



## Using Shared Story Reading in Mathematics

Teachers can use shared story reading with interdisciplinary lessons to simultaneously advance students' mathematics, literacy, and social-emotional competencies. In this article, we use the book, *Two of Everything*, to illustrate how this routine can be used in K-2 classrooms.

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**Making connections to students'** lives while addressing content standards within the constraints of the school day is one of elementary school teachers' greatest challenges. One way to address these challenges is to use an instructional routine such as a shared story reading (Courtade et al. 2013). A shared story reading can support teachers' instruction across content areas, create connections to students' experiences, promote students' social-emotional learning, and maximize instructional time. When used in mathematics lessons, a shared story reading can increase the quantity of mathematical talk (Hojnoski, Polignano, and Columba 2016), promote student engagement, and foster language development (Whitney et al. 2017). A range of stories could be used with a shared story reading; however, folktales offer an appealing way for students to learn mathematics because they can create opportunities for students to engage with concepts in nonthreatening ways that can foster students' mathematical identities (Furner 2017; Rezvi, Han, and Larnell 2020).

### USING SHARED STORY READING WITH *TWO OF EVERYTHING*

One of our favorite books for a shared story reading with children in PK-grade 2 is *Two of Everything* (Hong 1992) (link online) by Lily Toy Hong. This storybook

explores a Chinese folktale in which a poor farmer, Mr. Haktak, discovers a brass pot while digging in his garden. The farmer and his wife discover the pot is magical and doubles every object that is placed inside. We like this book for three main reasons. First, the mathematical content spans counting, addition, multiplication, and early algebra, easily providing opportunities to use this book across multiple grades. For instance, we have used it to facilitate first and second graders' understanding of addition and double facts, multiplication, even/odd numbers (SMP 7: *Look for and make use of structure*; NGA Center and CCSSO 2010), and algebra (e.g., input/output). Second, the context of the story provides a rich opportunity for students to develop a mathematical understanding of "double," which connects to the first Standards for Mathematical Practice (SMP 1: *Make sense of problems*). Third, the story can advance students' social emotional learning, particularly the domains of self- and social-awareness and decision-making, as they consider the Haktaks' situation, and the ethical decisions related to it as well as consider what they might use the pot for in their own lives.

A shared story reading has three parts: (1) *before*, (2) *during*, and (3) *after* reading, with each part having different goals. To illustrate what this routine can look like in an interdisciplinary mathematics lesson, we describe our experiences with first and second graders.

### Before Reading

The first part of this routine focuses on introducing students to the book and its text features. To foster students' understanding of "two," we pointed to the title and talked about how the number two is represented on the cover (e.g., there are two people, two birds, but one pot) and asked such questions as "How does the illustration help you understand the number two?" and "What do you think this story is about?" When we discussed this latter question, students' predictions drew on their own experiences (e.g., cooking and holiday traditions), which promoted their self-awareness. We also used this stage of the routine to tell students this story is a Chinese folktale, ask students about their prior experiences with folktales (inside and outside of our shared experiences), and remind students of the purpose of many folktales (i.e., teach a moral lesson or describe a tradition connected to a specific culture).

### During Reading

The second part of this routine focuses on students' reading comprehension, understanding the mathematical relation of the pot, and introducing the term *double*. It is important at this stage that students (1) identify that the pot doubles items and (2) determine total quantities after items are doubled. To facilitate this discussion, we used a large pot to model and asked questions: "What happens when you put objects into the pot?" "How many \_\_\_ are there?" "How can we represent what happens when you put objects in the pot?" In these discussions, we represented the mathematical relation of the pot in a number of ways, including

counting cubes, base-ten blocks, diagrams, drawings, and equations, while emphasizing the terms *double* and *groups of*.

We also used this stage as an opportunity to foster students' social awareness and decision-making. For example, we discussed the emotions and behaviors of Mr. and Mrs. Haktak after they discovered the pot and began to put different items inside. We imagined what life may have been like for the Haktaks and discussed points of conflict and resolution, such as when Mrs. Haktak falls into the pot!

### After Reading

The last part of this routine focuses on asking students to verify their initial story predictions and retell the story in their own words using ordinal language (i.e., *first* and *second*). At this time, we also gave students a range of mathematical tasks in which they identified, applied, and represented strategies they used to calculate the number of items that doubled when put into the pot. For instance, they solved problems similar to the following:

I put (8) (toys) into the pot. Now, I have (16) (toys).

Jae put some cars into the pot. Jae now has 18 cars. How many cars did Jae put into the pot?

We like these kinds of tasks because students can use a range of strategies (e.g., direct modeling, double facts, and multiplication). We also asked students to create their own rule for a magical pot and a

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corresponding problem to solve. (See our PowerPoint® in the supplementary materials [link online] for examples of student work.) We asked students who needed additional challenge to represent and solve problems for a pot that will triple or quadruple items.

After students shared their problem-solving strategies and the rules they created, we ended the class by discussing what they would put in a magic pot to double. We found that students' experiences influenced what they said. For instance, students said they would put pumpkin seeds, food, schoolwork, Target®, and money into a pot. These discussions were highly engaging and provided opportunities to foster students' decision-making, self-awareness, and social awareness as they considered what they would do with such a pot and why, their peers' ideas, and the ramifications of those decisions. When time has allowed, or in the next day's lessons, we have followed up this lesson by making connections to and comparing the moral or ethical lessons of other folktales that students have read (i.e., contentment in *Two of Everything*, greed in *Two Greedy Bears* [Ginsburg 1998], honesty in *The Empty Pot* [Demi 1990], and fairness in *One Grain of Rice* [Demi 1997]). Additionally, students compared items they would put into the pot with those of the Haktaks' as a way to understand the Haktaks' experiences.

### Reflecting on the Lesson

Across the shared reading and problem-solving activities, students demonstrated high levels of enthusiasm. For instance, they were excited to share their story predictions and raised questions of the logistics of having such a pot (e.g., Could you put a house in the pot? Could you make a husband for the second Mrs. Haktak?). The range of students' strategies and representations (e.g., drawings and equations) led to rich mathematical discussions and situations where students tried peers' more sophisticated strategies.

### BENEFITS OF SHARED STORY READING

We enjoy using a shared story reading with folktales in interdisciplinary lessons because it provides a structure that can facilitate students' mathematics, literacy, and social-emotional competencies while maximizing instructional time. Furthermore, folktales present a unique entry into mathematics while tapping into student interests and increasing the relevancy of mathematics to students' lives. Moreover, it can challenge students' notions of what it means to do mathematics, as one student stated after a lesson, "I thought we were doing math today!" —

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