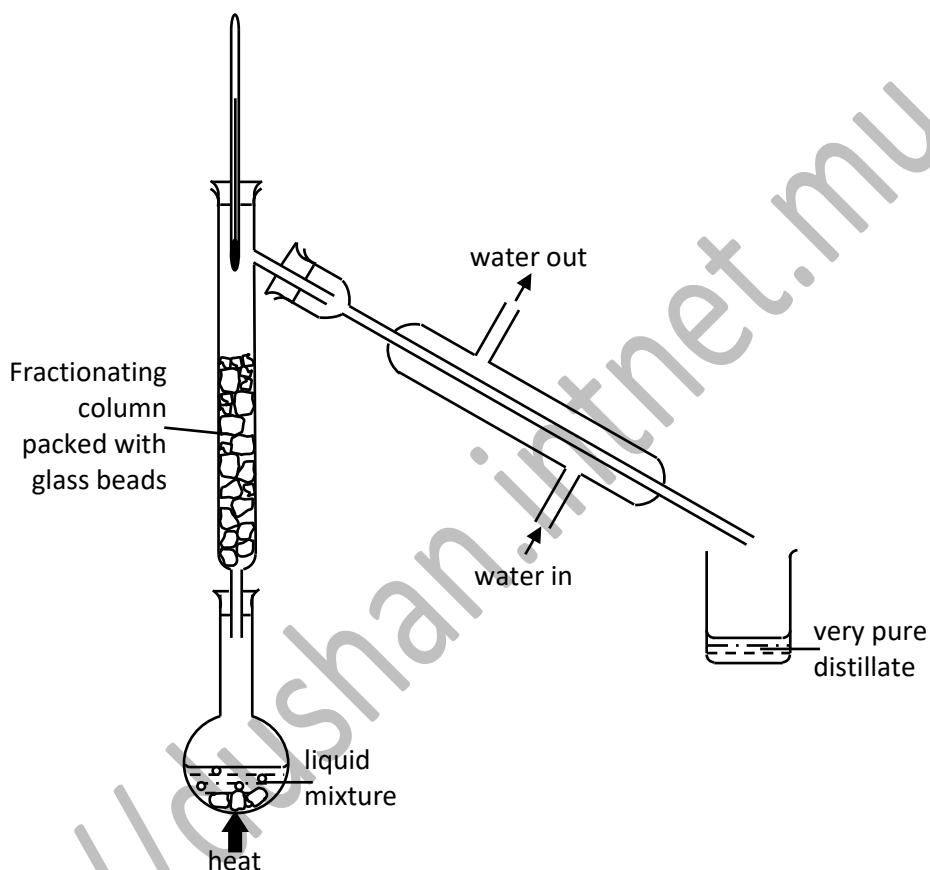


## CHAPTER 7: SCIENCE, TECHNOLOGY AND SOCIETY 3

Applications of distillation  YouTube

Fractional distillation is more efficient than simple distillation and it can be used to separate and purify a mixture of several miscible liquids, for example, crude oil or liquid air.



As the vapour rises up the fractionating column, it gets purer and purer. The liquid with the lowest boiling point is collected first.

Fractional distillation is used in everyday life:

1. for the separation of the components of crude oil,
2. for the separation of the components of air,
3. for obtaining essential oils from plants, and
4. in distilleries, for obtaining alcoholic drinks.

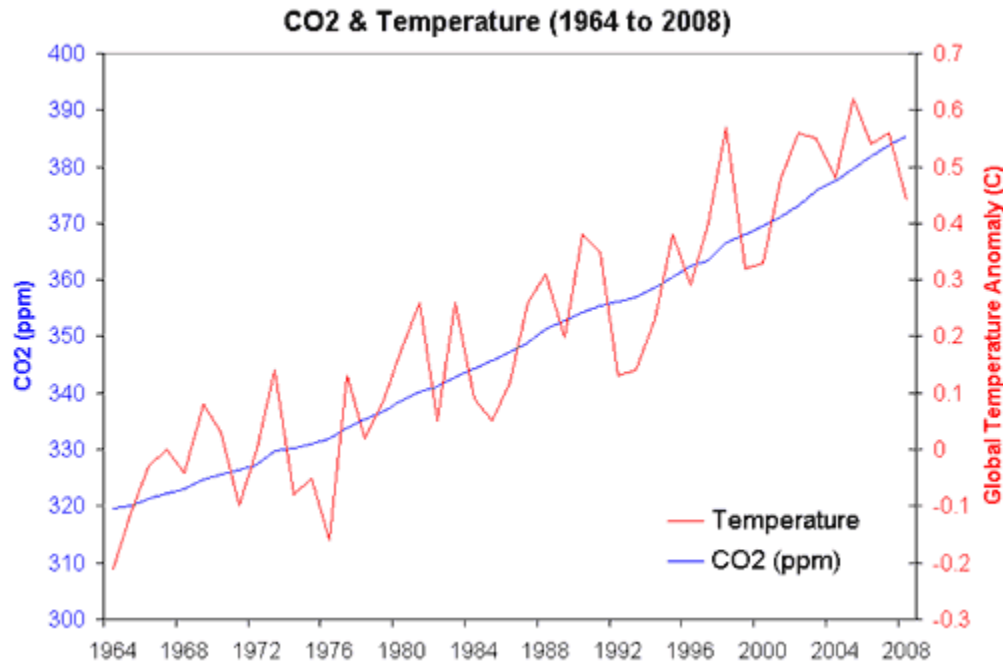
Applications of chromatography  YouTube

Chromatography is used in everyday life:

1. to detect the presence of drugs in sports,
2. to detect the presence of pesticides in agriculture,
3. to detect the presence of contaminants in food
4. to test for the purity of substances. If a given substance is pure, only one intense spot will be developed; impurities will produce several spots.

Global warming  YouTube

Causes of global warming and climate change



Global warming refers to the measurable increases in the average temperature of the Earth's atmosphere, oceans and landmasses. Gases like carbon dioxide, methane or nitrogen dioxide can trap too much of the Sun's heat and cause global warming. Carbon dioxide and nitrogen dioxide come from the burning of fossil fuels like petroleum, coal and natural gas (methane). Cutting down of trees also leads to an increase in carbon dioxide.

Global warming will cause a rise in the sea level. It will also be responsible for destructive climatic conditions. This will eventually cause a decreased agricultural yield or the extinction of many plant and animal species.

#### Measures to combat climate change

Addressing the problem of global warming is a difficult task. Because there is a great demand for electricity and goods made in factories, they continue to be produced. People concerned about the environment suggest that individuals can reduce that demand in several ways. Sharing cars or taking a bus puts fewer vehicles on the road. Turning off lights, televisions and other electrical items when not in use puts less demand on electric companies to supply power. Buying appliances that have been designed to save energy helps directly, and it encourages companies to make more of these types of products.

Global warming is a worldwide problem. Governments are trying to find ways to limit the amount of greenhouse gases put into the air each year. The most significant step towards this was the introduction of the United Nations' Kyoto Protocol. Countries who agree to the protocol promise to reduce the amount of greenhouse gases that they produce by a particular time. Although some countries were hesitant about accepting the Kyoto Protocol, 172 nations had agreed to it by 2007.

## Ethical issues involving science and technology

### Chemical waste disposal YouTube

Chemical waste is a waste that is made from harmful chemicals (mostly produced by large factories). If you live in a developed nation, chances are companies in your country dispose of quite literally tons of hazardous waste products every day. Sadly, much of this waste is not dealt with properly, and can come back to haunt us. Anything from a wadded-up bubble gum wrapper to radioactive waste, if left unchecked, can leave a huge and damaging footprint on our ecosystems.

As the amount of hazardous waste produced increases annually, places and methods of disposal that are scientifically, technologically, politically and environmentally safe are becoming more difficult both to discover and to agree upon. Many alarming events in the past decade have resulted from indiscriminate dumping of wastes. Wastes have been considered to be worthless, and so there has been little economic incentive to recover them, and, instead, considerable desire to dump them as quickly and cheaply as possible. But improper disposal may render a relatively harmless substance dangerous.

### Low-quality and counterfeit pharmaceuticals YouTube

Until recently, detecting low-quality and counterfeit pharmaceuticals required access to complex testing equipment, often unavailable in developing countries where these problems abound. The enormous amount of trade in pharmaceutical intermediaries and active ingredients raise a number of issues, from the technical (improvement in manufacturing practices and analytical capabilities) to the ethical and legal (for example, India ruled in favour of manufacturing life-saving drugs, even if it violates U.S. patent law).

### Illegal drugs YouTube

Each year about 20 people, young and old, die in Mauritius because of drug abuse. Many governments have banned the use of certain drugs—for example, marijuana, cocaine, LSD, heroin and Ecstasy. Illegal drugs are generally not used as medicine. People often take illegal drugs for fun but ignore the harmful side effects. They may become addicted, or unable to stop taking them. They may get sick or even die. Such dangerous use of illegal drugs is called drug abuse. People can abuse legal drugs, too. They may take medication when they are not really sick, or they may take too much.

Synthetic or designer drugs are created using man-made chemicals rather than natural ingredients. A designer drug is a synthetic (chemically made) version of an illegal drug that was slightly altered to avoid having it classified as illegal. It is essentially an experiment by a chemist done to create a new drug that can be sold legally, allowing dealers to make money without breaking the law.

Some of these drugs are sold as “herbal smoking blends”, while others are disguised as products labeled “not for human consumption” (such as “herbal incense,” “plant food,” “bath salts” or “jewelry cleaner”) to mask their intended purpose and avoid health and safety rules.

### Personalized genetic tests

Within the last 10 years, the creation of fast, low-cost genetic sequencing has given the public direct access to genome sequencing and analysis, with little or no guidance from physicians or genetic counsellors on how to process the information. What are the potential privacy issues, and how do we protect this very personal and private information? Are we headed toward a new era of therapeutic intervention to increase quality of life, or a new era of eugenics? Eugenics is the study of the methods to improve the mental and physical characteristics of the human race by choosing who may become parents.

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