

# Maths Escapades

## TABLE OF CONTENTS

<b>Instructions</b> .....	<b>4</b>
<b>In Search of Numbers</b>	
Teacher Notes .....	7
Script.....	11
<b>“Pet Care” Kids</b>	
Teacher Notes .....	29
Script.....	33
<b>Alex in Numberland</b>	
Teacher Notes .....	51
Script.....	55
<b>Reader’s Theatre Rubric</b> .....	<b>72</b>

**W**elcome to this Reader's Theatre Theme Collection. Each collection in this series offers thematically linked Reader's Theatre scripts that build fluency, comprehension and content knowledge based on common curricula. This type of Reader's Theatre is unique in offering multi-levelled scripts that allow students at different reading levels to collaborate to build reading skills.

---

## The Research Behind Reader's Theatre

Fluency is the ability to read a text accurately and with appropriate expression and phrasing. Fluency is important because it is directly related to comprehension. Research has shown that fluency develops gradually over considerable time and through substantial practice. Students who read and reread passages orally as they receive guidance and feedback become better readers. Studies have shown that reader's theatre can effectively enhance reading fluency and, subsequently, comprehension.

## How to Implement Reader's Theatre

The Reader's Theatre Theme Collections make it easy to use reader's theatre in your classroom. Each script comes with the following teacher support:

- Literacy and content-area objectives
- A script summary
- A list of characters by level to help you assign the right roles to each student
- Background information to help you relate the script to content-area concepts and/or literary genres
- Staging and performance suggestions
- Literacy extensions including research, role-play and writing activities
- Content connections
- Character education connections

## Using a 5-Day Approach to Reader's Theatre

To make the most of your reader's theatre experience, try a 5-day approach, providing opportunities for students to become familiar with the text, and read it multiple times to build fluency and comprehension. A suggested pacing plan is provided on the next page.

# Five-Day Lesson Plan for Using Reader's Theatre

Day	Focus	What to Do
<b>1</b>	<b>Introduce the Script</b>	<ul style="list-style-type: none"> <li>• Give each student a copy of the script.</li> <li>• Have students skim through the text looking at the organisation and the illustrations.</li> <li>• Share the background information provided, as needed, to prepare students to read.</li> </ul>
	<b>Introduce Vocabulary</b>	<ul style="list-style-type: none"> <li>• Read the words and definitions in the glossary for the script, and ask students to use the words in sentences.</li> </ul>
	<b>Model Fluent Reading</b>	<ul style="list-style-type: none"> <li>• Ask students to listen and follow along with you as you read the script aloud to model fluency and expression.</li> </ul>
<b>2</b>	<b>Build Fluency: Echo-Read</b>	<ul style="list-style-type: none"> <li>• Read the script aloud, and ask students to echo-read, or repeat, the lines after you. Stop when necessary to explain vocabulary.</li> <li>• Call attention to the different types of punctuation marks and model how to read them.</li> </ul>
	<b>Build Comprehension</b>	<ul style="list-style-type: none"> <li>• Ensure students understand the ideas in the story, as well as character development, by involving them in a discussion. For example: <i>How would you describe the characters?</i> <i>What was the play mostly about?</i> <i>How did the characters change?</i> <i>What happened when ... ?</i></li> </ul>
	<b>Build Vocabulary</b>	<ul style="list-style-type: none"> <li>• Make sure students fully understand the glossary terms.</li> </ul>
<b>3</b>	<b>Assign Roles</b>	<ul style="list-style-type: none"> <li>• Use the reading levels provided for each script to help you assign roles that support or challenge each student appropriately.</li> </ul>
	<b>Choral-Read for Fluency</b>	<ul style="list-style-type: none"> <li>• Involve students in a choral-reading of the script to reinforce fluency. Remind students to use dramatic expression to bring each character's mood or personality to life.</li> </ul>
	<b>Rehearse the Script</b>	<ul style="list-style-type: none"> <li>• Use small-group time for students to rehearse their script. Monitor students as they rehearse, and offer suggestions for expression, voice and characterisation.</li> </ul>
<b>4</b>	<b>Rehearse the Script</b>	<ul style="list-style-type: none"> <li>• Use small-group time for student rehearsal. Do not interrupt this second rehearsal, but simply observe students as they read.</li> <li>• Use the assessment rubric on page 72 to monitor students' rehearsal behaviour and reading fluency.</li> </ul>
	<b>Staging and Performance</b>	<ul style="list-style-type: none"> <li>• Decide on a stage area, how students will be positioned, and whether props or movements will be added. See Staging and Performance Suggestions provided for each script.</li> </ul>
<b>5</b>	<b>Perform the Script</b>	<ul style="list-style-type: none"> <li>• Invite students to present the script to an audience of other class members, students from other classes, school staff members and/or parents.</li> <li>• Use the assessment rubric on page 72 to monitor students' rehearsal behaviour and reading fluency.</li> </ul>

## Assessing Student Progress

The Reader's Theatre Assessment Rubric on page 72 helps you evaluate student progress in all areas of fluency. Included on the rubric is a rating scale for assessing:

- Phrasing and Fluency
- Intonation
- Listening
- Pace
- Accuracy
- Characterisation
- Behaviour

## Literacy, Content and Character Education Connections

Each story has script-specific literacy and content extension activities based on the script. Select the activities that will benefit your students the most.

Most scripts also have a character education connection. Some of the core concepts and ethical values addressed within the scripts are listed here:

- **Trustworthiness:** integrity, honesty, reliability, loyalty
- **Respect:** tolerance, acceptance, non-violence, courtesy
- **Responsibility:** accountability, perseverance, self-control, does the right thing
- **Fairness:** open-minded, just, shares, plays by the rules
- **Caring:** kind, considerate, compassionate, helpful, charitable, expresses gratitude
- **Citizenship:** involved in school and community affairs, volunteers, cooperates, respects authority, protects the environment

# In Search of Numbers

## Summary

An on-the-spot reporter from the TV series *You're Right There!* goes back in time to find out about the history of numbers. His first visit is to goat herders who use the number system of one and more-than-one, which causes a few problems with counting! The next location the reporter visits is Sumeria, about 5000 years ago. The people there use a system of dots and notches based on the number 60. The reporter then interviews ancient Egyptians, who use a number system based on 10 that incorporates hieroglyphics. The Romans have a number system using letters, which works well for recording numbers but not so well for multiplying them. The reporter goes to Iraq to discover the Arabic number system, which draws on the work of the Hindus and Greeks. Finally, the reporter talks to computer scientists in 1946 to learn about the binary system.



# In Search of Numbers

## Objectives

### Literacy

#### Students will:

- Develop fluency and expression
- Understand characters' motives, actions and feelings
- Relate their reading experience to what they already know about number systems

### Mathematics

#### Students will:

- Learn about the history of numbers
- Compute fluently and make reasonable estimates

### Character Education

#### Students will learn about:

- **Respect** – deal peacefully with disagreements
- **Perseverance** – keep trying to make things better

Characters	Reading Levels
First Player	N
Second Player	N
Reporter B	O
Fourth Player	O
Third Player	P
Reporter A	P

# Background Information

## Facts About Ancient Numbers

### Babylonians

The Babylonians had a 24-hour day that included 60-minute hours and 60-second minutes. They were known for their tables that aided calculations. Archaeologists have discovered a table that calculates squares of numbers up to 59 and a table that calculates cubes of numbers up to 32.

### The Greeks

The Greek alphabet served a dual purpose. Each character had a corresponding number. Euclid's treatise on geometry, proportions and the theory of numbers, titled *Elements* and written about 300 B.C.E., is one of the most long-lived mathematical works in history.

### The Indians

The Indians developed the 0–9 system that was transmitted to the West via the Arabs. It has come to be known as the Arabic system.

### The Mayans

Mayan mathematics used a base-20 system, probably because that's the number of fingers and toes that people used to count on. They had two calendars: a ritual calendar of 260 days, with 13 months of 20 days representing the 13 gods, and a 365-day calendar, with 18 months of 20 days. They carried out astronomical measurements with remarkable accuracy. They used two sticks in the form of a cross and viewed astronomical objects through the right angles formed by the sticks.

### Earliest Numbers

Recent research by Denise Schmandt-Besserat looks at tokens found in archaeological sites in the Middle East. She believes numbers came before writing. When people had surpluses of wheat or other products, they would store them in a central location. To mark the number of items stored they would use tokens fired from clay. These tokens were stored in clay envelopes. They would press the number of tokens on the outside of the clay envelope to indicate what was inside. Over time, people in Mesopotamia got the idea to replace the tokens with cuneiform writing on slabs of clay. Egyptian writing and numerals came later. The Maya developed their own mathematics and writing, without influences from Europe and Asia.

## Staging and Performance Suggestions

- The different roles in each time period can be read by different students, or you can choose to have students read all of First Player's lines, all of Second Player's lines, etc., for all the scenes.
- Direct students to wear large placards around their necks that indicate the time they come from. If they are reading lines from different time periods, they will need to change the placards as they go.
- Alternatively, an extra could hold up a large sign to indicate the time frame. In the case where two time periods overlap, the extra will need to hold up two signs.
- To show the changes in time, direct characters to freeze for a moment while the narrators read their lines. Or characters can walk off-stage and then back on again.

## Literacy Extensions

### Number Chart

Instruct students to research the number systems of different ancient civilisations and present their findings in the form of a chart that compares a selection of numbers from each culture.

### Write a Story

Challenge students to use what they know about the number system of one of the civilisations they research to write a story about a young person from that civilisation learning to count or calculate.

## Content Connections

### History

As well as a number system based on ten, the ancient Egyptians left behind some of the most amazing structures in the world. Of course, these are the Great Pyramids – giant tombs that were built for Pharaohs. The largest pyramid was built by the Pharaoh Khufu. Each of the four sides of this pyramid is 236 metres long. When it was built, the pyramid was more than 137 metres tall and covered an area of about five hectares. Archaeologists have calculated that about 2.3 million blocks were used in its construction. Each block had to be carved out of a rock bed, transported across the Nile River, and then rolled on wooden trunks to the construction site. This structure is rightly considered to be one of the seven wonders of the ancient world.

## Character Education Connection

Throughout history, the way we make numbers has changed many times. The reporters in the script investigate the different groups of people around the world who have influenced our number system, like the Romans and Iraqis.