

## Tutorial 3: Purpose and Process

### Activity one

#### **Self evaluation – entry test**

##### ■ Supply the missing words.

Example:

The **go** ..... of the Cancer Research Fund is to provide financial backing for research teams. (objective)

→ The **goal** of the Cancer Research Fund is to provide financial backing for research teams.

1. As far as public transport is concerned, the **ta** ..... is to extend the tram network by 25 km within the next 6 years. (goal, objective)
2. The infection causes an inflammation which blocks the artery **su**..... blood to the appendix. (providing, feeding)
3. To survive on land, reptiles had to develop a skin which was relatively impermeable to water **so** ..... prevent desiccation. (in order to – 3 words)
4. The **ai** ..... of the Government's population policy is to bring about a fundamental change in the demographic pattern. (the objective)
5. When predators are withdrawn from the area, the number of dominant species increases, **th** ..... reducing diversity. (by doing this, thus)
6. It was Canadian scientists who first proposed and **de** ..... the experiment. (made the plan)
7. A complete survey of the surface of the Earth has been carried out **by** ..... high-resolution satellite photography. (using, thanks to – 3 words)
8. The escape velocity, which is 40,250 kph, **en** ..... a rocket to overcome the Earth's gravitational pull. (permits)
9. It was only in 1947 that women were first **al** ..... to become full members of Cambridge University. (permitted)
10. The machine was badly damaged **th** ..... negligence and lack of maintenance. (because of)

**Activity two:**

**A. (Purpose) Insert the required word or expression: MAKE IT POSSIBLE ▪ PROVIDES ▪ RESPONSIBLE FOR ▪ SO THAT ▪ PURPOSE ▪ AIMS ▪ DESIGNED ▪ IN ORDER TO.**

1. It is a new generation of artificial organs specifically ..... to be implanted in patients with diabetes.
2. The Akosombo dam on the Volta river ..... hydroelectric power to Ghana and neighbouring countries.
3. A small bit of specialised tissue, called the sinoauricular node, is ..... initiating the heartbeat.
4. The software will ..... to detect the virus before any harm is done.
5. Cadmium can be used ..... lower the melting point of alloys.
6. The sensors are orientated ..... cosmic  $\gamma$ -rays will be detected.
7. It should be pointed out that quantum mechanics was originally introduced for the ..... of explaining chemical facts.
8. Biochemistry, like other sciences, ..... at quantifying or measuring results.

**B. (Process) Draw arrows to link the phrases.**

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. The main advantage of sexual reproduction is that it <b>enables</b> ...</li> <li>2. The particles then collide with gas molecules in the atmosphere, <b>thereby</b> ...</li> <li>3. Earth-orbiting satellites have <b>made it possible</b> ...</li> <li>4. In all probability, he got the job <b>through</b> ...</li> <li>5. The acoustic wave enters the ear and the information is transmitted to the brain <b>via</b> ...</li> <li>6. If the infection is <b>allowed</b> ...</li> <li>7. The cancerous cells are transmitted to the other organs <b>by means of</b> ...</li> </ol> | <ol style="list-style-type: none"> <li>a. exciting them and causing luminescence.</li> <li>b. to determine with accuracy the path and speed of the Gulf Stream.</li> <li>c. the blood stream.</li> <li>d. to spread, there will be thousands of deaths.</li> <li>e. an advertisement.</li> <li>f. a species to adjust and adapt to changing conditions.</li> <li>g. the auditory nerve.</li> </ol> |
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### Activity Three:

## Sleeping pilots and chaos theory

Why are there accidents? Where does the responsibility lie? One of the uses of technology is to devise ways and means of reducing the consequences of human error.

*Fill in the gaps with the following words:*

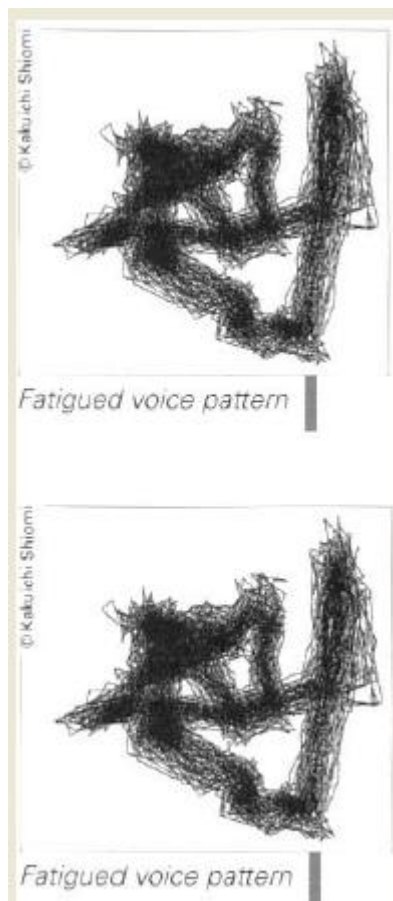
**SO THAT • OBJECTIVES • BY MEANS OF • ENABLES • DESIGN • DEVISE • PROVIDE • MAKES IT POSSIBLE TO • IS RESPONSIBLE FOR.**

Despite the thousands of parts which are used in the construction of aeroplanes, very few air-crashes are caused by component failure. It is, in fact, human error that ..... 80% of air accidents. This explains why one of the primary ..... of the aircraft industry today is to ..... ways of improving these figures. One area of particular concern is pilot fatigue. This problem is far more widespread than is commonly realised and Dr. Mark Rosekind

claims that "70% or more pilots say that they have fallen asleep at least once while piloting". Fatigue is particularly linked to the crossing of time zones which can severely disturb the circadian rhythm.

The Japanese company, Electronic Navigation Research Institute (ENRI), is currently in the process of developing a monitoring system which will be able to ..... early warning of fatigue ..... voice recognition techniques.

Biological functions, such as blood pressure, heart-beat and voice, have a fractal structure which can be identified. Under stress or fatigue, these physiological manifestations undergo change and consequently, as can be seen in the figure, the pattern alters, gradually losing its structure and becoming chaotic. By using the mathematics of chaos theory, Kakuichi Shiomi, chief researcher of ENRI, has been able to ..... software which ..... these minute distinctions to be identified ..... the pilot's voice pattern can be matched with a control model of an alert voice. It takes no more than 10 seconds for data samples to be processed which means that fatigue can be measured in real time without interfering with the normal activity of the flight crew.



According to Shiomi, the system ..... detect tiredness in test subjects 10 to 20 minutes before they become aware of it themselves.