

# Antietam National Battlefield

National Park Service  
U.S. Department of the Interior



## You're the Gunner Math Activity

**Problem #1** You have three types of cannons in your battery: a 10-pound Parrott rifle, a six-pounder smoothbore, and a Napoleon (a 12-pounder smoothbore). Use the table below to answer the following questions:

- Which cannon would you use against advancing soldiers who are 1,500 yards away? Why?
- Which cannon would you use to destroy a brick building? Why?
- Which has a longer range, rifled or smoothbore cannons?

TYPES OF CANNONS	
<b>SIX-POUNDER GUN (SMOOTHBORE)</b>	
Good for medium-range fire against enemy soldiers and good for canister. Range: Up to 1,300 yards.	
<b>NAPOLEON (12-POUNDER SMOOTHBORE)</b>	
Like the six-pounder, but more destructive and shoots farther. Range: Up to 1,600 yards.	
<b>10-POUNDER PARROTT (RIFLE)</b>	
Good for long-range accurate fire against buildings or enemy artillery. Range: Up to 2,000 yards.	

**Problem #2** The elevation of the cannon tube determines how far a projectile travels. Use the table of fire below to answer the following questions. Hint: 1/4 mile = 440 yards, 1/2 mile = 880 yards, 1 mile = 1,760 yards

- Find the elevation in degrees required to hit troops about a half mile away (you can round up or down to the closest number on the chart) in the Cornfield using spherical case. Approximately how long would the spherical case be in flight?
- A 6-pounder gun elevated to 2 degrees will fire a spherical case how many yards? What percentage of a mile is this?

TABLE OF FIRE. 6 POUNDER GUN				
SHOT- Charge 1 ¼ Pounds		SPHERICAL CASE- Charge 1 ¼ Pounds		
ELEVATION In Degrees	RANGE In Yards	ELEVATION In Degrees	TIME OF FLIGHT In Seconds	RANGE In Yards
0°	318	1°0'	2"	600
1°	674	1°45'	2" 75	700
2°	867	2°0'	3"	800
3°	1138	2°45'	3" 25	900
4°	1256	3°0'	3" 75	1000
5°	1523	3°15'	4"	1100
		4°0'	5"	1200

**Problem #3** There are several different types of ammunition available to the gunner. Use the table below to figure out what kind of ammunition to fire if:

A. Soldiers are marching toward you from the Cornfield in a line. They are 850 yards away from you. Explain your choice.

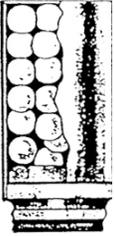
B. You want to destroy the Piper Farm 900 yards away to prevent snipers from hiding there. Explain your choice.

**SOLDIERS IN A COLUMN**

↑  
X X X X  
X X X X  
X X X X

**SOLDIERS IN A LINE OF BATTLE**

↑  
XXXXXXXXXXXXXXXX

TYPES OF AMMUNITION		
SOLID SHOT	SPHERICAL CASE	CANISTER
		
Used against buildings and used like a bowling ball against soldiers marching in a column.	Used against soldiers marching in line of battle and used against enemy artillery.	Used against soldiers charging the cannon at close range.
Range: 800-1,500 yards	Range: 600-1,400 yards	Range: Less than 300 yards

**Problem #4** Captain John Tompkins, commander of the 1<sup>st</sup> Rhode Island Artillery, moved his battery into position near where the present park visitor center stands. His guns fired south towards the Piper Farm, then they were turned to fire on Confederates charging from the Dunker church, then they resumed firing to the south.

A. During this barrage, which lasted three hours, Tompkins' six guns fired a total of 1,050 rounds of ammunition. What is the average number of rounds per minute per gun?

B. If Tompkins Battery has six cannon and 2,500 rounds of ammunition and if each cannon could fire one round per minute how long until Tompkins' gunners are out of ammunition?

**Problem #5** The Army of the Potomac had 293 guns present at Antietam. The Confederate Army had an estimated 246 guns. What was the ratio of Union to Confederate guns at Antietam?

**Bonus Question** Name several factors that would cause an artillery gunner to reposition or re-aim the cannon?

