Picture Books in Mathematics Year 3 to Year 6

Introduction

Picture books in Mathematics examine big ideas through imaginative storytelling. They can transform the way maths is taught through the power of pictures. Throughout the Maths in Schools courses there are a range of ideas on how to use picture books when teaching mathematical concepts. Below you will find which books are used in our courses along with many teaching ideas and activities

Picture books help to teach maths.

Teachers can create rich maths learning experiences based on picture books to help reinforce the 'big ideas' through imaginative storytelling. They can be the launchpad to engaging maths lessons. Picture books offer so many opportunities to explore and develop a student's mathematical thinking.

- They build excitement and wonder.
- They can create opportunities for rich learning experiences.
- They can provide mathematical thinking in real life scenarios.

Books with math concepts woven into the pictures and storylines can promote children's mathematical thinking and introduce foundational math concepts such as numbers, shapes, patterns, and measurement. Asking questions and making observations about the mathematical concepts found in a picture book can support children's curiosity and enjoyment of maths.

Year 3 to Year 6 Maths in Schools online course

We have listed the books and the location in our 3-6 course below. Please note accessing the links will require registration into the course.

GETTING STARTED

Getting started | Maths in the home | Positive mindsets in maths | [Family activities](#)

Open family activities to find links to lists of picture books for unpacking maths concepts.

PRACTICE AND PEDAGOGIES

Practice and pedagogies | [Maths investigation](#)

The Foolish King by Mark Price and Martin Brown is a picture storybook that includes an entertaining storyline whilst teaching the rules of chess. Students explore the moves of the king on a number chart and observe how the value of the numbers change as the king moves.

CONNECTIONS WITH COMMUNITY

Connections with community | People in maths careers | [Mathematicians across the world](#)

Read stories that highlight people who have chosen maths careers and made significant contributions to the field throughout history.

In the story **What's your angle Pythagoras,** go on a maths adventure with Pythagoras and he discovers that the square of the hypotenuse of a right-angled triangle equals the sum of the squares of the lengths of the other two sides.

Through this little people big dreams book meet **Ada Lovelace** and learn about her life as a mathematician from her early love of logic to her plans for the world's first computer program.

Counting on Katherine is the story of Katherine Johnson, an African-American mathematician who worked for NASA during the space race. As a child, she loved to count the steps on the road, the number of dishes and spoons she washed in the kitchen sink. Boundless, curious, and excited by calculations, young Katherine longed to know as much as she could about maths and the universe.
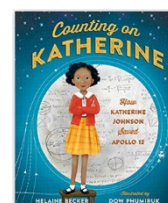
The girl with a mind for math is the story of Raye Montague who set her sights on being an engineer despite life's adversity. Through her mathematical understandings she was a pioneer who was able to change the course of ship design forever.
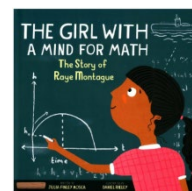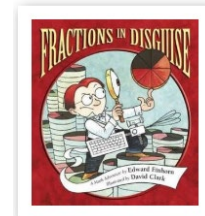

⬡ NUMBER IN ACTION Number in Action | Scaffolding knowledge | Fractions, fractions, everywhere

Cindy Neuschwander's picture book ***Sir Cumference and the Fracton Faire*** *(*Note title is Fracton, not Fraction) introduces concepts around fractions such as part-whole meaning of fractions, understanding the numerator and the denominator, as well as equivalence and comparison. [Year 3 and Year 4]
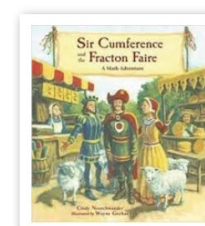
Year 5 and Year 6: ***Fractions in Disguise: A Math Adventure*** by Edward Einhorn and David Clark tells the story of George Cornelius Factor, an avid collector of fractions who develops a device called the reducer to help him find a valuable fraction that has been stolen.
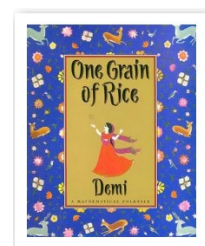

⬡ ALGEBRA IN ACTION Algebra in Action | Scaffolding knowledge | Number Patterns

Year 3 and Year 4: Discuss growing patterns with the story ***Two of Everything: A Chinese Folktale*** retold by Lily Toy Hong. While digging in his garden, Mr Haktak uncovers a magic pot that acts like an algebraic function machine, doubling anything dropped inside. For example, the purse with 5 coins inside becomes two purses with 5 coins each.


Year 5 and Year 6***: One Grain of Rice*** by Demi is an Indian folktale teaching a lesson about sharing and the power of doubling. Rani, a village girl, formulates a plan to outsmart the raja who refuses to share the rice with the starving villagers during a famine.

⬡ ALGEBRA IN ACTION Algebra in Action | Investigations | Maths investigations | How many combinations?

Introduce students to ***Mix-A-Mutt*** by Sarah Ball, a flipbook combining heads, bodies and tails to create one thousand different dogs. For example, if each dog is created using three sections, how many would be needed to make 1,000 different combinations? [Year 3 and 4]
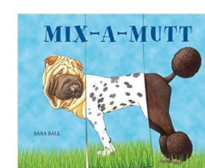
Measurement in Action | Scaffolding knowledge | Measuring up
Year 3 and Year 4

Angles can be introduced through stories such as **Sir Cumference and The Great Knight of Angleland** by Cindy Neuschwander. In this story, Radius quickly learns that a protractor-shaped medallion can be used to measure angles and solve the story's riddle. The book addresses how children should use a protractor correctly and explores the historical origins of how degrees, obtuse, acute and parallel all got their names.
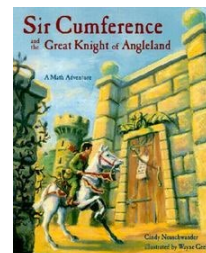
## Space in Action | Scaffolding knowledge | Map your surroundings

Lisa is the main character of **Mapping Penny's World** by Loreen Leedy and makes a map with construction paper and clay. The story introduces creating a map and shows the need to add a title, key, symbols, scale, compass rose and labels. [Year 3 & 4]
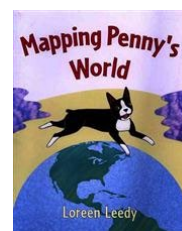
The picture book **Captain Invincible and the Space Shapes** by Stuart J. Murphy could be used to introduce the activity. To navigate back to earth, the Captain and his space-dog Comet must use their knowledge of three-dimensional shapes, including cubes, cones, and pyramids. [Year 3 & 4]

Cut down to size at high noon by Scott Sundby provides context for students to see how proportions can be used to scale up or scale down objects. Buzzsaw Bart is new in town and challenges the renowned Louie Cortorze, the local barber of Cowlick, to a scaled haircut showdown. [Year 3 & 4]
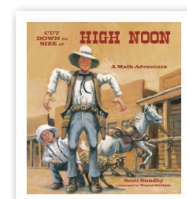
The Fly on the Ceiling: A Math Myth by Julie Glass is a story about how Rene Descartes created the coordinate system. Legend has it that Descartes was watching a fly on the ceiling from his bed and wondered how best to describe the fly's location. This story introduces the use of ordered pairs and a grid system in locating points in the first quadrant of a coordinate plane. [Year 5 & 6]
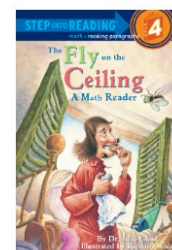
Space in Action | Investigations | [Secret locations on a map](#)

There are a number of picture books that could be used to introduce this investigation such as; *Are we there yet?* by Alison Lester, *There's a map on my Lap: All about maps* by Tish Rabe, *Follow that map!* by Scot Ritchie or *Me on the map* by Joan Sweeney. These stories can help students become familiar with creating maps of their environments and follow and provide directions to navigate between locations.


Literature to support maths investigation

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Professional Learning

Probability in Action | Scaffolding knowledge | [What are the chances](#)

To learn more about examples of probability in real life, read *Probably Pistachio* by Stuart J. Murphy and Marsha Winborn. Jack's day is a disaster as everything goes wrong for him. What is the likelihood of his day turning around and his streak of bad luck coming to an end? As you read about each event in the story, discuss whether the events are likely, unlikely, possible, impossible, or an equal chance. [Year 3 & 4]
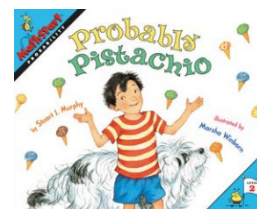
To teach how to describe, calculate and represent the probability of a range of simple events, read *A Very improbable story* by Edward Einhorn. What are the odds? Ethan wakes up one morning to find an extraordinary cat stuck on his head. The cat, Odds, refuses to budge until Ethan wins a game of probability. [Year 5 & 6]
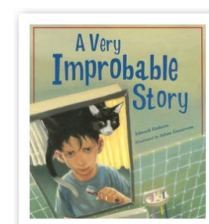
To learn more about acquiring and representing data read **Lemonade for Sale** by Stuart J. Murphy and Tricia Tusa. The children sell lemonade to raise funds to upgrade their clubhouse. They collect data, recording the number of cups sold each day and use a bar graph to represent information. The graph helps to track the success of the stall and make business decisions.
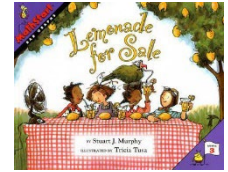
To interpret and communicate data using various representations firstly read **If the World Were a Village** by David J Smith. This book presents the world's population of 6.8 billion as a village of 100 people. The statistics are more relatable presented through the villagers and is an example of using a one-to-many representation of data. Students can explore the data and create their own version using data relative to their classroom or local to their area.
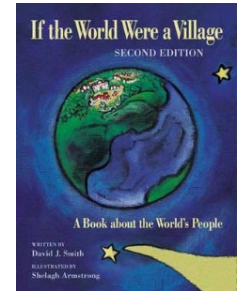
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