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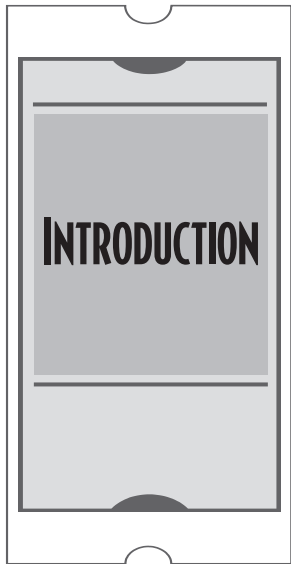


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= total number of parts



Fluency instruction provides a bridge between being able to “read” a text and being able to understand it. Readers who decode word by word sound plodding and choppy. They are too busy figuring out the words to think about what they are reading. Fluent readers are accurate, quick, and able to read with expression. They make the reading sound interesting. Beyond the experience of the listener, fluent readers are also demonstrating skills that are crucial to their understanding of what they read. Fluent readers recognize words at a glance, group words into meaningful phrases, and move beyond the struggle to decode individual words. They are able to focus on making sense of what they read.

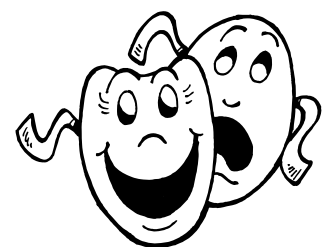
Reader’s Theater is an exciting way to help students improve reading fluency without being too time intensive for the teacher. It requires no props and no additional teaching skills on your part, and it is not difficult to manage. Reader’s Theater promotes better reading comprehension because students who have learned to read a passage expressively also come to better understand its meaning. In addition, research says that these gains transfer well to new text. Reader’s Theater also addresses standards in listening while providing a fun environment for everyone involved. When students practice their lines, they read and reread the same passages. Under your direction, they gradually add more expression, read more smoothly, and find any subtle meanings in the passages.

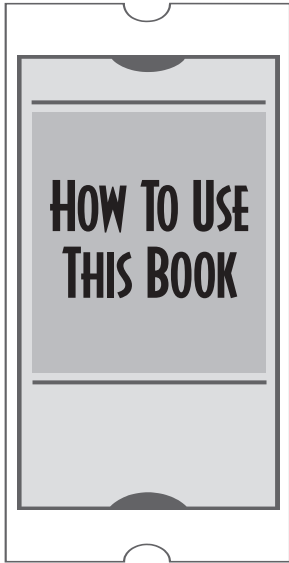
The scripts in *Discoverers and Inventors Reader’s Theater* are intended to be read in large groups of 7 to 11 students. Each script is prefaced by an activity that focuses on vocabulary from the script, the factual and fictional background of the piece, fluency instruction specific to that script, and comprehension questions that span the levels of Bloom’s Taxonomy. Each script is followed by activities related to the content of the script.

These scripts are designed for fluency instruction. While they are based on factual information about the time period or characters, many of the characters and scenes are entirely fictional. The overall purpose is to provide students with text at their reading level that is fun to read. The background section that precedes each script provides additional information about the characters or the period around which the script is built. All the scripts provide the following hallmarks of a good Reader’s Theater text:

- fast-moving dialogue
- action
- humor
- narrative parts

Discoverers and Inventors Reader’s Theater provides hours of fluency practice that features characters students know and may even admire. The large-group format gives students an opportunity to work together to craft an entertaining reading for a peer or adult audience.





Each Reader's Theater script should be covered over the course of five practice days (although those days do not need to be consecutive). The first day should include some or all of the elements of the suggested reading instruction. It should also include an expressive reading by you of the script as students read along silently. On each of the following days, give students an opportunity to practice their reading. On the final day, have each group read its script for the class.

Five sections that support reading instruction precede each script. You will find **vocabulary, background information** for the script, **a brief description of each character,** specific **coaching for fluency instruction,** and **comprehension questions** that progress from the simplest level of understanding to the most complex.

On the first day of instruction, briefly discuss with students the vocabulary. Each vocabulary list includes a short activity to help students understand the meaning of each vocabulary word. For example, the vocabulary activity for Archimedes (page 7) asks students to create a chart that clarifies the meaning of one of the words.

Next, use the background and information about each character to tell students what the script will be about and describe the characters.

Read aloud the script, modeling clear enunciation and a storyteller's voice. Do not be afraid to exaggerate your expression—it will hold the attention of your audience and stick more firmly in their minds when they attempt to mimic you later. Model the pacing you expect from them as they read.

Finish the reading instruction by discussing the fluency tips with students and having them answer the questions in the comprehension section.

Now it is time to give students a copy of the script! Use the following schedule of student practice for a five-day instruction period.

Day 1	After following the steps outlined on page 4, give each student a personal copy of the script. Pair students and have Partner A read all the parts on the first page, Partner B read all the parts on the second page, and so on.
Days 2 and 3	Assign students to a group. Give each group a script for each student, and have each student highlight a different part. Have students gather to read aloud the script as many times as time permits. Have them change roles with each reading by exchanging the highlighted scripts. Move from group to group, providing feedback and additional modeling as needed. At the <i>end</i> of day 3, assign roles or have students agree on a role to own.

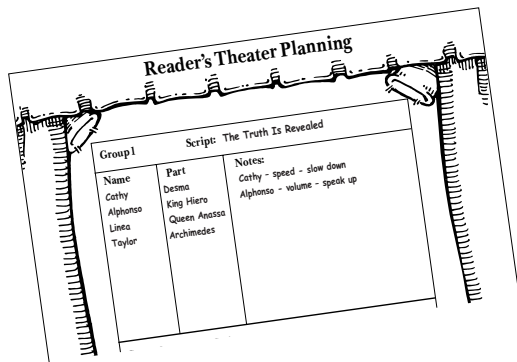
Day 4	Have each group read aloud the script. Move from group to group and provide feedback. Have students discuss their favorite lines at the end of each reading and why the manner in which they are read works well. Repeat.
Day 5	Have each group perform its script for the rest of the class (or other audience members provided by buddy classes and/or school personnel).

Throughout the week, or as time permits, provide students with the activities that follow each script. These are optional and do not have to be completed to provide fluency instruction; however, many provide students

with additional background information that may help them better understand the characters or setting of the script.

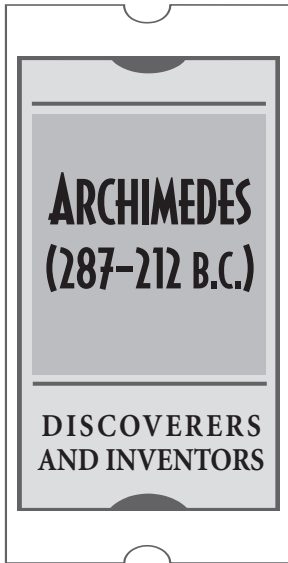
Additional Tips

- Use the Reader's Theater Planning reproducible (page 6) to track the assigned roles for each group and to jot down any informal observations you make for assessment. Use these observations to drive future fluency instruction.
- Notice that there are no staging directions in the scripts. These plays are written to be read expressively in a storyteller's voice. If the focus is placed on *acting out* the script, students will shift their focus from the reading to the movement. If students become enchanted with a script and want to act it out, invite them to do so after they have mastered the reading. Then, have the group go through the script and brainstorm their own staging directions to jot in the margins.
- To fit fluency instruction into an already full day of instruction, it will work best to have all groups work on the same script. This will permit you to complete the first day's activities as a whole class. Students will enjoy hearing how another child reads the same lines, and some mild competition to read expressively will only foster additional effort.
- If you have too many roles for the number of students in a group, assign one child more than one part.
- If you have too many students for parts, divide up the narrator parts. As a rule, these parts tend to have longer lines.
- The roles with the greatest and least number of words to read are noted in the teacher pages. The 🏠 and 🏡 indicate a higher or lower *word count*. They are not a reflection of reading level. The narrator parts usually reflect the highest reading level. However, less fluent readers may benefit from having fewer words to master. More advanced readers may benefit from the challenge of the greater word count.



Reader's Theater Planning

Group 1		
Script: _____		
Name	Part	Notes:
Group 2		
Script: _____		
Name	Part	Notes:
Group 3		
Script: _____		
Name	Part	Notes:



VOCABULARY

Discuss each of the following words with students. Then, have students choose one of the words to research in a print or an online encyclopedia or dictionary. Have students create a chart that teaches the class more about their word.

buoyancy: the upward force that a fluid exerts on an object less dense than itself

Eureka: a Greek word meaning "I have found it!"

sire: a title of respect for a king or monarch





stench: an unpleasant smell

BACKGROUND

Archimedes did indeed discover the principle of buoyancy, and he did discover it as a result of the king's suspicions about his crown. However, the story of his naked leap from his bath and his run through the streets is a legend—we do not know how much or little of it is true. The characters of Archimedes, Pheidias, and King Hiero are real; the others, and the events of this script, were created to add interest to this story.



PARTS

-  Narrator 1
-  Narrator 2
- Archimedes (AR kuh MEE deez):
a 30-year-old inventor and mathematician
- King Hiero (HIGH uh row):
King of Syracuse on the island of Sicily
- Desma (DEZ muh): Archimedes' 48-year-old mother
- Queen Anassa (uh NASS uh):
wife of King Hiero
- Heracleides (her uh klee AYdeez):
a friendly neighbor
- *Pheidias (FAY DEE uhz): Archimedes' 50-year-old father, an astronomer
- Hypus (HIGH puhs): a 20-year-old assistant to the king
- *Apelles (uh PEL us): a craftsman
-  Old Woman: a friend and neighbor of Archimedes
-  Young Woman: a friend and neighbor of Archimedes
- *May be read by the same student

FLUENCY INSTRUCTION

Have students discuss the ages of the characters to help them reflect the maturity level in their reading. When you read aloud the script for students, have them listen for the following:

- When the king becomes suspicious of the crown, it is reflected in his voice and his manner. Discuss how he tries to hide his suspicions from the others.
- When a character is in deep thought or distracted, his or her speech is halting and soft. Have students point out places in the script where a character is distracted.
- Ask students to demonstrate how people talk when they mutter. Explain that people mutter when they think out loud, aren't sure of what they are saying, or if they don't want someone else to hear what they are saying. Have students find the place in the script where a character mutters the lines. Ask students to determine why the character is muttering at this point.

COMPREHENSION

After you read aloud the script, ask students these questions:

1. Who is Desma? What role does she play in the story?
2. Why would Archimedes' behavior lead people to conclude he is crazy?
3. Which character would you choose to be in this story? Why?
4. Tell about a time you have been suspicious about someone's behavior or actions.
5. What do you think will happen to the craftsman? Why?



THE TRUTH IS REVEALED



Narrator 1: We find ourselves on the island of Sicily in the city of Syracuse. The king and queen give audience to a craftsman.

Narrator 2: The king hired the craftsman to make him a new crown. The king gave the craftsman some gold from which to make the crown.

Narrator 1: Now the crown is finished. The craftsman has returned to the king's court to present the new crown.

Hypus: Your highness, may I present the craftsman Apelles.

King Hiero: Come forward, Apelles. I want to see the crown you have made me.

Apelles: Sire, I have used all of my skills to make this beautiful crown for you. There is no other like it in all of Greece.

Narrator 2: The room is silent as everyone watches Apelles unfold a cloth to reveal the crown.

Queen Anassa: Ohhh, it is wonderful! It is truly a crown for your royal head, my king.

King Hiero: [grinning] Indeed. I am very pleased. Hypus, take the crown and place it in my hands. I wish to see this crown more closely.

Hypus: As you wish, sire.

Narrator 1: Apelles hands the crown to Hypus. He places the crown carefully in King Hiero's hands.

Narrator 2: But as he does so, the king's smile changes to a frown. He looks puzzled.

Queen Anassa: What is it?

PARTS



Narrator 1

Narrator 2

Archimedes (AR kuh MEE deez):

a 30-year-old inventor and mathematician

King Hiero (HIGH uh row): King of Syracuse on the island of Sicily

Desma (DEZ muh): Archimedes' 48-year-old mother

Queen Anassa (uh NASS uh): wife of King Hiero

Heracleides (her uh klee AYdeez): a friendly neighbor

Pheidias (FAY DEE uhz): Archimedes' 50-year-old father, an astronomer

Hypus (HIGH puhs): a 20-year-old assistant to the king

Apelles (uh PEL us): a craftsman

Old Woman: a friend and neighbor of Archimedes

Young Woman: a friend and neighbor of Archimedes



THE TRUTH IS REVEALED

Hypus: Sire, have I made you angry somehow?

King Hiero: [muttering] It is nothing. [to the craftsman] Apelles, you may go. If I need you again, I know where to find you.

Narrator 1: Apelles bows to the king and queen. As he walks away, a smile appears on his face. His smile grows wider as he leaves the room.

Narrator 2: The king grows more and more unhappy. He orders Hypus to leave the room.

Queen Anassa: What is the matter? Do you not like this new crown?

King Hiero: It is not the design I am unhappy with.

Queen: Then what is it?

King Hiero: Something is not right. The crown is heavy, like it is made of solid gold, but it is too big. I think this craftsman has cheated me.

Queen Anassa: How can that be? It looks like gold to me.

King Hiero: It is gold on the outside. But I suspect Apelles has used silver on the inside and covered it with gold. He has kept the rest of the gold for himself.

Queen Anassa: How can you prove it?

King Hiero: Pheidias has a son who is very smart. He does experiments all the time. I think he will be able to give me an answer.

Narrator 1: King Hiero sends a messenger to the house of Pheidias. The messenger explains to Pheidias and Desma that their son is needed by the king.

Narrator 2: Pheidias and Desma do not know where their son is, but they assure the messenger that Archimedes will be happy to help the king.

Desma: Once again, there is important work for Archimedes and he is nowhere to be found.

Pheidias: Not to worry, wife. He will be back soon. I ordered the servants to take him to the baths. He has been so busy with his experiments, I do not believe he has bathed in days.

Desma: I wondered why the air was fresher today. I thought perhaps the stables had been cleared.

Narrator 1: Later, Archimedes learns from his mother and father that he is wanted by the king.



THE TRUTH IS REVEALED

Narrator 2: Archimedes goes to King Hiero, looking and smelling cleaner than he has been in days. The king could not have called for him at a better time.

King Hiero: Ah, Archimedes. You have a brilliant mind. I need your help. I suspect I am being tricked. Is this crown pure gold? Or is it silver covered in gold? I cannot tell. Maybe it is all in my head.

Queen Anassa: I believe it is on your head, sire.

Archimedes: [holding the crown] It does look like gold. But shouldn't a crown of this size be much heavier? Something does not look right.

King Hiero: I knew it was not all on my head, er, in my head. That is the problem. Now, Archimedes, can you find the answer?

Archimedes: My king, nothing makes me happier than finding the answers to problems.

Narrator 1: Archimedes begins to think about the crown. He knows that gold is very heavy.

Narrator 2: He also knows that the same amount of silver is not as heavy as gold. How can he prove which metal is in the crown?

Narrator 1: For days, Archimedes thinks about the problem. He is so obsessed that he barely eats or speaks, and he certainly does not bathe!

Young Woman: Desma, is your son working on another problem?

Desma: Why, yes, he is. Have you heard about it?

Old Woman: No, it was the stench in the air. We knew that once again Archimedes must be hard at work.

Young Woman: You must find your son a wife. He needs someone to keep him fed and clean.

Desma: Are either of you volunteering for the job?

Old Woman: Oh no. It is too much work for me.

Desma: And now you know why he is not married.

Narrator 1: Finally, Archimedes' neighbors can take no more. They ask his friend Heracleides to help.

Narrator 2: Heracleides takes Archimedes to the public baths. Archimedes is so deep in thought, he pays little attention to his friend or to his bath.



THE TRUTH IS REVEALED

- Archimedes:** Don't you think you have filled my bath a bit full, Heracleides?
- Heracleides:** Yes, but I think the more water the better. I would not be surprised if I had to refill the bath with fresh water more than once. How can you live with yourself?
- Archimedes:** What? Oh, yes, thanks. I can manage.
- Narrator 1:** Archimedes steps into the bath. As he sits down in the water, the water sloshes over the sides of the tub.
- Narrator 2:** The sloshing water catches Archimedes' attention. Suddenly, his eyes open wide and he yells . . .
- Archimedes:** [loudly] Eureka! Eureka!
- Heracleides:** What is it? Is the water too hot?
- Narrator 1:** Archimedes ignores his friend. He jumps out of the water.
- Narrator 2:** He also ignores his clothes. He runs outside naked, yelling . . .
- Archimedes:** [loudly] Eureka! I have the answer at last!
- Heracleides:** What? That you have lost your mind? People are staring, Archimedes. You have no clothes. No one will listen to your answers if they think you are crazy.
- Narrator 1:** Archimedes is too excited to be stopped. He runs through the streets without a stitch of clothing.
- Narrator 2:** He flings open the door to his home.
- Desma:** Ahhh! My son has lost his mind!
- Pheidias:** Here is a towel, Archimedes. Cover yourself. What has possessed you to act this way?
- Archimedes:** Tell King Hiero I will see him now. I have his answer at last.
- Narrator 1:** Later that day, Archimedes stands before the king, properly dressed of course. He has asked the king for the crown, the same amount of pure gold, the same amount of silver, and three vessels of water.
- King Hiero:** I hear that you have been scaring the citizens of our city, Archimedes.
- Archimedes:** I am sorry, King Hiero. But I was so excited I forgot myself.
- King Hiero:** I do not think others will forget you for quite some time.



THE TRUTH IS REVEALED

- Archimedes:** When I sat in my bath, my body displaced the water. The water sloshed over the sides of the tub. When I stepped out of the bath, the tub was not so full anymore.
- King Hiero:** What does that have to do with my crown?
- Archimedes:** Everything! Watch.
- Narrator 2:** Archimedes marks the side of a vessel of water to show the water level. Then, he places the king's crown into the vessel. The water level goes up. He marks this new water level.
- Archimedes:** See how the water level goes up? The more dense an object is, the more water it displaces. Silver is not as dense as gold. So the amount of silver that weighs the same as this amount of gold displaces more water because the gold is more dense.
- Narrator 1:** King Hiero stares as Archimedes places the silver in another vessel. The water level is higher than the first vessel with the crown. Then, Archimedes places the pure gold in the third vessel. The water level does not rise as high as the water with the crown.
- King Hiero:** If my new crown was made of pure gold, the water level of the vessels with my crown and the pure gold should be the same. But the water level of the vessel with my crown is between the gold and the silver.
- Archimedes:** Yes, sire, your crown is made of gold *and* silver.
- King Hiero:** Bring me that craftsman. He has some explaining to do. Archimedes, where are you going? Archimedes?
- Narrator 2:** Archimedes is already deep in thought. He has discovered the principle of buoyancy. Archimedes realizes he has other experiments to do. And he is clean again for two more weeks, at least!



RELATED LESSONS

Displacement and Buoyancy

OBJECTIVE

Investigate the effects of buoyancy on various objects.

ACTIVITY

Explain that buoyancy is how things float. Buoyancy can refer to something floating in a liquid, such as water; or a gas, such as the air. Boats and balloons have buoyancy. In order for an object to have buoyancy, it must be less dense than the liquid or gas it is floating in. Divide the class into small groups. Give each group a **clear container of water**, a **grease pencil**, and **several objects of various materials, shapes, and sizes**. Have students place each object in the container of water and determine if it is buoyant. For those objects that are buoyant, ask students to mark the water level before and after the object is placed in the container. Have students determine which floating objects cause a greater change in the water level.

The Greek Alphabet

OBJECTIVE

Read and answer questions about the ancient Greek alphabet.

ACTIVITY

Give each student **The Greek Alphabet reproducible (page 15)**. Explain that the Greeks established an alphabet that included the vowel sounds, an improvement over a previous alphabet developed by other cultures in the region. Explain that the ancient Greek alphabet has some letters that are not on the chart and not all English letters have a single Greek equivalent. Have students identify the letters that most closely resemble those in English. Point out the English words at the bottom of the page that have Greek origins. Ask students to think of another word that has the same Greek root word to add to the list.

ANSWERS

- | | |
|-----------------------|---------------------------|
| 1. horse | 2. captain |
| 3. mother | 4. $\Sigma\Theta\Upsilon$ |
| 5. ΑΥΞΑΥΖΥΑΥ | 6. ΣΥΖΞΥΖΞ |
7. Possible answers: pentagram, pentathlon
 8. Possible answers: biography, biomass
 9. Possible answers: automatic, autograph, autobiography
 10. Possible answers: geode, geography, geometry

The Greek Alphabet

Directions: Use the Greek letters below to decode the words.

Greek Letter	Greek Name of Letter	English Letter	Greek Letter	Greek Name of Letter	English Letter
Α	alpha	A	λ	lambda	L
Β	beta	B	μ	mu	M
Γ	gamma	C	ν	nu	N
Δ	delta	D	ο	omicron	O
Ε	epsilon	E	π	pi	P
Ϝ	digamma	F	ϙ	koppa	Q
Η	heta	H	ρ	rho	R
Ι	iota	I	ς	sigma	S
Κ	kappa	K	τ	tau	T

1. ΑΟΑΣΕΑ

2. ΓΑΓΤΑΖΥ

3. ΓΟΤΑΕΑ

Use the Greek letters to write these words.

4. son

5. American

6. science

Many English words come from Greek words. The Greek root and one English word is shown below. Write another word that uses the same root.

7. penta (five)

pentagon

8. bio (life)

biology

9. auto (self)

automobile

10. geo (earth)

geocentric
