

6th Grade



Spring Break Vacation Packet

Name: _____

Due: Monday, April 9, 2018

D*irections* Read this poem. Then answer questions 1 through 7.

Autumn Orchards

by Charles V. Ford

I remember lines of bare still trees on flat sandy ground.
There's a sense of warmth when my thoughts wander back to these orchards of my youth.
I delighted in the order and neatness of my father's farm.

- I loved the rich, dark nights when only the starlight reflected off the branches.
5 There was a perfect hush and reverence¹ amongst the solid trunks that spanned these fields.
I walked in secret on these long, lone walks, and I walked without purpose or destination.

Loyal animals accompanied me on these excursions through the groves.
There were fast, powerful dogs, and a rainbow of funny feline hunters and loafers.
There was a lost pig and even a turkey that joined the parade for a time.

- 10 I listened and learned to return the gentle call of the turtle dove.
The big rigs rattled and whooshed by on the highway.
My tread was light and silent in the forgiving sand.

I loved the warm summer nights when onion and garlic fields perfumed the night air.
The smell of burning almond brush in autumn will forever be a comfort and solace² to me.

- 15 Each season's breath was a multisensory thrill of moist, rich air.
The orchards captured my imagination and calmed and soothed me.
Old and gray now, but still I'll steal off by myself into a neighbor's neat and tidy orchard.
And the trim trees still listen to my ramblings and respond only with silhouettes against a silent moon.

¹ **reverence:** sense of respect, admiration, awe

² **solace:** calm, support

GO ON

1

Read line 2 from the poem.

There's a sense of warmth when my thoughts wander back to these orchards of my youth.

How does this sentence help develop the speaker's feelings about the orchards?

- A** It establishes that the speaker no longer enjoys wandering through orchards.
- B** It suggests that the speaker's memories are of hot weather in the orchards.
- C** It tells the speaker's thoughts about the warm colors of orchards.
- D** It introduces the speaker's sense of fondness for the orchards.

2

According to lines 7–9, what does the poem suggest about the speaker's walks through the orchard?

- A** The speaker would have preferred to walk alone.
- B** The speaker viewed the walks as a kind of pleasant celebration.
- C** The animals helped break the silence of the night for the speaker.
- D** The animals guided the speaker through the dark.

3

Reread line 12 of the poem.

My tread was light and silent in the forgiving sand.

What does the word “forgiving” suggest about the sand?

- A** It felt soft to the speaker.
- B** It seemed to excuse the speaker.
- C** It seemed to blame the speaker.
- D** It felt unsteady to the speaker.

4

What is the main effect of lines 13–15 in the poem?

- A** They remind the speaker of what the orchard looked like in autumn.
- B** They show that the speaker's memories come from various senses and seasons.
- C** They provide a review of the speaker's childhood hopes and dreams of farm life.
- D** They explain which are the speaker's favorite memories.

5

How do the ideas of the last stanza of the poem echo the ideas from the first stanza?

- A** In the last stanza, the speaker finds a place where he can express his thoughts freely for the first time.
- B** In the last stanza, the speaker finds comfort in the order and clean lines of another orchard.
- C** In the last stanza, the speaker finds a real orchard to replace the one from his imagination.
- D** In the last stanza, the speaker describes finding a deep sense of peace after the chaos of his childhood.

6

What message or theme does the poet communicate by including sensory details in the poem?

- A** Places are best understood when visited at night.
- B** Children can experience their surroundings more fully than adults.
- C** Memories remain strong even after the passage of time.
- D** Growing old can cause you to forget beautiful images of youth.

7

Which is the **best** summary of the poem?

- A** The speaker has a fast, powerful dog and funny cats in many different colors. He also has a pig and even a turkey. He takes these animals for long walks in the orchard.
- B** The speaker used to delight in the orderly neat way his father kept the farm. The trees were bare and still and in a straight line. The ground was flat and sandy.
- C** The speaker loves rich, dark nights when only moonlight reflects off branches. He walks in the orchard today without purpose or direction. He feels a sense of warmth as he walks along.
- D** The speaker recalls the comfort he took from walks long ago in an orchard. He has fond memories of walking there at night with his pets. Now, many years later, he still enjoys walking among trees.

GO ON

Building a Vivarium

by Anna Lopez

A vivarium is a clever way to have a miniature ecosystem in your own home. The word *vivarium* means “place of life” in Latin. A vivarium is like an ecosystem in an enclosed space. An ecosystem is an environment of living things. The area includes plants and animals as well as materials such as rocks, soil, air, and water. Terrariums and aquariums are a type of vivarium. Terrariums contain only plant life.

5 Aquariums contain fish and other water animals.

You can build your own desktop vivarium at home. With your vivarium, you can observe small animals such as ants and earthworms or larger animals such as lizards. You can build a vivarium of any size or shape out of many different materials. A glass or plastic box is a good choice because you will want to be able to see inside your vivarium. However, a wooden or metal box with glass or plastic on one side also works well.

10

The floor of a vivarium must be made of a substrate that will support whatever will live in it. Some substrates include soil, pebbles, sand, peat, wood chips, or vegetable matter such as corn or coconut husks. The substrate will help control the moisture in the small new world. It will also give the animals that live there something to live on and dig in.

15 Other things to consider when planning a vivarium are lighting, temperature, and ventilation. You need to make sure the lighting and temperature are appropriate for the species that will live in the space. For instance, earthworms live largely below ground, so they do not need much light. Lizards need heat rocks or heat lamps because they are cold-blooded. Proper ventilation will keep the air moving and prevent mold from growing. All these elements will help the animals in a vivarium stay healthy.

20 When you are ready to build your vivarium, first decide what plants and animals you want to live there. Make sure they can all live in the same environment. For example, a desert plant will not do well in the same conditions that a frog needs to thrive. Desert plants are accustomed to dry conditions, but frogs need lots of moisture. With such things in mind, buy a suitably sized container. Consider how large your plants and animals might get.

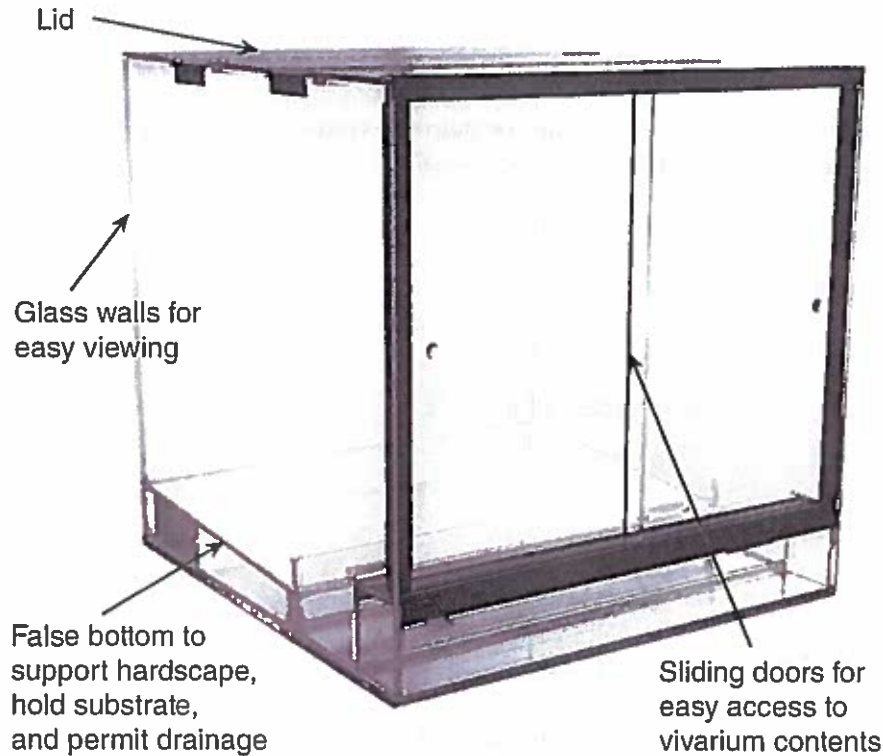
25 Once you’ve decided on the plants and animals, start building the environment for the vivarium. Your environment will need a background and a hardscape. For the background, be creative. It can be anything you can dream up to look like the living area you have chosen to model. A hardscape is an artificial surface that will support and contain the substrate on which your plants and animals will live. Make sure that any glue and other products you use will not harm your plants and animals.

30 A vivarium with lots of water and plants will probably need a false bottom beneath the hardscape. A false bottom raises the bottom layer of the environment above the bottom of the container. This creates a space for drainage and prevents the soil and plants on the bottom of the vivarium from becoming waterlogged. A false bottom should be made of a permeable material, which water can flow through.

35 Next, build a top, or lid. You will need to determine how much light and moisture your vivarium will require. Your lid can be made of screen, glass, plastic, or any other material. Be sure you can easily lift the lid to reach the life inside.

If your lid is not clear, you will need to install a light inside the vivarium. Plants and animals require light to remain healthy. At this point, you can add thermometers, heaters, and other instruments needed to keep your vivarium safe and healthy for its inhabitants.

Example of a Vivarium



40 This is when you add whatever substrate you've chosen for the bottom of your vivarium. And, if your vivarium requires it, add water. Make sure the water is not treated with chemicals. Once you have added the substrate and water, turn on all lights and monitors and let this new environment "settle" for at least a day or two.

45 After the environment has stabilized, it's time to add your plants and animals. Add them slowly so they have time to adjust to their new home. Remember to feed any animals you place in your vivarium.

A final tip: Don't overfill your vivarium! Be sure to leave room for the plants and animals to grow. Remember that after a few weeks of growing, your vivarium will mature, or fill in. A mature vivarium looks quite different from a brand new one! Part of the reward of having a vivarium is watching all the growth and change of the life forms within.

GO ON

8

What is the purpose of lines 1 through 24 in the article?

- A They give a list of facts about various kinds of vivariums and what can live in them.
- B They present useful information about the planning stage of a vivarium.
- C They offer helpful ideas for designing the background and hardscape of a vivarium.
- D They provide all necessary instructions for the building stage of a vivarium.

9

In lines 15 through 19, how does the author help the reader understand why different lighting and temperatures are needed for different vivariums?

- A by naming different earth materials
- B by contrasting plant life with animal life
- C by discussing features of different materials
- D by discussing the needs of different animals

10

Read this sentence from line 26 of the article.

For the background, be creative.

What does the word “creative” suggest about designing the background of a vivarium?

- A Much preparation may be involved in the design.
- B Some imagination may be involved in the design.
- C The design should be simple.
- D The design should be elaborate.

11

What additional information about vivariums can be gained from the labeled diagram?

- A** A person can reach inside a vivarium from a side wall, not only from a top lid.
- B** A person can see inside some vivariums from all four sides of the container.
- C** A vivarium needs a false bottom, which sits above the bottom of the container.
- D** Some vivariums use pebbles for substrate, while others use peat or wood chips.

12

Which sentence from the article **best** supports the idea that vivariums provide enjoyment as well as a learning experience?

- A** "A vivarium is a clever way to have a miniature ecosystem in your own home." (line 1)
- B** "With your vivarium, you can observe small animals such as ants and earthworms or larger animals such as lizards." (lines 6 and 7)
- C** "Remember to feed any animals you place in your vivarium." (line 45)
- D** "Part of the reward of having a vivarium is watching all the growth and change of the life forms within." (lines 48 and 49)

GO ON

13

Read these words from line 46 of the article.

A final tip: Don't overfill your vivarium!

Why did the author probably include this information?

- A** Vivariums are usually too large for the plants and animals they contain.
- B** Vivariums cannot thrive if the plants and animals they contain are too small.
- C** People new to building vivariums don't know which plants and animals to include.
- D** People new to building vivariums are tempted to load them with plants and animals.

14

Which sentence from the article best supports the idea that carefully planning an environment is very important when designing a vivarium?

- A** "It will also give the animals that live there something to live on and dig in." (lines 13 and 14)
- B** "For example, a desert plant will not do well in the same conditions that a frog needs to thrive." (lines 21 and 22)
- C** "Once you've decided on the plants and animals, start building the environment for the vivarium." (line 25)
- D** "If your lid is not clear, you will need to install a light inside the vivarium." (line 37)

Directions

Read this passage. Then answer questions 15 through 20.

In 1848, at the age of 13, Andrew Carnegie and his family moved to Allegheny, Pennsylvania. Through various work, Carnegie was able to make investments and eventually own his own business, Carnegie Steel Company. He became one of the richest men in America. Later in life, he donated most of his wealth towards art, public libraries, music, and education, most notably Carnegie Hall and Carnegie Mellon University.

Pittsburgh and Work

*from Autobiography of Andrew Carnegie,
published by Houghton Mifflin Company, 1920.*

I had just completed my thirteenth year, and I fairly panted to get to work that I might help the family to a start in the new land. The prospect of want had become to me a frightful nightmare. My thoughts at this period centered in the determination that we should make and save enough of money to produce three hundred dollars a year—twenty-five dollars monthly, which I figured was the sum required to keep us without being dependent upon others. Every necessary thing was very cheap in those days.

The brother of my Uncle Hogan would often ask what my parents meant to do with me, and one day there occurred the most tragic of all scenes I have ever witnessed. Never can I forget it. He said, with the kindest intentions in the world, to my mother, that I was a likely boy and apt to learn; and he believed that if a basket were fitted out for me with knickknacks to sell, I could peddle them around the wharves and make quite a considerable sum. I never knew what an enraged woman meant till then. My mother was sitting sewing at the moment, but she sprang to her feet with outstretched hands and shook them in his face.

“What! my son a peddler and go among rough men upon the wharves! I would rather throw him into the Allegheny River. Leave me!” she cried, pointing to the door, and Mr. Hogan went.

She stood a tragic queen. The next moment she had broken down, but only for a few moments did tears fall and sobs come. Then she took her two boys in her arms and told us not to mind her foolishness. There were many things in the world for us to do and we could be useful men, honored and respected, if we always did what was right. . . . It was not because the occupation suggested was peaceful labor, for we were taught that idleness was disgraceful; but because the suggested occupation was somewhat vagrant in character and not entirely respectable in her eyes. Better death. Yes, mother would have taken her two boys, one under each arm, and perished with them rather than they should mingle with low company in their extreme youth.

As I look back upon the early struggles this can be said: there was not a prouder family in the land. A keen sense of honor, independence, self-respect, pervaded the household. . . .

Anything low, mean, deceitful, shifty, coarse, underhand, or gossipy was foreign to that heroic soul. Tom and I could not help growing up respectable characters, having such a mother and such a father, for the father, too, was one of nature’s noblemen, beloved by all, a saint.

GO ON

30 Soon after this incident my father found it necessary to give up hand-loom weaving and to enter the
cotton factory of Mr. Blackstock, an old Scotsman in Allegheny City, where we lived. In this factory he
also obtained for me a position as bobbin boy, and my first work was done there at one dollar and twenty
cents per week. It was a hard life. In the winter father and I had to rise and breakfast in the darkness,
reach the factory before it was daylight, and, with a short interval for lunch, work till after dark. The
hours hung heavily upon me and in the work itself I took no pleasure; but the cloud had a silver lining,
35 as it gave me the feeling that I was doing something for my world—our family. I have made millions
since, but none of those millions gave me such happiness as my first week's earnings. . . .

 Soon after this Mr. John Hay, a fellow-Scotch manufacturer of bobbins in Allegheny City, needed a
boy, and asked whether I would not go into his service. I went, and received two dollars per week; but at
first the work was even more irksome than the factory. I had to run a small steam-engine and to fire the
boiler in the cellar of the bobbin factory. It was too much for me. I found myself night after night, sitting
40 up in bed trying the steam gauges, fearing at one time that the steam was too low and that the workers
above would complain that they had not power enough, and at another time that the steam was too high
and that the boiler might burst.

 But all this it was a matter of honor to conceal from my parents. They had their own troubles and
bore them. I must play the man and bear mine. My hopes were high, and I looked every day for some
45 change to take place. What it was to be I knew not, but that it would come I felt certain if I kept on.
Besides, at this date I was not beyond asking myself what Wallace would have done and what a Scotsman
ought to do. Of one thing I was sure, he ought never to give up.

15

Why does the author include the sentence “My thoughts at this period centered in the determination that we should make and save enough of money to produce three hundred dollars a year—twenty-five dollars monthly, which I figured was the sum required to keep us without being dependent upon others” in lines 2 through 5 of the passage?

- A** to describe what Carnegie earned as a bobbin boy
- B** to prove that Carnegie’s parents were proud people
- C** to illustrate how willing Carnegie was to care for his family
- D** to demonstrate how little goods cost in Carnegie’s boyhood

16

Read this statement from line 23 of the passage.

As I look back upon the early struggles this can be said: there was not a prouder family in the land.

Which sentence from the passage could best be used as evidence to support this statement?

- A** “I had just completed my thirteenth year, and I fairly panted to get to work that I might help the family to a start in the new land.” (lines 1 and 2)
- B** “The next moment she had broken down, but only for a few moments did tears fall and sobs come.” (lines 15 and 16)
- C** “Yes, mother would have taken her two boys, one under each arm, and perished with them rather than they should mingle with low company in their extreme youth.” (lines 20 through 22)
- D** “In the winter father and I had to rise and breakfast in the darkness, reach the factory before it was daylight, and, with a short interval for lunch, work till after dark.” (lines 31 and 32)

17

Which of the following details from the passage best supports the claim that Andrew Carnegie felt a great sense of responsibility, even as a child?

- A** “It was . . . because the suggested occupation was somewhat vagrant in character and not entirely respectable in her eyes.” (lines 18 through 20)
- B** “Tom and I could not help growing up respectable characters, having such a mother and such a father . . .” (line 26)
- C** “Soon after this Mr. John Hay, a fellow-Scotch manufacturer of bobbins in Allegheny City, needed a boy, and asked whether I would not go . . .” (lines 36 and 37)
- D** “I found myself night after night, sitting up in bed trying the steam gauges, fearing . . . at another time that the steam was too high and that the boiler might burst.” (lines 39 through 42)

GO ON

18

Which statement best reflects a central idea of the passage?

- A** In Carnegie's boyhood, a family could purchase necessary items without spending a lot of money.
- B** Although he did not enjoy the work, Carnegie took pride and pleasure from earning wages at the cotton factory.
- C** When Carnegie was a child, his father switched from working at hand-loom weaving to working at a cotton factory.
- D** Uncle Hogan's brother believed that the young Carnegie could earn plenty of money by selling knickknacks.

19

How does Carnegie illustrate that his father was one of "nature's noblemen" in the passage?

- A** by revealing his father's influence with Mr. Blackstock and Mr. John Hay
- B** by describing the hard life he and his father lived as factory workers
- C** by revealing that his father went on to have great financial success
- D** by describing his father's reaction to the idea of peddling

20

Which sentence from the passage best conveys Carnegie's point of view about this part of his life?

- A** "The prospect of want had become to me a frightful nightmare." (line 2)
- B** "I never knew what an enraged woman meant till then." (line 10)
- C** "They had their own troubles and bore them." (lines 43 and 44)
- D** "My hopes were high, and I looked every day for some change to take place." (lines 44 and 45)

Directions

Read this article. Then answer questions 36 through 38.

Spies in Petticoats

by Lisa Torrey

During the Civil War, thousands of women served as nurses. They worked in hospitals and on the front lines for the Union and the Confederacy. These “angels of the battlefields” hold a well-known place in American history. Less known, however, is the fact that hundreds of women also served in a far different capacity. They risked their lives as undercover spies.

5 These women spies came from a variety of backgrounds—from former slaves to fashionable socialites. Yet these very different women shared some valuable traits. Each had detailed knowledge of daily activities and troop movements in the part of the country where she lived. This knowledge made the women very helpful to military leaders, both Union and Confederate. These women also shared a passion for either the Union or the Confederacy, and they were willing to die for it. Across the country,
10 these female spies worked within carefully constructed networks, gathering information and using various means to relay messages.

One of the Union’s top female spies was a Southern woman named Elizabeth Van Lew. Even though Van Lew lived in the South, she was strongly against slavery. She convinced her own family to free their slaves. She was wealthy and well-educated. And she lived in Richmond, Virginia—the capital of the
15 Confederacy. When a Union general asked Van Lew to work as a spy, she readily agreed.

Elizabeth Van Lew enlisted the help of other Union supporters in Richmond to become her couriers. These couriers delivered secret information from her to General Grant, who led the Union troops. She also set up relay stations for the couriers at secret meeting points between Richmond and Grant’s headquarters. Van Lew wrote her coded messages in invisible ink. And the messages were often hidden
20 inside hollowed-out vegetables from Van Lew’s garden. Because of Van Lew’s efforts, General Grant learned how the Confederate army was defending Richmond. When General Grant and his Union troops captured Richmond, Elizabeth Van Lew proudly flew the Union flag from the roof of her house. General Grant even visited her at her home. He wanted to thank Van Lew in person for her service to the Union.

The former slave Harriet Tubman is celebrated for her work as a “conductor” of the Underground
25 Railroad. She led hundreds of slaves to freedom in the North. And she was also one of the Union’s most valuable spies. Because of her work with the Underground Railroad, Tubman knew firsthand all of the land and waterway transportation routes throughout the South. With this knowledge, she was able to map territory behind enemy lines for the Union. Also because of her work with the Underground Railroad, Tubman had the great respect of many people, especially slaves and former slaves. She enlisted
30 the help of these loyal people as scouts when she set up a vast spy ring for the Union. Led and trained by Tubman, her scouts went on dangerous missions behind enemy lines. Harriet Tubman herself led successful raids along the South Carolina coast in Confederate territory. These raids disturbed supply lines vital to the Confederate army, and they freed hundreds of slaves.

GO ON

35 While Elizabeth Van Lew, Harriet Tubman, and many other women worked as spies for the Union, other women were actively spying for the Confederacy. One woman in particular was the Confederacy's master spy. Her name was Rose O'Neal Greenhow. Greenhow was a wealthy widow. She was also a charming hostess. She often invited military and political leaders to her home for social evenings. And she lived in the ideal place for secretly obtaining information about the Union—Washington, D.C. Not only was Washington, D.C., the capital of the United States, it was the headquarters of the Union Army during the
40 Civil War.

Rose Greenhow considered herself a Southerner through and through. She would do anything to help the Confederacy win the Civil War. Operating from the Union capital, Greenhow soon organized the war's largest network of Confederate spies. Writing in secret code, she sent her reports by courier. Each courier passed Greenhow's reports to the next courier in a relay system known as the "Secret Line."

45 Rose Greenhow's messages were highly detailed. They described Union troop movements and strategies, or plans of action. One of these messages gave urgent information about the Union Army's plan of attack at the First Battle of Bull Run. Greenhow's accurate information led to a victory for the Confederate Army. In 1861, Rose was placed under house arrest by the newly formed secret service. Even then, the master spy managed to find out Union secrets and send them to Confederate military leaders.
50 After Rose was released from house arrest, she tried to smuggle gold for the Confederate treasury. However, the boat she was in turned over in rough water. Rose drowned, weighed down by the heavy gold.

36

How does the author illustrate the careful and creative ways Elizabeth Van Lew used to send messages to General Grant? Use two details from the article to support your response.

37

In paragraph 5, the author describes Harriet Tubman's work as a spy during the Civil War. What can be inferred about Harriet Tubman's skill as a spy from this evidence? Use **two** details from the article to support your response.

38

What is the author's point of view about the women she describes? Use **two** details from the article to support your response.

GO ON

Archimedes and the Siege of Syracuse

by Charles F. Baker, Calliope

INTRODUCTION

Syracuse, a peaceful and thriving city on the island of Sicily, a Greek colony off the southern coast of Italy, was the home of the famous mathematician and inventor Archimedes. Under the reign of King Hieron II, Syracuse found itself affected by a fierce conflict involving Rome and Carthage, a powerful city-state on the north coast of Africa.

- 5 *The Romans and the Carthaginians were vying for control of the Mediterranean Sea. Carthage already had colonies in Spain and claimed all of the western Mediterranean and most of Sicily except for Syracuse. Rome's armies had been capturing the Greek city-states in Italy. It was reasonable to expect that Syracuse, because of its location, would be caught in a war between the rapidly growing powers.*

ACT I

- 10 *It is the year 220 B.C. Syracuse has an alliance with Rome, but King Hieron is wondering how long it will last. Carthage has a great fleet of ships, and the Romans are spread out all over the area and cannot be relied on for protection. King Hieron needs a plan to defend his vulnerable city and turns to his longtime friend and kinsman Archimedes for advice and help.*

SCENE 1

- 15 *The royal palace of King Hieron. The king and his son, Prince Gelon, have received news that the Romans are angry with the Carthaginians, because they cannot trade in Sicily. Carthage has recently gained control of the Strait of Messina, which separates Sicily and Italy. Hieron has just sent for Archimedes.*

KING HIERON: My son, I fear for the safety of our city. Rome will not tolerate the aggressive actions of Carthage, and there will be a war.

- 20 **PRINCE GELON:** I agree. This is a dangerous situation. Rome will be cut off from its own ports in eastern Italy. The Romans cannot even sail around Sicily because Carthage also controls the western Mediterranean. All-out war is inevitable, and we will be caught in the middle.

KING HIERON: We must prepare to defend ourselves, even though we have an alliance with Rome. They could not possibly come to our rescue against the Carthaginians. They are already fighting in many different areas and cannot spare soldiers or ships to protect our city.

- 25 **PRINCE GELON:** I would not trust the Romans to continue to be our allies. They are an ambitious people, and I am sure they will want to add our prosperous city to their growing empire.

KING HIERON: I think you are right. That is why I want to build up our defenses. It is my hope that I will leave a strong, independent city for you and my grandson, Prince Hieronymos, to inherit. I have sent for Archimedes so that we can discuss this serious situation with him. I value his advice.

- 30 **PRINCE GELON:** I also have great respect for Archimedes, but how can he help defend our city? He is only a mathematician, not a soldier.

(Archimedes enters the royal chamber and hears Prince Gelon's statement.)

ARCHIMEDES: You are right, Your Royal Highness. Since I returned to Syracuse from Egypt many years ago, I have dedicated my life entirely to mathematical research.

35 KING HIERON: You know as well as I do, my friend, that you have become famous for your clever mechanical inventions.

ARCHIMEDES: They are only the diversions of geometry at play, and I attach no importance to them. I regard the business of mechanics as vulgar and despicable.

KING HIERON: Syracuse is in danger of becoming involved in the war between Rome and Carthage.

ARCHIMEDES: So I have heard.

40 KING HIERON: Having been at peace for so many years, we have not bothered to maintain our defenses. We forgot that our city was taken by siege years ago. I do not want that to happen again. Archimedes, I implore you to use your scientific knowledge to prepare offensive and defensive engines for me that can be used in every kind of siege warfare.

ARCHIMEDES: I do not like the idea of using science to destroy people.

45 KING HIERON: Why can you not use some of your scientific knowledge to defend the city that has sheltered you and given you the freedom to do your mathematical research for so many years? I should think that you would be anxious to prove that science can provide a better means for the defense of Syracuse than an army can.

50 ARCHIMEDES: You have won. I will begin at once to devise plans for all sorts of engines to use against any besiegers.¹

KING HIERON: We will all be grateful for your expertise.

¹ **besiegers:** attackers

39

At the beginning of the play, King Hieron has a problem. Tell what the problem is and how he tries to solve it. Use **two** details from the play to support your response.

GO ON

Directions

Read this story. Then answer questions 40 through 42.

from *The Sand Reckoner*

by Gillian Bradshaw

The young man took his compasses out of his mouth and turned, beaming. He was thin, long-limbed, and angular, and the general effect as he twisted about was of a grasshopper preparing to jump. “It’s a hundred and twenty myriads-of-myiads!” he exclaimed in triumph, brushing back a tangle of brown hair and regarding his interrupter with a pair of bright brown eyes. . . .

5 “Marcus,” he said eagerly, “what’s the biggest number you can imagine? The number of grains of sand in Egypt—no, in the world! No! How many grains of sand would it take to fill the universe?”

“Can’t say,” replied Marcus shortly. “Sir, we’re in Syracuse. In the Great Harbor. Where we disembark¹—remember? I need to pack the abacus.”

Archimedes put his hands protectively over the tray of sand—called by the same name as the more
10 familiar reckoning machine—and looked around with dismay. He had come up to the ship’s stern deck when the vessel had sighted the point of Plemmyrion and Marcus had started packing. Syracuse then had been only a patch of red and gold against green slopes; now a whole stretch of time seemed to have vanished into the sand, and Syracuse lay all around him. Here, in its harbor, the city—richest and mightiest of all the Greek cities of Sicily—appeared as nothing but walls. To his right loomed the citadel
15 of Ortygia, a rocky promontory² enclosed by massive battlements, and before him the seawall swept around in a long curve of gray to end in the tower-studded walls of the fort which commanded the approach from the marshes to the south. Two quinqueremes³ sat . . . ready for sea, their sides feathered white with the triple banks of their shipped oars.

Archimedes shot a longing glance at the clear water of the harbor entrance behind the ship. There
20 the Mediterranean stretched open and unbounded as far as the coast of Africa, brilliantly blue and hazy in the bright June afternoon. “Why the Great Harbor?” he asked unhappily. He was Syracusan-born, and the city’s customs were as natural to him as its dialect. Merchant ships like the one on which he and Marcus were passengers usually put into Syracuse’s Small Harbor, on the other side of the promontory of Ortygia. The Great Harbor belonged to the navy.

25 “There’s a war on, sir,” said Marcus patiently. He squatted down beside Archimedes and put out his hands for the box of sand.

Archimedes looked down sadly at the twelve billion grains of gleaming sand and his own scratched
calculations. Of course, Syracuse was at war, and the Small Harbor was sealed off. All the traffic was forced into the Great Harbor, where the navy could keep an eye on it. He knew about the war: it was one
30 of the reasons he had come home. The small farm his family owned lay to the north of the city, well beyond any possible zone of defense, and it was unlikely that there would be any income from it this year. His father was ill and could not practice his usual occupation as a teacher. Archimedes was the only

¹ **disembark:** go ashore

² **promontory:** something that projects, protrudes, or juts out

³ **quinqueremes:** a type of large war ship

son of the house, and supporting the family and protecting it through what was likely to be a very bad war was now his responsibility. It was time to give up mathematical games and find some real work.

35 Walls, he thought miserably; unbreachable⁴ walls, closing in.

Slowly, he took his hands off the notched rim of the abacus. Marcus picked it up, found the lid, and closed the reckoning box away. He slid it into its canvas sack and walked off with it. Archimedes sighed and sat back, hands dangling over his knees. The compasses slipped from his limp fingers and impaled⁵ themselves in the deck. He stared at them blankly for a moment, then pulled up one side of the instrument and swept it around, scratching a circle in the rough wood. Let the area of the circle be K—No. He folded the compasses and pressed the cool double bar against his forehead. No more games.

40

⁴ **unbreachable:** unable to be broken through

⁵ **impaled:** stuck like a spear

40

Closely reread lines 7 and 8 of *The Sand Reckoner*.

“Can’t say,” replied Marcus shortly. “Sir, we’re in Syracuse. In the Great Harbor. Where we disembark—remember? I need to pack the abacus.”

How do Marcus’s words about needing to disembark contribute to the plot? Use two details from the story to support your response.

GO ON

41

In *The Sand Reckoner*, what does Archimedes realize about the Great Harbor that turns the story toward its resolution? Use **two** details from the story to support your response.

Planning Page

You may **PLAN** your writing for question 42 here if you wish, but do **NOT** write your final response on this page. Write your final response on pages 30 and 31.



GO ON

In both “Archimedes and the Siege of Syracuse” and *The Sand Reckoner*, Archimedes was faced with the reality of wartime. How did he feel about this initially? Did his attitude change? Describe how Archimedes reacted to the reality of wartime in both passages. Use details from **both** the play and the story to support your response.

In your response, be sure to do the following

- describe how Archimedes reacted to the reality of wartime in “Archimedes and the Siege of Syracuse”
- describe how Archimedes reacted to the reality of wartime in *The Sand Reckoner*
- explain the similarity or difference in his final reaction to wartime in both passages
- use details from **both** the play and the story in your response
