

Unit 13

Greatest Scientific Achievements

Objectives

After the completion of this unit, you will–

- read and understand texts through silent reading.
- ask and answer questions.
- describe the greatest scientific achievements.

Overview

Lesson 1: Some of the Greatest Scientific Achievements of the Last 50 Years

Lesson 2: Science and Technology Against an Age-old Disease

Lesson 3: Scientific Breakthroughs We Are Waiting For-I

Lesson 4: Scientific Breakthroughs We Are Waiting For-II

Answer Key

Lesson 1 : Some of the Greatest Scientific Achievements of the Last 50 Years

1. Warm-up activity:

Discuss the following questions in pairs.

- What advantages has technology brought to everyday life?
- How do science and technology make life better?
- What, in your opinions, are some of the greatest scientific achievements so far?

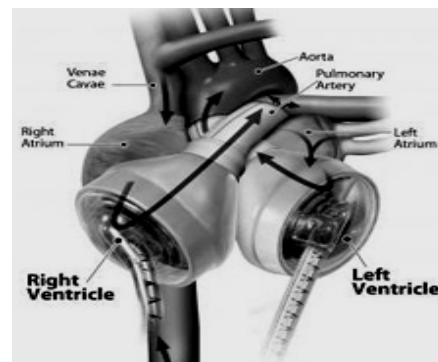


2. Read the passage which discusses some of the greatest scientific achievements in the last fifty years:

We human beings tend to forget how far we have come as a species in a relatively short period of time. It was only in the 1870s when we had the first house that was lighted with electricity. Cars just started to become available 100 years ago. Charles Lindbergh made the first trans-Atlantic flight in 1927. Televisions didn't become widely available until after World War II. In other words, the advances humankind has made in a relatively short period of time have been nothing short of extraordinary. Perhaps just as extraordinary is how we tend to simply adapt to these incredible changes, not realizing how completely our world has been altered in a short span of time. With that in mind, it is worth looking back at some of the amazing scientific advances we have made in the last few decades.

The Artificial Heart:

There is nothing that piques the interest of a human being quite as much as the prospect of living a longer life. Implanting a person with an artificial heart in 1982 was an extraordinary step towards increasing the human lifespan. A Seattle based dentist, Dr. Barney Clark, was the first person implanted with the Jarvik-7, an artificial heart intended to last a lifetime. The Jarvik-7 artificial was designed by Robert Jarvik. Though the patient survived 112 days, it was a huge step towards the development of heart transplant surgery. One day, more advanced versions of artificial organs will likely allow us to live much longer and more productive lives. When we get there, we will owe a lot to Robert Jarvik's artificial heart.



Cell phones:

Phones have been around since the late 1800s, but cell phones made their appearance only in the 1990s. Today, by some estimate, more than 100 million people in Bangladesh and more than 4.6 billion people worldwide have mobile phones. Anything that is useful and spreads of all time. Just two decades ago, in Bangladesh, even land lines were difficult to obtain, let alone mobile phones. Today people from all social strata use cell phones, from street vendors to business executive in luxury cars, and from villagers to urbanites. Since May 2015, Bangladesh joined its South Asian neighbors'



India (862 million) and Pakistan (122 million) on the list of countries with 100 million or more mobile phone users. The other countries on the list are China (one billion users), Russia, Brazil, the United States, Indonesia, Japan, Germany, the Philippines and Nigeria.

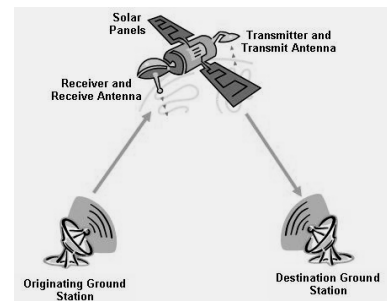
The Personal Computer:

Today, we take for granted that we have one machine that allows us to access the Internet, do word processing, use a calculator, watch TV, play games and do a host of other things. But the personal computer only became available to consumers in 1974. Things really took off when Microsoft Windows was introduced in 1985 and it's good that it was since without the prevalence of personal computers, the Internet wouldn't have had nearly as big an impact as it has ever since.



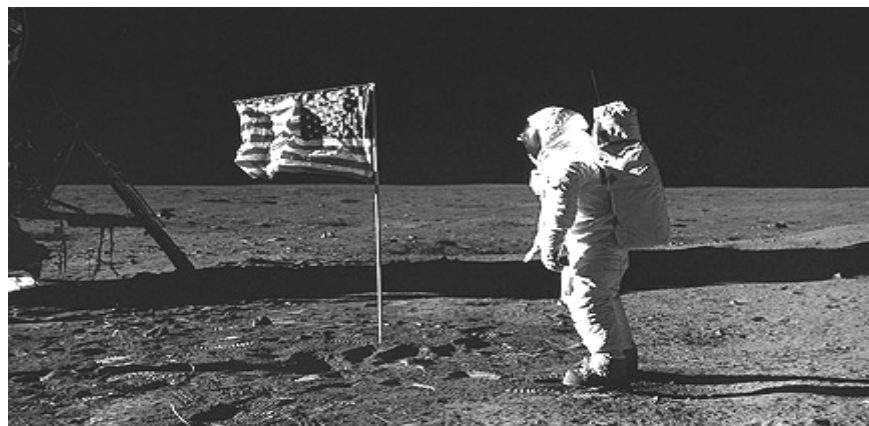
The First Communications Satellite:

People on Earth may take for granted today's high-tech world of cell phones, GPS and the satellites high above the planet that make instant communication possible. But it all began 50 years ago with one giant space balloon. 10 July 1962 marked the birth of satellite communications. On this day the Telstar satellite commenced its journey into space and become the first ever active communications satellite. It carried the first live trans-Atlantic TV broadcasts. Telstar was built by a team at Bell Telephone Laboratories in USA and incorporated many innovations such as the transistor and the 3,600 solar panels that powered the satellite. Telstar produced 14 watts and relayed its first and non-public television pictures on 11 July 1962. The satellite could carry 600 voice calls and one black-and-white TV channel from an egg-shaped orbit. Today, we use satellite for GPS, TV, radio, weather tracking, military surveillance, space exploration and global communications, among other things.



The Moon Landing:

For thousands of years, human beings had looked to the heavens and dreamed of walking on the moon. In 1969, as part of the Apollo 11 mission, Neil Armstrong become the first person to accomplish that dream, followed only minutes later by Buzz Aldrin. Their accomplishment gave

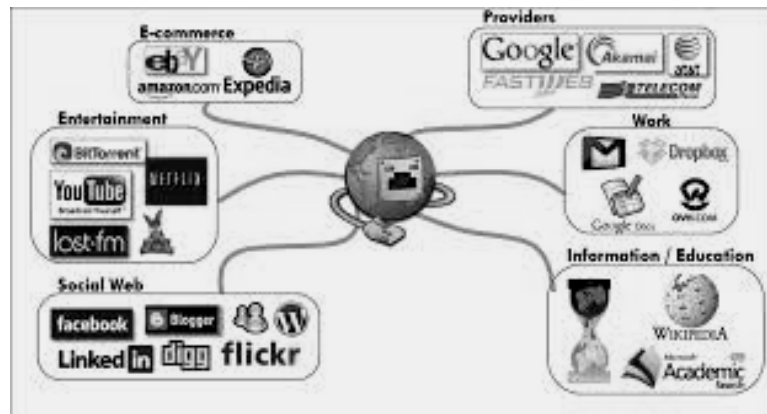


people around the world the hope of future space exploration. In fact, it was a feat that was so fantastic that there are still conspiracy theorists who insist it could not be possible. Putting a man on the moon is perhaps man's most inspiring accomplishment; it opened the door to future space

travel and led to a number of spin-off inventions including flame resistant textiles used by firefighters, invisible braces, improved satellite dishes, and better medical imaging.

The Internet/World Wide Web:

The ARPANET, The first Internet, was invented in 1969 and the public only had access to the World Wide Web starting in 1993. Today, just 22 years later, the web has revolutionized the dissemination of information; created a new multi-trillion dollar economic phenomenon, played a role in revolutions, and has interconnected much of the globe.



It has also made it possible for people all over the planet to reach out and touch someone.

The Microchip:

A microchip is a set of electronic circuits on one small plate (chip) of semiconductor material, normally silicon. Microchips are used in virtually all electronic equipment today and have revolutionized the world of electronics. The forerunner to the microchip was invented back in 1959, but it didn't really start to take off until the 1980s. Since then, incredible advances in microchips have made it possible for them to be cheaply and efficiently used for calculators, personal phones, and microwave ovens among many other products.

Vocabulary:

Tend (v) – behave in a particular way or have a certain characteristic

Extraordinary (adj.) very unusual or remarkable

Incredible (adj.) – impossible to believe

Alter (v) – change in character or composition

Amazing (adj.) – causing great surprise or wonder

Pique (v) – arouse interest or capacity

Intend (v) – to have as a plan or purpose

Design (v) – to make or draw plans for something

Survive (v) – to continue to live or exist

Commence (v) – to begin or start something

Broadcast (n) – a programme on the radio or on television

Orbit (n) – a curved path followed by a satellite

Insist (v) – persist in doing something

Dish (n) – a bowl-shaped radio aerial

3. Choose the correct answer from the alternatives.

- (a) What does the word ‘flame’ refer to?
i) forget ii) influence iii) flash iv) examine
- (b) What does the phrase ‘all over’ mean?
i) everywhere ii) somewhere iii) nowhere iv) open places
- (c) Neil Armstrong landed on the moon in –
i) 1968 ii) 1969 iii) 1967 iv) 1966
- (d) What does the word ‘explore refer to?
i) scrutiny ii) observation iii) search iv) arrival
- (e) What is the closest meaning of the word ‘forerunner’?
i) follower ii) successor iii) ancestor iv) transformation



4. Answer the following questions:

- a. By 2015, how many countries in the world had a hundred million or more mobile phone users?
- b. What is Jarvik-7? Why is it so significant in the advancement of medical science?
- c. What is the most important function performed by the Telstar satellite?
- d. There are some conspiracy theorists who insist that no human being ever set foot on the moon. Do you support their views? Give reasons for your answer.
- e. You have read about seven amazing achievements of science in the last fifty years. In your view, which of the achievements has the strongest influence on human beings? Explain why.
- f. What could the Telstar satellite carry?
- g. When did common people become able to access to the World Wide Web?
- h. Why do we use satellite for?

5. Complete the table below with information given in the text. Use no more than three words and/or numbers in each of the blank spaces.

Scientific advancements in the last fifty years	
When	What
1870s	Electricity was successfully used for (a).....
(b).....	The first aircraft flew across the Atlantic ocean.
1982	Successful (c)..... ofartificial heart in human body.
(d).....	A prototype of the microchip was invented
1985	Microsoft (e) an operating system called Windows.
(f)....., 1962	First television pictures were telecast via satellite.
1969	Neil Armstrong (g)..... on the moon.
1993	People started to have (h) to the World Wide Web.

6. Find out the meaning of the following words; then make sentences with them.

- a. urbanite
- b. pique
- c. implant
- d. transplant
- e. satellite
- f. orbit
- g. spin-off
- h. brace
- i. imaging
- j. spam

7. Make five sentences from the substitutions table below. Make sure the sentences have the correct information given in the text.

Note: The parts of sentences in the first column are examples of gerunds/gerund phrases.

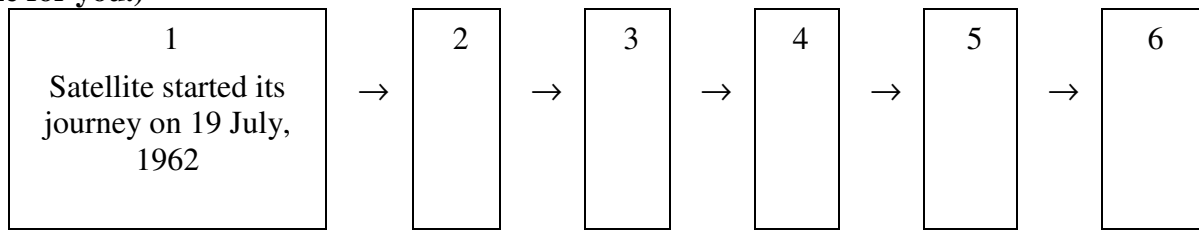
a. Implanting a person with an artificial heart in 1982	is	an example of the abuse of the Internet.
b. Putting a man on the moon	was	an amazing step towards a longer life span for humans.
c. Using microchips in useful devices		revolutionized the world of electronics.
d. Spamming	has	Perhaps man's most inspiring success.
e. Putting a giant space balloon 50 years ago		The first initiative of satellite communication.

8. Complete the sentences below with the words given in the box.

however although when let alone until

- i. Television sets were not widely available the end of the Second World War.
- ii. The 10th of July, 1962 marked the birth of satellite communication..... the Telstar satellite was sent to the space.
- iii. Twenty-years ago mobile phones were not easily available in Bangladeshfixed phones.
- iv. The first patient implanted with an artificial heart survived only 112 daysit marked a huge progress in the field of heart transplantation.
- v.the Internet has revolutionized the means of communication globally; it has invited some hazards too.

9. Based on your reading of the passage, make short notes in each of the boxes in the flow chart showing the information about satellite and moon landing. (No. 1 has been done for you.)



10. Write a brief summary of the passage in your words.

11. Fill in the gaps with an appropriate word in each gap.

Man has an unquenchable thirst (a) — knowledge: He is never satisfied (b) — what he] has known and seen. He wants to know and (c) — more and more. This curiosity to (d) — more coupled with his indomitable spirit of adventure, has inspired him to undertake and (e) — out difficult and dangerous tasks which eventually resulted in epoch (f) — discoveries and inventions and led him in his (g) — and continuous journey from his helpless state of a caveman to his present (h) — of power and progress. In the fields of science and technology man has (i) — achieved what was once inconceivable. Today he is (j) — the threshold of the space age.

Lesson 2 : Science and Technology Against an Age-old Disease

1. Warm-up activity:

Discuss the following questions in pairs.

- What infectious diseases have been recorded in our country?
- What is some important advancement in medical science that you know about?
- How do advancements in medical science and technology help fight fatal diseases?



2. Now read the following text written by Steve Reed who is the founder, President and Chief Scientific Officer of Infectious Disease Research Institute (IDRI).

IDRI is a non-profit organization based in Seattle, USA. It develops novel and advanced products for the diagnosis, prevention and treatment of neglected diseases related to poverty.



When I started working on the research and science of leprosy more than a decade ago, people thought this chronic infectious disease would eliminate itself and burn out over time.

We didn't have time for that. Why? Nearly 250,000 new cases of leprosy are diagnosed every year, and many more go undetected. Approximately 10 percent of new cases occur in children.

Even though it's associated with biblical times, leprosy remains a problem in the modern era and was reported in 130 countries worldwide. Its most prevalent in a number of countries throughout Africa, Asia and South America. Symptoms include progressive and permanent damage to the skin, nerves, limbs and eyes but they can take several years to appear, making the disease hard to diagnose at an early stage.

Even worse, leprosy comes with a stigma. Unlike most other diseases, leprosy results in isolation, as people with leprosy are often shunned. The good news, however, is that we now have the key scientific solutions and momentum as well as key collaborations to finally have the opportunity to eliminate leprosy. I couldn't have said these 10 years ago.....

At IDRI, we are developing a fast, easy, easy-to-use that provides an early diagnosis of infection before clinical symptoms, such as nerve damage, begin to appear. This new approach is far superior to the traditional method of diagnosis, which has generally involved clinical and/or microscopic assessment. IDRI is also developing a companion test so that we can identify which people will likely progress to the disease and to determine the appropriate course of treatment.

And, second, by developing a vaccine that can be used therapeutically in conjunction with antibiotics to shorten therapy. IDRI's diagnostic tools would be used to identify infected individuals and IDRI's vaccine would then be used on a targeted basis for treatment of the patient as well as to immunize family members and close contacts. This treatment and prevention strategy has been significantly bolstered by support from some pharmaceutical giants that donate the currently used antibiotics.

The most exciting part of this breakthrough is the fact that we're now right on the course of human clinical trials after a decade of leprosy vaccine development. The Food and Drug Administration will initially oversee the multi-stage trials in the USA before they move on to the Philippines, India and Brazil.

Global technology has been an integral part of our quest to eliminate leprosy. The rapid diagnostic test for leprosy infection, for example, was developed in conjunction with a Brazilian company. This company combined IDRI's leprosy diagnostic antigens with a smart phone-based platform that standardizes the ability to accurately interpret results and get a quantitative value. The test requires just a single drop of blood, mixed with a developing reagent. The appearance of two lines indicates that the person is positive for leprosy. From there, the information from the phone is pushed to the person's medical records.

People around the world now believe we will soon have the tools to finally eliminate leprosy. The next step is making this disease disappear.

By: Steve Reed

[Source:<http://www.xconomy.com/seattle/2014/01/24/using-cutting-edge-science-and-technology-against-an-age-old-disease/>]

Vocabulary:

Leprosy (n) – a contagious disease that the skin

Eliminate (v) – completely remove or get rid of

Undetected (adj.) – not detected or discovered

Occur (v) – happen; take place

Biblical (adj.) – relating to or contained in the Bible

Symptom (n) – sign of something

Bolster (v) – support or strengthen

Donate (v) – give money or goods for good cause, for example to a charity

Appear (v) – come into sight

Prevalent (adj.) – widespread in a particular or at a particular time



3. Answer the following questions:

- a. What are some of the symptoms of leprosy?
- b. How is the study of leprosy bacterium different from the study of other infectious organisms?
- c. What are the two approaches taken by IDRI to curb the threats of leprosy?
- d. What, according to the author, is the most exciting breakthrough in IDRI's war against leprosy?
- e. Can you find example of blending of cutting-edge life-science technology with state-of-the-art communications technology.
- f. Do you think that the author is an optimist? Explain why/why not?
- g. What are some of the symptoms of leprosy?
- h. What are the two approaches taken by IDRI to curb the threats of leprosy?

4. Debate: Form two groups. Debate on the following motion.

Each year, developed countries spend billions of dollars on research on infectious diseases but this has little impact on the lives of the poor.

5. How is the leprosy situation in Bangladesh?

6. What do the following words mean?

- a. antigen
- b. symptom
- c. stigma
- d. momentum
- e. microscopic
- f. therapy
- g. eliminate
- h. quantitative
- i. gene
- j. antibiotics
- k. chronic
- l. immunize
- m. therapeutic
- n. reagent

7. Provide verbs for the following noun words:

- a. synthesis
- b. standard
- c. elimination
- d. diagnosis
- e. donation

8. Re-write the following sentences in active voice:

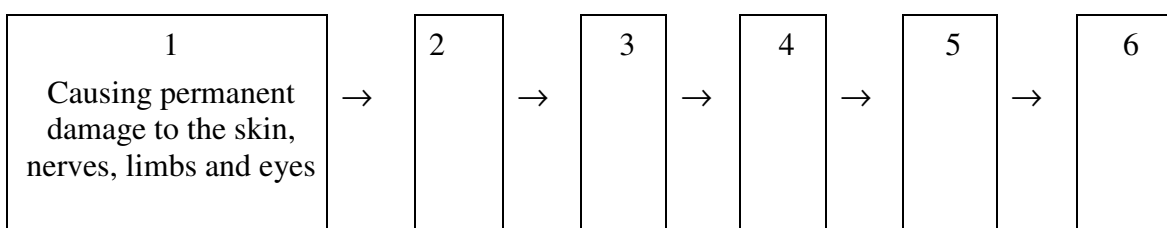
- i. IDRI's diagnostic tools would be used to identify infected individuals.
- ii. This treatment and prevention strategy has been significantly bolstered by support from some pharmaceutical giants.
- iii. The rapid diagnostic test for leprosy infection was developed jointly by IDRI and a Brazilian company.
- iv. The diagnostic tests for leprosy are done with a smart phone-based platform.

9. Join the following sentences as directed:

- i. I started my research on leprosy more than a decade ago. People at that time thought this disease would eliminate itself over time. (use when)
- ii. Leprosy is associated with biblical times. It still remains a problem. (Use although)
- iii. The new approach of diagnosis is far superior to the traditional method. The traditional method involved clinical and/or microscopic assessment. (use that)
- iv. A decade has passed since the leprosy vaccine was developed. Now we are going to conduct human clinical trials of leprosy. (use after)
- v. We will soon have the tools to finally eliminate leprosy. People around the world now believe this. (Use that)

10. What does Mr. Reed mean when he says:

- a. People thought this chronic infectious disease would eliminate itself.
- b. We are also attacking leprosy in two different ways.
- c. We're right on the course of human clinical trials.
- d. We can identify which people will likely progress to disease.
- e. The person is positive for leprosy.

11. Based of your reading of the passage, make short notes in each of the boxes in the flow chart showing the aftermath of leprosy.(No. 1 has been done for you.)**12. Write a brief summary of the passage in your words.****13. Fill in the blanks with an appropriate word in each gap.**

Rockets are expensive, as it can be used only (a) ——. Scientists have therefore developed a (b) ——— spacecraft called a space shuttle, which takes (c) ——— like a rocket but does not get (d) ——— as it comes back to earth. It can also be used to launch satellites into space, retrieve them from space if any repairing is needed and allows about 7— 8 scientists to carry out (e) ——— in space. It does not (f) ——— under water like the command module of a (g) ——— but smoothly (h) ——— on a runway like a plane. When it is ready for the next launching, new (i) ——— tank is fitted in it. This way scientists can save the huge (j) ——— of building a new rocket every time they need one.

Lesson 3 : Scientific Breakthroughs We Are Waiting For-I

1. Warm-up activity:

- Share the following introduction with your friend and give your own views on the opinions expressed in the passage.

Science has grown rapidly over the past few centuries, making things possible that were once considered completely impossible. Science has done a lot to cure many of our worldly troubles, but one thing about science is that it isn't perfect, and never will be. The reason for this is that there is no last word in science. There is always more to discover.

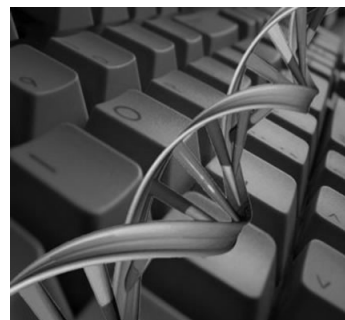
- Why do you think there is no last word with science?



2. Now read the text and answer the questions that follow. It is about some of the breakthroughs that have not happened yet.

DNA Computer

Imagine having an iPod capable of holding thousands of years of high definition video. A DNA computer would make such a device very possible. DNA is the substance that living organisms use to store genetic information. What makes DNA special is that it is extremely efficient when it comes to storing information in a limited space. Just one milligram of DNA is capable of holding all the printed material in the world. DNA computing is currently in its infancy, with prototypes such as MAYA-II only capable of showing the concept. If DNA computing is perfected, computers will become capable of holding amounts of information that are hard to imagine by today's standard.



Permanent Moon Base

Ever since setting up human habitation in space was first imagined, it was thought that the Moon would be the first object to be colonized since it was closest to earth. In 1969, when man first walked on the moon, a permanent colony suddenly appeared to be very achievable. However, for a variety of reasons, both economical and technical, the project was never truly attempted. However, NASA currently has plans to have one constructed by 2024. The European Space Agency (ESA) also has plans to construct a moon base by 2025. Japan and India also each have plans to have a base by 2030. The biggest barrier to a base is money. Many people within NASA, including Buzz Aldrin, have criticized the building of a moon base, saying that NASA should put more focus on different issues like clean energy.



Clean Energy



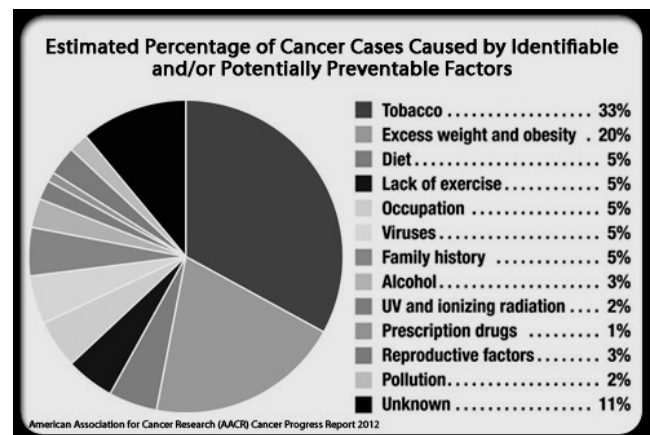
While many alternatives to fossil fuels have been investigated, there is still quite a way to go before mankind's energy supply is completely renewable. As of today, about 85% of all energy comes from fossil fuels. The reason clean energy is considered to be important is because fossil fuels aren't expected to last much longer, they pollute the environment, and they have led to tensions between nations. The reason clean energy is hard to come by is that we've spent the past 150 years dependent on oil, and it's quite difficult to make the switch. Some have even suggested that the technology for producing vast amounts of clean energy already exists but is being suppressed by big oil companies. However, several European countries have produced considerable amounts of clean energy. Current methods of clean energy include wind, solar, geothermal, tidal, hydropower, nuclear and bio-fuel.

Cure for Cancer

Cancer is one of the deadliest diseases of the modern era. Ever since the days of Hippocrates people have been searching for a cure. Cancer is similar to the common cold in that although there are many ways to treat it, modern medicine is still yet to come up with a cure. This is partially because like the common cold, there are many different types of cancer, and they are all slightly different. Unfortunately, with over seven million deaths per year, cancer is much more serious than the common cold. A wide assortment of drugs, chemicals, stem cells, genetically modified viruses, and even arsenic has all been proposed as cancer cures.

By: *Jamie Frater*

[Source:<http://listverse.com/2009/12/29/top-10-scientific-achievements-we-are-waiting-for/>]



Vocabulary:

- Genetic (adj.) – relating to genes or heredity
- Limited (adj.) – small in amount or number
- Compute (v) – to determine by calculation
- Infancy (n) the early stage in development of something
- Perfect (v) – make completely free from faults or defects
- Standard (n) – a level of quality
- Economical (adj.) – avoiding waste
- Attempt (v) – to try to do or perform
- Construct (v) –to build or form by putting together parts
- Criticize (v) to find fault with
- Substance (n) – the most important or essential part of something
- Solar (adj.) – of or relating to the sun
- Vast (adj.) – of very great extent or quantity
- Propose (v) – to suggest



3. Answer the following questions:

- a. Why are DNA computers much more powerful than today’s standard computers?
- b. What different methods of producing clean energy are being used now?
- c. How is cancer similar to the common cold?
- d. Which of the four scientific breakthroughs listed in the text do you think will be most useful for mankind? Why do you think so?
- e. Which four scientific breakthroughs are listed in the passage?
- f. What is the specialty of a DNA computer?
- g. Which have been proposed for cancer cures now?
4. What medical or clinical breakthrough do you think will help the people of our country most? Write your answer in 300 words.
5. In the next 5 years, what scientific achievements do you think will the world see?
6. Compare the smart mobile phones today with the mobile phones of 10 years ago. What advantages have the changes brought?
7. What has been the most outstanding scientific work done in Bangladesh in the last 10 years?
8. From your reading of the text, match the parts of sentences in *Column A* and *Column B* to make complete sentences:

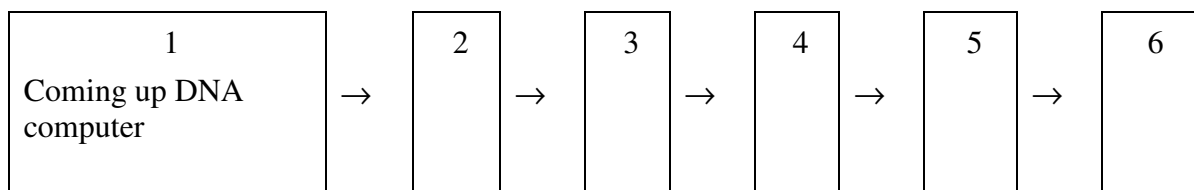
<i>Column A</i>	<i>Column B</i>
1. Science will never be perfect because	a. it is always getting better.
2. DNA is considered very special because of	b. its ability to store huge amount of data.
3. There was no attempt to make human colony in the moon due to	c. both financial and technical reasons.
4. Importance is given on clean energy because	d. there are many demerits of fossil fuel.
5. In one sense, cancer is similar to the common cold because	e. medical science has not come up with drugs to cure them

9. What do the following words and terms mean?

- a. device
- b. organism
- c. genetic

- d. prototype
- e. colony
- f. fossil
- g. geothermal
- h. stem cells
- i. virus

10. Based of your reading of the passage, make short notes in each of the boxes in the flow chart showing the ways of coming up DNA computer. (No. 1 has been done for you.)



11. Write a brief summary of the passage in your words.

Lesson 4 : Scientific Breakthroughs We Are Waiting For-II

1. Warm-up activity:

- Form two groups. Hold a debate on the following topic “Science should not try to make human beings live very long lives”.



2. Now read the following text. It deals with three scientific breakthroughs the world is yet to see.

Manned Mission to Mars:

Putting men on Mars has been an idea in science fiction for quite a while. However, when man first walked on the Moon, walking on Mars suddenly seemed feasible. A manned mission to Mars would be a huge milestone in space exploration. It would allow a more in-depth study of the Red Planet, and many have argued that building a permanent base on Mars is much more practical than building one on the Moon. A mission to Mars would be similar to the Moon landings, but much more difficult. The trip is about a hundred times longer, and there are new problems such as the Martian weather which must be considered. NASA currently has plans to have a man on Mars sometimes in the 2030s, while the ESA plans to do so also around the same time. Russia has plans to launch a manned Mars mission by 2020.



Nanomedicine:

Nanotechnology has the potential to revolutionize several fields, but its greatest contribution may very well be in medicine. The applications of nanotechnology in medicine are literally endless. Molecules could be built to stick to and destroy cancer cells, and only cancer cells. Advanced drug delivery techniques could be used to deliver drugs to specific parts of the body and eliminate side effects. Microscopic robots could be used to perform ultra-delicate surgeries, to repair damaged tissues, or to hunt down and destroy certain cells, like cancer cells or bacteria. Nanomedicine is currently in its infancy, but it may prove to be the biggest breakthrough in modern medicine since the first vaccine.

Journey to the Centre of the Earth

Journey to the Centre of the Earth

In the 19th century, it was generally thought that man would reach the center of the Earth long before he reached the Moon. This shows just how unpredictable technology can be. A journey to the center of the Earth is actually much more difficult than it sounds. The pressure at the center of the Earth is enormous because, quite literally, the entire weight of the world is on top of you. There is no known substance, not even carbonnanotubes that can maintain its shape at such a great pressure. While the Earth's deep interior may offer vast amount of energy, it may be quite a while before we can tap into it directly.

By: Jamie Frater

[Source:<http://listverse.com/2009/12/29/top-scientific-achievements-we-are-waiting-for/>]

Vocabulary:

Manned (adj.) – carrying or operated by one or more person

Milestone (n) – a significant event or stage

Permanent (adj.) lasting or remain unchanged indefinitely

Practical (adj.) capable of being put to use

Launch (v) – to send off an object especially with force

Potential (n) – capable of being or becoming

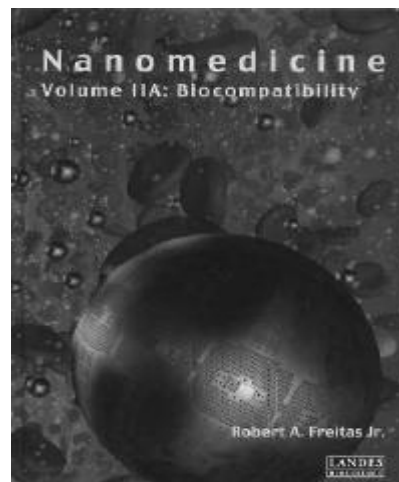
Enormous (adj.) – very large in size, extent

Eliminate (v) – to remove or get rid of

Delicate (adj.) – easily damaged

Infancy (n) – to be very new and still developing

Interior (n) – the inside part of something



Tap (v) – to get or make use of something

Reach (v) – to arrive at

Consider (v) – to think carefully about

Generally (adv.) – for the most part

3. Choose the correct answer from the alternatives.

(a) What is the closest meaning of the word ‘fiction’?

- i) reality ii) unreal iii) fabrication iv) fantastic

(b) What is the synonym of the phrase ‘breakthrough’?

- i) decline ii) accomplish iii) break up iv) enter forcibly

(c) The word ‘unpredictable’ in the text means.

- i) random ii) uncertain iii) changeable iv) impulsive

(d) It is planned by ----- to launch a manned Mars mission by 2000.

- i) NASA ii) ESA iii) Russia iv) Bangladesh

(e) The word ‘milestone’ in the text means.

- i) a landmark ii) highlight iii) signpost iv) impossible

4. The text is about three potential scientific breakthroughs which have been listed in the box below. Read each of the statements (i-iv) and decide which probable breakthrough it is related to.

i. Both NASA and ESA have identical deadline to launch a special mission.

ii. This will contribute significantly modern medicine.

iii. No known substance can maintain its shape at that depth

iv. This is more difficult than it sounds.

- Manned Mission to Mars
- Nanomedicine
- Journey to the Centre of the Earth



5. Write a paragraph on the following topic in about 150 words.

The most exciting scientific achievement I am waiting to see in my lifetime.

6. Make five sentences from the substitutions table below. Make sure the sentences have the correct information given in the text.

Note: The parts of sentences in the first column are examples of gerunds/gerund phrases.

1. Putting men on Mars	has been	a. a means to perform very delicate surgeries
2. Building a permanent base on Mars	is	b. more feasible than construction of a permanent base on the Moon.
3. Installing a space elevator		c. easier than what it was thought to be
4. Using microscopic robots		d. a popular theme in science fiction for a long time.
5. Travelling to the center of the earth.	can be	e. actually much more challenging than it sounds.

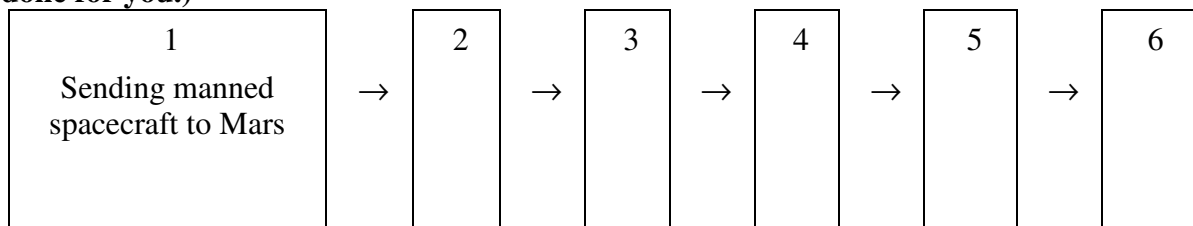
7. Find out the meanings of the following words:

- a. exploration
- b. Martian
- c. launch
- d. gravity
- e. milestone
- f. speculate
- g. nano
- h. interior
- i. bacteria
- j. unpredictable

8. Change the sentences as directed:

- a. A space elevator would be thousands of times taller than the current tallest building. (Use positive degree of adjectives)
- b. A mission to Mars would be similar to the Moon landings, but much more difficult. (Make complex sentences using ‘although’)
- c. Advanced drug delivery techniques could be used to deliver drugs to specific parts of the body. (Use active voice)
- d. How unpredictable technology can be! (Make it a statement)
- e. The pressure at the center of the Earth is enormous because of the entire weight of the world. (Make it a compound sentence).

9. Based of your reading of the passage, make short notes in each of the boxes in the flow chart showing the ways of Sending manned spacecraft to Mars. (No. 1 has been done for you.)



10. Write a brief summary of the passage in your words.

Key Answer Key

Lesson 1

3. Prepare the answers by yourself and show your tutor.

5.

(a) lighting houses; (b) 1927; (c) Implantation; (d) 1959; (e) introduced; (f) July 11; (g) landed; (h) access.

6.

- a. urbanite (someone who lives in a city): More than half of UK urbanities have an iPod.
- b. pique (a feeling of anger): My friend tried his best to put me in a pique.
- c. implant (to put an organ or device into the body in a medical operation): The owner's name and address is stored on a microchip.
- d. transplant (to move something or to be moved): The plants should be grown indoors until spring, when they can be transplanted outside.
- e. satellite (a device sent up into space to travel round the Earth, used for collecting information or communicating by radio, TV etc): The world Cup was transmitted around the world by satellite.
- f. orbit (the path through which objects in space move around a planet or star): The satellite is now in a stable orbit.
- g. spin-off (a programme or other show involving characters from a previous programme): The stage show is a spin-off from a television programme.
- h. brace (something that is used to support or connect things): He was recently fitted with a brace for his bad back.
- i. imaging (the process of producing an exact picture of something): Imaging of a boat on paper is not a difficult matter.
- j. spam (unwanted email) : I get so much spam at work.

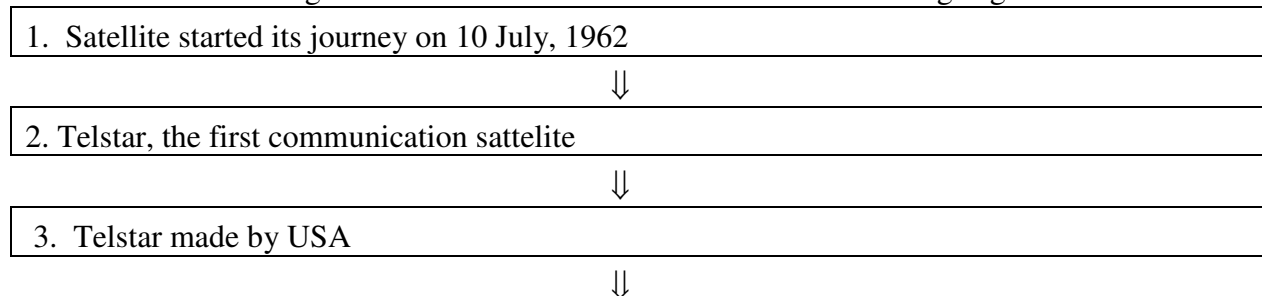
7.

- a. Implanting a person with an artificial heart in 1982 was an amazing step towards a longer lifespan of human.
- b. Putting a man on the moon is perhaps man's most inspiring success.
- c. Using microchips in useful devices has revolutionized the world of electronics.
- d. Spamming is an example of the abuse of the Internet.
- e. Putting a giant space balloon 50 years ago was the first initiative of satellite communication.

8.

- a. Until; ii. when; iii. let alone; iv. however; v. Although;

9. A flow chart showing the information about satellite and moon landing is given below:



4. Telstar broadcast first TV picture on 11 July 1962



5. Man first landed on moon in 1969



6. The moon landing opened the door to future space travel

10. Prepare the answers by yourself and show your tutor.

11.

- a) for
- b) with
- c) explore
- d) know
- e) to bring
- f) making
- g) way
- h) position
- i) already
- j) near

Lesson 2

3. Prepare the answers by yourself and show your tutor.

4. Prepare the answers by yourself and show your tutor.

5. Prepare the answers by yourself and show your tutor.

6.

- a. antigen – a substance that causes the production of antibodies in the body.
- b. symptom – indication
- c. stigma – disgrace, shame;
- d. momentum - the ability to keep increasing or developing.
- e. microscopic – extremely small or difficult or impossible to see without a microscope;
- f. therapy – healing, treatment;
- g. eliminate – eradicate, remove;
- h. quantitative – connected with the amount or number of something.
- i. gene – genetic material, DNA/RNA;
- J. antibiotic – antibacterial or antiviral;
- k. chronic – continuing for a long time.
- l. immunize - to protect a person or animal against a disease by putting a substance into the body to make it produce antibodies.

- m. therapeutic – causing someone to feel happier and more relaxed or to be more healthy.
 n. reagent – a substance used to cause a chemical reaction to find out if another substance is present.

7.

a. synthesis	synthesize
b. standard	standardize
c. elimination	eliminate
d. diagnosis	diagnose
e. donation	donate

8.

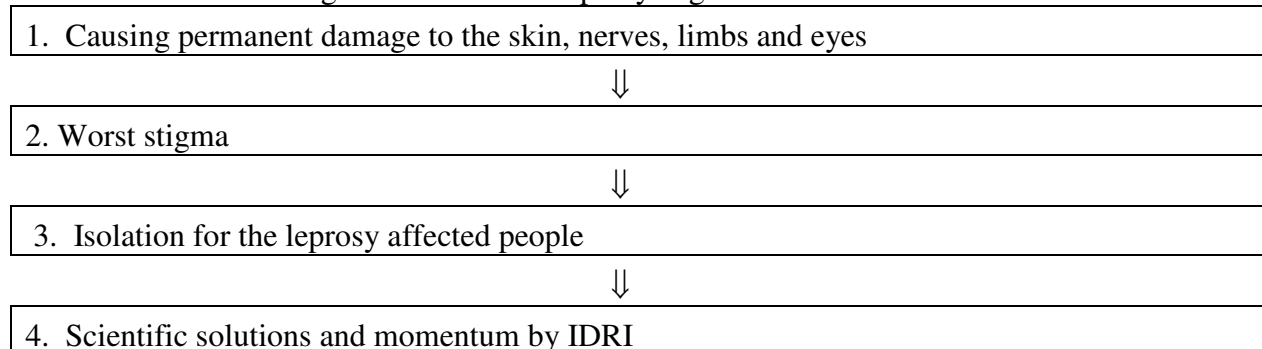
- i. We should use IDRI's diagnostic tools to identify infected individuals.
- ii. Support from some pharmaceutical giants has significantly bolstered this treatment and prevention strategy.
- iii. IDRI and a Brazilian company jointly developed the rapid diagnostic test for leprosy infection.
- iv. IDRI/They do the diagnostic test for leprosy with a smart phone based platform.

9.

- i. I started my research on leprosy more than a decade ago when people thought this disease would eliminate itself over time.
- ii. Although leprosy is associated with biblical times, it still remains a problem in this modern time.
- iii. The new approach of diagnosis is far superior to the traditional method that involved clinical and/or microscopic assessment.
- iv. Now we are going to conduct human clinical trials of leprosy after a decade has passed since the leprosy vaccine was developed.
- v. People around the world now believe that we will soon have the tools to finally eliminate leprosy.

10. Prepare the answers by yourself and show your tutor.

11. A flow chart showing the aftermath of leprosy is given below:





5. Development of a method for an early diagnosis of infection



6. Using of vaccine for infected individuals

12. Prepare the answers by yourself and show your tutor.

13. a) once b) reusable c) off d) destroyed e) experiments f) fall
g) rocket h) land i) fuel j) expense

Lesson 3

3. Prepare the answers by yourself and show your tutor.

4. Prepare the answers by yourself and show your tutor.

5. Prepare the answers by yourself and show your tutor.

6. Prepare the answers by yourself and show your tutor.

7. Prepare the answers by yourself and show your tutor.

8.

(1+a) Science will never be perfect because it is always getting better.

(2+b) DNA is considered very special because of its ability to store huge amount of data.

(3+c) There was no attempt to make human colony in the moon due to both financial and technical reasons.

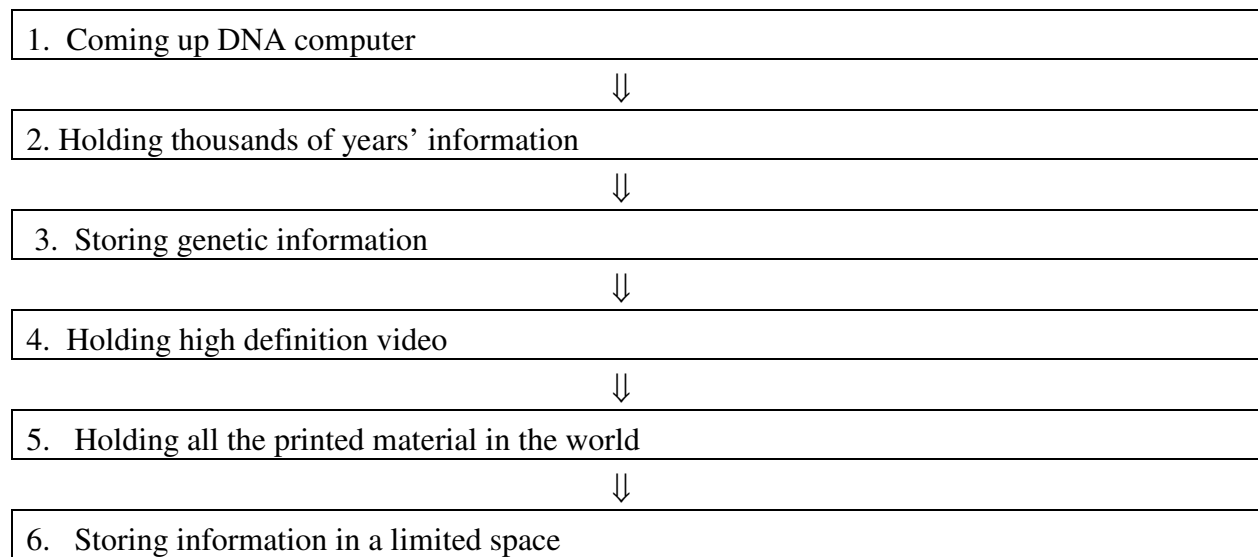
(4+d) Importance is given on clean energy because there are many demerits of fossil fuel.

(5+e) In one sense, cancer is similar to the common cold because medical science has not come up with drugs to cure them.

9.

- a. device: A thing made or adapted for a particular purpose, especially a piece of mechanical or electronic equipment.
- b. organism: An individual animal, plant, or single-celled life form.
- c. genetic: Related to genes or heredity.
- d. prototype: A first or preliminary version of a device or vehicle from which other forms are developed.
- e. colony: A country or area under the full or partial political control of another country and occupied by settlers from the country.
- f. fossil: The remains or impression of a prehistoric plant or animal embedded in rock and preserved in petrified form.
- g. geothermal: Related to or produced by the internal heat of the earth.
- h. stem cells: Undifferentiated cells of a multicellular organism which are capable of giving rise to indefinitely more cells of the same type.
- i. virus: An infective agent that typically consists of a nucleic acid molecule in a protein coat. A virus is too small to be seen by light microscopy.

10. A flow chart showing the capability of DNA computer is given below:



11. Prepare the answers by yourself and show your tutor.

Lesson 4

5. (1+d) Putting men on Mars has been a popular theme in science fiction for a long time.

(2+b) Building a permanent base on Mars can be more feasible than the construction of a permanent base on the Moon.

(3+c) Installing a space elevator is easier than what it was thought to be.

(4+a) Using microscopic robots can be a means to perform very delicate surgeries.

(5+e) Travelling to the centre of the earth is actually much more challenging than it sounds.

6.

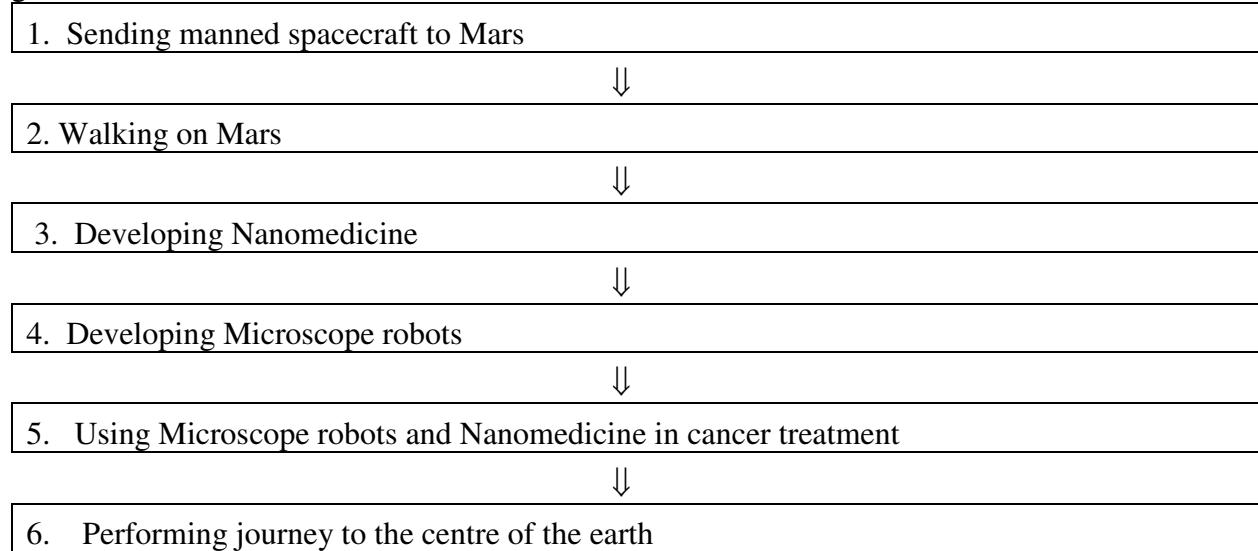
- a. exploration: the action of exploring in an unfamiliar area.
- b. Martian: relating to the planet Mars or its supposed inhabitants.
- c. launch: an occasion when a spacecraft is sent into space, or a ship is put into water.
- d. gravity: the force that attracts a body towards the centre of the earth, or towards any other physical body having mass.
- e. milestone: an important event in the development or history of something or in someone's life.
- f. speculate: form a theory or conjecture about a subject without firm evidence.
- g. nano: extremely small.

7.

- a. The current tallest building would not be as tall as a space elevator.
- b. Although a mission to Mars would be similar to the Moon landings, it is much more difficult.
- c. We/Scientists could use advanced drug delivery techniques to deliver drugs to specific parts of the body.
- d. Technology can be very unpredictable.

- e. It is the entire weight of the world and so the pressure at the center of the Earth is enormous.

8. A flow chart showing the coming scientific breakthroughs and its impacts on our life is given below:



9. Prepare the answers by yourself and show your tutor.