1. Phases of the Moon

The phases of the Moon describe the changing appearance of the Moon as seen from Earth. These changes happen because the Moon orbits the Earth and reflects sunlight. As its position changes, we see different portions of the illuminated surface, such as new moon, first quarter, full moon, and last quarter.

2. Constellations

Constellations are groups of stars that form recognizable patterns in the night sky. Early astronomers used them for navigation, keeping track of seasons, and storytelling. Examples include Orion, Ursa Major, and Scorpius.

3. Solar Eclipse

A solar eclipse occurs when the Moon passes between the Earth and the Sun. This blocks part or all of the Sun's light from reaching Earth. Solar eclipses can be total, partial, or annular depending on how much of the Sun is covered.

4. Lunar Eclipse

A lunar eclipse happens when the Earth comes between the Sun and the Moon. The Earth's shadow falls on the Moon, causing it to darken or appear reddish. Lunar eclipses only occur during a full moon.

5. Isaac Newton

Isaac Newton formulated the three laws of motion, which explain how force, mass, and motion are related. These laws describe why objects move, stop, or change direction and are fundamental to understanding classical physics.

6. Aristotle

Aristotle believed that a continuous force is needed to keep an object moving. According to his idea, objects naturally come to rest unless a force is applied. This view was later proven incorrect by Galileo and Newton.

7. Uniform Motion

Uniform motion refers to motion in which an object moves at a constant speed in a straight line. This means the object covers equal distances in equal intervals of time and does not change direction or speed.

8. Copernicus

Nicolaus Copernicus proposed the heliocentric or sun-centered theory. He stated that the Earth and other planets revolve around the Sun, which challenged the earlier Earth-centered model.

9. Phases of the Moon (Basis for Ancient Calendars)

Ancient civilizations used the phases of the Moon as the basis for their calendars. A lunar month is based on the time it takes the Moon to complete one full cycle of phases, which helped early societies track time and seasons.

10. Eudoxus

Eudoxus calculated the length of the year as approximately 365 days and 6 hours. His work contributed to early astronomical models and helped improve calendar systems used in ancient times.

1. TRUE

During a lunar eclipse, the Earth's shadow falling on the Moon is always circular. Greek philosophers used this observation as strong evidence that the Earth is spherical.

2. FALSE

The Sun's daily rising in the east and setting in the west is a **daily motion**, not an annual motion. Annual motion refers to the Sun's apparent movement among the stars over a year.

3. FALSE

Retrograde motion of planets like Mars cannot be easily explained by simple sky observation alone. It required models like Copernicus' heliocentric theory to explain why planets appear to move backward.

4. FALSE

Although comets were observed by ancient astronomers without telescopes, they were **not considered predictable**. Many believed comets were sudden or ominous events.

5. TRUE

Ancient astronomers carefully observed and recorded the changing shapes of the Moon (phases) throughout the month using only the naked eye.

6. FALSE

Greek philosophers used the **curved shadow** seen during lunar eclipses as evidence that the Earth is **spherical**, not flat.

7. FALSE

The gradual disappearance of ships (hull first, mast last) shows that the Earth is **curved**, not flat.

8. TRUE

Travelers observed that some stars visible in one region were not visible in another. This change in star visibility with location supports the idea that the Earth is spherical.

9. FALSE

It was **Greek philosophers like Aristotle**, not Copernicus, who argued that the Earth casts a round shadow during lunar eclipses.

10. FALSE

Observing objects fall downward does not prove the Earth is flat. Ancient philosophers misunderstood gravity, but falling objects alone are not evidence of Earth's shape.

11. TRUE

Galileo Galilei argued that no force is needed to keep an object moving horizontally, as long as no friction or external force acts on it. This idea later became Newton's First Law.

12. FALSE

Aristotle believed that **heavier objects fall faster than lighter ones**, but this was proven wrong by Galileo through experiments.

13. TRUE

Galileo demonstrated that horizontal motion continues independently while gravity acts vertically. This explains projectile motion, such as a ball thrown forward while falling downward.

14. TRUE

Aristotle believed that vertical motion naturally slows and stops unless a force continues to act on the object. This idea was later disproved.

15. FALSE

Galileo's concept of projectile motion showed that horizontal and vertical components are **independent**, not dependent on each other.

1. natural

Aristotle described **natural motion** as motion that occurs naturally without external force. Smoke rises upward because it is made of light elements that naturally move away from Earth.

2. The marble moves faster as it goes down the slope.

As the marble moves down a slope, gravity causes it to **accelerate**, increasing its speed.

3. Force

According to classical physics, a **force** such as friction or a push is required to stop a moving object.

4. Antiperistasis

Aristotle used **antiperistasis** to explain resistance from air or water that opposes motion.

5. It will move

When an **external force** acts on an object at rest, the object begins to move.

6. Provided precise data

Tycho Brahe's very **accurate observations** allowed Kepler to discover the true laws of planetary motion.

7. Used Tycho's observations

Kepler formulated his laws by **analyzing Tycho Brahe's detailed data**, not by inventing new instruments.

8. It gained strong support based on the evidence observed through telescopes.

The **heliocentric model** places the Sun at the center and was later supported by telescopic observations.

9. Moon's phases

Ancient astronomers could observe **Moon phases** using only their naked eyes.

10. Galileo described motion through observation, while Newton explained motion using laws.

Galileo focused on **experiments and observations**, while Newton created **mathematical laws** to explain motion.

11. Friction opposes motion

Both Galileo and Newton explained that objects stop moving due to **friction**, not because motion naturally fades.

12. A puck sliding on ice

A puck continues moving with little friction, showing **inertia**, which supports Galileo's ideas and Newton's First Law.

13. inertia of motion

Passengers move forward because their bodies **resist changes in motion**, a property called inertia.

14. The floor creates less friction on the wheels

Smooth surfaces have **less friction**, making it easier to push the cart.

15. Friction

The ball stops because **friction** between the ball and ground slows it down. Understanding friction helps design better sports shoes for grip and control.

16. Newton's First Law

An object at rest will move only when a **force is applied**, which is Newton's First Law of Motion.

17. The person's inertia resists the sudden motion of the bus

The person's body resists the sudden change in motion due to **inertia**.

18. The Moon moves between the Sun and Earth blocking sunlight

A **solar eclipse** happens when the Moon blocks sunlight from reaching Earth.

19. The Moon's orbit is tilted compared to Earth's orbit around the Sun

Eclipses don’t occur every month because the Moon’s orbit is **tilted**, so alignment doesn’t always happen.

20. Retrograde motion happens naturally when planets orbit the Sun at different speeds

In the **heliocentric model**, retrograde motion is an apparent effect caused by planets moving at different speeds.