

UNIT 2

Pre-task

See the image below. How can you put all the three ideas into practice in your daily life?



| Reduce | Reuse | Recycle |
|--|--|---|
| <ul style="list-style-type: none"> • Less use of wooden furniture | <ul style="list-style-type: none"> • Reuse used bottles | <ul style="list-style-type: none"> • Recycle used paper and make greeting cards. |
| <ul style="list-style-type: none"> • | <ul style="list-style-type: none"> • | <ul style="list-style-type: none"> • |
| <ul style="list-style-type: none"> • | <ul style="list-style-type: none"> • | <ul style="list-style-type: none"> • |
| <ul style="list-style-type: none"> • | <ul style="list-style-type: none"> • | <ul style="list-style-type: none"> • |

Now form three groups. Each group will take one idea and suggest how it can be applied in day-to-day life.

Read 1

AUTOFAB TECHNOLOGY

Imagine yourself in a car showroom. You are not happy with any model of the cars in the showroom. Now you work on a computer and create your dream car on the screen. And magic! Next week you get delivery of a car fabricated exactly like your design. Such magic is possible through a process known as automated fabrication.

Automated fabrication, or 'autofab' is a set of technologies that automate the process of building three dimensional solid objects from raw materials. This industry uses solidification of polymers, powders, and other raw materials, guided by designs drawn on ordinary computers. Now it will be possible for human beings to acquire powers to manipulate the properties of matter. Autofab is now creating opportunities for manufacturers to satisfy the unique needs of customers. Inviting the customer into the design, development and production process will lead to unexpected new products. In Autofab, the customer is a co-constructor. Now product liability, other risks and patent rights may be shared with the customers. Automated fabrication will have a dramatic impact on society.

1. **Better product quality** : The automated methods of inspection and assembly will improve the quality and durability of products. One effect is that cars, televisions, refrigerators etc. will last much longer than

earlier models. Therefore, there will be decline in need for replacement.

2. **More recycling** : Instead of buying the latest model of a car or throwing away an old toaster, the customers will return their older models and get back new models fabricated from that old stuff. There will be recycling of materials in new ways. This will be a great compensation to environment.
3. **The return of the village craft worker** : If mass production loses its economic advantage, huge centralized factories would disappear. They will be replaced by smaller and community based facilities. There will be a continuous decline in the amount of human efforts needed to produce material goods. Then the customers may be served better by a local owner and operator of a manufacturing shop. Thus the factories will become decentralized and the naturally talented village craft workers will be back with a bang.
4. **New medical treatments** : Soon the scale of autofab will shrink to nanostructure level. Then the size of newly manufactured medical instrument will be no bigger than a drug molecule. It will be possible to reconstruct ratified tissues and even reversal of matured tissue decay will be done. The extension of human life span will continue. The health of old people will improve. It is likely that people will gain the ability to painlessly redesign their bodies.

The combined effect of such changes could be dramatic. It is believed that after some years a small mountain-top community could be self sufficient with a collection of fabricators and a solar power generator.

As the methods of autofab advance, the form of raw materials will be unimportant. Sophisticated autofab machines will be capable of rearranging molecular structures to generate any object from them. Plastic milk jugs and last night's punctured car tube could be molecularly rearranged to get a new table lamp.

Highly improved autofab technology will perhaps be able to meet all our material desires. The freedom resulting from this achievement will bring about a golden age of art, music and scientific discovery. But the open question is whether people want such freedom and will rejoice in it. In life, it is often found that the greatest satisfaction comes not from getting what one wants, but from working for it. The greatest challenge facing humanity as we proceed into the age of automated fabrications is to find a meaningful use for ourselves.

Glossery

automated computer guided *manipulate* make changes in the *properties* characteristics *liability* responsibility *decline* down turn, reduction *compensation* benefit, reparation *bang* suddenly *shrink* minimize *molecule* particle *ratified* permitted

Comprehension 1

C.1.1 Answer these questions in two to four sentences each :

1. Why is the customer called a co- constructor?
2. How will autofab reduce demands of replacement?
3. How will autofab boost the local commerce?
4. 'Autofab will be a boon to environment.' Give your argument for the statement.
5. What will be the effect of autofab on health and age of people?

C.1.2 Write the statements from the text pertaining to the following areas :

- Chemistry : _____
- Automobile : _____
- Environment : _____
- Legal rights : _____
- Health : _____

C.1.3 Find sentences from the text with similar message :

1. You give the design of the vehicle you want and you will get it within a few days.
2. Autofab technology will modify chemical structure of molecules and will create a different element.
3. Autofab Technology will make the local people self reliant.
4. Work gives more joy than the product.

C.1.4 Complete the sentences :

1. Instead of buying an old gadget, _____
2. When big factories will disappear, _____
3. To stop ageing autofab will _____
4. There will be more customer satisfaction because _____

Read 2

A PALANPUR YOUTH REINVENTS THE HUMBLE WATCH

Pranav Mistry, a native of Palanpur, North Gujarat showcased the impossibly futuristic watch "Gear" to the world. Mistry is the head of Think Tank Team, Samsung Research America, who has designed the 'digital' watch that lets you check messages with a glance or make conversation 007 style. "With Gear, you're able to make calls and receive calls without even taking your phone out of your pocket," said Pranav Mistry.



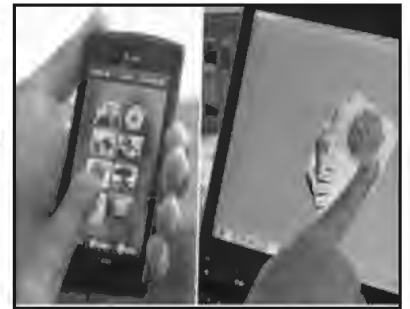
"When he was about 11, he (Pranav) used to say, '*Hu moto thaine bahu naam kamaish*' (When I grow up, I'll earn a lot of fame)," said his father Kirtibhai. "We never knew it will be so soon. Pranav was like any other child but his IQ powered him to the 1st rank in every academic year he spent at Vividhlakshi Vidyamandir, Palanpur. He was good in every activity; be it studies, music (he sings) or sports (plays badminton)," said the proud father.

He studied in his mother tongue, Gujarati, and later joined Nirma University, Ahmedabad for his BE in computer engineering. He went on to complete his post-graduation (industrial design) from IIT-Mumbai, which earned him a job with Microsoft in Hyderabad and a president's award from APJ Abdul Kalam.

He said, "From my engineering in computer science to my masters I worked on varied fields like interaction design, robotics, computer graphics, HCI, AI, information graphics, embedded systems, social computing, ... and the list goes on. I explored the fields with different projects and research papers. Here are some of my projects in brief."

TeleTouch lets you touch and control things from a distance. See through your smart phone's camera

and control everything you see on the screen by touching it. Now you can interact with your appliances from a distance, in a fun way. TV, alarm, music player, open the door, turn on that light... Just by touching it on screen. It's simple. TeleTouch lets you interact with your world with touch, from a distance.



Sparsh lets you conceptually transfer media from one digital device to your body and pass it to the other digital device by simple touch gestures. Touch whatever you want to copy from laptop, TV, smart phone, e-book reader etc. Now it is saved conceptually in you. Next, touch the device you want to paste. SPARSH uses touch based interactions as an indication for what to copy, from where and where to pass it on.

SunFlower lets us track the sun. It is an artificial sunflower. With simple op-amp 741 circuitry & photo sensors he has created a sunflower which would move with the sun. Though



Later the concept was very efficiently used in solar panels at his institute as the panels could get the most efficient angle each time.

SixthSense is a wearable gestural interface that augments the physical world around us with digital information and lets us use natural hand gestures to interact with that information. By using a camera and a tiny projector mounted in a pendant like wearable device, 'SixthSense' sees what you see and visually augments any surfaces or objects we are interacting with. It projects information onto surfaces, walls, and physical objects around us, and lets us interact with the projected information through natural hand gestures, arm movements, or our interaction with the object itself. 'SixthSense' attempts to free information from its confines by seamlessly integrating it with reality, and thus making the entire world your computer.

Glossary

interaction communication **robotics** the design and construction of robots, as well as computer systems **AI** Artificial Intelligence **explored** searched **appliances** machines, devices **gestures** signals **indication** suggestion **augments** adds to **conceptually** as an idea **embedded** fixed into something, planted

Comprehension 2

C.2.1 How would these gadgets bring change in our regular life? List them in order of priority according to their usefulness :

GEAR, TeleTouch, SPARSH, SixthSense, SunFlower

C.2.2 Answer the following questions in brief :

1. Why is Kirtibhai proud of his son?
2. Which aspect of Pranav's educational life touches you most? Why?
3. How does the copy-paste system in SPARSH differ from that of our current system?

4. What are the input and output systems in SixthSense?
5. What inspiration do you get from Pranav?
6. What questions will you ask Pranav if you happen to meet him? List five questions.
7. List the Gujarati words used in the passage.

C.2.3 Match the pairs :

| A | B |
|------------|--|
| GEAR | It sets your solar panel |
| TeleTouch | You can receive calls without lifting the handset |
| SPARSH | Copy paste is a job of your fingers. |
| SunFlower | You are on the way and you switch off fans of your study room. |
| sixthsense | Now the whole world is your computer. |

C.2.4 Pranav has worked on the following projects. Search the web and find information about any three of them :

Mouseless, PreCursor, BlinkBot, thirdEye, inktuitive, QUICKiES, TaPuMa, invent, DATAG2.02, Marbo, projectCHILD, Sandesh, Ghost in the machine, RoadRunner, VET, Sthiti, Akshar


Read 3

THE SECRET OF THE MACHINES

By Rudyard Kipling

We were taken from the ore-bed and the mine,
 We were melted in the furnace and the pit—
 We were cast and wrought and hammered to design,
 We were cut and filed and tooled and gauged to fit.
 Some water, coal, and oil is all we ask,
 And a thousandth of an inch to give us play :
 And now, if you will set us to our task,
 We will serve you four and twenty hours a day!
 We can pull and haul and push and lift and drive,
 We can print and plough and weave and heat and light,
 We can run and race and swim and fly and dive,
 We can see and hear and count and read and write!
 But remember, please, the Law by which we live,
 We are not built to comprehend a lie,
 We can neither love nor pity nor forgive.
 If you make a slip in handling us you die!
 Though our smoke may hide the Heavens from your eyes,
 It will vanish and the stars will shine again,
 Because, for all our power and weight and size,
 We are nothing more than children of your brain!

Glossary

ore a metal-bearing mineral or rock *furnace*  *wrought* shaped *filed* smoothened *gauged* measured *haul* drag *heavens* sky *vanish* disappear

Comprehension 3

C.3.1 Form four groups and discuss the following points and prepare a list. Then a reporter from each group will share the list with the class :

- List the machines around you and say how they make your life easier.
- Have you ever felt crippled in the absence of any machine or gadget? Talk about one such experience.
- List some incidents where mishandling of machines has created disasters.
- Can machines replace human beings? Why?

C.3.2 Give another title to the poem : _____

C.3.3 Write the stanza number against the theme of each stanza :

☐

Origin

☐

Treatment they need

☐

How they serve

☐

No emotions, no regrets

C.3.4 Answer the questions in two or three sentences each :

1. What is the law of machines?
2. Why do the machines consider themselves transitory?
3. What can machines do?
4. How do machines serve us?
5. How do machines differ from human beings?

C.3.5 Given below is the gist of some lines in the poem. Read the poem carefully and find the matching lines.

1. Be careful when you work with machines. _____

2. We don't need to take a lot of effort to run and maintain machines. _____

3. After all, we are man-made objects. _____

4. We can do multiple jobs very easily. _____

C.3.6 Find the most appropriate option :

1. This poem is about : (A) importance of machines in the age of industry (B) human emotions (C) our dependence on machines (D) inventions of different machines
2. Machines consider themselves : (A) Kings (B) equal to human beings (C) superior to human beings (D) inferior to human beings
3. Machines warn us against : (A) overuse (B) mishandling (C) slavery (D) sensitivity

Vocabulary

V.1 Fill in the blanks with the most appropriate words :

- Autofab is the technology to _____ your own computer designs into _____ objects. [concrete, strengthen, fabricate, demolish]
- _____ of the properties of a matter is now _____ with autofab machines. [instruction, possible, difficult, manipulation]
- The _____ of the old objects will be _____ into a new form as a part of a new object with the help of automated fabrication. [converted, matter, theme, polished]
- Autofab will be a great help to _____ because it will increase _____. [recycling, creativity, population, environment]
- Autofab technology may _____ the way of _____ human body. [close down, immortalizing, immoralizing, open up]

V.2 Fill in the blanks with the proper forms of the words :

- The autofab _____ (technique) will _____ (thorough) change the world.
- With the _____ (arrive) and spread of autofab, the huge factories will _____ (appear).
- Pranav has made an _____ (ordinary) _____ (achieve).
- At a _____ (youth) age Pranav Mistry has earned a lot of _____ (famous) with a president's award.
- _____ (extend) of _____ (inhuman) life span will be much easier with autofab technologies.

V.3 Frame sentences using all the words. You may change the forms of the words if needed.

Work in pairs :

Example : Pranav – make – father – achievement

Answer: Pranav made his father proud because of his achievements. OR Pranav's achievements made his father proud. OR You can make your father proud with your achievements as Pranav did. etc.

- old stuff – reform – new objects – help – autofab
- autofab – qualitative – durable – machines
- redesign – human body – painlessly – possible
- decentralization – factory – village craft
- tele touch – distant – things
- machines – properly – dangerous – otherwise

V.4 Match A – B and frame a sentence using both of these words :

| Part A | Part B | Sentences |
|---------|--------|--|
| capable | for | 'ren-baseras' are <u>built</u> <u>for</u> the night stay of homeless people. |
| in | in | |
| lead | brief | |
| good | to | |
| built | by | |
| touched | of | |

Function

F.1 Study the table and frame sentences comparing the income of these people :

| Name | Mr Desai | Mrs Roy | Mr Soni | MS Rani | Mr Basu | Mrs Kapoor |
|--------|-----------|---------|-----------|----------|----------|------------|
| Income | 18,00,000 | 14,700 | 18,00,000 | 1,90,000 | 1,46,900 | 18,00,000 |

e.g. Mr Desai is as rich as Mrs Kapoor.

Mr Desai is richer than Mrs Roy.

F.2 Read the survey and frame sentences as given below :

WINNERS AND WHY THEY MADE IT

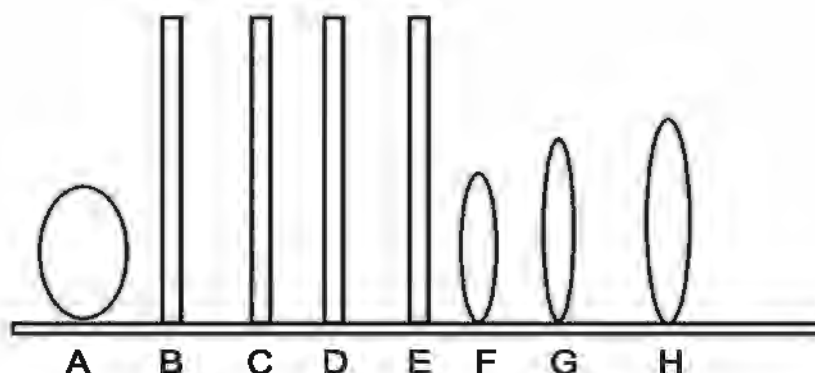
| Category | Best City | Emerging City | Parameters |
|-------------------------|--------------------|---------------|---|
| Overall | Chennai | Vadodara | quality of classrooms, expenditure on education, crime rates, economic growth and investment generation |
| Housing and Transport | Thiruvananthapuram | Rajkot | quality of public transport and percentage of slum population |
| Environment | Shimla | Madurai | level of Suspended Particulate Matter and Respirable Suspended Particulate Matter |
| Lowest Crime and Safety | Gandhinagar | Surat | lowest percentage of violent crimes and crimes against women |
| Public Services | Shimla | Vadodara | percentage of LPG usage, frequency of power cuts, sewage and water supply system |

e.g. Chennai is the best city in overall category.

No other city is as good as Chennai in overall category.

Chennai is better than any other city in overall category.

F.3 Study the picture and read the sentences :



Let's compare A with other students : • A is the fattest boy in the class.

• A is fatter than any other boy in the class. • No other boy in the class is as fat as A.

If we compare B in the same way, it is not true : • B is the tallest boy in the class.

• B is taller than any other boy in the class. • No other boy in the class is as tall as B.

So, B can be compared this way : • B is one of the tallest boys in the class.

• B is taller than most other boys in the class. • Very few boys in the class are as tall as B.

F.4 Now frame sentences for the information :

1. There are a few fast bowlers in your school. Ramesh is one of them.
2. There are a few long rivers in India. The Narmada is one of them.
3. There are a few countries with high population in the world. India is one of them.
4. There are a few tall trees in the world. Coconut tree is one of them.
5. Many girls in your class run fast. Maitri is one of them.

e.g. Ramesh is one of the fastest bowlers in our school.

Very few bowlers in our school are as fast as Ramesh.

Ramesh is faster than most other bowlers in our school.

F.5 Here are some real facts of life :

1. If you work hard, you will get better result.
2. If I dig more, I will get more water.
3. If she walks fast, she will reach earlier.

These things can be said in this way too :

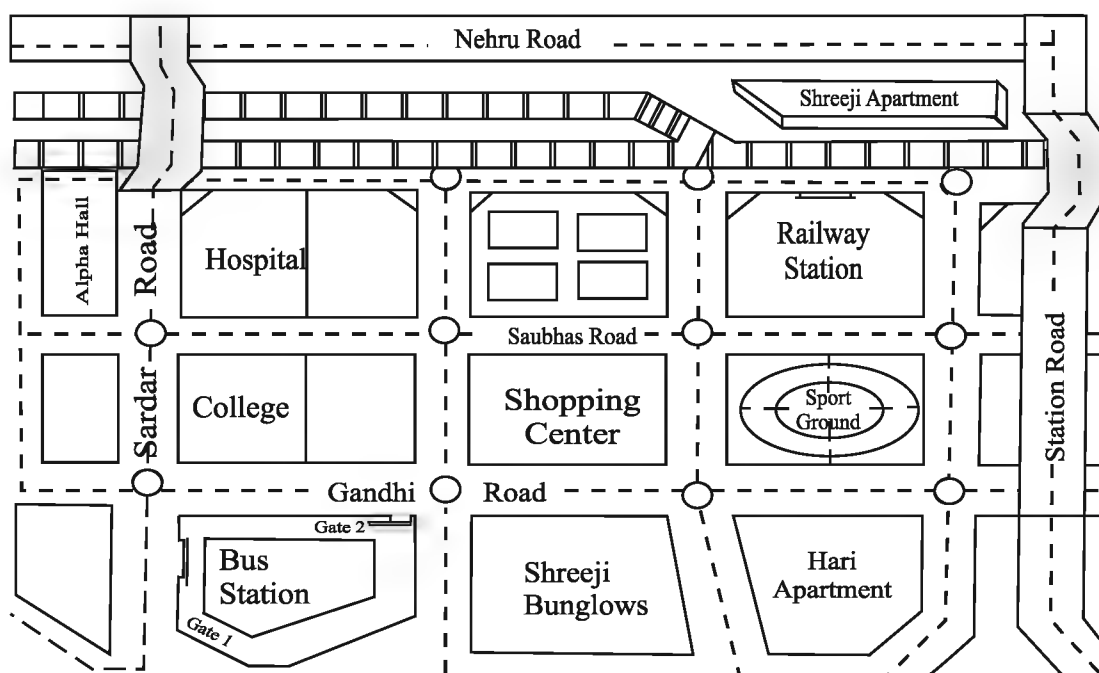
1. The harder you work, the better result you will get.
2. The more I dig, the more water I will get.
3. The faster she walks, the earlier she will reach.

F.6 Complete the sentences :

1. The more _____ it is, _____ I like it. (adventurous / much)
2. _____ I see it, _____ I like it. (much / much)
3. The older we grow, _____ we become. (old / wise)
4. _____ you climb, _____ it gets. (high / cold)
5. _____ they go, _____ it is. (soon / good)

Writing

W.1 Your friend is coming to your hometown for the first time. He is at the Bus station. He calls you for the direction to your house. You live in Shreeji Apt. Guide him to your home.



Friend : Hello! Krishna, I am at the bus station of your city. How can I reach your home?

You : Welcome. It's at walking distance. You come out of the bus station from gate no : 2. Just take left turn....

W.2 How to make a paper bag?

Material : card paper, scissors, glue, cotton strings

- Steps** : 1. Take a piece of card paper. (24 X 38 cm)
2. Fold the bottom edge upto five cm.
3. Fold the sides of the card paper.
4. Join them.
5. Fold the side creases inward.
6. Fold and glue the bottom.
7. Attach cotton string as a handle.
8. Decorate the bag.



Now, write about your experience of making this paper bag in about 10-15 sentences. Narrate it to the class.

Example :

Start this way...

Last week we did a creative and exciting activity.....

W.3 Read the following details of Sam Pitroda and write a paragraph about him :

born on 4-5-1942 in Odisha – childhood in Gujarat – schooling in Vallabh Vidyanagar, M S University Baroda – career : telecom engineer – joined Wescom switching company at Chicago – in India – worked as inventor entrepreneur advisor – his contribution in telecom revolution in India – his other contribution - awards : Padmabhushan

Activity

- A.1** Autofab technology will be a boon for waste management. Form groups and discuss how it will be best used to benefit common people. You may discuss how it can be beneficial in reducing poverty, increasing employment, reducing pollution, etc. Discuss if it could also have adverse effects.
- A.2** 'Plastic milk jugs and last night's punctured car tube could be molecularly rearranged to get a new table lamp.' Now, make a list of your things that you want to get recycled through Autofab technology. Also, add what you would want to make out of them. Share it in class.
- A.3** Work in groups and try to design any one of these with improved or new functions and facilities :
- a cell phone, a laptop, a lock, a pen, a bicycle, a school bench
- A.4** We in India are very good at reuse. Make a list of things that your family reused or recycled in last one year.
- A.5** Find the poem “જ્યાં જ્યાં વસે એક ગુજરાતી ત્યાં ત્યાં સદાકાળ ગુજરાત” by Ardesar Faramji Khabardar and recite it in the class.