

Year 11 Physics student work sample – Grade D

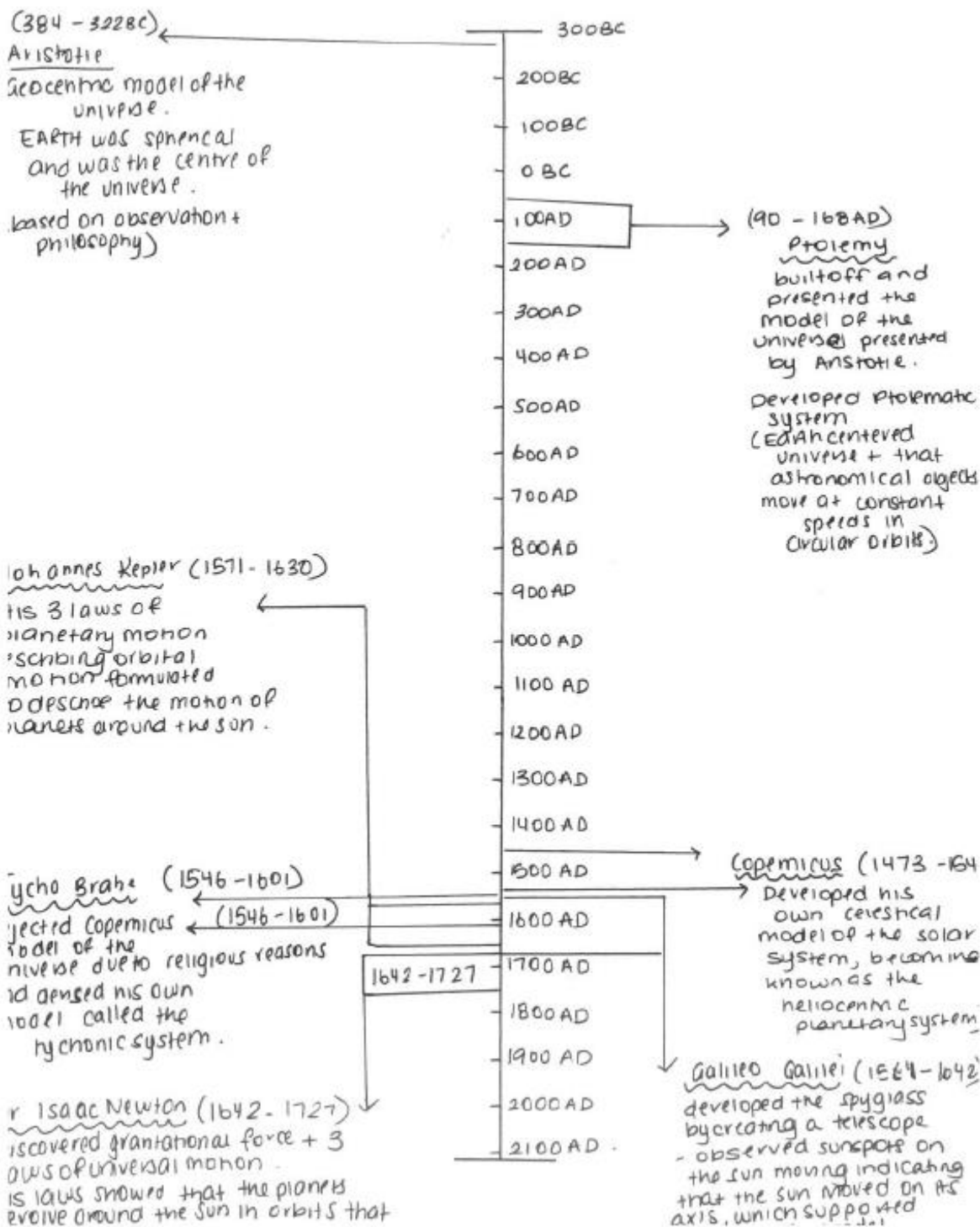
Models of the universe

Over centuries, technological advances have contributed to advances in scientific knowledge and understanding, providing new evidence and concepts. This is depicted through the development of ideas on models of the universe. Aristotle in 384 BC, Ancient Greece, had no technology or proper equipment, hence basing his findings on observations and philosophy. After centuries of development ~~of technology~~, Copernicus in 1473 - 1543 AD, developed a new celestial model of the solar system. His theory of the geocentric model of the universe was due to his reasoning that if the Earth revolved around the sun, then the stars would shift position. Since he did not have the technology to detect this shift, he concluding that Earth must rest at the centre of the universe. However, after centuries of development in technology, Nicholas Copernicus in 1473 - 1543, developed a new celestial model of the solar system stating that the sun was in fact the centre of the universe. Additionally, around the same time Johannes Kepler, ~~Tycho Brahe~~ and Galileo Galilei were all supporting Copernicus' theory of the heliocentric model of the universe. Kepler's 3 laws of planetary motion ~~the~~ ~~these~~ describes the orbital motion used to describe the motions of the planets revolving around the sun. Advancements also ~~by~~ the spy glass by Galileo allowed him to observe sunspots on the sun supporting the theory of the heliocentric model as the sun must of spun on its axis. Moreover, Isaac Newton's gravitational theory stated that the stars are at the right distances from the sun so that their attractions cancelled, and that the planets revolve around the sun in orbits that are oval. The development of technology such as the telescope at such a time allowed scientists to get accurate data and change and develop their ideas of those before them.

Describes and justifies Aristotle's geocentric model of the universe and correctly states that Copernicus proposed the heliocentric model of the universe

States that Kepler developed three laws of planetary motion but does not relate these to Brahe's observations

Whilst providing a detailed historical account of the relevant scientist, the response would be enhanced by an analysis of how advances in technology provided new evidence



Develops an appropriate scale to present information from 400 BCE to 1700 CE

Some relevant information has been presented including models for Aristotle, Ptolemy, Copernicus, Brahe, Kepler, Galileo and Newton

Galileo's use of the telescope for observations is indicated

Grade Commentary

Nami outlines information in a logical sequence using relevant scientific ideas. The response demonstrates a basic knowledge of the use of models of the solar system and could be enhanced by a detailed analysis of the concepts.

Nami's response demonstrates characteristics of work typically produced by a student performing at a grade D standard.