

## **Math Content in Adventure Stories**

*Math Trailblazers*® Adventure Stories are interesting, illustrated stories that appear throughout the curriculum to introduce and highlight mathematical concepts in Grades 1–5. These stories are designed to captivate students’ interest and imaginations in a thought-provoking and entertaining medium that students do not typically associate with learning mathematics. The stories connect mathematics to real-world (or whimsical) situations and help teachers establish an authentic context for learning that would otherwise be difficult to recreate. This contextualization engages students and sets the stage for the rigorous mathematic tasks that follow.

### **1<sup>st</sup> Grade**

#### **Look around You (G1U1L1)**

In the story, the teacher models counting and the students use one-to-one correspondence to count objects and represent and compare quantities while exploring their own classroom.

#### **Animals in the Pet Shop (G1U4L2)**

A pet shop poster provides students the opportunity to discuss and solve part-whole addition problems.

#### **At the Circus (G1U6L3, G1U6L6, and G1U6L7)**

A circus poster provides context for students to create and solve comparative addition, join addition, and separate subtraction problems.

#### **Betty Builds a Better Racer (G1U7L3)**

A problem-solving and modeling process, the TIMS laboratory method, is introduced to lay the groundwork for an investigation where students will use nonstandard units to measure and compare the length toy cars roll. The story prepares students to focus on solving addition problems involving grouping, counting by fives and tens, and counting on.

#### **A World of Cubic Animals (G1U13L4)**

Students visualize and are introduced to volume concepts through a dream adventure where animals have changed into cube creatures. The story helps students make connections between 3-dimensional drawings and cube models, find volume with skip counting and repeated addition, and recognize that different shapes can have the same volume.

#### **Tensland (G1U17L1)**

Students travel to a magical place where the characters practice organizing, grouping, and counting large quantities of objects. Then students apply these grouping and counting strategies to find the number of objects in large collections and write partitioned number sentences to show their strategy, which lays the groundwork for understand the units (e.g., ten and hundreds) in our number system.

## **2<sup>nd</sup> Grade**

### **Check it Out (G2U3L8)**

Marcus uses math strategies to solve a problem in the grocery store, setting the context for students to solve grocery store problems using a variety of addition and subtraction strategies.

### **Mine is the Best: The Challenge (G2U4L6)**

The story sets the context for an investigation in which students measure the length toy cars roll in centimeters. Students are then prepared to focus on measuring, finding medians, comparing and ordering lengths, and solving multidigit addition and subtraction word problems involving length.

### **The Princess and Her Playmate (G2U5L2)**

A prince passes the royal playmate test when he demonstrates his understanding of volume concepts by knowing that the tallest container is not always the one with the greatest volume. This prepares students to investigate the volume of different-sized containers as they estimate quantities; group and count objects by hundreds, tens, and ones; and add, subtract, and compare whole numbers using their volume data.

### **The Nameless Scribe (G2U7L3)**

In this tale of how zero might have been invented, a scribe learns the importance of this digit as a placeholder while writing orders for the king. Students use and apply place-value concepts and solve two- and three-digit addition and subtraction problems as they read the story. They continue to solve addition word problems related to the story using mental math strategies such as composing and decomposing numbers and counting on.

### **The Mouse-Proof Shelf (G2U8L2)**

Four mice apply what they have learned about mass to balance a tilting lamp by placing different weight combinations on each side. This prepares students to apply the properties of addition to write number sentences, solve both addition and subtraction problems involving mass, compare and order quantities, and compare number sentences to demonstrate that the equal sign represents the relationship between two equal quantities.

### **Armadillo Families (G2U15L1)**

A professor and his daughter study the number of pups in armadillo families and patterns in data, setting the context for students to conduct a survey of the number of children in the families of students in class. Students then represent their data in a line plot and bar graph, which they analyze to explore data patterns such as range and mode.

### **Lords of the River: The Giant Otter (G2U15L5)**

A professor and his daughter map the location of dens of giant river otters. Students then use the story's map and journal to solve problems about the locations of the dens, measuring length using nonstandard and standard units, and describing the location of an object relative to an origin using direction and distance.

### 3<sup>rd</sup> Grade

#### **Yu the Great: A Chinese Legend** (G3U2L4)

Students are introduced to ancient number puzzles called Magic Squares to develop problem-solving skills and addition strategies.

#### **The Haunted House** (G3U5L5)

Rosita and Peter solve a haunted house mystery by analyzing a model and data to find the length and area of a ghost's footprint. This prepares students to solve an open-response problem involving the measurement of the length and area of an irregular shape.

#### **Leonardo the Traveler** (G3U7L6)

Students review representations and partitioning of numbers, place value, regrouping, and multidigit addition and subtraction strategies as they learn about the life and discoveries of the famous Italian mathematician, Leonardo Fibonacci.

#### **Cipher Force** (G3U8L8)

A series of silly superhero adventures show what happens when you add, subtract, multiply, and divide by zero. Students are then prepared to apply properties, and use patterns and strategies to solve multiplication and division problems.

#### **The Clever Tailor** (G3U9L7)

A clever girl outsmarts giants and robbers with her knowledge of many important fraction concepts including comparing fractions, the meaning of different-size unit wholes, and equal shares. Students then use the context of the story to solve similar fraction problems.

#### **The Ghost Galleons** (G3U12L3)

Two adventurous children use a grid with an origin to plot the location of sunken items as they search for the wrecks of Spanish galleons. This leads to students working with a point graph to practice using coordinates, drawing a best-fit line to make predictions, and solving multiplication problems using measurement.

#### **The Elixir of Youth** (G3U13L6)

Young investigators solve a mystery at the Ancient History Museum through clever detective work involving volume measurement. The story sets the context for explorations with volume in which students solve multidigit multiplication and division problems.

### 4<sup>th</sup> Grade

#### **The Four Servants** (G4U1L4)

In this variation of a traditional folk tale, a young prince searches for a golden bird that will save his father's life. A problem-solving and modeling process, the TIMS laboratory method, is reviewed to prepare students for the Arm Span vs. Height lab. Students use patterns in data to make predictions and apply models to solve real-world problems.

### **Two Heads are Better Than One (G4U5L5)**

As students read the story, they analyze and critique the work of the characters. This sets the context for students to solve multistep word problems by representing, interpreting, and analyzing data in a graph; use patterns to make predictions and generalizations; examine the reasonableness of their solutions; and persist in the problem-solving process.

### **Journey to Flatopia (G4U9L11)**

Students describe, analyze, and classify two-dimensional shapes, study congruency, and practice sliding, flipping, and turning shapes. Then they apply and extend these concepts as they journey to the two-dimensional world of Flatopia with Professor Peabody.

### **Phil and Howard's Excellent Egyptian Adventure (G4U11L5)**

Two boys learn about an ancient Egyptian multiplication strategy. As students read the story, they solve 2-digit by 2-digit multiplication problems, work with numbers to one million, and practice regrouping and partitioning numbers. They are then ready to practice flexibly applying estimation, mental math, and paper-and-pencil strategies to solve two-digit multiplication problems based on the context of the problems presented.

## **5<sup>th</sup> Grade**

### **A Matter of Survival (G5U1L4)**

Betty and her parents study rain forest animals to introduce the technique of population sampling. The story provides a real context for exploring what it means to make a reasonable estimate and the value of finding the median of a data set to make predictions and generalizations about a population. Students are then prepared to use a sampling technique to study the distribution of colors in a population of colored square-inch tiles.

### **Sand Reckoning (G5U3L4)**

The story of Archimedes' estimate for the number of grains of sand needed to fill the universe helps develop number sense for large numbers. The story introduces very large numbers, such as googol and googolplex, and reviews the use of exponents to represent these numbers. Students multiply multiples of ten in the story, and continue using patterns to multiply numbers by multiples of ten in the problems that follow.

### **Wherefore Art Thou, Romeo (G5U6L2)**

Students learn to use Cartesian coordinates as they read about a child trying to use ordered pairs and a computer to control a spotlight for the performers in a play. Students use ordered pairs to identify and describe locations in all four quadrants as they discuss the story.

### **George Washington Carver: Man of Measure (G5U7L5)**

George Washington Carver uses unusual items to measure length, area, volume, and mass as students deepen their understanding of variables and standard units of measurement in mathematics and scientific investigation. The story prepares students to choose appropriate units to measure variables in various situations.

**Peanut Soup (G5U10L7)**

George Washington Carver and his students plan a luncheon where they use fractions to convert recipes to the needed size. Students use a variety of strategies and representations to multiply fractions by whole numbers to solve real-world problems in and related to the story.

**Bats (G5U11L6)**

A professor and his children use connections between ratios, proportions, and graphing to determine whether the number of tagged bats in a fictional sample is proportional to the total number of bats in a sample. This sets the context for a sampling and proportion activity where students use sampling ratios, graphs, and proportional reasoning to find an approximation of the total number of bats in their own fictional bat cave.