
# IELTS Mock Test 2023 November

## Reading Practice Test 4

## HOW TO USE

**You have 2 ways to access the test**

1. Open this URL **https://link.intergreat.com/Sagf8** on your computer
2. Use your mobile device to scan the QR code attached

# READING PASSAGE 1

*You should spend about 20 minutes on* ***Questions 1-14*** *which are based on Reading Passage 1 below.*


## Thomas Harriot: The Discovery of Refraction

A

When light travels from one medium to another, it generally bends, or refracts. The law of refraction gives us a way of predicting the amount of bending. Refraction has many applications in optics and technology. A lens uses refraction to form an image of an object for many different purposes, such as magnification. A prism uses refraction to form a spectrum of colors from an incident beam of light. Refraction also plays an important role in the formation of a mirage and other optical illusions. The law of refraction is also known as Snell's Law, named after Willobrord Snell, who discovered the law in 1621. Although Snell's sine law of refraction is now taught routinely in undergraduate courses, the quest for it spanned many centuries and involved many celebrated scientists. Perhaps the most interesting thing is that the first discovery of the sine law, made by the sixteenth-century English scientist Thomas Harriot (1560-1621), has been almost completely overlooked by physicists, despite much published material describing his contribution.

B

A contemporary of Shakespeare, Elizabeth I, Johannes Kepler and Galilei Galileo, Thomas Harriot (1560-1621) was an English scientist and mathematician. His principal biographer, J. W. Shirley, was quoted saying that in his time he was "England's most profound mathematician, most imaginative and methodical experimental scientist". As a mathematician, he contributed to the development of algebra, and introduced the symbols of ">", and "<" for "more than" and "less than." He also studied navigation and astronomy. On September 17, 1607, Harriot observed a comet, later Identified as Hailey-s. With his painstaking observations, later workers were able to compute the comet's orbit. Harriot was also the first to use a telescope to observe the heavens in England. He made sketches of the moon in 1609, and then

developed lenses of increasing magnification. By April 1611, he had developed a lens with a magnification of 32. Between October 17, 1610 and February 26, 1612, he observed the moons of Jupiter, which had already discovered by Galileo. While observing Jupiter's moons, he made a discovery of his own: sunspots, which he viewed 199 times between December 8, 1610 and January 18, 1613. These observations allowed him to figure out the sun's period of rotation.

**C**

He was also an early English explorer of North America. He was a friend of the English courtier and explorer Sir Walter Raleigh and travelled to Virginia as a scientific observer on a colonising expedition in 1585. On June 30, 1585, his ship anchored at Roanoke Island off Virginia. On shore, Harriot observed the topography, flora and fauna, made many drawings and maps, and met the native people who spoke a language the English called Algonquian. Harriot worked out a phonetic transcription of the native people's speech sounds and began to learn the language, which enabled him to converse to some extent with other natives the English encountered. Harriot wrote his report for Raleigh and published it as ***A Briefe and True Report of the New Found Land of Virginia*** in 1588. Raleigh gave Harriot his own estate in Ireland, and Harriot began a survey of Raleigh's Irish holdings. He also undertook a study of ballistics and ship design for Raleigh in advance of the Spanish Armada's arrival.

**D**

Harriot kept regular correspondence with other scientists and mathematicians, especially in England but also in mainland Europe, notably with Johannes Kepler. About twenty years before Snell's discovery, Johannes Kepler (1571-1630) had also looked for the law of refraction, but used the early data of Ptolemy. Unfortunately, Ptolemy's data was in error, so Kepler could obtain only an approximation which he published in 1604. Kepler later tried to obtain additional experimental results on refraction, and corresponded with Thomas Harriot from 1606 to 1609 since Kepler had heard Harriot had carried out some detailed experiments. In 1606, Harriot sent Kepler some tables of refraction data for different materials at a constant incident angle, but didn't provide enough detail for the data to be very useful. Kepler requested further information, but Harriot was not forthcoming, and it appears that Kepler eventually gave up the correspondence, frustrated with Harriot's reluctance.

**E**

Apart from the correspondence with Kepler, there is no evidence that Harriot ever published his detailed results on refraction. His personal notes, however, reveal extensive studies significantly predating those of Kepler, Snell and Descartes. Harriot carried out many experiments on refraction in the 1590s, and from his notes, it is clear that he had discovered the sine law at least as early as 1602. Around 1606, he had studied dispersion in prisms (predating Newton by around 60 years), measured the refractive indices of different liquids placed in a hollow glass prism, studied refraction in crystal spheres, and correctly understood

refraction in the rainbow before Descartes.

**F**

As his studies of refraction, Harriot' s discoveries in other fields were largely unpublished during his lifetime, and until this century, Harriot was known only for an account of his travels in Virginia published in 1588, and for a treatise on algebra published posthumously in 1631. The reason why Harriot kept his results unpublished is unclear. Harriot wrote to Kepler that poor health prevented him from providing more information, but it is also possible that he was afraid of the seventeenth century's English religious establishment which was suspicious of the work carried out by mathematicians and scientists.

**G**

After the discovery of sunspots, Harriot' s scientific work dwindled. The cause of his diminished productivity might have been a cancer discovered on his nose. Harriot died on July 2, 1621, in London, but his story did not end with his death. Recent research has revealed his wide range of interests and his genuinely original discoveries. What some writers describe as his "thousands upon thousands of sheets of mathematics and of scientific observations" appeared to be lost until 1784, when they were found in Henry Percy's country estate by one of Percy's descendants. She gave them to Franz Xaver Zach, her husband's son's tutor. Zach eventually put some of the papers in the hands of the Oxford University Press, but much work was required to prepare them for publication, and it has never been done. Scholars have begun to study them, and an appreciation of Harriot's contribution started to grow in the second half of the twentieth century. Harriot's study of refraction is but one example where his work overlapped with independent studies carried out by others in Europe, but in any historical treatment of optics his contribution rightfully deserves to be acknowledged.

## Questions 1-5

Reading Passage has 7 paragraphs **A-G**.

Choose the correct heading for paragraphs **B-E** and **G** from the list of headings below.

*Write the correct number, **i-x**, in boxes **1-5** on your answer sheet.*

| | List of Headings |
|---|---|
| i | A misunderstanding in the history of science |
| ii | Thomas Harriot's biography |
| iii | Unknown reasons for his unpublished works |
| iv | Harriot's 1588 publication on North America studies |
| v | Expedition to the New World |
| vi | Reluctant cooperation with Kepler |
| vii | Belated appreciation of Harriot's contribution |
| viii | Religious pressures keeping him from publishing |
| ix | Correspondence with Kepler |
| x | Interests and researches into multiple fields of study |

*Example Answer*

*Paragraph* **A** ***i***

1 [ ] Paragraph B

2 [ ] Paragraph C

3 [ ] Paragraph D

4 [ ] Paragraph E

5 [ ] Paragraph G

## Questions 6-10

Answer the questions below using **NO MORE THAN THREE WORDS** from the passage for each answer.

*Write your answers in boxes* **6-10** *on your answer sheet.*

Various modem applications base on an image produced by lens uses refraction, such as 6 _____ . And a spectrum of colors from a beam of light can be produced with 7 _____ . Harriot travelled to Virginia and mainly did research which focused on two subjects of American 8 _____ . After, he also enters upon a study of flight dynamics and 9 _____ for one of his friends much ahead of major European competitor. He undertook extensive other studies which were only noted down personally yet predated than many other great scientists. One result, for

example, corrected the misconception about the idea of 10 _____ .

## Questions 11-14

Look at the following researchers (listed **A-D**) and findings.

Match each researcher with the correct finding.

*Write your answers in boxes **11-14** on your answer sheet.*

**NB** *You may use any researcher more than once.*

| | |
|---|---|
| **A** | Willobrord Snell |
| **B** | Johannes Kepler |
| **C** | Ptolemy |
| **D** | Galileo |
| **E** | Harriot |

11 [ ] Discovered the moons of Jupiter

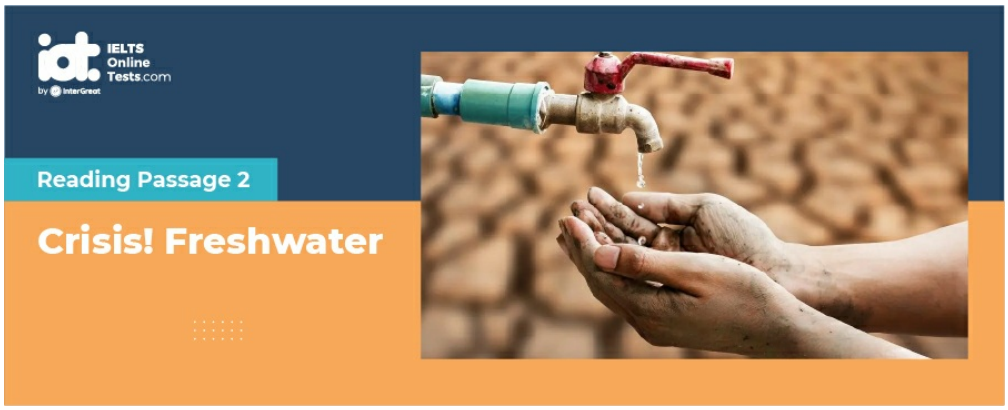
12 [ ] Distracted experimental calculation on refraction

13 [ ] The discovery of sunspots

14 [ ] The person whose name the sin law was attributed to

# READING PASSAGE 2

*You should spend about 20 minutes on* ***Questions 15-27*** *which are based on Reading Passage 2 below.*




## Crisis! freshwater

**A .** As in New Delhi and Phoenix, policymakers worldwide wield great power over how water resources and managed. Wise use of such power will become increasingly important as the years go by because the world's demand for freshwater is currently overtaking its ready supply in many places, and this situation shows no sign of abating.

**B .** That the problem is well-known makes it no less disturbing: today one out of six people, more than a billion, suffer inadequate access to safe freshwater. By 2025, according to data released by the United Nations, the freshwater resources of more than half the countries across the globe will undergo either stress- for example, when people increasingly demand more water than is available or safe for use-or outright shortages. By mid-century, as much as three-quarters of the earth's population could face scarcities of freshwater.

**C .** Scientists expect water scarcity to become more common in large part because the world's population is rising and many people are getting richer (thus expanding demand) and because global climate change is exacerbating aridity and reducing supply in many regions. What is more, many water sources are threatened by faulty waste disposal, releases of industrial pollutants, fertilizer runoff, and coastal influxes of saltwater into aquifers as groundwater is depleted.

**D .** Because lack of access to water can lead to starvation, disease, political instability, and even armed conflict, failure to take action can have broad and grave consequences. Fortunately, to a great extent, the technologies and policy tools required to conserve existing freshwater and to secure more of it are known among which several seem particularly effective. What is needed now is action. Governments and authorities at every level have to formulate and execute plans for implementing the political, economic, and technological measures that can ensure water security now and in the coming decades.

**E .** The world's water problems require, as a start, an understanding of how much freshwater each person requires, along with knowledge of the factors that impede supply and increase demand in different parts of the world. Main Falkenmark of the Stockholm International Water Institute and other experts estimate that, on average, each person on the earth needs a minimum of 1000 cubic meters (m3) of water. The minimum water each person requires for drinking, hygiene, and growing food. The volume is equivalent to two-fifths of an Olympic-size swimming pool.

**F .** Much of the Americas and northern Eurasia enjoy abundant water supplies. But several regions are beset by greater or lesser degrees of "physical" scarcity-whereby demand exceeds local availability. Other areas, among them Central Africa, parts of the Indian subcontinent, and Southeast Asia contend with "economic" water scarcity limit access even though sufficient supplies are available.

**G.** More than half of the precipitation that falls on land is never available for capture or storage because it evaporates from the ground or transpires from plants; this fraction is called blue-water sources-rivers, lakes, wetlands, and aquifers-that people can tap directly. Farm irrigation from these free-flowing bodies is the biggest single human use of freshwater resources, but the intense local demand they create often drains the surroundings of ready supplies.

**H .** Lots of water, but not always where it is needed one hundred and ten thousand cubic kilometers of precipitation, nearly 10 times the volume of Lake Superior, falls from the sky onto the earth's land surface every year. This huge quantity would easily fulfill the requirements of everyone on the planet if the water arrived where and when people needed it. But much of it cannot be captured (top), and the rest is disturbed unevenly (bottom). Green water (61.1% of total precipitation): absorbed by soil and plants, then released back into the air: unavailable for withdrawal. Bluewater (38.8% of total precipitation): collected in rivers, lakes, wetlands, and groundwater: available for withdrawal before it evaporates or reaches the ocean. These figures may not add up to 100% because of rounding. Only 1.5% is directly used by people.

**I .** Waters run away in tremendous wildfires in recent years. The economic actors had all taken their share reasonably enough: they just did not consider the needs of the natural environment, which suffered greatly when its inadequate supply was reduced to critical levels by drought. The members of the Murray-Darling Basin Commission are now frantically trying to extricate themselves from the disastrous results of their misallocation of the total water resource. Given the difficulties of sensibly apportioning the water supply within a single nation, imagine the complexities of doing so for international river basins such as that of the Jordan River, which borders on Lebanon, Syria, Israel, the Palestinian areas, and Jordan, all of which have claims to the shared, but limited, supply in an extremely parched region. The struggle for freshwater has contributed to civil and military disputes in the area. Only continuing negotiations and compromises have kept this tense situation under control.

## Questions 15-19

Do the following statements agree with the information given in Reading Passage?
In boxes **15-19** on your answer sheet, write

| | |
|---|---|
| **TRUE** | if the statement agrees with the information |
| **FALSE** | if the statement contradicts the information |
| **NOT GIVEN** | If there is no information on this |

15 [ ] The prospect for the need for freshwater worldwide is obscure.

16 [ ] To some extent, the challenge for freshwater is alleviated by common recognition.

17 [ ] Researchers arrive at the specific conclusion about the water crisis based on persuasive consideration of several factors.

18 [ ] The fact that people do not actually cherish the usage of water scarcity.

19 [ ] Controversy can't be avoided for adjacent nations over the water resource.

## Questions 20-24

The readings Passage has eleven paragraphs A-I

Which paragraph contains the following information?

Write the correct letter A-I, in boxes 6-10 on your answer sheet.

| | |
|---|---|
| A | A |
| B | B |
| C | C |
| D | D |
| E | E |
| F | F |
| G | G |
| H | H |
| I | I |

**NB** You may use any letter more than once.

20 [ ] The uneven distribution of water around the world.

21 [ ] Other factors regarding nature bothering people who make the policies.

22 [ ] Joint efforts needed to carry out the detailed solutions combined with various aspects.

23 [ ] No always-in-time match available between the requirements and the actual rainfall.

24 [ ] The lower limit of the amount of fresh water for a person to survive.

## Questions 25-27

Complete the following summary of the paragraphs of Reading Passage, using **NO MORE THAN THERR WORDS** from the Reading Passage for each answer. Write your answers in boxes **25–27** on your answer sheet.

Many severe problems like starvation and military actions etc result from the storage of water which sometimes for some areas seems 25 _____ because of unavailability but other regions suffer another kind of scarcity for insufficient support. 26 _____ of the rainfall can't be achieved because of evaporation.
Some other parts form the 27 _____ which can be used immediately. Water to irrigate the farmland takes a considerable amount along with the use for cities and industries and the extended need from the people involved.

# READING PASSAGE 3

*You should spend about 20 minutes on* ***Questions 28-40*** *which are based on Reading Passage 3 below.*


## Education Philosophy

A

Although we lack accurate statistics about child mortality in the pre-industrial period, we do have evidence that in the 1660s, the mortality rate for children who died within 14 days of birth was as much as 30 per cent. Nearly all families suffered some premature death. Since all parents expected to bury some of their children, they found it difficult to invest in their newborn children. Moreover, to protect themselves from the emotional consequences of children's death, parents avoided making any emotional commitment to an infant. It is no wonder that we find mothers leave their babies in gutters or refer to the death in the same paragraph with reference to pickles.

B

The 18th century witnessed the transformation from an agrarian economy to an industrial one, one of the vital social changes taking place in the Western world. An increasing number of people moved from their villages and small towns to big cities where life was quite different. Social supports which had previously existed in smaller communities were replaced by ruthless problems such as poverty, crime, substandard housing and disease. Due to the need for additional income to support the family, young children from the poorest families were forced into early employment and thus their childhood became painfully short. Children as young as 7 might be required to work full-time, subjected to unpleasant and unhealthy circumstances, from factories to prostitution. Although such a role has disappeared in most wealthy countries, the practice of childhood employment still remains a staple in underdeveloped countries and rarely disappeared entirely.

C

The lives of children underwent a drastic change during the 1800s in the United States.

Previously, children from both rural and urban families were expected to participate in everyday labour due to the bulk of manual hard working. Nevertheless, thanks to the technological advances of the mid-1800s, coupled with the rise of the middle class and redefinition of roles of family members, work and home became less synonymous over time. People began to purchase toys and books for their children. When the country depended more upon machines, children in rural and urban areas, were less likely to be required to work at home. Beginning from the Industrial Revolution and rising slowly over the course of the 19th century, this trend increased exponentially after civil war. John Locke, one of the most influential writers of his period, created the first clear and comprehensive statement of the 'environmental position' that family education determines a child's life, and via this, he became the father of modem learning theory. During the colonial period, his teachings about child care gained a lot of recognition in America.

**D**

According to Jean Jacques Rousseau, who lived in an era of the American and French Revolution, people were 'noble savages' in the original state of nature, meaning they are innocent, free and uncorrupted. In 1762, Rousseau wrote a famous novel Emile to convey his educational philosophy through a story of a boy's education from infancy to adult-hood. This work was based on his extensive observation of children and adolescents, their individuality, his developmental theory and on the memories of his own childhood. He contrasts children with adults and describes their age-specific characteristics in terms of historical perspective and developmental psychology. Johan Heinrich Pestalozzi, living during the early stages of the Industrial Revolution, sought to develop schools to nurture children's all-round development. He agreed with Rousseau that humans are naturally good but were spoiled by a corrupt society. His approach to teaching consists of the general and special methods, and his theory was based upon establishing an emotionally healthy homelike learning environment, which had to be in place before more specific instructions occurred.

**E**

One of the best-documented cases of Pestalozzi's theory concerned a so-called feral child named Victor, who was captured in a small town in the south of France in 1800. Prepubescent, mute, naked, and perhaps 11 or 12 years old, Victor had been seen foraging for food in the gardens of the locals in the area and sometimes accepted people's direct offers of food before his final capture. Eventually, he was brought to Paris and expected to answer some profound questions about the nature of human, but that goal was quashed very soon. A young physician Jean Marc Gaspard Itard was optimistic about the future of Victor and initiated a five-year education plan to civilise him and teach him to speak. With a subsidy from the government, Itard recruited a local woman Madame Guerin to assist him to provide a semblance of a home for Victor, and he spent an enormous amount of time and effort working with Victor. Itard's goal to teach Victor the basics of speech could never be fully achieved, but Victor had learnt

some elementary forms of communication.

**F**

Although other educators were beginning to recognise the simple truth embedded in Rousseau's philosophy, it is not enough to identify the stages of children's development alone. There must be certain education which had to be geared towards those stages. One of the early examples was the invention of kindergarten, which was a word and a movement created by a German-born educator, Friedrich Froebel in 1840. Froebel placed a high value on the importance of play in children's learning. His invention would spread around the world eventually in a verity of forms. Froebel's ideas were inspired through his cooperation with Johann Heinrich Pestalozzi. Froebel didn't introduce the notion of kindergarten until 58 years old, and he had been a teacher for four decades. The notion was a haven and a preparation for children who were about to enter the regimented educational system. The use of guided or structured play was a cornerstone of his kindergarten education because he believed that play was the most significant aspect of development at this time of life. Play served as a mechanism for a child to grow emotionally and to achieve a sense of self-worth. Meanwhile, teachers served to organise materials and a structured environment in which each child, as an individual, could achieve these goals. When Froebel died in 1852, dozens of kindergartens had been created in Germany. Kindergartens began to increase in Europe, and the movement eventually reached and flourished in the United States in the 20th century.

## Question 28 - 31

Reading Passage 1 has six paragraphs, **A-F**.
Choose the correct heading for paragraphs **A** and **C-E** from the list of headings below.
Write the correct number, **i-vii**, in boxes **28-31** on your answer sheet.

| | List of Headings |
|---|---|
| **i** | The inheritance and development of educational concepts of different thinkers |
| **ii** | Why children had to work to alleviate the burden on family |
| **iii** | Why children are not highly valued |
| **iv** | The explanation for children dying in hospital at their early age |
| **v** | The first appearance of modem educational philosophy |
| **vi** | The application of a creative learning method on a wild kid |
| **vii** | The emergence and spread of the notion of kindergarten |

28 [ ] Paragraph A

Example Answer

Paragraph B ii

29 [ ] Paragraph C

30 [ ] Paragraph D

31 [ ] Paragraph E

## Solution:

### Part 1: Question 1 - 14

1. x
2. v
3. ix
4. iii
5. vii
6. magnification
7. prisms
8. land and language
9. Ship design
10. rainbow refraction
11. D
12. B
13. E
14. A

### Part 2: Question 15 - 27

15. FALSE
16. FALSE
17. TRUE
18. NOT GIVEN
19. TRUE
20. F
21. I
22. D
23. H
24. E

25 PHYSICAL

26 CAPTURE OF SHORTAGE

27 BLUE-WATER

### Part 3: Question 28 - 31

28 iii

29 v

30 i

31 vi