic, any questions that they still have about the topic, or pose a problem about the topic that they want others to solve. They are to keep moving individually to each topic and read what others have written. They are to add their thoughts to any posters and make connections to thoughts on the poster by drawing arrows or circles. Before time is up (this can go on from

10-20 minutes), have the students make one last pass by each poster and read them. This makes a good review for the test.

When the Math Chat is done, there is no discussion. It is done.

Time varies according to need.

- Have posters, with a topic on each one.
- Each person has a writing utensil.
- No talking.
- People write something about the topic.
- When it's done, it's done.

Numbered Heads

Purpose: Individual accountability during teamwork

Numbered Heads is an effective strategy for keeping all students involved and accountable during teamwork.

Students number off in their 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.

While teams are working, you can use the numbers to randomly ask students questions about the work their team is doing. When the teams finish, use the numbers to have teams share their answers, the process used, or any other appropriate response. Students can signal responses, explain, hold up a paper for a quick check, etc.

This is also a good way to assign team roles or have students pick up materials or turn in papers. For example, all the #3's can pick up the supplies for their team project. The #4's can report out.

- Students number off in study team.
- The team is given a problem to do.
- When the team finishes, use random numbers (1 - 4) to ask questions or have team members share the solution process.
- The numbers can also be used to assign roles.

Pairs Check (Rally Coach)

Purpose: Check individual understanding with opportunity to ask questions

Pairs Check is an effective strategy to use when students are practicing a new skill or procedure or to pre-assess a topic that will soon be taught. Students work in pairs to solve problems and then check their solutions with another pair. Each pair has one paper and one pencil. Student #1 does the writing while student #2 does the explaining. If Student #1 does not understand part of the explanation, it is their responsibility to ask questions and *not* blindly write everything that Student #2 says. Then the paper and pencil are passed to student #2 and they reverse roles for the second problem.

When the first two problems have been completed, each pair stops and checks with another pair. If both pairs agree on the first two problems, have them make a check mark and proceed to the next two problems. If they disagree, they review their work and figure out what went wrong.

Once the students are familiar with the process of Pairs Check, they can set up their own work-space or work directly from sets of problems in their text. It is easy to use problems from the book for this strategy.

- Each pair has one paper and pencil.
- Student #1 writes what Student #2 explains.
- Then roles are reversed for the second problem.
- Then each pair checks their work with the other study team pair.
- Continue on to the next pair of problems.

Participati on Quiz

Purpose: Assess team interaction and communicate characteristics of effective teamwork.

~~Teaching students to work effectively in study teams must be done explicitly and routinely. Even in classes that function well, teamwork can periodically break down. When a particular lesson is especially challenging, students may not realize that their best teamwork skills are required for success. To help with these struggles, teachers developed a structure known as a Participation Quiz.~~

From Assessment in TE-there are 2-3 more pages.... Participation Quizzes allow teachers to assess (and therefore support) the quality of the teams' cooperation, independent of mathematical content. We know that students do not just work well together automatically. Teachers who are clear about the value of study teams for student learning nevertheless often report struggles such as these:

“How do you get students to work well in study teams? My students seem to just talk about hair care and sports unless I’m standing right there.”

“My students are just rushing through the problems without looking for deep understanding.”

“Whenever my students hit a tough problem, they just give up and sit there.”

“My students are really reluctant to work together, so I end up running all over the classroom answering individual questions.”

Teaching students to work effectively in study teams must be done explicitly and routinely. Even in classes that function well, teamwork can periodically break down. And, when a particular lesson is especially challenging, students may not realize that their best teamwork skills are required for success. To help with these struggles, teachers developed a structure known as a *Participation Quiz*.

In a Participation Quiz, the **quality of the teamwork** on any given task is documented and assessed directly by the teacher, rather than the mathematical

content. As students work together, the teacher watches and listens, recording observations on a transparency or board. Below is an example of what this record might look like:

TEAM 1	TEAM 2
<ul style="list-style-type: none"> • <i>Quick start! Facilitator reading immediately.</i> • <i>“Does everyone understand the question?”</i> • <i>Great team question</i> • <i>“What if we...”</i> • <i>Explaining in the middle of the table – all 4 leaning in to see and discuss.</i> • <i>“I think the graph is saying that ____ because ____...”</i> • <i>“Wait, explain that again.”</i> • <i>All four sticking together: “Are we all ready for the next question?”</i> 	<ul style="list-style-type: none"> • <i>All four reading quietly – Make sure you discuss!</i> • <i>Talking outside group – Task Manager please do your job!</i> • <i>Making statements but without reasons – Tell WHY!</i> • <i>All four working but in pairs – be sure everyone understands and agrees.</i> • <i>One person blasting ahead.</i>

As you can see from the sample notes, a Participation Quiz documents the language, behavior, and even body language teams use as they work on a task. For classes implementing team roles (Facilitator, Task Manager, Recorder/Reporter, and Resource Manager), it documents successful use of these roles. This documentation gives teams real-time feedback on the teacher’s expectations and how teams are doing.

- Pick a team worthy task.
- Tell students which norm you are focusing on.
- Show teams how you are keeping track (overhead, posters, chalkboard).
- Record comments while students are working.
- Debrief (do not need to record everything).

Peer Edit

Purpose: Individuals give partners feedback

This strategy allows peers to give each other feedback either orally or in writing. It can be used especially when writing Math Notes or Learning Logs. After the students write their consolidation of thinking, they find a partner.

One way to do Peer Edit is to have the student read their paragraph to their peer. The peer can ask questions for clarification, give suggestion or compliments. Then switch roles. Reading aloud can offer a different perspective than writing does.

The other way to do a Peer Edit is to have the two peers switch papers and then read and edit the work. Then they return the paper. The peers should read the comments, and rewrite, if needed.

- Students write.
- Peers read aloud or switch papers.
- Peers edit the paper (orally or in writing).
- Return to the writer for rewrite.

Proximity Partner:

Purpose: Pairs share information

Using Proximity Partners allow the students to get up and move around. It is very important for students to move during a lesson so that their brains can grow. They are to find a partner other than someone on their team. This can be done in many ways. One way is to have the students stand up and push their chairs in, then walk around to music. When the music stops, whoever is nearby is their Proximity Partner. They introduce themselves and wait for directions. Another way is to give them a list of directions to do. When they finish, whoever is standing nearby is their partner. Directions could be, "Touch two walls, one door, and three desks." With their partner you can have them do Reciprocal Teaching (see below), or a Walk and Talk (see below) or just stand and summarize everything they have learned that day. If you do Learning Logs or Journals, have the partners talk to each other about the prompt before writing their thoughts. This can help to clarify their thinking. Make sure to have them thank their partner when they have finished, before they return to their team.

- Students stand up and move to find a partner.
- They share information with their partner.
- They return to their team.

Reciprocal Teaching

Purpose: Individuals articulate understanding

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 had just learned. Or this might be a way to introduce the topic of the day by remembering some of the parts leading up to the concept that have been learned in previous units. Done in the middle of class reciprocal teaching could be used to check the comprehension of what is being learned in that day's lesson. This is also one way to summarize topics at the end of class.

Have students seated in pairs facing the front of the room. One student is A, the other is B. After a small amount of material has been presented (teacher, video, reading, etc.) ask student A to suppose that her partner B just arrived and, therefore, missed the information presented. A's task is to teach the material to B. While A is teaching, listen to as many pairs as possible to make sure what they are teaching is correct and to identify questions and points of difficulty.

As more information is presented continue having the pairs teach, but

reverse the role each time.

- In pairs, Person A pretends that Person B was absent and explains a concept.
- Switch roles and continue.

Red Light Green Light

Purpose: Check in with teacher at a specified point.

Often the teacher will not want the students to go ahead and work on the next problems without having the opportunity to make sure the solution is correct in the first problem. It might be that the problems all build on one another and if the first problem is done incorrectly, it will affect the outcome of subsequent problems. Or it might be that there are many different problems that are unrelated, but the teacher wants to check each solution before the teams move on to the next type of problem. This is when a Red Light Green Light Strategy can be used.

Have the teams work on the problems together but they cannot go on to the next problem (Red Light) until they check their answers with the teacher personally or at a location the teacher has designated for answers (a set of solutions placed in a corner, on a wall or even the teacher edition open and ready to view). When their solution is verified, the team moves on (Green Light) to the next problem.

To make a competition out of it you can draw a game board on the board with places for each problem in the lesson. Use post-its with each team's number (or magnets might work) and place them in the box with the first problem number. As a team finishes a problem and it is correct, they move their post-it to the next space/problem. This continues throughout the period. The teacher can monitor the progress of all the teams and work with the teams who are not progressing as quickly. They can also check in with the teams that are moving quickly and check for understanding by asking them a more challenging questions to deepen their understanding.

- The team works together on a problem or set of problems.
- When they finish the problem, then they must *Stop*.
- The teacher verifies the work/answer with questions.
- The team is then given permission to *Go* to the next problem or set of problems.

Silent Debate

Purpose: Present logical arguments; written communication

A Silent Debate is a great way to improve the writing/communication skills of students. It helps them to realize that it is important to be very clear with what they are saying and also learn how to present logical arguments. This is very similar to an oral debate except that it is *silent*. The students pair up and the teacher assigns one person to take the pro side and the other takes the con side. They do not get to choose. The pro goes first. Each pair has

one paper and one pencil between them.

A topic is given to the students. The pro writes it down and then makes a statement, *in writing*, in support of the topic. Then the con reads the statement and responds to the statement or makes a comment against the topic. This goes on, back and forth, until everyone has had three or four chances to respond. Remember the topic must be a statement and not a question.

- Student pairs: One is “pro,” the other “con.”
- Each pair has one pencil and one sheet of paper.
- A topic is given, the pro goes first.
- The pro makes a supportive statement in writing.
- The con reads the statement and then writes a comment against the topic.
- The process repeats three or four times.

Swapmeet

Purpose: Share ideas (beyond study teams)

When students are working on a Big Problem, sometimes it is well worth the time to have them share their ideas or hear other team’s ideas without having a whole class discussion. One way to do this is through a Swapmeet. Part of the way through a problem (or when the problem is completed), have two people from each team rotate to a new team. They can then share what they have been working on, what strategies they have tried and what questions they still have. After each pair shares with one team, they return to their original team. Then they share what was learned from other teams and continue to work.

- When a team task is partially finished, one pair from each team rotates to the next team.
- Pairs from the two teams share ideas, solutions, thinking...
- Pairs return to their original teams and share what they learned.

Teammates Consult (Pencils in the Middle)

Purpose: Team discussion and decision-making

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. Students begin by putting all pencils and calculators in the center of the table. One student reads the problem or question to the team or each student reads it individually (silently). The students take a minute to think of their own strategy for solving the task or even come up with questions they have about the task. Then they discuss the problem, making sure that each team member understands the information given and what they are asked to do. Possible strategies and answers are also discussed and explored. This is not Mental Math.

When each student in the team understands the problem and has a strategy for solving it, all the students pick up their pencils and write out their solution. It is best for the teacher to signal to the class when they may pick up their pencils. The teacher can determine when to do this by walking around the room, listening to the team discussions, and questioning team members. To check for understanding of the task questions to the team or whole class should include questions about the task and what the team is supposed to do, what supplies might be needed, how the task could possibly be split up among the team and maybe some questions about what strategies the team is considering. Students may then compare their work with others in their team or share it with the class. Team Roles or Numbered Heads can be used for determining who will read the problem, who will answer the questions, and who will share the solution with the class. Individual student papers can be collected for evaluation.

- All pencils and calculators are set aside.
- Students read the problem or question.
- Give students individual think/work time.
- The problem is discussed by the team for clarity.
- Possible strategies are shared.
- Teacher gives okay for pencils to be picked up and written work to begin.

Think-Ink-Pair-Share (Timed Pair Share)

Purpose: Individual reflection prior to discussion

Think-Ink-Pair-Share was developed by Frank Lyman and his associates at the University of Maryland. It works well when students are involved in concept development or problem solving situations. The strategy emphasizes the importance of thinking about the situation before jumping to an answer. It gives students the opportunity to be creative and to explore different approaches.

Students work with a partner. They begin by *thinking* about a question or problem without the use of a pencil or paper (about two minutes, depending on the difficulty of the problem). Then the teacher gives the signal that they

may use their pencils. At this point they still may not talk to their partner. They decide what approach to use and write down their ideas, solutions, etc. Then after a period of time determined by the teacher, they *pair* up and *share* their thinking and work with their partner. When partners have finished sharing, you may want to have each pair share within their team or have students share with the whole class.

It is called a Think-Pair-Share when no writing is required.

- Teacher poses a question/problem.
- Without pencils, students think for one or two minutes.
- (Students may then use pencil to begin working...without talking to partner).
- Students then share their thinking and results with their partner.
- Pairs then may share with their team or the class.

Traveling Salesman

Purpose: To have students communicate mathematically

The Traveling Salesman strategy has students in a team plan a presentation around a math problem or topic. It doesn't matter if all the teams have the same problem or not. The students plan and practice the presentation with their team. Then one member (salesman) from each team rotates to another team to pitch their presentation. The team can ask the 'salesman' any clarifying questions. Then the 'salesman' rotates to the next team to present again. The salesman can be the same person for the sales pitch or a different team member can do the presentation each time there is a rotation. This works well in combination with Numbered Heads. The Number 1's all rotate the first time, the Number 2's the second time and so on. Or the teacher can always randomly (or on purpose) choose the 'salesman.' It might be the time to choose someone who does not speak up much or one who usually does not get actively involved in working with the team. There does not need to be a rotation to every single table. The purpose is to make sure that students have a chance to present.

If time is limited, one rotation might be all that can be done.

- Teacher assigns a topic/problem to each team.
- Students solve the problem then plan a presentation.
- One team member presents the mathematics to another team.
- Repeat.

Tuning Protocol

Purpose: To have students receive feedback from peers

In a team, one person presents to the other members (1-2 minutes). The presentation can be a portfolio project, a report, a math problem or even a Learning Log. The other team members are taking notes. When the time is

up, the presenter answers/clarifies any non-evaluative issues that team members may have (1 minute). Then the presenter turns his/her back to the team while they discuss any points, key questions, issues that come up as they strive to deepen their understanding of what was presented (5-7 minutes). The presenter is taking notes. The presenter then turns back around to join the team and shares their reflection on the team members' conversation. Change presenters and repeat the process. If doing Learning Logs, the time can be shortened.

- One person presents problem to team.
- Teammates ask clarifying questions.
- Presenter turns around.
- Teammates discuss problem, coming to a better understanding.
- Presenter takes notes and reflects on what is said.

Walk and Talk

Purpose: Use movement while communicating mathematically

Walk and Talk allows the student to move around, which is good for their brain cell growth, while talking about mathematics. Students are put in pairs, their choice or the teacher's, and take a walk around the classroom (or outside if possible) while they talk about some aspect of what they have been learning. They can summarize what they learned, clarify ideas, ask each other questions or come back with a question for the teacher.

If there is not enough room to have the pairs walk around, another idea is to have the students find proximity partners. They stand up, push their chair in, touch 2 tables/desks, three walls and a chair and find a partner, not from their team (or you can play music and have the students walk around until the music stops). Then whomever they are standing near is their proximity partner. They stand there and talk about the topic. When they are finished, they say thank you and return to their team.

- Topic is presented.
- Pairs walk around the classroom (or meet with a partner) discussing the topic.

Whip-Around

Purpose: Elicit final reflective comment from each individual

The Whiparound allows each person to have a final comment about a problem or lesson, or offer a suggestion. Whiparounds work best with everyone sitting in a circle, but does not have to be set up that way.

The teacher states a topic or question and the students make a brief comment about it. They could go in order around the circle or anyone could talk. Everyone does not have to make a comment, but they are encouraged to do so. Some teachers do a Whiparound with a ball (or ball of string) and has the student who is sharing toss it to the next person who will share.

- Topic or question is presented.

- Students randomly have an opportunity to say something briefly about it.
- Everyone does not have to comment but are encouraged to do so.

*Another form
of Whiparound*

*I Have....., Who
Has.....*

- Each student has one card with problem and an answer to a different problem.
- Student 1 asks “Who has...” and states the problem.
- The person with the solution says “I have” and states the answer.
- The responding student then poses his problem and the student with the answer on his card responds.
- The process continues until all the questions and responses are given.

