

Use Your Math Power Books: Model Mathematical Practices

The following lessons present ideas for using the **Use Your Math Power** books to model mathematical practices, focusing on perseverance and communication. In the lessons, students reflect on how they can engage in a learning community to help them succeed in math.

The **Use Your Math Power** books and lessons are useful early in the year to set expectations, or during the year to reinforce best practices. Though set in a primary classroom, elementary students of various ages can easily focus on the practices in the books, even if they are familiar with the math content.

The following lessons include suggestions for first readings of the books and two additional lessons for each book.

Book Summaries

In **Monkeys for the Zoo**, the characters solve a “Put together” problem where both addends are unknown. During the initial discussions, Mia thinks to herself about her confusions and her ideas. As Mia listens to her classmates ask questions and take risks, she works up the nerve to add her own ideas to the conversation.

In **Hatching Butterflies**, the characters work to solve an “add to” problem with the “change unknown”. They work to understand the problem and find the missing addend. Carlos and Hannah struggle as partners, but finally figure out how to share their thinking and work together successfully.

In **Penguins on Parade**, the characters work to figure out how to count by tens starting at a non-zero number. Trevor wants his teacher to tell him how to do this, but he reluctantly joins his partner Zoe as she uses ten frames to add on tens and list the subtotals. Their classmates help them understand patterns in counting by tens.

A First Reading: Focus On Enjoying And Retelling

Before Reading

If your students have never worked on the type of problem in the story, you may want to give them a similar problem to work on in pairs first. A bit of time working together to make sense of the problem will prepare students to understand the thinking in the book, helping them focus on the characters’ interactions.

A similar problem for **Monkeys for the Zoo**:

Ms. Green’s class saw 10 birds in the yard. Some of them were pigeons and some of them were cardinals. How many of each could they have seen?

A similar problem for **Hatching Butterflies**:

Justin’s class had 6 roses in a vase. Ms. Green wants to give them some more roses so that they will have 12 roses. How many roses should Ms. Green give them?

A similar problem for **Penguins on Parade**:

Maria had 2 tulips in a vase. Her mom gave her ten more. How many tulips did she have then? Then her dad gave her ten more. How many did she have then?

If students are already comfortable with the math content, ask the following:

Think about a time when you were working on a math problem you hadn’t seen before. What was that like? What helped you?

Read and Discuss

Read the story. Have students retell the story together. This is a chance for students to describe how the characters worked together without being told how to solve the problem by the teacher. Prompt with questions such as:

What happens in this story? What happens next? Did anything surprise you? What did the characters do? What were the characters feeling? Why?

Monkeys for the Zoo: Gaining Confidence to Share Your Ideas

Goal: Children will gain insight into how they can work with classmates to make sense of unfamiliar problems.

Rereading the Book

Reread the book **Monkeys for the Zoo**, stopping at key points for discussion. Prompt with questions such as:

Page 4: How does Mia feel at the beginning of this book?

Page 6: How does Mia feel when she works with Ben?

Page 10: How do you know that Mia understands some things about the problem?

Page 16: What do you think Mia does that helps her understand the problem?

Page 19: Why does Mia volunteer to share? How do you think she feels?

Page 23: How would you feel if you were Mia at this point in the story?

Page 29: What did Mia do in the story to help her feel more confident?

Confidence to Share Your Thinking

Ask students to think of a time when they were not sure about how to solve a problem or how to share their math ideas. Have a class discussion about why children might lack confidence in math class and what helps them gain confidence and take risks.

Prompt with questions such as:

Have you ever felt like Mia in math class? Do you think any of your classmates have ever felt like Mia?

What can make students feel uncomfortable about sharing confusions and questions? How can we help each other feel more comfortable so that everyone will take risks and share their thinking?

Class Reflection On Perseverance and Taking Risks

Have partners work on one of the following:

- With a partner, design a poster that encourages students to share their ideas and questions in math.
- Write your own reflection about what helps you feel more confident in math.
- Write Mia's reflection on what helps her use her math power.

Monkeys for the Zoo: Having Productive Math Discussions

Goal: Children will gain insight into how to communicate their thinking and questions in math class.

Rereading the Book

Reread the book **Monkeys for the Zoo** to students. Stop at key points to discuss how the characters have discussions as a class. Prompt with questions such as:

Page 9: How does Carlos help the class start to act out the problem?

Page 10: How does Tyler's question help the class?

Page 14: How does Ellie's idea help?

Page 16: How do you know that Rosie understood Ellie's idea?

Page 18: How do you know students understood Rosie's idea?

Page 24: How do you know that students understood Mia's idea?

Reader's Theater: Everyone Learning From Discussions

Use the attached Reader's Theater script to act out the discussion on pages 12 - 24. Give out the roles for narrators, students and the teacher. Students look for evidence that Ms. Green's class is learning.

Discuss the evidence. Prompt with questions such as:

What evidence did you see that characters were listening to each other and thinking about each other's ideas? What evidence did you see that characters tried to help each other understand their ideas? What did they do if they didn't understand or disagreed with each other?

Class Reflection and Choices for Reflection

Reflect on how your class can use ideas from Ms. Green's class. Prompt with questions such as:

How did the characters listen, speak and think with each other? What can we do in our class to be sure everyone learns from our discussions?

Have students work on one of the following:

- With a partner list ideas for how your class can communicate about math in ways that help everyone learn.
- Make a poster to encourage classmates to do the following:
 - Ask questions to help you understand
 - Listen well to others so you understand their thinking
 - Explain your thinking clearly

Hatching Butterflies: Working With Partners

Goal: Children will gain insight into how they can work productively with partners.

Rereading the book:

Reread the book **Hatching Butterflies** to focus on how Hannah and Carlos help each other learn. Stop at key points to discuss how the two children are learning to work together. Use key points and questions such as:

Pages 3 – 5: How do you know that Carlos and Hannah aren't helping each other on these pages?

Page 9: What do the students say that helps them begin to work together?

Page 15: What do Carlos and Hannah do on pages 11-15 that helps them?

Page 20: How did Carlos and Hannah work together here?

Page 27: How do you know that Carlos and Hannah helped each other on pages 24 through 27?

A Role-Play: A Problem About Partners Working Together

Tell students they will think about a different interaction Carlos and Hannah might have had. Quietly explain these roles to two volunteers:

Carlos explains how he wants to add on some butterflies.

Hannah disagrees and doesn't pay attention to his ideas.

Carlos and Hannah continue talking but not really listening to each other.

Discuss this role-play. Prompt with questions such as:

What did you notice about how Carlos and Hannah worked together here? What can they do to help each other learn?

Class Reflection and Reflection Choices

Discuss students' ideas about partner work. Prompt with questions such as:

When is it hard to work with a partner? What makes it easier?

What ideas can our class take from our role-play and from Carlos and Hannah that will help us work better as partners?

Have students work on one of the following:

- Work with a partner to design a poster showing classmates how to work together well.
- Write your own reflection about how you work with partners. In pairs, read and discuss each other's reflections. How are they similar? How will these ideas help everyone learn? Students can revise their reflections based on the discussions.

Hatching Butterflies: Having Productive Math Discussions

Goal: Children will gain insight into how to communicate their thinking and questions in math class.

Rereading the book:

Reread the book **Hatching Butterflies** to students. Stop at key points to discuss how the characters have discussions as a class. Prompt with questions such as:

Page 17: How do you know that Carlos is uncomfortable? How did Ms. Green and the class help him?

Page 21: What evidence do you have that students were listening to Carlos and Hannah?

Page 23: How did Carlos and Hannah help their classmates?

Page 25: Why did Carlos ask questions? How did his questions help the class learn?

Page 29: How do you know that Carlos and Hannah listened to Jayden and Ellie?

Reader's Theater: Everyone Learning From Discussions

Use the Reader's Theater attached script to act out the class discussion on pages 16- 24. Give out the ten roles for readers. Students look for evidence that Ms. Green's class is learning.

Discuss the evidence. Prompt with questions such as:

What evidence did you see that characters were listening to each other, thinking about each other's ideas, and helping each other?

Class Reflection and Choices for Reflection

Reflect on how your class can use the ideas from Ms. Green's class.

Prompt with questions such as:

What makes it hard to take part in a class discussion? What can make it easier? What can we do in our class to help everyone take part in our discussions and learn from our discussions?

Have students work on one of the following:

- Work with a partner to list the ideas your class shared about having productive discussions.
- Make a list of the ideas that were brought up in the discussion. Then have partners share their lists with each other and look at what is the same and what is different. They can each revise their list to include more ideas based on this sharing.

Penguins on Parade: Making Sense of Unfamiliar Problems

Goal: Children will gain insight into how they can work with classmates to make sense of unfamiliar problems.

Rereading the book:

Reread the book **Penguins on Parade**, stopping at key points for discussion. Prompt with questions such as:

Page 9: Why does Trevor go to Ms. Green, not Zoe?

Page 14: What does Zoe do to make sense of counting by tens from 8?

Page 17: How does Trevor feel after Tyler talks about their list?

Page 29: Why is Trevor smiling at the end of the book?

A Role-Play: A Problem About Partners Working Together

Prepare students to watch a different scenario with Trevor and Zoe. Quietly explain these roles to two volunteers:

Trevor uses ten frames to try to figure out how to count on by tens starting at 8.

Zoe says it doesn't make sense to count by tens from 8.

Trevor persists, but Zoe keeps saying it won't work.

Discuss this role-play. Prompt with questions such as:

What did you notice about the way Zoe worked with Trevor? What could Trevor or Zoe do differently to help them learn?

Class Reflection On Perseverance and Taking Risks

Have students think about a time when they worked on a math problem they hadn't seen before or a time when they didn't understand a problem or a strategy.

Discuss what helps people keep trying to understand a new idea in math.

Prompt with questions such as:

Why was it difficult? What helped you?

What helped Trevor learn to solve a problem he'd never seen before? What risk did Zoe take? How did it help?

Reflect on how your class can use the ideas from Ms. Green's class.

Prompt with questions such as:

How can we persevere to make sense of new problems?

Have students work on one of the following:

- With a partner, write a list of things we can do to help us figure out how to do a problem that no one has taught us to solve.
- Write your own reflection about what you can do to try to figure out how to solve a problem you've never seen before.

Penguins on Parade: Having Productive Math Discussions

Goal: Children will gain insight into how to communicate their thinking and questions in math class.

Rereading the book:

Reread the book **Penguins on Parade** examining the discussions in Ms. Green's class. Prompt with questions such as:

Page 13: Does Trevor understand Zoe's strategy? How do you know?

Page 16: What does Zoe tell the class? Why?

Page 19: How does Zoe and Trevor's list and Tyler's suggestions help the class?

Page 22: How did Ellie and Kayla help the class make sense of the problem?

Reader's Theater: Everyone Learning From Discussions

Use the Reader's Theater attached script to act out the class discussion on pages 12 - 24. Give out the roles for narrators, classmates and Ms. Green. Students look for evidence that Ms. Green's class is learning.

Discuss the evidence. Prompt with questions such as:

What evidence did you see that the characters were listening to each other and thinking about each other's ideas? What evidence did you see that the characters tried to help each other understand their ideas? What did they do if they didn't understand or disagreed with each other?

Class Reflection and Choices for Reflection

Reflect on how your class can use the ideas from Ms. Green's class.

Prompt with questions such as:

How did the characters listen, speak and think about each other's ideas? How did this help them learn? What can we do in our class to be sure everyone learns from our discussions?

Have students work on one of the following:

- With a partner, list ideas for how your class can communicate effectively.
- With a partner, discuss what Trevor learned about working on new problems. Write a letter from Trevor to Ms. Green describing what he learned about sharing ideas with classmates.