The invention of the compass

Origins in the ancient world

The invention of the pair of compasses, the drawing instrument used to create circles and measure distances, dates back to antiquity. Archaeological evidence suggests that early versions were used in Ancient Egypt around 2000 BC. Craftsmen and architects needed precise tools to design temples, monuments, and decorative patterns. Simple compasses were made from wood or bronze and consisted of two hinged legs that could rotate around a fixed point. Similar instruments have also been found in Ancient Greece and Ancient Rome, where geometry played a central role in science, engineering, and art. Greek mathematicians used the compass to explore geometric constructions, laying the foundations of classical geometry.

Classical geometry and mathematical importance

The pair of compasses became especially important through the work of Euclid, who lived around 300 BC. In his famous treatise, *Elements*, Euclid described geometric constructions that required only a straightedge and a compass. This method influenced mathematics for over two thousand years. The compass was not only a drawing device but a symbol of logical reasoning and precision. By fixing one leg in place and rotating the other, mathematicians could construct perfect circles and transfer distances accurately. The simplicity of the instrument made it universal and adaptable to many practical tasks.

craftsman: *artigiano*
to flourish: *fiorire, prosperare*
hinged: *incernierato*
rod: *barra*
straightedge: *riga (non graduata)*
treatise: *trattato*

Developments during the Middle Ages and Renaissance

During the Middle Ages, the compass remained essential for architecture, navigation, and manuscript illustration. Craftsmen in Europe refined its design by adding metal joints and adjustable screws for greater stability. In the Renaissance (14th-17th centuries), the instrument gained importance as art and science flourished. Artists such as Leonardo da Vinci used compasses in technical drawings and anatomical studies. Architects relied on it to design domes, churches, and fortifications with precise proportions. The compass also became a symbol of knowledge and craftsmanship.

Modern improvements and lasting impact

From the 18th century onwards, advances in metalworking allowed for the production of highly precise steel compasses. Manufacturers introduced interchangeable pencil and ink attachments, making the instrument more versatile. During the Industrial Revolution, compasses were widely used in engineering, drafting, and education. Although digital design tools are common today, the pair of compasses remains a fundamental instrument in geometry classrooms worldwide. Its invention represents a key step in the development of mathematics, architecture, and technical drawing, demonstrating how a simple mechanical tool can shape centuries of scientific and artistic progress.

1 Write questions to these answers.

1. Early versions were used in Ancient Egypt around 2000 BC.
2. They were made of wood or bronze and had two hinged legs.
3. Similar tools were found in Ancient Greece and Ancient Rome.
4. It was used to perform geometric constructions and helped the development of classical geometry.
5. Euclid made it essential through his geometric methods.
6. A straightedge and a compass.
7. Craftsmen added metal joints and adjustable screws for greater stability.
8. It remains a fundamental tool in teaching geometry despite the use of digital design technology.

2 Complete the text with the words given below.

mathematical • tools • drawing • structures • detailed • level • standardise • lines • achieve • geometric

Technical Drawing in Ancient China

Ancient Chinese technical **1.** ..... was a sophisticated, linear, and often diagrammatic art form used for architecture, engineering, and cartography. Builders, artisans, and scholars relied on precise **2.** ..... methods to design palaces, temples, bridges, and city walls. During periods such as the Han Dynasty and later the Song Dynasty, technical knowledge was carefully recorded and transmitted. Manuals and diagrams helped **3.** ..... construction techniques and ensured accuracy in large-scale projects.

Drawing **4.** ..... were essential in this process. Craftsmen used measuring rods, ink brushes, set squares, and early forms of the pair of compasses to create circles and arcs. The compass, in particular, allowed designers to **5.** ..... symmetry and balance, principles that were central to Chinese architecture and urban planning. Circular shapes were important in symbolic designs, representing harmony and unity, while straight **6.** ..... were used to create stable structural layouts.

One of the most significant technical texts of ancient China is the *Yingzao Fashi*, published in 1103 during the Song Dynasty. This architectural manual provided **7.** ..... drawings, measurements, and instructions for building construction. It reflects the advanced **8.** ..... of technical drawing at the time, combining practical skill with **9.** ..... reasoning. Through careful measurement and geometric planning, ancient Chinese engineers were able to construct durable and aesthetically balanced **10.** ..... Technical drawing, supported by precise tools like the compass, was therefore fundamental to China's architectural and technological achievements.

Adapted from: *https://www.cuhk.edu.hk/ics/journal/articles*

3 Translate the sentences into English.

1. L'invenzione del compasso da disegno risale a tempi molto antichi.
2. Le prime versioni furono utilizzate in Egitto intorno al 2000 a.C.
3. Architetti e artigiani avevano bisogno di strumenti precisi per progettare edifici e decorazioni.
4. I primi compassi erano fatti di legno o bronzo e avevano due bracci incernierati.
5. In Grecia e a Roma la geometria era fondamentale per la scienza e l'ingegneria.
6. Euclide spiegò costruzioni geometriche che richiedevano solo riga e compasso.
7. Nel Rinascimento il compasso divenne importante per artisti e architetti.
8. Nonostante i moderni strumenti digitali, il compasso rimane essenziale nello studio della geometria.