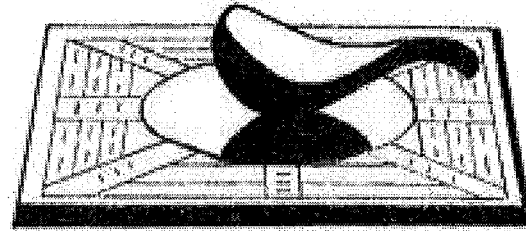


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## Chinese Inventions - Compass & Gunpowder

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Have you ever had an idea that didn't quite turn out the way you intended? That "surprise" element is something inventors are very familiar with. A case in point is Leo Szilard (1898 - 1964), who patented the idea of a nuclear chain reaction in 1934. Though Leo Szilard came up with the idea and helped the U.S. government create the first atomic bomb, he was adamantly against using it on moral grounds. Despite his repeated pleas, the U.S. government dropped two atomic bombs on Japan in 1945 and ended World War II.



Leo Szilard was certainly neither the first nor the last inventor whose product was used in a way different from its initial design. Looking back in history, there are two Chinese inventions that fit the bill. They are the compass and gunpowder.

The earliest-known compass dates from China during the Warring States Period (475 B.C. - 221 B.C.) At the time people used an instrument called "sinan" for fortune telling and other spiritual applications. A sinan consisted of two components. The first, top part was a spoon made of loadstone. The second, bottom part was a square bronze plate with markings pointing to twenty-four different directions. Because loadstone aligned with the Earth's natural magnetic field, the spoon's handle would always point to south when placed on the plate. The ancient Chinese quickly realized the potential application of this direction-finding device. So they began to work on improving its stability. The compass of later days had a magnetized needle on a round plate. Its first recorded use as a navigation tool on ships was during the Northern Song dynasty (960 A.D. - 1127 A.D.)

The invention of the compass was not well known to the rest of the world until Zheng He came along. Zheng He was a royal envoy of the Ming dynasty (1368 A.D. - 1644 A.D.) He made seven ocean voyages between 1405 and 1433. His Treasure Fleet, consisting of more than 30 ships and 30,000 men, went to places as far as today's Somalia in eastern Africa. Through his expeditions, Zheng He opened up trade routes for China, and he built diplomatic relations with other countries. And of course, through his expeditions, he showed the usefulness of a compass in marine navigation. Caught up by the idea, Christopher Columbus used a compass for his journey in 1492. He sailed from Spain and traveled west. After being at sea for about 70 days, he finally reached land. He thought the land was India, his final destination. But it was not. The land Christopher Columbus discovered was America!

Gunpowder is a mixture of sulfur, saltpeter, and charcoal. While the three ingredients are safe enough by themselves, the compound is not. If set on fire, the concoction can produce a powerful explosion. Chinese alchemists stumbled upon this combination in the 8th century as they experimented with ways to prolong life. Shortly after the discovery, the Chinese military began to use gunpowder in warfare. They made several new weapons. For example, they created rockets by launching gunpowder from bamboo tubes. They shot arrows tied with packets of igniting gunpowder.

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Gunpowder was introduced to the Arab world during the 13th century. Then, it made its way to Europe sometime during the 14th century. Ironically, though the Chinese invented gunpowder, they never fully utilized it to its potential. They restricted themselves to using it more for firework displays than for military combat. The Chinese's lack of interest in developing new applications for gunpowder was a costly mistake. When Europeans came to China in the 19th century demanding free trade, they attacked China with cannons and other weapons using -- what else?-- gunpowder!

### Chinese Inventions - Compass & Gunpowder

## Questions

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- \_\_\_\_\_ 1. What made the sinan work as a compass?
  - A. lodestone
  - B. bronze
  - C. the square shape of the plate
  - D. the shape of the spoon
  
- \_\_\_\_\_ 2. What was the original purpose of the compass?
  - A. to prolong life
  - B. to cure illness
  - C. to tell fortunes
  - D. all of the above
  
- \_\_\_\_\_ 3. When did Leo Szilard patent his idea of a nuclear chain reaction?
  - A. 1943
  - B. 1945
  - C. 1934
  - D. 1954
  
- \_\_\_\_\_ 4. What dynasty was Zheng He from?
  - A. the Yuan dynasty
  - B. the Warring Period
  - C. the Ming dynasty
  - D. the Northern Song dynasty
  
- \_\_\_\_\_ 5. When the Chinese created gunpowder, what were they hoping that it would do?
  - A. prolong life
  - B. find directions
  - C. kill enemies
  - D. tell fortunes
  
- \_\_\_\_\_ 6. Which of the following about gunpowder is **INCORRECT**?
  - A. Gunpowder is a mixture of three ingredients -- saltpeter, charcoal, and sulfur.
  - B. The ancient Chinese called gunpowder "sinan."
  - C. Gunpowder was introduced to the Arab world during the 13th century.
  - D. Though the Chinese invented gunpowder, they didn't use it as extensively in the military as the Europeans.

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- \_\_\_\_\_ 7. What Chinese dynasty had the first written record of using the compass on ships?
- A. the Northern Song dynasty
  - B. the Northern Qi dynasty
  - C. the Northern Wei dynasty
  - D. the Northern Zhou dynasty
- \_\_\_\_\_ 8. How many directions could a sinan point out?
- A. 28
  - B. 24
  - C. 20
  - D. 48

