

Read the text and answer questions 1–8.

Eureka!

by James Baldwin

There was once a king of Syracuse whose name was Hiero. The country over which he ruled was quite small, but for that very reason he wanted to wear the biggest crown in the world. So he called in a famous goldsmith, who was skillful in all kinds of fine work, and gave him ten pounds of pure gold.

“Take this,” he said, “and fashion it into a crown that shall make every other king want it for his own. Be sure that you put into it every grain of the gold I give you, and do not mix any other metal with it.”

“It shall be as you wish,” said the goldsmith. “Here I receive from you ten pounds of pure gold; within ninety days I will return to you the finished crown which shall be of exactly the same weight.”

Ninety days later, true to his word, the goldsmith brought the crown. It was a beautiful piece of work, and all who saw it said that it had not its equal in the world. When King Hiero put it on his head it felt very uncomfortable, but he did not mind that—he was sure that no other king had so fine a headpiece. After he had admired it from this side and from that, he weighed it on his own scales. It was exactly as heavy as he had ordered.

“You deserve great praise,” he said to the goldsmith. “You have wrought very skillfully and you have not lost a grain of my gold.”

There was in the king’s court a very wise man whose name was Archimedes. When he was called in to admire the king’s crown he turned it over many times and examined it very closely.

“Well, what do you think of it?” asked Hiero.

“The workmanship is indeed very beautiful,” answered Archimedes, “but—but the gold—”

"The gold is all there," cried the king. "I weighed it on my own scales."

"True," said Archimedes, "but it does not appear to have the same rich red color that it had in the lump. It is not red at all, but a brilliant yellow, as you can plainly see."

"Most gold is yellow," said Hiero; "but now that you speak of it I do remember that when this was in the lump it had a much richer color."

"What if the goldsmith has kept out a pound or two of the gold and made up the weight by adding brass or silver?" asked Archimedes.

"Oh, he could not do that," said Hiero; "the gold has merely changed its color in the working." But the more he thought of the matter the less pleased he was with the crown. At last he said to Archimedes, "Is there any way to find out whether that goldsmith really cheated me, or whether he honestly gave me back my gold?"

"I know of no way," was the answer.

But Archimedes was not the man to say that anything was impossible. He took great delight in working out hard problems, and when any question puzzled him he would keep studying until he found some sort of answer to it. And so, day after day, he thought about the gold and tried to find some way by which it could be tested without doing harm to the crown.

One morning he was thinking of this question while he was getting ready for a bath. The great bowl or tub was full to the very edge, and as he stepped into it a quantity of water flowed out upon the stone floor. A similar thing had happened a hundred times before, but this was the first time that Archimedes had thought about it.

"How much water did I displace by getting into the tub?" he asked himself. "Anybody can see that I displaced a bulk of water equal to the bulk of my body. A man half my size would displace half as much."

"Now suppose, instead of putting myself into the tub, I had put Hiero's crown into it, it would have displaced a bulk of water equal to its own bulk. All, let me see! Gold is much heavier than silver. Ten pounds of

pure gold will not make so great a bulk as say seven pounds of gold mixed with three pounds of silver. If Hiero's crown is pure gold it will displace the same bulk of water as any other ten pounds of pure gold. But if it is part gold and part silver it will displace a larger bulk. I have it at last! Eureka! Eureka!"

Forgetful of everything else he leaped from the bath. He ran through the streets to the king's palace shouting, "Eureka! Eureka! Eureka!" which in English means, "I have found it! I have found it! I have found it!"

The crown was tested. It was found to displace much more water than ten pounds of pure gold displaced. The guilt of the goldsmith was proved beyond a doubt. But whether he was punished or not, I do not know, neither does it matter.

The simple discovery which Archimedes made was worth far more to the world than Hiero's crown.

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Item	Grade	Claim	Target	DOK	Standard(s)
#4	6	1	2	3	RL.2

Evidence Statement
The student will determine or summarize key ideas and events in a text.

Summarize what happens after Archimedes sees his bath water overflowing. Use key events from the text to support your summary.

Score	Rationale	Exemplar
2	<p><u>A response:</u></p> <ul style="list-style-type: none"> Gives sufficient evidence of the ability to determine/ summarize the theme/central idea/message, or to summarize what happens after or during a key event Includes specific examples/details that make clear reference to the text Adequately explains the theme/central idea/message or summary with clearly relevant information based on the text 	<p>Archimedes has had something like this happen a million times before. This was the first time he had thought about it. Archimedes discovered that His leg had displaced water. He figured that his crown would displace as much as a normal ten-pound lump of gold would displace. Pure gold would displace more than seven pound of silver mixed with three pounds of gold. Therefore he tested by mesuring the displaced water for a lump of ten pound of gold. Then, He measured the displaced water of the crown and found that it was different. He learned that the goldsmith had kept a couple pounds of gold for himself.</p>
1	<p><u>A response:</u></p> <ul style="list-style-type: none"> Gives limited evidence of the ability to determine/ summarize the theme/central idea/message, or to summarize what happens after or during a key event Includes vague/limited examples/details that make reference to the text Explains the theme/central idea/message or summary with vague/limited information based on the text 	<p>Archimedes sees his bath overflowing because of him taking up room in the bath. Archemedes creates an idea of finding out if the crown is solid gold or not. Archemedes finds out not the whole crown is gold because he put the crown in water to test the weight.</p>
0	<p><u>A response:</u></p> <ul style="list-style-type: none"> Gives no evidence of the ability to determine/summarize the theme/central idea/message, or to summarize what happens after or during a key event <p>OR</p> <ul style="list-style-type: none"> Gives the theme/central idea/message or summary, but includes no examples or no examples/details that make reference to the text <p>OR</p> <ul style="list-style-type: none"> Gives the theme/central idea/message or summary, but includes no explanation or no relevant information from the text 	<p>An idea clicks in his head.</p>