

# **Introduction**

This topic provides an overview of the Computing and other sciences such as formal, natural and social sciences and the applications in different fields included also is an Appreciation of Computing in different fields such as Biology, Sociology, Environment and Gaming.

## **Objective**

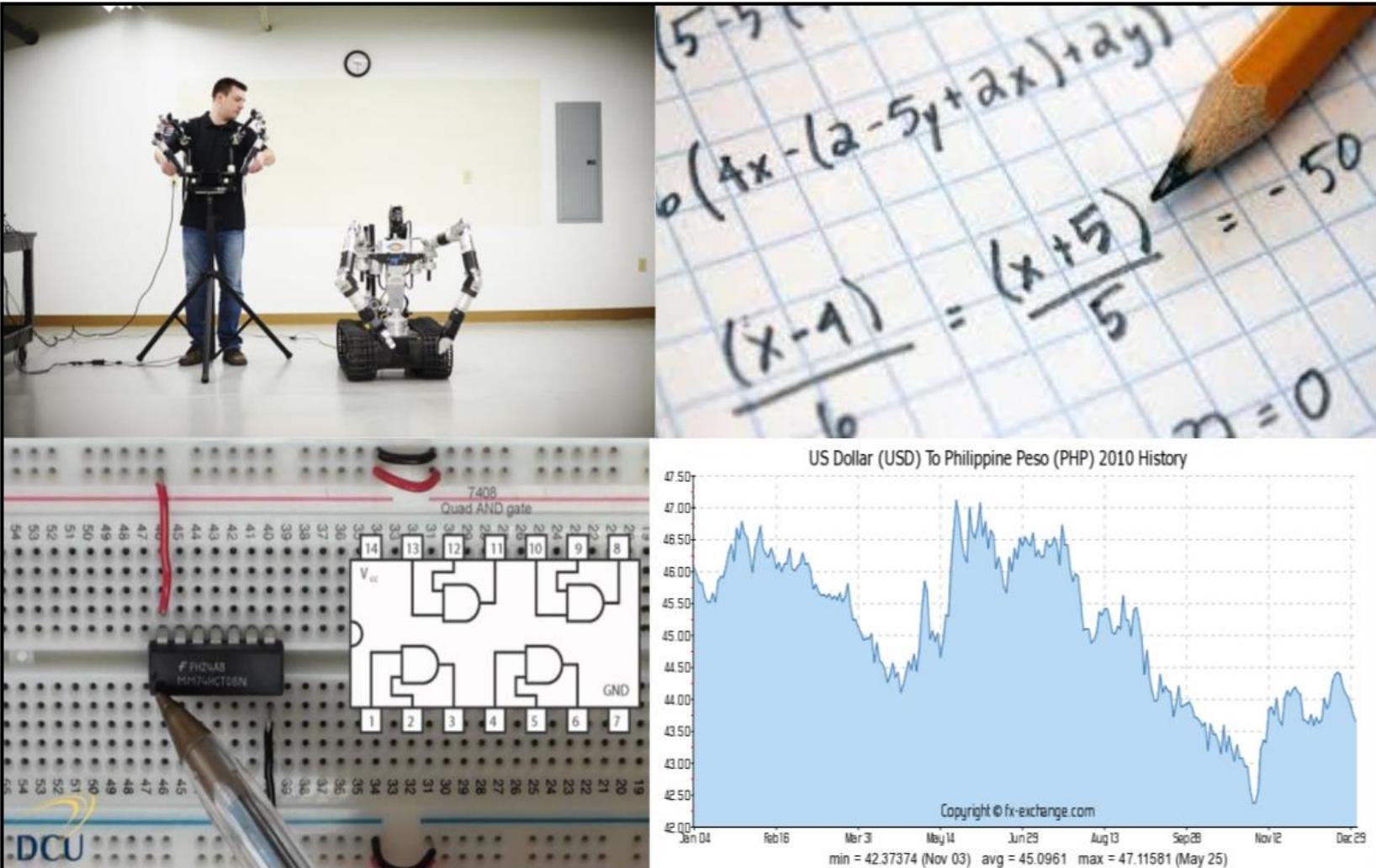
- Explain the relation between the computing industry and other branches of science.
- Identify the branches of science that benefit the most from advancements in the computing industry.

# Introduction

Computing will require input and process of using technology to produce a desired output that can be applicable to any industry. Whereas science is any system of knowledge that is concerned with the physical world and its phenomena and that entails unbiased observations and systematic experimentation.

Computing is very much science itself in executing different processes and operation. Computing combine with other sciences will have an application of greater software in the field of different research being used in the any industry today. The understanding of computing and science will have a broader impact in the development of software for computing in order to answer any problem that provide solution in the different field of science and industry.

# Computing and Formal Science



# **Computing and Formal Science**

- Computing is a formal science. It is an area of study that uses **mathematically definable logic systems** to generate a **result**.
- Some examples of formal science are mathematics, logic, computer science, statistics, cryptography, information technology, and robotics
- Formal science uses abstract logical systems, such as assigning values or determining True versus False, which can be applied to both natural science and social science via quantitative research.
- **Numbering** (mathematics) and **reasoning** (logic) are some of the oldest sciences.

# **Computing and Formal Science**

Since the advent of computer technology, formal sciences have benefited from it. For example:

- **Calculators** are useful for computation (mathematics).
- **Spreadsheet** software is useful for numerous formulas and graphs (statistics).
- **Robotics** and **artificial intelligence** combined mathematics and reasoning (logic) leading to greater research in the implementation of all concerned sciences.
- **Virtual environments** serve as reusable and sometimes shared spaces when testing new ideas for implementations of mathematics and logic.

# Application of Computing in Formal Science



# Computing and Natural Science



*Figure 3. Computing as Natural Science*



# Computing and Natural Science

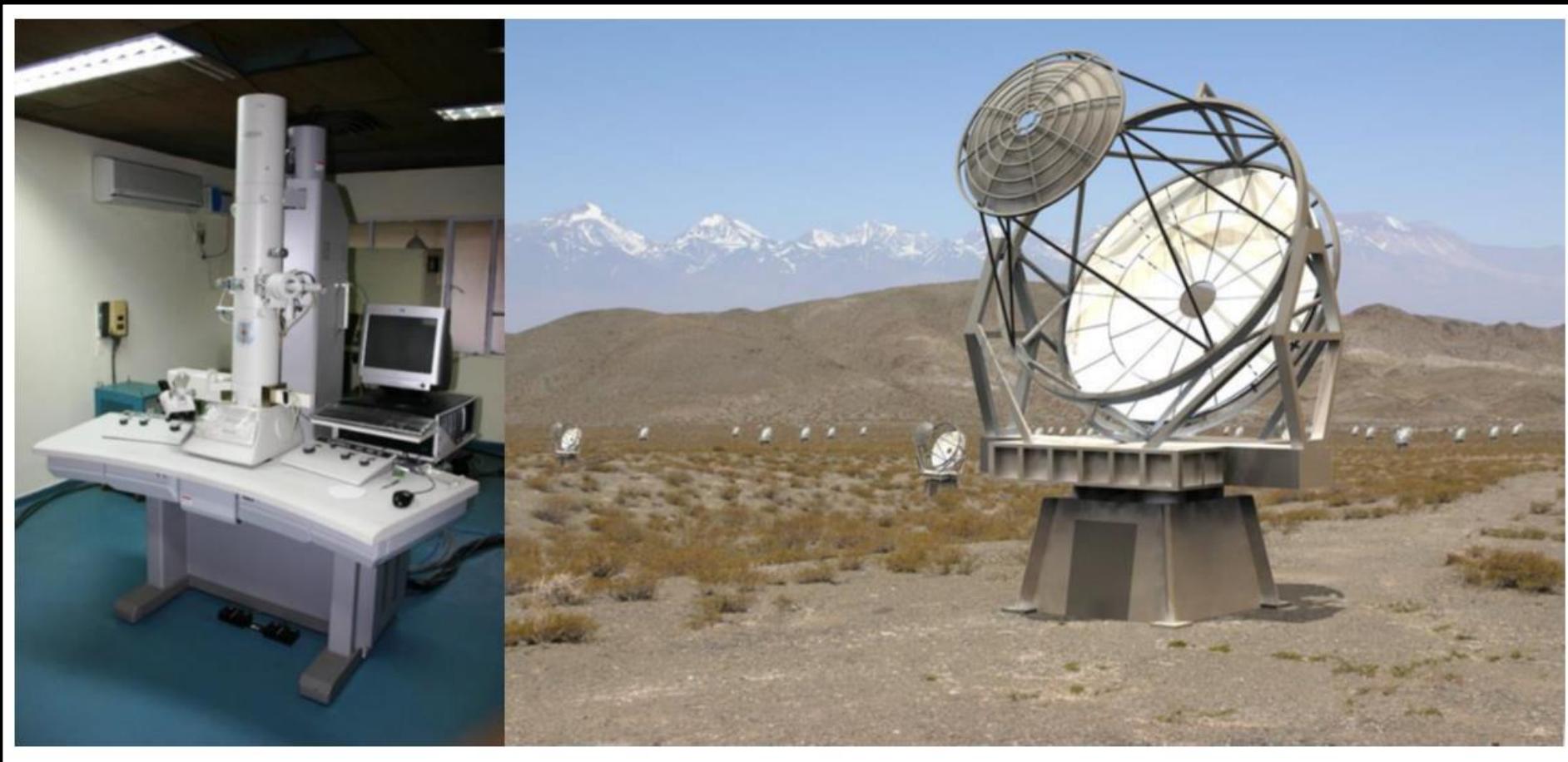
- A natural science is an area of study that describes, understands, explains, and predicts natural phenomena by **observing and experimenting**.
- Some examples of natural science are: biology, chemistry, physics, astronomy, oceanography, environmental science, ecology, biochemistry, and earth science
- Natural science uses **quantifiable data**, such as the results of mathematical formulae, obtained from quantitative research. Validity, accuracy, and quality through peer review are important criteria for scientific research related to the natural sciences.
- The study of living organisms (biology) and study of celestial objects and phenomena (astronomy) are some of the oldest natural sciences.

# **Computing and Natural Science**

Natural sciences have also benefited from the developments of the computing industry. For example:

- **Electron microscopes** are used in biology for inspecting objects that are not visible to regular microscopes, such as the viral load per millilitre of infected substance.
- **Computer tomography** or **CT scans** are useful for capturing high-contrast x-ray images from various angles and of sensitive organs.
- **Gamma ray telescopes** are mounted on Earth-orbiting satellites to observe distant heavenly bodies and phenomena.
- **Digital sensors** aid in monitoring oceanic changes and movement.

# **Application of Computing in Natural Science**



# Computing and Social Science



# Computing and Social Science

- Social science is an area of study which is concerned with society and the relationship between humans.
- Some examples of social science are: anthropology, archaeology, education, geography, psychology, sociology
- Social science uses **quantitative** and **qualitative** research but focuses on **data** from the latter. Social research is more eclectic than scientific research.
- The study of human behavior and societies (anthropology) and the study of human activity (archaeology) are social sciences that have uncovered how science as a whole has developed through the ages.

# **Computing and Social Science**

Social sciences have also benefited from the developments of the computing industry. For example:

- **Polls** and **census** can be carried out using online forms.
- **Websites** can be **educational** and the Internet can bring together people of the same lineage yet separated by distance.
- **Social networks** make it easier to observe societal trends.
- **Laptops** and **projectors** are used as teaching tools.

# Application of Computing in Social Science

