

READING PASSAGE 1

You should spend about 20 minutes on **Questions 1–13**, which are based on Reading Passage 1 below.

Questions 1–7

Reading Passage 1 has seven paragraphs **A–G**.

Choose the correct heading for each paragraph from the list of headings below.

Write the correct number, **i–x**, in boxes 1–7 on your answer sheet.

List of Headings

- | | |
|-------------|---|
| i | Early years of Gilbert |
| ii | What was new about his scientific research method |
| iii | The development of chemistry |
| iv | Questioning traditional astronomy |
| v | Pioneers of early science |
| vi | Professional and social recognition |
| vii | Becoming the president of the Royal Society |
| viii | The great works of Gilbert |
| ix | His discovery about magnetism |
| x | His change of focus |

1 Paragraph **A**

2 Paragraph **B**

3 Paragraph **C**

4 Paragraph **D**

5 Paragraph **E**

6 Paragraph **F**

7 Paragraph **G**

William Gilbert and Magnetism

- A** The 16th and 17th centuries saw two great pioneers of modern science: Galileo and Gilbert. The impact of their findings is eminent. Gilbert was the first modern scientist, the accredited father of the science of electricity and magnetism, an Englishman of learning and a physician at the court of Elizabeth. Prior to him, all that was known of electricity and magnetism was what the ancients knew: nothing more than that the lodestone possessed magnetic properties and that amber and jet, when rubbed, would attract bits of paper or other substances of small specific gravity. However, he is less well known than he deserves.
- B** Gilbert's birth predated Galileo's. Born into an eminent local family in Colchester, Essex, on 24 May 1544, he went to grammar school and then studied medicine at St John's College, Cambridge, graduating in 1573. Later he travelled on the Continent and eventually settled in London.
- C** He was a very successful and eminent doctor. All this culminated in his election as president of the Royal Society. He was also appointed personal physician to Queen Elizabeth I and was later knighted by her. He faithfully served her until her death. However, he did not outlive the Queen for long and died on 30 November 1603, only a few months after his appointment as personal physician to King James.
- D** Gilbert was first interested in chemistry but later changed his focus because alchemy contained too great a portion of mysticism (such as the transmutation of metals). He gradually developed an interest in physics, inspired by the great minds of the ancients, particularly the knowledge the ancient Greeks had about lodestones—strange minerals with the power to attract iron. In the meantime, Britain became a major seafaring nation in 1588 when the Spanish Armada was defeated, opening the way to British settlement of America. British ships depended on the magnetic compass, yet no one understood why it worked. Did the Pole Star attract it, as Columbus once speculated; or was there a magnetic mountain at the pole, as described in the *Odyssey*, which ships would never approach because the sailors thought its pull would yank out all their iron nails and fittings? For nearly 20 years, William Gilbert conducted ingenious experiments to understand magnetism. His works include *On the Magnet*, *Magnetic Bodies*, and *The Great Magnet of the Earth*.

- E** Gilbert's discoveries were of great importance to modern physics. He investigated the nature of magnetism and electricity, and he even coined the word "electric". Early beliefs about magnetism were largely entangled with superstitions—for instance, sailors believed that rubbing garlic on a lodestone could neutralise its magnetism and that even the smell of garlic would interfere with the action of a compass, which is why helmsmen were forbidden to eat it near a ship's compass. Gilbert also found that metals can be magnetised by rubbing materials such as fur on them. He named the ends of a magnet the "north pole" and "south pole". The magnetic poles can attract or repel, depending on polarity; ordinary iron, however, is always attracted to a magnet. Though he began to study the relationship between magnetism and electricity, he did not complete this work. His research into static electricity using amber and jet only demonstrated that objects with electrical charges can attract small pieces of paper and the like. It was a French scientist named du Fay who later discovered that there are actually two electrical charges—positive and negative.
- F** He also questioned traditional astronomical beliefs. Though a Copernican, he did not state explicitly whether the Earth is at the centre of the universe or in orbit around the Sun. However, he believed that stars are not equidistant from the Earth but have their own Earth-like planets orbiting around them. The Earth itself is like a giant magnet, which is also why compasses always point north: they align with the planet's polarity. He likened the polarity of a magnet to the polarity of the Earth and built an entire magnetic philosophy on this analogy. In his explanation, magnetism is the soul of the Earth. Thus a perfectly spherical lodestone, when aligned with the Earth's poles, would wobble all by itself in 24 hours. Further, he believed that the Sun and other stars wobble just as the Earth does around a crystal core, and he speculated that the Moon might also be a magnet caused to orbit by its magnetic attraction to the Earth. This was perhaps the first proposal that a force might cause a heavenly orbit.
- G** His research method was revolutionary in that he used experiments rather than pure logic and reasoning, as the ancient Greek philosophers had done. This represented a new attitude towards scientific investigation; until then, systematic experiments were not in fashion. Because of this scientific attitude, together with his contribution to our knowledge of magnetism, a unit of magnetomotive force—also known as magnetic potential—was named the *gilbert* in his honour. His approach of careful observation and experimentation, rather than reliance on authoritative opinion or deductive philosophy, laid the very foundation for modern science.

Questions 8–10

Do the following statements agree with the information given in Reading Passage 1?

In boxes 8-10 on your answer sheet, write

TRUE	<i>if the statement agrees with the information</i>
FALSE	<i>if the statement contradicts the information</i>
NOT GIVEN	<i>if there is no information on this</i>

- 8 Gilbert is less famous than he should be.
- 9 Gilbert was famous as a doctor before he was employed by the Queen.
- 10 Gilbert lost faith in the medical theories of his time.

Questions 11–13

Choose **THREE** letters, **A–F**.

Write the correct letters in boxes 11-13 on your answer sheet.

Which **THREE** of the following are parts of Gilbert's discovery?

- A** Metal can be transformed into another.
- B** Garlic can remove magnetism.
- C** Metals can be magnetised.
- D** Stars are at different distances from the Earth.
- E** The Earth wobbles on its axis.
- F** There are two charges of electricity.

1–7 段落标题配对

题号	段落	正确标题编号	关键定位&理由
1	A	v Pioneers of early science	段落开头把 <i>Galileo</i> 和 <i>Gilbert</i> 并列称为“两个现代科学的先驱 (pioneers)”，整段介绍他作为先驱的地位。
2	B	i Early years of Gilbert	全段写他的出生、家庭、求学经历，典型的“早年经历”。
3	C	vi Professional and social recognition	先讲他“成功且著名的医生”，接着列举当选皇家学会会长、被伊丽莎白一世任命御医并受封骑士等多重社会/职业荣誉。
4	D	x His change of focus	先说“起初对化学 (alchemy) 感兴趣，后来转向物理/磁学”，标题中的 change of focus 正好对应。
5	E	ix His discovery about magnetism	重点叙述他对磁性（以及顺带的静电）的一系列发现：命名南北极、摩擦致磁、破除大蒜迷信等。
6	F	iv Questioning traditional astronomy	质疑旧天文学观念：星星距地不等、地球像巨大的磁石、行星绕转等。
7	G	ii What was new about his scientific research method	强调他“用实验证明而非纯推理”，并指出这种方法论对现代科学奠基的意义。

8–10 判断题 (TRUE / FALSE / NOT GIVEN)

题号	答案	关键定位 & 解释
8	TRUE	段落 A 末句：“However, he is less well known than he deserves.”——与题干“less famous than he should be”一致。
9	TRUE	段落 C 前两句先描述他已是“a very successful and eminent doctor”，随后才说“He was also appointed personal physician to Queen Elizabeth I”。说明在受聘前就已因医生身份出名。
10	NOT GIVEN	文中从未提到他对当时医学理论“失去信心”或加以否定，只说他之后将兴趣转向物理/磁学，与医学信念无关。

多选题 (11–13)

题干：下列哪 THREE 项 属于吉尔伯特的发现？

选项	判断	关键定位句	说明
A 金属可转化为另一种金属	✗	D段首句提到他放弃包含“transmutation of metals”的炼金术	他认为这是神秘化学，并非自己的发现。
B 大蒜可去除磁性	✗	E段：“Early sailors believed that rubbing garlic on a lodestone could neutralise its magnetism...” 随后实验证明迷信错误	他否定了这一说法，不算发现内容。
C 金属可被磁化	✓	E段：“Gilbert also found that metals can be magnetised by rubbing materials such as fur on them.”	属于实验结论。
D 恒星与地球距离不等	✓	F段：“He believed that stars are not equidistant from the Earth but have their own Earth-like planets orbiting around them.”	他的天文学见解之一。
E 地球自转时会轻微摇摆	✓	F段：“He believed that the Sun and other stars wobble just as the Earth does around a crystal core.”	认为地球会 wobble (轻微摆动)。
F 电荷分为正负两种	✗	E段末：“It was a French scientist named du Fay who later discovered that there are actually two electrical charges...”	说明此发现归功于 du Fay，而非吉尔伯特。

正确组合：C D E