

Tutorial 4: Hypothesis

Activity one

Self evaluation – entry test

■ Supply a suitable verb form or conjunction.

Example:

If oil prices increased, air travel more expensive. (to become)

*→ If oil prices increased, air travel **would** become more expensive.*

1. If water is boiled, it into steam. *(to be transformed)*
2. The U.S. Geological Survey predicted that if the stress on the San Andreas fault increased, there an earthquake of magnitude 5.5 to 6. *(to be)*
3. According to Morrison, the dinosaurs would not have become extinct if an asteroid with the Earth. *(not to collide)*
4. If the red light begins to flash, it that the machine has overheated. *(to mean)*
5. Provided the smoke has been detected, the alarm *(to go off)*
6. If you went by plane, the journey less than an hour. *(to take)*
7. As soon as phosphorus is exposed to ultraviolet light, it luminescent. *(to become)*
8. If Galileo had not withdrawn his claims, he *(to be burned)*
9. You must follow the instructions carefully, otherwise there an accident. *(to be)*
10. you oxygenate the water, those fish will die. *(if you do not)*

Activity two:

A. Explain the difference in meaning between the two sentences to your partner.

1. a) If **you get** a Nobel prize, **you receive** a gold medal, a diploma and a large sum of money.
b) If **you get** a Nobel prize, **you will receive** a gold medal, a diploma and a large sum of money.
2. a) If the anti-pollution measures **become** law, cars **will be** more expensive.
b) If anti-pollution measures **became** law, cars **would be** more expensive.
3. a) If oil **was discovered** in Ireland, the standard of living **would change**.
b) If oil **had been discovered** in Ireland, the standard of living **would have changed**.

Activity Three:

Rewrite the sentence using a conditional. Indicate in the box which sort of conditional you have used, e.g. timeless, 1st conditional, 2nd conditional or 3rd conditional. N.B. – Avoid using modals (must/could, etc.).

1. It was Malthus who pointed out that there was a link between population growth and the danger of famine.

Malthus warned that if the population continued to grow, *(there to be)*

2. To become a member of the Antarctic research team, it is imperative to be single.

You have to be single if *(to want)*

3. The continued production of progesterone by the ovaries depends on fertilisation taking place.

Provided fertilisation occurs, *(the ovaries)*

4. You didn't get the job for one reason; you hadn't got enough work experience.

If you had had more work experience, *(you)*

5. Selection to go on a Russian space mission entails learning Russian.

If you were chosen for the space mission, *(to have to)*

6. Millions of people were saved thanks to Penicillin.

Unless they had developed Penicillin, *(to die)*

7. Pasteur realised that the destruction of micro-organisms depended on heating milk to 57°C.

Pasteur realised that if milk was heated, *(to be destroyed)*

8. Pterosauria had very primitive wings. Scientists assume that they lived on cliffs by the sea as this is the only way to explain that they learned to fly.

Unless they had lived by the sea, Pterosauria *(not to learn)*

Activity Four:

Tomorrow's technology

What is the most important question of all? Doubtless, "What will the future be like?". In a recent issue of the "Technology Review" from the Massachusetts Institute of Technology the editors listed areas of emerging technology that they believe will have the greatest impact during the next decade.

- *What does progress depend on? Rephrase the words in **bold**. Use the first conditional (PRES + WILL) and the following conjunctions in turn: UNLESS • PROVIDED • OTHERWISE • ON CONDITION THAT.*

*Example: **Unless** they **develop** better algorithms, the project **will** fail.*

① BRAIN-MACHINE INTERFACES

Implanting sensors in the cortex will open the way to the interpretation of electrical activity so that thought processes can be converted into actions.

RESEARCH REQUIREMENTS

- Improved algorithms for interpreting electrical activity in the brain.
- Progress also depends on the development of **reliable and safe implant techniques**.

POTENTIAL USES – Brain-machine interfaces would allow disabled or paralysed people to control wheel-chairs, write e-mails, etc. In the long term, accurate control of artificial arms should be possible.

③ MICROPHOTONICS

Photonic crystals and photons can be compared to semiconductors and electrons. Depending on the wavelengths and the design of the crystal, they can be used to bend, to split or to reunite photons. As these crystals do not scatter or absorb light, they are significantly faster and more efficient.

RESEARCH REQUIREMENTS

- Identification and cheap synthesis of electro-optical polymers which have the appropriate physical properties.
- **Improved amplification and signal regeneration techniques will also be required.**

POTENTIAL USES – The fibre optics network for telecommunications is on the point of saturation. Transmitting data at speeds approaching that of light means that a 1,000 times as much data could be transmitted.

② BIOMETRICS

Biometrics is concerned with developing systems that can recognise unique biological features so that individuals can be reliably identified.

RESEARCH REQUIREMENTS

- More sophisticated search algorithms and pattern recognition software will be needed.
- **Huge data bases will have to be set up** and storage capacity developed.

POTENTIAL USES – Current identification methods are not secure for electronic transactions. Biometric software can already identify finger prints, retinal patterns, voice patterns, and facial features. In the near future, digital codes and other passwords could be replaced by biometric identification.

④ MICROFLUIDICS

This field is concerned with research at the level of the nano or picolitre. Once understanding has been attained at a micro-scale, many basic functions of analysis, synthesis and diagnosis could be done automatically.

RESEARCH REQUIREMENTS

The main prerequisites for progress in this area are :

- Improved interfaces.
- **A breakthrough in chip miniaturisation.**

POTENTIAL USES – High speed analysis of DNA, automatic analysis and synthesis, detection of gene mutation and drug-delivery techniques.