THE BRITISH MUSEUM

ANCIENT GREECE
Background Information 9:
Astronomy

General Introduction:

- Astronomy is considered to be the first science
- The term **astronomy** comes from 2 Greek words; *astron* – 'star,' and *nemein* – 'to name.'
- Humans observed the stars for thousands of years before the Greeks – but many of the names of stars come directly from the Ancient Greeks because they were the first astronomers to make a systematic catalogue of the stars.

Heritage:

- The Babylonians believed that the sun, moon, planets and stars were placed there by the gods. They observed that the stars travelled in a certain band of sky – which they divided into 12, recognizable patterns or constellations – now known as the zodiac. They named the constellations after animals / characters they recognized.
- The Egyptians used astronomy for timekeeping only. They developed a calendar based on the solar year.
- The Greeks combined this knowledge adding a Greek twist to some elements (see signs of the zodiac) and extending it.

Historically Significant Individuals / Developments

- 6th C BC — Greeks realise the earth is a sphere. Made first accurate measurements of earth's circumference and moon's size and distance from earth.
- 6th C — *Thales*: the earth rests on water
- 6th C — *Anaximander*: the earth doesn't rest on anything
- 540-480 BC — *Heraclitus*: universe behaves in a periodic fashion. The sun is a foot wide and is new every day.

- 500-428 BC — *Anaxagoras*: the mind controls the universe, comets are formed by planets colliding, eclipses are explained by shadows, and the earth is flat and solid, supported in the air.
- 450 BC — From this time onwards, the Greeks began writing astronomical and meteorological diaries called *parapegmata*.
- 320-250 BC — *Aristarchus*: was the first astronomer to suggest that the earth revolves on its axis and travels around the sun (heliocentric model). However, despite Aristarchus' work, the general belief was in a geocentric model – as made famous by Greek astronomer Ptolemy (c. AD 90-168)
- c.276-195 BC — *Eratosthene*: calculated that the earth was 38,600km in circumference – real figure is 40,074km! Not bad!
- 146-127 BC — *Hipparchus*: tracked the sun's path in the sky, and calculated the solar year within 7 mins. His catalogue of 850 stars completed in 129 BC, was still in use 1,800 years later.
- c.100-178 AD — *Ptolemy*: v.famous – published the first systematic account of astronomy. His key work, *Almagest* which puts the earth at the centre of the universe.

Practicalities of Observation:

All ancient astronomy relies on naked-eye observations. What could an ancient see with the naked eye?

1. sun, moon, Mercury, Mars, Venus, Jupiter and Saturn
2. 1000s of stars – of which only about 1000 were identifiable in groups – namely the 48 ancient constellations which were formalised by Ptolemy (c.AD100 – 178)
3. Occasional phenomena – e.g. eclipses, comets and shooting stars.

All ancients (the Greeks included) had a geocentric view of the universe i.e., the assumption that the earth was at the centre of the universe with planets orbiting it.

However, after close observation over a period of years, the Greeks (and others – the Babylonians…?) could deduce that:

- Stars share a uniform wheeling movement from east to west – on curved orbits.
- Some stars have large orbits & are visible throughout the night – whilst others have small orbits, visible only for a short time. Some stars are constantly visible.
- Different starts are prominent during different seasons.

Summary of the Greeks' relation to the stars:

- The stars were deemed to have celestial significance - the Greeks adopted the Babylonian tradition of naming their planets and stars after gods with 'similar' characteristics.

- The science of astronomy grew out of a belief in astrology – the power of the planets and stars to affect life on earth. Each planet was believed to have the personality and power of one of the gods. e.g. Mars = god of war – associated with war, plague, famine and violent death.

- The term *astrology* comes from the Greek words, *astron* meaning 'star,' and *logos* meaning 'the science.' The signs of the zodiac were developed by the Babylonians. The Greeks adopted and adapted the zodiac signs.

- The stars were used as gigantic clocks to measure the changes in the seasons.