

Fort Pulaski

U.S. Department of the Interior
National Park Service



Fort Pulaski National Monument

Cannons by the Numbers

5th-6th grade

Teacher Guide

Welcome to Fort Pulaski National Monument. Your students should have the student worksheet and a pencil to complete this activity. To start this math activity, lead your students inside the fort to

the parade ground--the large, grassy area in the middle. Take them to the large black cannon on the left side. A map is attached at the back for your use.

Stop 1

Gather the students around the black cannon. You can share these facts with them.

- It took six men to load and fire the cannon.
- This is called a Parrott cannon, named after its inventor Robert Parrott. (Cannons were often named after their designers in the Civil War.)
- This cannon is an exact replica of the cannons used by the Union army at the battle for Fort Pulaski. These were new, high-technology cannons. The range and accuracy of these cannons allowed the Union to win the battle.
- The cannon was loaded at the opening in the front of the barrel.
- The plug at the front of the barrel was used to keep the inside of the barrel clean when the

cannon was not in use.

- This cannon fired a 30-pound projectile. Projectile is a fancy word for a cannon ball.

Math problem: How many ounces did the projectile weigh?

Answer:

$$16 \text{ ounces} \times 30 \text{ pounds} = 480 \text{ ounces}$$

Find casemate 46. Casemates are the large rooms on the lower level of the fort. Once you find casemate 46, count one casemate to the right and enter what would be casemate 45.

Stop 2

Stop 2 is the casemate gin. You can share these facts with them.

- The casemate gin was used to lift cannon barrels on and off the carriages. The carriage is the structure that supports the barrel.
- Larger gins were used to lift cannon barrels to the top of the fort.
- Using pulleys and levers attached to the gin, 10 men would lift a 15,000-pound cannon barrel.
- The photo shows the gin rigged for use.

Math problem: The smaller bronze barrel under the gin weighs 800 pounds. Using the 15,000-pound barrel example, how many men would it take to lift the 800-pound barrel?



Stop 2 (continued)

Answer:

$$\frac{15,000 \text{ pounds}}{10 \text{ men}} = \frac{1,500 \text{ pounds}}{1 \text{ man}}$$

$$800 < 1,500 = 1 \text{ man}$$

Question for students: There are six pieces of

wood bolted to one of the gin's legs. What do you think they were used for?

Answer: The soldiers used them like a ladder to climb up the gin to work on it.

Walk through the casemates, past a big black cannon, and around the corner until you come to a group of three black cannons. Stop at the first cannon.

Stop 3

Stop 3 is the large cannon rolled to the back of the carriage. You can share these facts with them.

- There are two math problems at this stop.
- The three nearby cannons are not real cannons, but they are built to resemble authentic Civil War cannons.
- Genuine Civil War cannons are at various locations throughout the fort.
- This cannon is in the loading position because the barrel is at the back of the carriage.

Math problem #1: The long, black metal part is called the barrel. It is 126 inches long. Express that in feet and inches.

Answer:

$$\frac{126 \text{ inches}}{12} = 10 \text{ feet and } 6 \text{ inches}$$

Question for students: There is a wheel attached to the side of the carriage (it looks like a steering wheel). What do you think it was used for?

Answer: To raise and lower the barrel. (The wheel on this cannon does not work properly.)

Math problem #2: The barrel was loaded in the front with a cannonball. A cannon like this could fire a ball 1,955 yards. Express that distance in miles and feet. (Hint: 1 yard = 3 feet and 1 mile = 5,280 feet.)

Answer:

$$1,955 \text{ yards} \times 3 = 5,865 \text{ feet}$$

$$5,865 \text{ feet} - 5,280 \text{ feet} = 585$$

1 mile and 585 feet

Question for students: After the cannon fired, it rolled backward. The soldiers re-loaded the cannon and rolled it forward into firing position. What part on the carriage helped them move the barrel back and forth?

Answer: The wheels that rolled on the smooth track.

Move along two more casemates till you reach the cannon that is rolled forward to the wall.

Stop 4

Stop 4 is the cannon rolled to the front of the carriage. You can share these facts with them.

- There are two math problems at this stop.
- The structure that supports the barrel is called the carriage.
- The carriage has two sets of wheels.
- The top set of wheels allowed the cannon to roll backward after it fired.

- The lower set of wheels allowed the soldiers to move the cannon from left to right for aiming.

Math problem #1:

The carriage alone weighs 3,695 pounds.

The upper set of wheels weighs 446 pounds.

The lower set of wheels weighs 258 pounds.

The barrel weighs 8,465 pounds.

Stop 4 (continued)

How much does the entire cannon weigh?

Answer:

$$\begin{array}{r} 3,695 \\ 446 \\ 258 \\ \hline 8,464 \\ \hline 12,864 \text{ pounds} \end{array}$$

Question for students: Why was the embrasure (the opening in the wall that looks like a window) so small?

Answer: To limit the space for incoming projectiles fired by the enemy.

Math problem #2:

- The battle for Fort Pulaski was fought from 8 a.m. till 6 p.m.
- In the Civil War, armies typically stopped fighting when it got dark because they couldn't see what they were doing.
- The soldiers were very busy during the battle for Fort Pulaski. they could re-load a weapon like this once every four minutes.
- If the soldiers fired continually for the

entire first day of battle, how many shots would they have fired?

Answer:

$$10 \text{ hours} \times 60 \text{ minutes} = 600 \text{ minutes}$$

$$\frac{600 \text{ minutes}}{4 \text{ shots}} = 150 \text{ shots}$$

Question for students: Whom were the Confederates in the fort firing at on Tybee Island?

Answer: Union soldiers.

Walk back toward casemate 47. Find the staircase and walk to the left of the staircase to find the powder magazine.



Stop 5

Stop 5 is the powder magazine. You can share these facts with them.

- All the gunpowder used for the fort cannons was stored in this magazine.
- This is a room with no windows to keep sparks out..
- There is no gunpowder in the barrels.
- At the time of the battle, the magazine held 40,000 pounds of gunpowder.
- Barrels were stacked on wood to keep them off the floor.
- The Confederates in the fort surrendered after less than two days of battle because they feared enemy fire would cause a massive explosion of gunpowder in the magazine.

Math problem: Each barrel contained 100 pounds of gunpowder. So how many barrels were stacked in the magazine?

Answer:

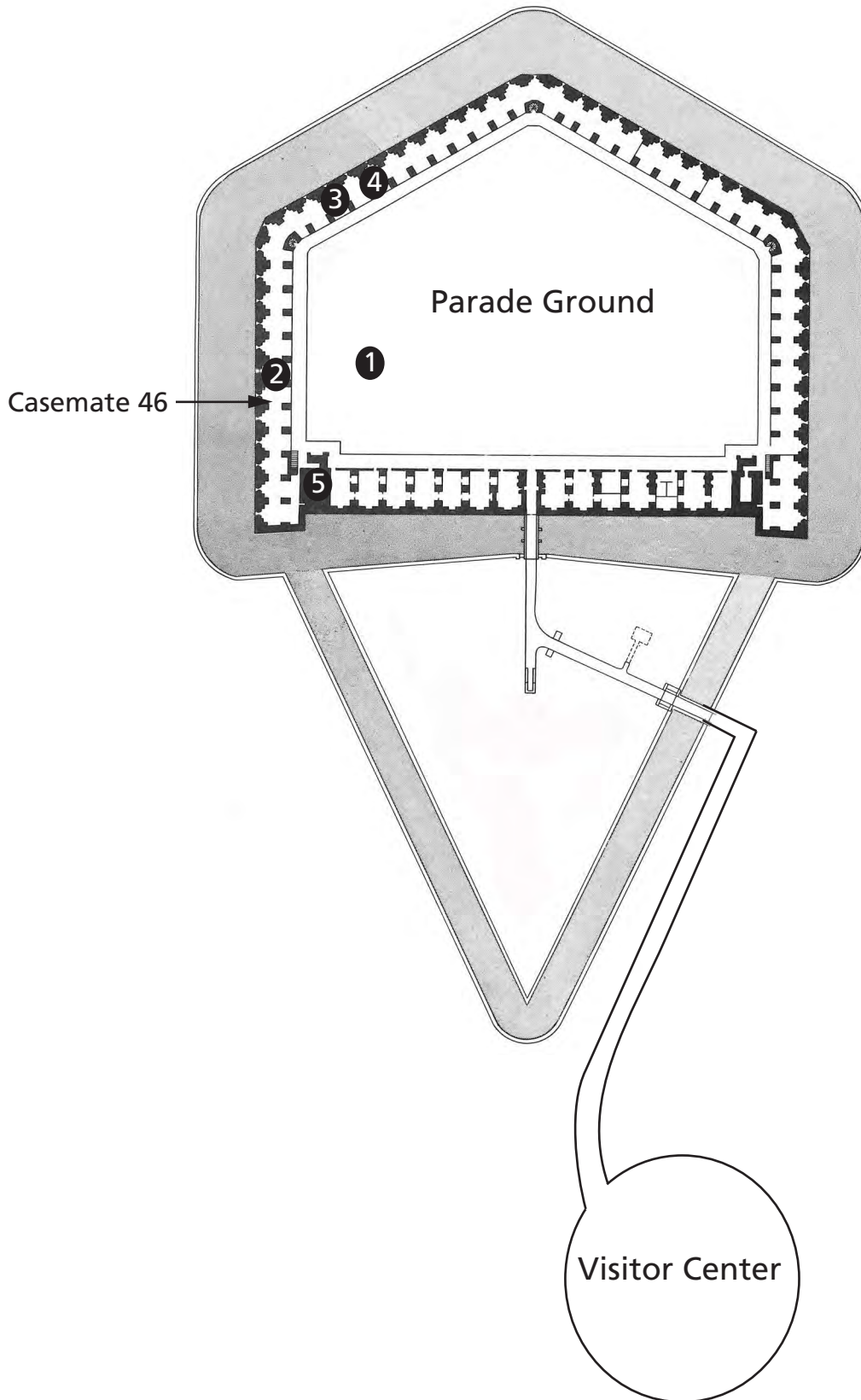
$$\frac{40,000 \text{ pounds}}{100} = 400 \text{ barrels}$$

Question for students: Why were the barrels elevated off the floor?

Answer: To keep the barrels dry and ventilated.

Congratulations, your students are now on their way to becoming experts on Civil War cannons.

Cannons by the Numbers
Teacher Guide
Map



Fort Pulaski

U.S. Department of the Interior
National Park Service



Fort Pulaski National Monument

Cannons by the Numbers

5th-6th grade

Student Worksheet

Welcome to Fort Pulaski National Monument.
You will be doing some math activities to learn
more about Civil War cannons.

Stop 1

This cannon represents the kind of cannon that
was used by the Union Army in the battle for Fort
Pulaski.

It fired a projectile that weighed 30 pounds.
Projectile is a fancy word for cannonball.

Express the weight of the projectile in ounces.

30 pounds = _____ ounces

Stop 2

This machine was used to lift cannons to the top
of the fort.

Using pulleys and levers attached to the gin, 10
men would lift a 15,000-pound cannon barrel.

The bronze cannon barrel under the gin weighs
800 pounds. Using the 15,000-pound barrel
example, how many men would it take to lift the
800-pound barrel?

Stop 3

Problem #1

The long, black metal part is called the barrel. It is 126 inches long. Express that in feet and inches.

126 inches = _____ feet and _____ inches

Math problem #2

The barrel was loaded in the front with a cannonball. A cannon like this could fire a ball 1,955 yards. Express that distance in miles and feet. (Hint: 1 yard = 3 feet and 1 mile = 5,280 feet.)

1,955 yards = _____ miles and _____ feet

Stop 4

Math problem #1:

The carriage alone weighs 3,695 pounds.

The upper set of wheels weighs 446 pounds.

The lower set of wheels weighs 258 pounds.

The barrel weighs 8,465 pounds.

How much does the entire cannon weigh?

_____ pounds

Math problem #2

The battle for Fort Pulaski was fought from 8 a.m. till 6 p.m. The soldiers could re-load a weapon like this once every four minutes. If the soldiers fired continually for the entire first day of battle, how many shots would they have fired?

_____ shots

Stop 5

At the time of the battle, the magazine held 40,000 pounds of gunpowder. Each barrel would have held 100 pounds of gunpowder. How many barrels were stacked in the magazine?

_____ barrels