

[NEW VOICES]

Positioning Picture Books within the Mathematics Curriculum



KATE JENKINS

shows how some of our favourite picture books can be used to develop understanding of position and location.

“You need to fill your classroom with quality, authentic picture books! They draw the kids in—instant engagement!”

Chances are, for many teachers this quote brings back memories of the English lecturers at university. Most teachers feel confident espousing the benefits of using picture books in English lessons, talking about the importance of using the illustrations to enhance the text, engaging students and fostering a love and appreciation of literature. How many teachers passionately advocate the use of these same picture books in mathematics lessons?

I hope to show how easily a quality picture book can stimulate mathematical discussion, introduce and develop abstract concepts and lead into relevant and interesting mathematical activities.

Why should I use picture books in my mathematics lessons?

Picture books develop the literacy skills of students: pictures provide extra scaffolding, and there are opportunities to relate the text content to one’s own background knowledge, to respond to themes, introduce problematic knowledge and so on. Similarly, we can use picture books to contextualise and introduce

real life, relevant mathematics to our students (Anderson, Anderson, & Shapiro, 2004).

According to the NSW Mathematics Syllabus (Board of Studies NSW, 2002, p. 7), we should be teaching our students how to apply mathematics in their everyday lives, so that they can be empowered participants in contemporary society. To do this successfully, we need to provide our students with learning experiences that are “experientially real”. Too easily, teachers employ textbooks that make superficial links to students’ real-life experiences (Sparrow, 2008). Using picture books to stimulate mathematical discussion and learning experiences gives students a starting point and provides a non-threatening learning environment for students with low mathematical self efficacy (Jenner, 2002).

Are you talking about a specific strand of the mathematics syllabus?

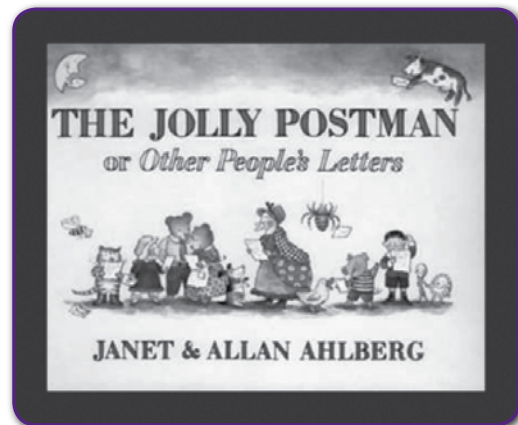
In using picture books to teach mathematics, you are limited only by your imagination and your library’s resources. Clarkson (2006) outlined a number of rhymes and fairy tales that provide opportunities to look at patterns, estimation and measuring, and Padula (2004) has developed an extensive list of fictional texts that deal with problem solving, sequential thinking, patterns, measurement and logic.

In this article, I will demonstrate how four fiction texts can be used specifically to develop students’ understanding of position, direction and mapping skills.

Position: The location of an object in relation to oneself or another object

The Jolly Postman or Other People’s Letters by Janet Ahlberg and Allan Ahlberg

This much-loved children’s book follows the village postman over the course of an ordinary day, as he cycles from house to house, delivering mail to a collection of well-known fairy tale characters.



Early Stage One (5–6 years)

Students are expected to give and follow simple directions and describe positions using every day language. Whilst reading the book, the learning experience can be as simple as a discussion prompted by questions such as:

- Can you put the letter back in the envelope?
- What can you see on the witches table?
- Who is standing next to Cinderella?

Stage One (6–7 years)

Students are expected to describe and represent the position of objects using drawings and models. Activities could include a discussion of the positions of characters. For example:

- Look at the guests sitting down at Goldilock’s birthday party. Who is sitting to the left of Goldilocks? Who is sitting in between Little Pig and Humpty Dumpty?
- Or, a more open-ended task such as;
- Imagine you are having a birthday party, make a model showing where your guests would sit around the table.

Stage Two (8–9 years)

Students should be working towards using simple maps to represent position and follow routes. You could:

- Give students a map of the village (or jointly construct one) and ask them to draw and describe the postman's journey in the book.
- Look at a map of the students' local area and introduce the idea of coordinate geometry.

Stage Three (10–11 years)

Students are developing their mapping skills: interpreting scales and using them to make simple calculations. Appropriate activities include the following:

- Based on the book's illustrations, ask students to estimate the distance between each of the Jolly Postman's stops. Discuss the length of his journey. Is it realistic that it took the postman all day to get around the village?
- Draw a plan of the village from an aerial view.

The Secret Birthday Message by Eric Carle

Tim wakes up on the morning of his birthday, to discover an envelope under his pillow, containing a secret message with directions leading him to his birthday gift. Possible activities are provided below for students from early Stage 1 to Stage 3.

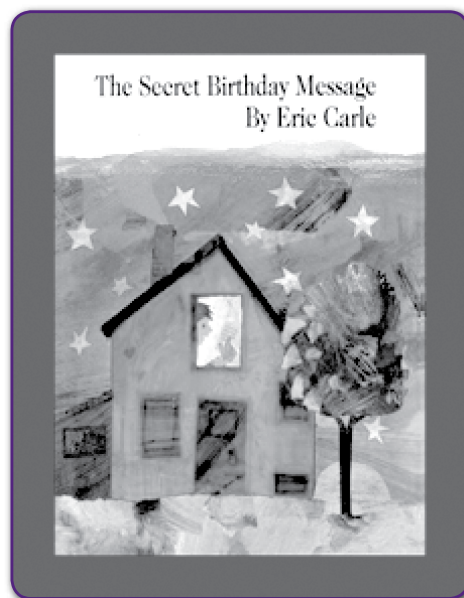
Early Stage One (5–6 years)

- Give students their own 'secret messages' to follow around the classroom or the school.

Stage One (6–7 years)

- Describe the path Tim takes along his journey.
- Use a drawing or model to represent Tim's journey.
- Create a drawing of the school or familiar

area and write two instructions for another student to complete; e.g.: Draw a house in between the school and the shops. Draw a chimney on top of the red building.



Stage Two (8–9 years)

- Ask the students to write the instructions for Tim's return journey.
- Ask students to write an alternative set of directions for Tim, based on the picture of his house and yard on the last page.

Stage Three (10–11 years)

- Students could create an aerial view of Tim's backyard on grid paper and plot his journey, using coordinates to describe his position at various times.
- Discuss the illustrations in the book: Are they to scale? Is that important? Why/Why not? Why is it important that "official" maps are drawn to scale?

10 Little Rubber Ducks by Eric Carle

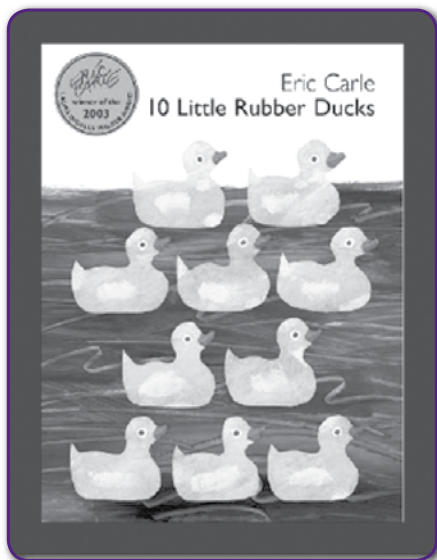
This book follows the journey of 10 rubber ducks that are thrown off their cargo ship during a wild storm at sea. The ducks float off in various directions. Activities suitable for younger students include the following:

Early Stage One (5–6 years)

- Have students re-enact the book so they are following a series of directions that describe their positions and movements; e.g.: A strong wind whistles across the sea. Have students show the movement of the waves by swaying from side to side.

Stage One (6–7 years)

- When the text reads, “The 5th rubber duck drifts to the left,” ask students to point in the direction the duck is moving.
- Ask students to describe what they can see in the illustrations using the terms “left” and “right”.

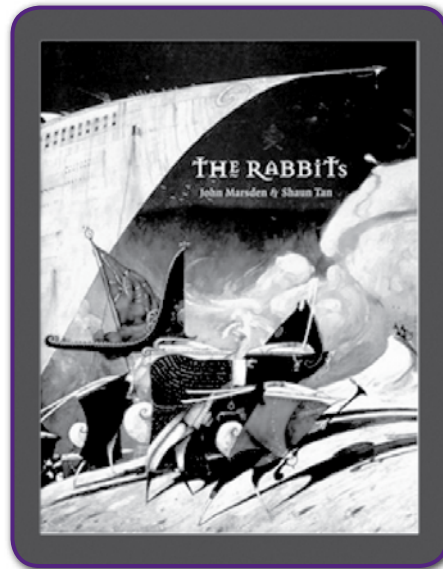


The Rabbits by John Marsden and Shaun Tan

This book is a tale of “the rabbits” who colonise a foreign land, told from the perspective of the native animals. It is most suitable for middle to upper primary students. Activities could include the following:

Stage Two (8–9 years)

- In the book, the rabbits “spread across the country”. Using a map of Australia and a compass rose, identify deserts, rivers or mountains and describe their locations; e.g., the mountains are north-west of Sydney.



- Give students an aerial view of the rabbits’ settlement and ask students to find the coordinates of particular rabbits or buildings and compare them to a central point.

Stage Three (10–11 years)

- Have students construct two maps of the rabbits’ settlement using different scales. Discuss the benefits of using one scale over another. Who would find each map more useful than the other?
- Give students an Aboriginal languages’ map of New South Wales and ask them to locate their suburb. Use the scale to calculate the distances between various Aboriginal nations and describe the position of one nation relative to another.

But wait, there’s more!

Although the activities provided in this article focus specifically on the Position sub-strand of the NSW syllabus (Board of Studies NSW, 2002), the four texts discussed also lend themselves to mathematical discussions that cover a variety of other strands. It must also be pointed out that some of the activities listed should be implemented whilst reading the books; others are designed as follow-up activities. The four texts that have been presented in this article were chosen

purposefully, to demonstrate that even an “easy” picture book can be made interesting and relevant for all primary students, depending on what the teacher chooses to do with it.

Picture books are a wonderful way to integrate mathematics across the curriculum and elicit relevant, meaningful mathematical discussion, but most importantly, they’re just plain fun.

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