SOFT SKILL PAPER(Mrudu Kousalya)

3rd Semester B.A./B.Com./B.B.M.

SCIENCE & SOCIETY

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SYLLABUS

https://bangaloreuniversity.ac.in/wp-content/uploads/2015/06/Soft-Skills-Science-and-Society-syllabus1.pdf

LEARNING OUTCOMES

1. Be able to have a basic understanding of what science is (and is not)
2. Be able to appreciate and critically evaluate the S&T impact on our lives
3. Be able to have an "educated guess" about the future course of technological evolutions
4. Participate in the democratic process as educated citizens

STRUCTURE

What is Science?

Milestones of 20th & 21st Century Science

Impact on economy & society

WHAT IS SCIENCE?

WHAT IS SCIENCE?

- Latin word - "Scientia" - KNOWLEDGE
- Science is both a body of knowledge and process
- Science is exciting
- Science is useful
- Science is ongoing
- Science is global human endeavour

Anything in the natural world – from exotic ecosystems to urban smog – can be the subject of scientific inquiry.

Science checklist:
How scientific is it?

- [x] Focuses on the natural world
- [ ] Aims to explain the natural world
- [ ] Uses testable ideas
- [ ] Relies on evidence
- [ ] Involves the scientific community
- [ ] Leads to ongoing research
- [ ] Benefits from scientific behavior

FIELDS OF SCIENCE

NATURAL SCIENCES: The Study of the natural world

SOCIAL SCIENCES: The systematic study of human behavior and society

https://www.qnrf.org/en-us/FOS

LIMITATIONS OF SCIENCE

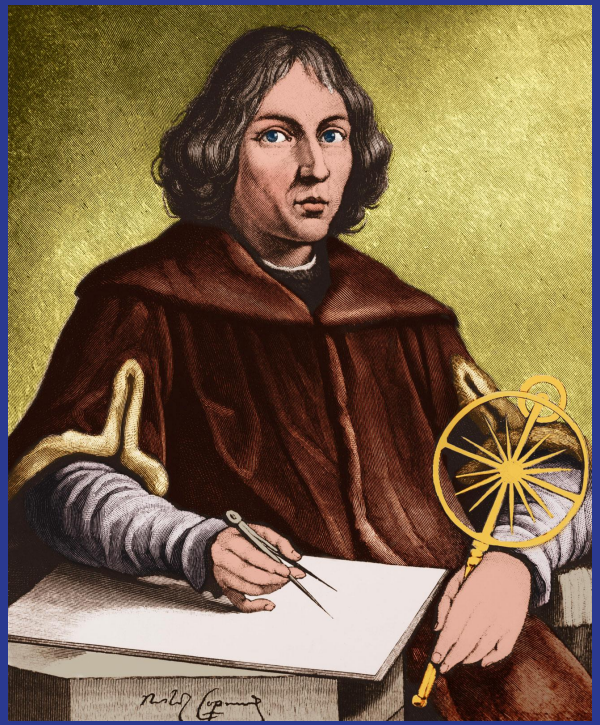
Science doesn't make moral judgments

Science doesn't make aesthetic judgments

Science doesn't tell you how to use scientific knowledge

Science doesn't draw conclusions about supernatural explanations

REVOLUTIONS IN PHYSICS

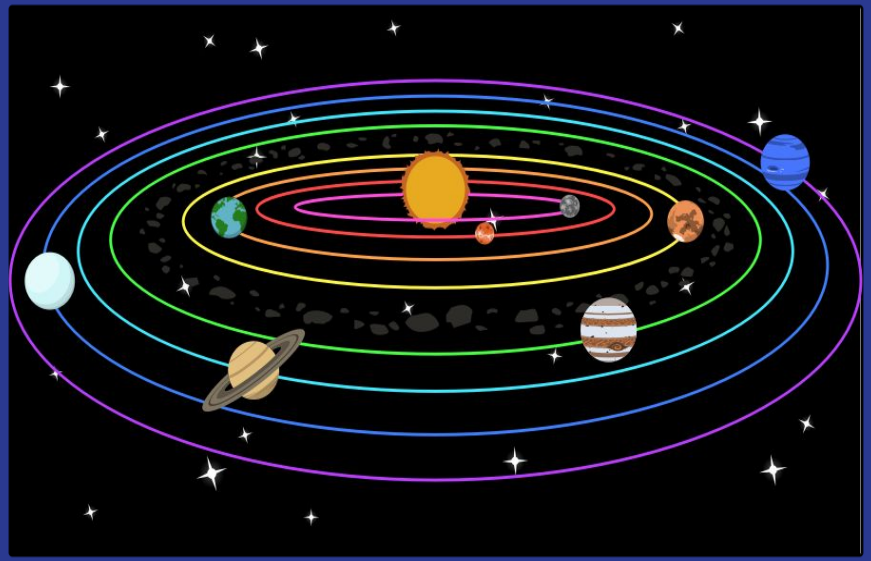


- ★ NICOLAUS COPERNICUS (1473 - 1543)
- ★ Astronomer, Mathematician, Physicist
- ★ HELIOCENTRIC SOLAR SYSTEM
- ★ (Planets & Planetary objects - orbit the SUN)
- ★ BOOK - De revolutionibus orbium.

(Earth rotate along its axis and orbited the sun once per year. He correctly positioned all of the known planets at the time and explained why the seasons occurred.

- ★ Publications - Copernican Revolution.
- ★ He was born in the city of TORUN - NORTHERN POLAND FEB 19, 1473
- ★ He also argued that distance from the earth to the sun is much less than the distance from the earth to the stars
- ★ Not married and dedicated his life to Science
- ★ Died on May 24, 1543 at the age of 70
- ★ Buried in FROMBORK CATHEDRAL, POLAND
- ★ Grave was lost for centuries but found in 2005.

HELIOCENTRIC MODEL



HELIOCENTRISM

A model of the universe which put the Sun in the center devised mathematically by Nicolaus Copernicus. This model replaced geocentrism, which placed the Earth at the center.

Create your own at Storyboard That

- All the *spheres revolve around the sun* as their mid point - **SUN IS THE CENTRE OF THE UNIVERSE**
- **Earth & other planets** revolve around the sun
- Earth rotates but also spins on a tilted axis
- Distance from earth to sun is less than distance from earth to stars - far away
- **Inconsistent motions recovered** in the motion of stars and planets is a result of the **earth moving at the same time** as those other celestial bodies around the Sun

GALILEO GALILEI (1564 – 1642)

- Father of MODERN SCIENCE
- Physics, Astronomy, Cosmology, Mathematician, Philosophy
- First person to study the sky with the telescope.
- Born: Italian city **PISA on Feb 15, 1563.**
- At the age of 22 - he published a book about **HYDROSTATIC BALANCE** he has invented
- At the age of 25 - Awarded: CHAIR OF MATHEMATICS - University of Pisa.
- Galileo's troubles began in 1613 - 49yrs old & published **LETTERS ON SUNSPOTS** (Dark patches on sun's surface)
- He wrote a short book called **"THE STARRY MESSENGER"** - upheld Copernican theory that the *earth and solar system rotated around the sun*.
- 1632 - Published his **"Dialogue concerning the two chief world systems"**
-

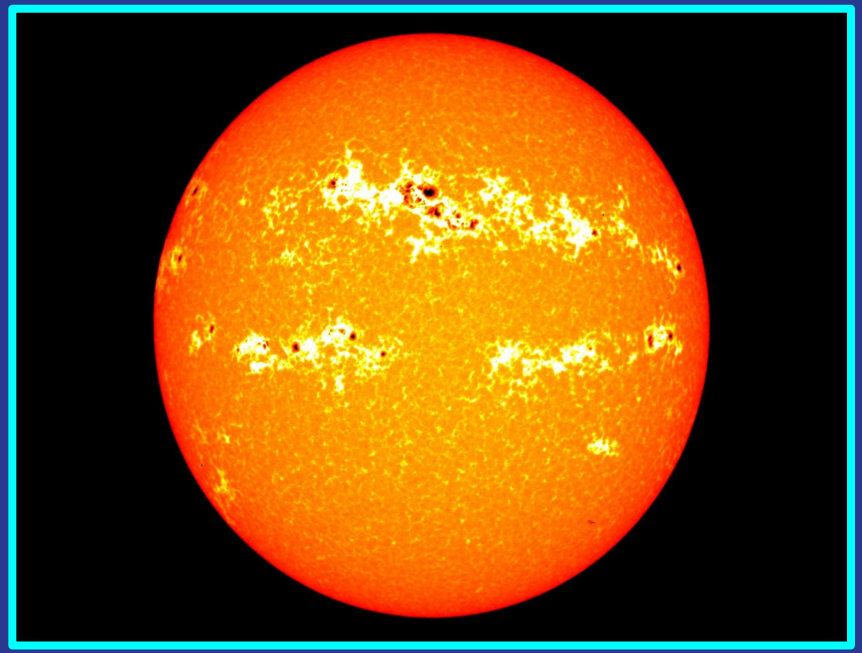
CONTRIBUTIONS OF GALILEO

THE TELESCOPE

- ★ Galileo made his telescope in 1609
- ★ Early telescopes magnified objects by *three times;*
- ★ Galileo learned to grind lenses and then created a telescope with a *magnifying moon*
- ★ Jupiter's four largest satellites(GALILEAN MOONS)
- ★ *Dark spots* on the surface of the sun known as Sunspots and phases of Venus.
- ★ Telescope also revealed that universe contained many more stars not visible to the naked eye.

CONTRIBUTIONS OF GALILEO

SUN SPOTS



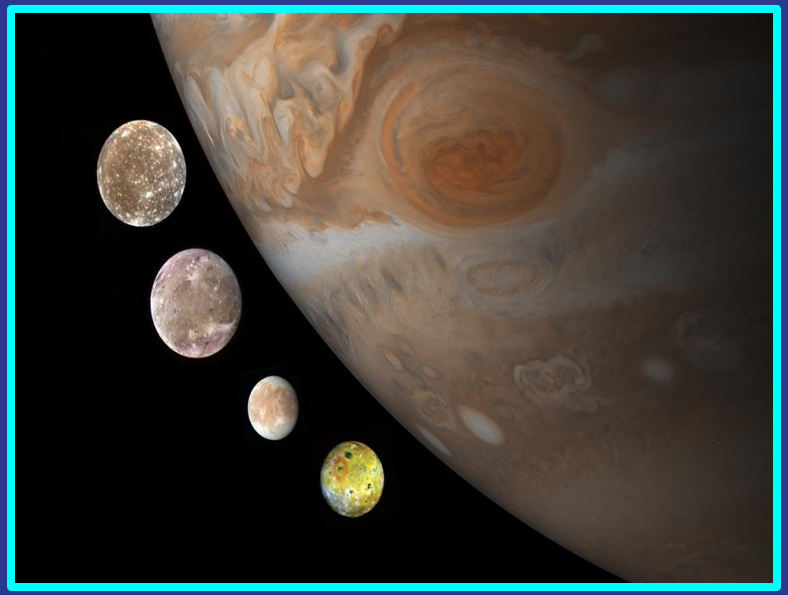
- ★ Galileo observed the Sun through his telescope and saw that the sun had dark patches called SUNSPOTS

Note: He went blind by looking at the Sun with his telescope

- ★ He also observed motion of the sunspots indicating that the sun was rotating on an axis.

CONTRIBUTIONS OF GALILEO

MOONS OF JUPITER



- ★ Galileo observed **4 points of light** that changed *their positions with time* around the planet Jupiter.
- ★ These were objects in orbit around Jupiter.
- ★ They were the **4 brightest moons** of **Jupiter, Io, Europa, Ganymede, and Callisto**
- ★ Commonly called the Galilean moons

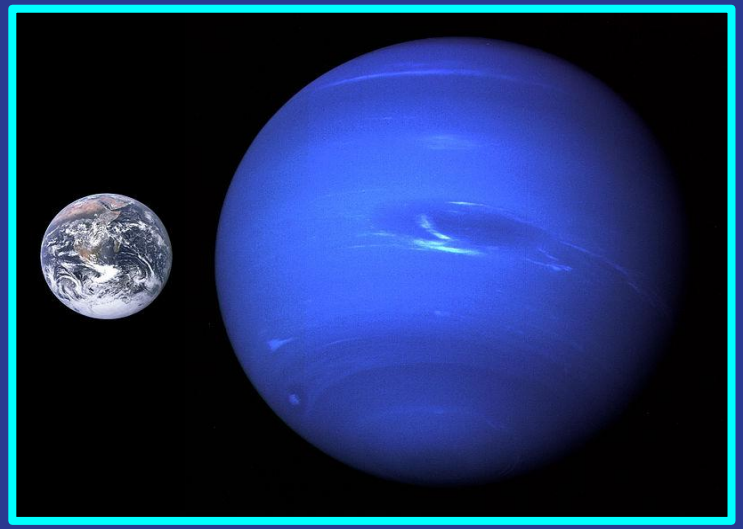
CONTRIBUTIONS OF GALILEO

THE PHASES OF VENUS

- ★ Galileo used telescope to show that Venus went through a complete set of phases, just like the Moon.
- ★ Most important observation among the most important in human history
- ★ Venus is never very far from the Sun in our Sky.

CONTRIBUTIONS OF GALILEO

PLANET NEPTUNE



- ★ First person ever to see the planet Neptune.
- ★ Unlike the other stars, it was moving.
- ★ In Galileo's time - Planets Mercury, Venus, Marks, Jupiter and Saturn had been for thousand of years.
- ★ Galileo lost rack of the moving star he had found

CONTRIBUTIONS OF GALILEO

- ★ He also discovered the rings of saturn.
- ★ Discovered that the Milky Way is made up of stars.
- ★ The first thing he found using his telescope was the moon. He notices that the moon was not a perfect, unchangeable spheres, but was full of mountains, valleys and craters.

THE MOTION OF FALLING OBJECTS:

- ★ He contributed to our understanding of the laws governing the motion of objects.
- ★ Established that if there is no air resistance, everything falls to the ground at the same rate regardless of its weight.
- ★ Gravity accelerates all objects equally, whatever their mass.

CONCEPT OF INERTIA:

- ★ Greatest contribution to physics
- ★ An object in a state of motion possess an “inertia” that causes it to remain in that state of motion unless an external force acts on it. .

Do I remember?

1. The word “Science” is derived from
   a. Greek
   b. b. French
   c. c. Latin
   d. d. Sanskrit

2. Natural science is the study of ?
   a. Solar system
   b. Organisms including plants & animals
   c. Natural world
   d. All the above.

3. Father of Modern Astronomy _____

4. Father of Modern Science _____