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**Models of the Universe**

*Instructions*: At the time of Galileo’s research, there were three main models of the universe proposed by different scholars. Using the descriptions below, draw a 2D model of each of these models as best you can in the box below each description.

1. Ptolemaic Model: Ptolemy’s model of the universe (which he based on Aristotle’s description) had earth at its center, with all of the bodies moving in perfect concentric circles around it. Around the earth itself were two layers of the essential elements, air and then fire, and outside of those layers were, in this order, the orbits of the Moon, Mercury, Venus, the Sun, Mars, Jupiter, and Saturn. Each of these equal layers was a perfect circle, with earth at the exact center. Beyond the planets was another layer with all of the stars which moved as one.

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1. Copernican Model: Copernicus’ model is very similar to the Ptolemaic model, except that he places the sun instead of the earth at the center. With the sun at the center, the rest of the layers were, moving outwards in this order, Mercury, Venus, Earth, Mars, Jupiter, Saturn, and then the layer of stars. Each of these layers was a perfect circle around the Sun. There is one exception: the Moon still rotated around Earth in the Copernican model with a radius equal to the distance between the other layers of the system.

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1. Tychonian Model: Tycho Brahe combined the Ptolemaic and Copernican systems in an interesting way. In his system, the earth was at the center of the universe, with the sun and moon orbiting it in perfect circles (the moon was much closer than the sun though). Then, all of the planets orbited the sun in circles which went outwards from Mercury to Saturn. The distance between the Earth and the Sun was much bigger than the distance between Saturn and the Sun.

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