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What are math routines, and how can you use them?

GRADES 6–A1

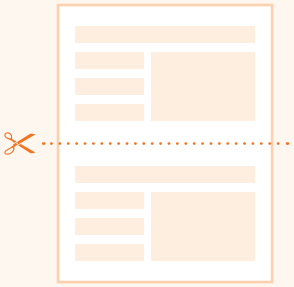
Routines are a way for you and your students to maintain a sense of familiarity and structure throughout the school year. Over time, routines free up time you would otherwise spend giving directions and allow students to focus on math rather than how to engage in an activity. When everyone knows how a certain activity should run, and when instructions and expectations are internalized, everything goes more smoothly. Having a core set of shared routines can also create a powerful, practical force for establishing a classroom learning community.

In addition to instructional routines, you will find Math Language Routines (MLRs). These routines are designed to facilitate meaningful communication and understanding of mathematics, aiming to support students in both their math learning and language development simultaneously.

The included routines have been adapted from established teaching practices and, in most cases, research that offers direct evidence that these routines are effective for the diversity of students who use them.

Instructions

Starting on the next page, split tables by cutting along the dotted line at the center of each page.



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Number Talk

Do you want to encourage students to think about structure, patterns, and properties?

GOAL: Develop fluency and solve problems efficiently with a various strategies

TIP
Encourage students to inconspicuously signal with their fingers the number of strategies they've come up with. Invite students who have fewer strategies to share first.

How to do it:

- Display one math problem at a time.
- Invite students to think quietly about the different ways to solve the problem and signal when they have an answer and a strategy.
- Invite several students to share different strategies for each problem. Consider asking questions like: "Who thought about it a different way?" or "What connections do you see between the strategies?" Record strategies along with the students' names for all to see.

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Tell a Story

Do you want to support students by activating prior knowledge and creativity?

GOAL: Foster creativity in making sense of images, tables, graphs, etc.

TIP
Have students work independently first, then share and compare their thinking with a partner before a whole class discussion.

How to do it:

- Display a graph, table, image, video, mathematical expression, etc.
- Give students a few minutes to write a story using their unique experiences, perspectives, and identities.
- During class discussion, celebrate creative responses, highlighting vocabulary and similarities and differences in students' stories.

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Notice and Wonder

Do you want to make certain mathematical tasks more accessible for all of your students?

GOAL: Make sense of a math representation, context, or task, and promote curiosity

TIP
In a time crunch? Invite students to share with the whole class without first sharing as pairs.

How to do it:

- Display a mathematical representation, image, or other media. Then ask, "What do you notice? What do you wonder?"
- Give students a few minutes to think. Then invite them to share with a partner.
- During class discussion, ask several students to share what they noticed and wondered, celebrating the variety and creativity of student responses.

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Which One Doesn't Belong?

Do you want to support students in noticing and precisely describing properties of mathematical objects as they compare and contrast them?

GOAL: Foster a need to define terms carefully and use words precisely

TIP
Consider asking a student to share why they chose an object without naming it. Then, ask the class to determine which object they chose.

How to do it:

- Display four mathematical objects such as, figures, diagrams, graphs, or expressions. Then ask, "Which one doesn't belong? Why?"
- Give students time to think independently and encourage them to look for more than one possibility.
- Invite students to share ways that each choice is different from the rest with the whole class, and give them opportunities to make their rationale more precise.

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Stronger and Clearer Each Time (MLR1)

Do you want to support students in explaining their thinking more precisely and clearly?

GOAL: Provide opportunities to critique mathematical reasoning and refine justifications

TIP
Consider posting sentence starters for feedback, such as, "How do you know that...?" and "What do you mean when you say...?"

How to do it:

- Give students time to think independently and create a first draft response to a problem.
- Invite students to take turns sharing their response with a partner and giving feedback to help them revise and clarify their thinking.
- Encourage students to revise their original response so that it's stronger and clearer.

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Collect and Display (MLR2)

Do you want to support students in developing new math language and concepts by creating a display of student language or strategies?

GOAL: Increase accessibility and make connections between student language and new mathematical language

TIP
Consider adding translations of the new terms in other languages your students speak.

How to do it:

- As students share their thinking, listen and take notes on how they are describing a strategy or making sense of a new mathematical term.
- Add student language, examples, diagrams, or strategies on a visual display for the class to reference.
- Encourage students to revise and add to the display over the lesson, unit, or course.
- Invite students to create a class definition or description from the gathered student thinking to add to the display.

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Compare and Connect (MLR7)

Do you want your students to make sense of multiple strategies for solving the same problem?

GOAL: Provide opportunities to identify, compare, and contrast multiple strategies

TIP
During partnered discussion, consider displaying sentence frames such as, " First they... Next they..." "Their strategy was to..." or "I see a/an... in both strategies."

How to do it:

- Invite students to solve a problem that can be solved with multiple strategies. Then, display two or more different responses representing different strategies.
- Give students time to analyze the strategies both on their own and then with a partner.
- Facilitate a class discussion to describe, compare, contrast, and connect the different strategies. Utilize open-ended questions like, "Why did different strategies lead to the same outcome?" or "What was helpful about each strategy?"

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Think-Pair-Share

Do you want your students to have more time to think before solving and sharing thoughts about a problem?

GOAL: Support collaborative learning in a low stakes environment

TIP
To encourage partner discussion and build classroom community, consider inviting students to connect over a fun, low-stakes question before they discuss the math prompt.

How to do it:

- Give students time to think independently about a given prompt.
- Invite students to swap ideas with a neighbor, and ask clarifying questions as needed.
- Invite several students to share their thoughts or their partner's thoughts with the whole class.