In 1914, war was in the air. The Archduke Ferdinand of Austria was assassinated in Sarajevo, propelling one European nation after another to choose alliances. It was not long before two sides stood opposed. The Allies, which included the United Kingdom, France, Italy, Japan, and Russia, made up one side. The Central Powers occupied the other side—Germany, Austria-Hungary, and Turkey. Tensions between world powers erupted, and World War I was soon underway. Never before had a war involved such great numbers of soldiers or such advances in technology.

President Woodrow Wilson did not want the United States to enter the conflict. He lobbied on behalf of neutrality from 1914 to 1917. However, Germany’s use of one type of boat contributed to the decision of the United States to join World War I in 1917. What kind of a vessel could create such an impact? The U-boat.

The First Submarines
Although submarines such as the German U-boats first had a major impact in World War I, they had been around for a lot longer. In 1578, William Bourne, a British naval writer, described his idea for a wooden boat that could enclosed, sunk, and rowed under the surface of the water. But Bourne never actually created such a vessel. The first working submarine did not appear until 1620, when Dutch inventor Cornelis Drebbel built a ship that sailed 12 to 15 feet below the surface of the Thames River in England. The outer hull of Drebbel’s craft was made of greased leather over a wooden frame.

By the mid-1700s, at least 14 types of submersible boats had been patented in England alone. One used goatskin bags attached to the hull to allow water to enter when sinking and force the water out when rising.

The first time a submarine was used in warfare was during the American Revolution in the late 1700s. A one-man craft invented by a student at Yale University was built of wood in the shape of a walnut. This boat was designed to sneak up on a British warship and explode a charge of gunpowder attached to the hull. That effort failed, however, but the quest to build a submersible ship for warfare continued.
Underwater Boats
It was not until powerful engines were developed that submarines really began to work as intended. When World War I began, all major navies included them in their fleets. These small vessels were designed to work near the coasts, so they could easily reach the safety of shore. German U-boats, however, were different.

U-boat stands for “underwater boat.” The German Deutschland U-boats were 315 feet long with two large cargo compartments. They could carry 700 tons of cargo at speeds of 12 to 13 knots (about 14 miles per hour) while above water and 7 knots (about 8 miles per hour) while below water. They were fitted with torpedo tubes and deck guns, so they could attack other vessels.

U-boats targeted ships carrying supplies across the Atlantic Ocean. This forced the cargo ships to travel in big groups called convoys. These convoys were often escorted by warships with heavy arms that could fight off the U-boats.

How a Submarine Works
The front of a submarine is called the bow, and the rear is called the stern. The conning tower is located on the top; it houses periscopes, radio antennae, and other instruments. When a submarine rises to the surface of the water, the conning tower appears first. This design allows the boat to stay mostly hidden, even as it rises to the surface. Before the small conning tower appears, though, the periscope juts out from the top and allows the ship’s captain to see above the surface of the water. The rudder and the propeller are on the stern of the boat. The rudder is for steering, while the propeller pushes the submarine through the water. Finally, hydroplanes are fins on the sides of the conning tower and on the stern as well. They work to keep a submarine either tilted up or down.

Before a submarine can make adjustments under water, it must first be submerged. Believe it or not, sinking a ship can be difficult! The hollow boat is filled with air, which naturally works to keep the boat afloat. To sink a submarine requires the use of ballast. Ballast is a device that improves stability and control, and in the case of a submarine, allows it to go up and down in the water. Ballast tanks are located inside the submarine. When these tanks are filled with water, the submarine sinks underneath the waterline. When they are filled with air, the submarine rises to the surface.
The *Lusitania*

In May 1915, the British ocean liner *Lusitania* was traveling to Liverpool, England, from New York. Nearly 2,000 passengers and crew members were on board. A German U-boat spotted the ocean vessel and fired a torpedo at it. An explosion followed, and the ship sunk quickly—within 20 minutes—and drowned nearly 1,200 passengers and crew. One hundred and twenty-eight of these passengers were U.S. citizens. The sinking of the *Lusitania* caused a firestorm in the press. Many demanded that the United States declare war on Germany, but the U.S. government maintained its position of neutrality.

Germany suspected—correctly, it turns out—that American ships were providing the British with war supplies. At first, Germany hesitated to continue attacking American ships because it wanted to keep the United States out of the war. However, in February 1917, Germany decided to adopt unrestricted U-boat warfare against merchant ships. The United States entered the war in 1917 and listed German submarine warfare as one of the reasons for its decision.

**U-boats on the Prowl**

During World War I, U-boats often traveled together and attempted to attack the supply ships. Many battles erupted between German, English, and American ships. The addition of deck guns to U-boats allowed the Germans to intimidate enemy merchant ships above the water. Then, the U-boat crew would signal for the merchant ship to stop so the Germans could search the ship. The Germans used the deck guns to fire on and sink small or unarmed ships instead of firing expensive torpedoes.

Some U-boats were modified so they could lay mines in the enemy’s harbors. Vertical mine tubes were inserted into the U-boats hulls, which allowed them to deposit the mines. In addition to their torpedoes, some U-boats carried up to 48 land mines. In April 1917, German U-boats destroyed more than 400 Allied and neutral ships carrying 850,000-plus tons of cargo. Germany built 334 U-boats by 1918. A total of 226 U-boats were under construction when the war ended. At any one time, there were never more than 60 U-boats sailing at sea.

Germany was not the only country using submarine warfare. The British developed a special kind of submarine in order to destroy U-boats. These small boats were both fast and easy to maneuver. They managed to sink 17 German U-boats. Although Germany had a strong naval fleet, the war did not end in Germany’s favor. The strong U.S. military, with its destroyers and convoys of ships, turned the tide on the war.
After reading the passage, answer the following questions:

1. When were submarines first used in warfare?  
   A. in the mid-1700s  
   B. during World War I  
   C. during the Civil War  
   D. during the American Revolution

2. Which submarine operation is correct?  
   A. The propeller steers the submarine after the rudder is engaged.  
   B. Periscopes must be extended while the submarine is on the surface of the water, not beforehand.  
   C. Submarines rise to the surface of the water when the ballast tanks are filled with air and sink underneath it when filled with water.  
   D. Hydroplanes that are pushed backward cause the submarine to sink underneath the water; hydroplanes pushed forward cause it to rise above the water.

3. How did U-boats affect American neutrality?  
   A. They carried supplies to America’s enemies, the Germans.  
   B. They encouraged Great Britain to declare war on the United States.  
   C. They fired on American merchant ships, causing the United States to enter World War I.  
   D. They allowed American merchant ships to continue to supply German ports with war cargo.

4. In what ways did submarines evolve from their earliest days to the U-boat? Provide at least two examples, using details and evidence from the passage to support your answer.