

Girls Excelling in Math Teams General Session Format and Coaching Tips, *compiled by Village School*

Suggested Coaching Norms

1. Emphasize **kindness and respect** in all interactions.
2. **Value mistakes** as learning opportunities. Provide opportunities for students to share their approaches, even if it led them to a wrong solution. There is almost always something *right* in the work a student has done to reach a *wrong* answer. Related, don't be afraid to be wrong in front of your team. If you solve a problem at the same time they do and get a different answer, ask them to show you their thinking. If they were right and you were wrong, they'll be thrilled, and everyone can learn from your mistake, too.
3. Encourage solution methods that **meet students where they are** rather than relying on solutions that depend on processes they may not have learned yet. There is always a way to solve a problem that students can access with their prior knowledge.
4. **Include everyone.** If a student seems disengaged, ask them questions about their thinking, their prior knowledge, and invite them in to the problem in an accessible way. Ask the team to consider how they can best employ everyone's efforts to maximize the team's success.
5. **Keep it positive.** Model and praise enjoyment of the math and the problem-solving process, including perseverance. Check in with a mathlete's teacher if you suspect anyone is struggling to enjoy the experience or struggling to allow others to enjoy it.

Suggested Team Norms

1. Ask questions.
2. Work hard.
3. Have a growth mindset.
4. Persevere.
5. Support others.
6. Collaborate.
7. Strategize.
8. Think outside the box.

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Suggested Pacing of 45-minute Session

2 min. Greeting* and take attendance

8 min. Introduce the problem-solving phase or strategy of the week and team cooperation strategies

25 min. *Option 1:* Solve problem set focused on the phase/strategy of the week

Option 2: Solve mixed team math contest problems

(Math Olympiad for grades 6 and below; MathCounts for grades 6 and above)

10 min. Check and discuss solutions (key provided)

**Especially toward the beginning of the season when your team is getting to know you and each other, include a math-related get-to-know-you question, like…*

- ☐ What is your favorite number and why?
- ☐ Is your birth date (day of the month) prime, composite, or neither, and how do you know?
- ☐ What is the ratio of your age to the age of someone else in your family, in its simplest form?
- ☐ Were you born on an odd or even day of the month?
- ☐ What day of the week will it be on your next birthday? (Remember 2024 is a leap year!)

Ideas for introducing the Problem-Solving Phase or Strategy of the Week…

- Preview the lesson before your team meeting and summarize it for your team. Point them to interesting example problems in the brief text that help make the point.
- Allow them to read through the lesson independently for a few minutes before discussing it. Ask them what they think the big take-away is.
- Frame the new phase or strategy by asking what could happen if you didn't take the time to consider that phase of the process or use that (or another effective) strategy.
- Before tackling any problems in the accompanying problem sets, ask them to preview them to look for problems where the new phase would be particularly important or the new strategy would be particularly useful.
- If available, show the accompanying video clip introducing the strategy on a projector or simply from your personal device. Pause and check for understanding as you go.

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Ideas for promoting team cooperation during the problem-solving portion of your sessions…

- **Introduce strategies for team collaboration:** *(See following page for strategies.)* These strategies can be used in combination or alone. Teams are encouraged to experiment with different approaches. Coaches can share all these at once, or introduce a couple each week.
- **Use a team Answer Column:** As the team comes up with solutions, they get entered in one collective answer column. If a problem is missing an answer, the team knows to put someone on it. If two people get the same answer, that problem is considered finished. Two different answers point to needing another check. You can provide feedback as they put answers on the official Answer Column: check if right, circle if wrong. Consider giving them a hint if wrong, and encourage them to submit a revised answer next to their original answer.
- **Use think-pair-share problem by problem:** Read the problem aloud. Allow everyone 1 minute to work alone. When they're ready, they look up and if others are ready, too, they begin collaborating in pairs or as a whole team. Allow about 2 minutes for this. When they're ready, they share their strategies with you and each other. This is a time to insert other ways to think about the problem or more efficient strategies (as developmentally appropriate) to consider. Repeat the cycle with the next problem.
- **Use think-pair-share for a whole problem set:** Same as above except expand to time increments suitable to a whole problem set. (Try all problems independently for 10 minutes; pair up on any problems as needed for 15 minutes; share as a whole group about the whole problem set for 20 minutes.)

Strategies for Team Collaboration

- ***Call-It*** As the team reads through the problems, individuals "call" as theirs the problems they feel most ready to solve, so each problem will be tackled by someone who considers that type of problem to be a strength.
- ***Odds-Evens*** Two team members do odds, two do evens. Partners can work together or solve and compare.
- ***Solve-and-Compare*** All try all problems, then compare answers.
- ***Cycle*** All try all problems, but each person starts at a different problem, so if you run out of time, every problem has at least been attempted by one person.
- ***Solve Together*** Team works together to solve all problems or some of the problems.
- ***Prioritize*** Realize that you may not have time to solve all problems and start with whichever problems seem most accessible.