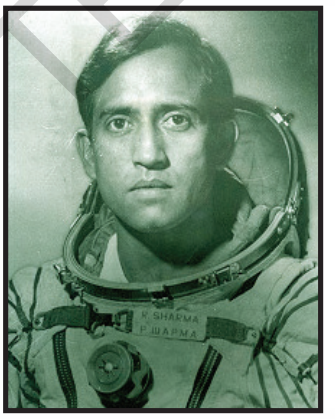
2 C.V. Raman, the Pride of India

I9T1Z8

Look at the pictures and answer the questions that follow:








1. Who are these people?
2. Tell your class what you know about them.
3. Do you want to be a scientist? Why?

Oral Discourse: Talk on - "Impact of scientific inventions on human life."

A. Reading

On the busy Bowbazaar Street in Calcutta there was an old building. It was the headquarters of the Indian Association for Cultivation of Science. In December, on a fine evening in 1927, there was much excitement in one of its laboratories. Chandrasekhar Venkata Raman was showing a visitor some of his instruments when a young man, K.S.Krishnan, rushed in and announced, "Professor Compton has won the Nobel Prize."

Raman was equally delighted. "Excellent news," he said, smiling at the visitor and then he was lost in thought. "But …. look here, Krishnan," he said turning to the young man, "if this Compton Effect is true of X-rays, it must be true of light too."

A few years earlier, A.H.Compton had shown that the nature of X-rays changes when passed through matter. The change was dependent on the kind of matter. This effect was called the 'Compton Effect.'

Could light also change its nature when passed through a transparent medium? That was the question that Raman asked himself. For five years he had been doing research in optics, the science of light. No sophisticated equipment was available in his laboratory, but Raman was confident that he could find the answer with some modifications in his equipment.

Four months later, on March 16, 1928, Raman announced his discovery of 'new radiation' (describing the behaviour of a beam of light passing through a liquid chemical) to an assembly of scientists at Bangalore (now called Bengaluru).

The world hailed the discovery as the 'Raman Effect'. For scientific research in this country, it was a red-letter day. His discovery caught the attention of the world. With equipment worth hardly Rs. 200/- and limited facilities, Raman was able to make a discovery which won him the Nobel Prize in physics in 1930.

Raman was born on November 7, 1888, at Tiruchirapalli in Tamil Nadu. His father was a physics teacher in a college. He was a brilliant student right from the start. When Raman passed his matriculation, his parents were keen to send him abroad for higher studies. But on medical grounds, a British surgeon advised them against it and Raman stayed in the country to do the M.A. course at Presidency College in Madras (now called Chennai).

Science had already made an impression on him and he began to write research papers for science journals. When he was only 19, he became a member of the Indian Association for Cultivation of Science. Meanwhile, respecting his parents' wishes, he took up an administrative job in the Finance Ministry in Calcutta. His interest in science, however, did not flag. He used to spend his hours after office in the lab of the Association working throughout the night.

In his youth, Raman was mainly interested in acoustics, the science of sound. He studied how stringed instruments like the violin and the sitar could produce harmonious music.

He was elected to the Royal Society of London in 1924 and the British Government made him a knight of the British Empire in 1929. It was a high honour for any great scientist.

His advice to young scientists was to look at the world around them and not to confine themselves to their laboratories. "The essence of science," he said, "is independent thinking and hard work, not equipment."

C.V.Raman was the first Indian scholar who studied wholly in India and received the Nobel Prize. He was the first Asian and the first non-white to win such a great award in science. He passed away in 1970 on November 21. But his memories are with us. February 28, the day on which he discovered the 'Raman Effect', is celebrated as National Science Day to commemorate his remarkable achievement in science.

(Adapted from SCIENTISTS OF INDIA published by Children's Book Trust, New Delhi)

Glossary

lost in thought:	giving all your attention to something so that you do not notice what is happening around you
transparent (adj):	allowing you to see through it
sophisticated (adj):	advanced and capable
equipment (n):	the things that are needed for a particular activity
modification(n):	change
discovery (n):	the process of finding something that was not known about before
red-letter day (idiom):	an important day
surgeon (n):	a doctor who is trained to perform surgery
abroad (adv):	in or to a foreign country
flag (v):	decline, become less
stringed instrument (n):	any musical instrument with strings (eg. the violin, the sitar etc.)
harmonious (adj):	very pleasant
knight (n):	a man of high social rank / a person with the title
confine (v):	to restrict

How well did I read?

Fill in the boxes using yes/ somewhat/ no.	
I enjoyed reading the passage.	
I got the idea of the passage on my own.	
I got the idea with the help of my friends in the group.	
The teacher helped me to understand the passage.	
I used the glossary given at the end of the passage.	

I. Answer the following questions:

1. Why was Raman happy when he learnt that Professor Compton had won the Nobel Prize?
2. What does the "Compton Effect" tell us?
3. What was Raman's advice to young scientists?
4. Which paragraph tells about the ill health of C.V. Raman?
5. What was the challenging situation when Raman started his experiment on light?
6. What was the unseen force working behind Raman for reaching great heights?
7. What is "Raman Effect"?
8. If A.H. Compton had not discovered the Compton Effect, do you think Raman would have discovered the Raman Effect? Give your reasons.
9. In what way was Raman different from other Indian scientists? List them and justify your answer.
10. If you were a scientist, what would you like to invent / discover?

II. Find whether the following statements are true or false and correct the false statements.

1. C.V. Raman was born in Calcutta. ( )
2. The Compton Effect was a discovery made by C.V.Raman. ( )
3. Raman's mother was a college physics teacher. ( )
4. Raman was an average student at school. ( )
5. Raman studied how the drum could produce music. ( )
6. Raman spent only two hundred rupees to win the Nobel Prize. ( )
7. Raman was only 42 when he won the Nobel Prize. ( )

Vocabulary

I. The following sentences are from your lesson. Read them carefully and tick (✓) the correct meaning of the underlined word in each sentence.

1. His parents were keen to send him abroad for higher studies.
   (a) particular (b) eager (c) worried
2. The world hailed the discovery as the 'Raman Effect'.
   (a) admired (b) called (c) thought
3. In his youth Raman was mainly interested in acoustics.
   (a) primarily (b) simply (c) certainly
4. The British made Raman a knight of the British Empire.
   (a) appointed (b) managed (c) placed
5. Raman passed away on November 21, 1970.
   (a) was killed (b) died (c) left

II. Read the following sentence.

Raman was equally delighted.

The underlined word ***'delighted'*** is a verb and has been used to express a feeling of joy or happiness. Its noun form is *'delight.'* **Now look at the following verbs and write their corresponding noun forms.**

S.No.	Verb	Noun or the feeling expressed
1.	enjoyed	**enjoyment**
2.	surprised	_____
3.	disappointed	_____
4.	worried	_____
5.	satisfied	_____

Now fill in the blanks with the suitable noun forms of the underlined words in each sentence.

1. He was shocked to see a snake in his room but he recovered from his _____ in no time.
2. He pretended to look relieved but, in fact, he did not have any _____ .
3. I can understand your _____. But do not be so excited that you have health problems.
4. Raju, an auto driver, was very honest. His _____ was known to everybody when he returned the bag of jewellery a passenger had left in his auto.

III. (1) Read the following sentence and notice the underlined part.

Raman stayed in the country to do the M.A. course.

The underlined letters in capitals denote an abbreviation. The full form of this abbreviation is 'Master of Arts'.

Here is a list of some common abbreviations. Write their full forms.

Abbreviation	Full form
B.A.	_____
A.D.	_____
B.C.	_____
C.M.	_____
C.D.	_____
D.V.D.	_____
a.m.	_____
p.m.	_____

(2) Read the following sentence and notice the underlined word.

He used to spend his hours after office in the *lab*.
The underlined word "lab" is the short form of "laboratory."

Look at the following list of short forms and write their full forms. The first one is done for you. (Use a dictionary)

Short form of the word	Full form of the word
plane	**aeroplane**
kilo	_____
para	_____
specs	_____
photo	_____
bike	_____
mike	_____

IV. In the paragraph 4 you have learnt that 'optics' is the study of light. Do you know the word for the *study of living beings*? It is 'biology'. It comes from *'bio'* (means '*life*') + *'logus' / 'logy'* (means '*study or science*'). So the suffix '-logy' adds the meaning 'the study of'.

Guess the meanings of the words under Column A and match them with the phrases under Column B.

A			B	
1.	Archaeology	( )	(a)	the study of the mind
2.	Physiology	( )	(b)	the study of animals
3.	Psychology	( )	(c)	the study of earth
4.	Geology	( )	(d)	the study of the cultures of the past
5.	Zoology	( )	(e)	the study of the bodies of living things.

Grammar

I. Read the following sentences from your lesson and observe how the underlined words are used before dates, years and the names of places.

1. Raman was born on November 7, 1888. (Para 6)
2. Raman passed away in 1970 on November 21. (Para 11)
3. Raman did his M.A. course at Presidency College in Madras. (Para 6)
4. In December, on a fine evening in 1927, there was much excitement. (Para 1)

> *Note:* **'on', 'in'** and **'at'** are prepositions of time and place. In sentence 1 & 2 **'on'** is used before a date. In sentence 2, 3 & 4 **'in'** is used before a year (in 1970), before the name of a big city (in Madras) and before the name of a month (In December). In sentence 3 **'at'** is used before the name of a small place / area.

Now fill in the blanks with *'in'* or *'on'* or *'at'*.

Sarathchandra and Keerthana are brother and sister. Sarathchandra was born _____ 25th April _____ 2000. Keerthana was born _____ December 2, 2001. They are with their parents. They live _____ Masaipet, a small village _____ Medak District. They play games _____ school. It is usually very hot _____ May _____ their village. So they spend their summer _____ Hyderabad _____ their uncle's house. Mr. Srisailam is their uncle. He resides _____ High Court Colony _____ Hyderabad with his wife, Jagadeeswari and his daughter, Vishnu Priya.

II. Revision of 'Articles'.

1. *'a'* is used *before singular common nouns /in noun phrases* beginning with *consonant sounds*.
2. *'an'* is used *before singular common nouns / in noun phrases* beginning with vowel *sounds*.
3. *'the'* is used
   - *(a)* before words / phrases that indicate unique things ("It was the headquarters of **the Indian Association** …')
   - *(b)* in situations where the sentence itself contains a clue to identify the thing or the person referred to (e.g. His advice to young scientists was to look at **the world around them)**
   - *(c)* in social situations where the identity of the person / object is understood ("But … look here, Krishnan," he said turning to **the young man** …").
   - *(d)* before the names of 'musical instruments (" He studied how stringed instruments like **the violin** ...")

III. List 20 phrases from the text that begin with 'a'/ 'an' or 'the'. Then put 1,2, 3(a), 3(b), 3(c), or 3(d) against them depending on how 'a'/ 'an' or 'the' is used. One is done for you.

an old building – 2

Now fill in the blanks with *'a'*, *'an'* or *'the'*.

1. In 1987 M.S. Swaminathan was awarded _____ Ramon Magsaysay Award.
2. We dined yesterday at _____ Maurya Sherton hotel.
3. Tejaswini lent me _____ interesting book.
4. My father is _____ school teacher.
5. M.S.Swaminathan worked at _____ Indian Agricultural Research Institute.
6. Rekha bought _____ long notebook yesterday.
7. Sravani is eating _____ mango now.
8. Ganesh always carries _____ umbrella with him.
9. Rambabu is _____ English teacher in a high school.
10. Manjula and Sruthi play_____ guitar well.

Writing

I. Write the Biography of J.C. Bose using the information given below. You must use the right linkers to join the sentences.

J.C. Bose – Indian scientist – born 30-09-1858 – St. Xavier's School, Calcutta – abroad for higher studies – returned in 1885 – published a monograph, Response in the Living and Non-living – became famous – Fellow of the Royal Society in 1920 – wireless telegraphy in 1895 – the Crescograph – plants have life – the Bose Institute in Calcutta – devoted to the study of plants – died 23-11- 1937.

Share your draft with your partner and refine your draft in the light of the suggestions offered by him.

How well did I write?

Fill in the boxes using yes/ somewhat/ no.	
I was able to write the biography.	
The sentences I used were properly connected.	
I was able to express my ideas in apt words.	
The ideas were arranged in proper sequence.	
I used proper punctuation marks.	

How well did I edit my work?

Fill in the boxes using yes/ somewhat/ no.	
I deleted the excess words.	
I corrected the wrong forms of words.	
I corrected the punctuation errors.	
I added new words wherever necessary.	
I corrected the misspelt words.	

II. Editing

The passage given below has some errors in the use of capital letters, verbs, prepositions and articles. Edit the passage by underlining the incorrect parts and writing them correctly over the space available. The first one is done for you.

born

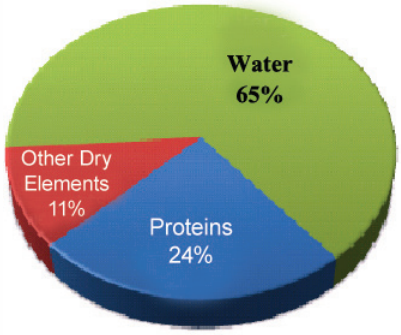
Raman was borne on November 7, 1888, in tiruchirapalli at tamil nadu. He finishes his m.a. course at Presidency college in chennai. He became member of the indian association for cultivation of science. He took up a administrative job in the finance

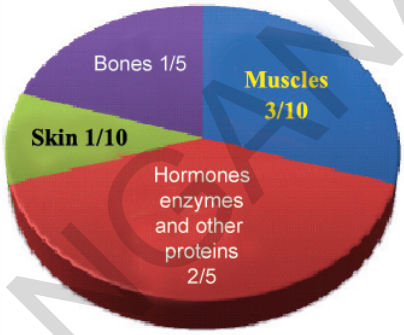
ministry in Calcutta. He was elected to the royal society of London in 1924 and the british government made him a knight of the british empire in 1929. He was first indian scholar who studied wholly in india and received the nobel prize.

Study Skills

I. Study the pie charts and answer the questions given below them.

Distribution of Weight in Human Body

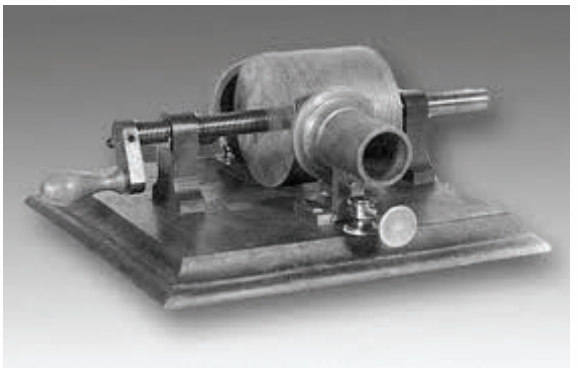


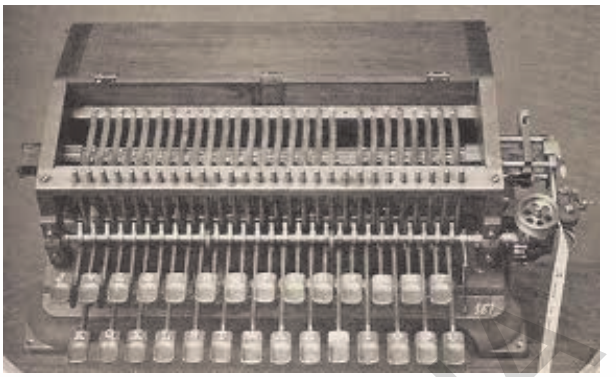


1. Which of the following constitute most of the weight in the human body? ( )
   (a) water (b) proteins (c) dry elements (d) bones
2. Which of the following statements is correct? ( )
   (a) Proteins constitute 11 per cent of the human body.
   (b) Dry elements constitute 15 per cent of the human body.
   (c) Hormones, enzymes and other proteins constitute 2/5 of the human body.
3. If a person's weight is 100 kilograms, how much do his bones weigh?
4. If the proteins in a person weigh 12 kilograms, what will be his weight?
5. Are the bones in our body heavier than the water in our body? Support your answer.

Listening and Speaking

Your teacher will read the passage 'The Inventor of Inventors.' Listen carefully and answer the questions given below:





I. Say whether the following statements are true or false.

1. When Edison was twelve, he established a school.
2. Edison discovered an important scientific principle known as the Edison Effect.
3. Edison was a poor observer.
4. Edison's father was a school teacher.
5. Edison loved to mix liquids and powders to observe the reaction.

II. Here is a list of inventions. Put a (✓)against them if it was invented by Edison.

Name of the Invention	
light bulb	✓
aeroplane	
electric engine	
watermark pen	
phonograph	
pedestal fan	
printing machine	
radio	
kinetograph	
computer	
power generator	

III. Oral Activity

1. Thomas Alva Edison invented electric bulb. If there were no electric bulbs, how would be our life?

2. **Debate the following proposition:**
'Science has proved to be more a curse than a blessing.' Divide the groups into two sets. One set of students speak in favour of the motion and the other against it. They may use the words / expressions listed in the box.

at the outset	may I begin by saying that	in his speech Mr. X said that
first of all	I look at it this way	I now draw your attention to
secondly	I'd like to explain	on the one hand / on the other hand
thirdly	the subject before us today	now because of this we have to support
lastly	I must add that	and for all these reasons, I propose
to conclude	I must take strong exception to	and there are similar cases such as

IV. Listen to the conversation between Sindhu and Mary.

Sindhu : Mary, where have you been all the week?
Mary : Um…I have been to Hyderabad.
Sindhu : Hyderabad? Why? Why did you go there?
Mary : You know, my uncle lives there. I went there to visit him.
Sindhu : That's nice. But did you visit any place?
Mary : Oh! Yes, I visited a museum . It's wonderful.
Sindhu : Really! What kind of museum is it?
Mary : It's a science museum.
Sindhu : Science museum? But it should be boring.
Mary : Not a bit. I learnt a lot about many interesting things. You must see it.
Sindhu : Is it that much interesting? Could you tell me something more about it?
Mary : Oh! It takes a long time. Now I am in a hurry. I will talk about it later.

Now work with your partner and ask and answer questions about the science fair that might have been organised in your school or district. Use the following questions too.

1. When did you go to the science fair?
2. What things did you see there?
3. Which was the most interesting thing you noticed there?