Activity "Solar Nebula Theory"

The following has been adapted from the following source
Wolf et al. 1 1999. Investigation 14-C and 14-D. Science Power 9. McGraw Hill Ryerson

PART 1

1. Divide your page into 6 equally sized boxes and number them 1-6.

2. Sketch 1 In Box 1 draw a huge cloud of dust and gas to represent a nebula and add the following labels. Dust particles, hydrogen gas and nebula.

3. Sketch 2 Repeat sketch 1 but add arrows showing the gravitational force as the cloud contracts.

4. Sketch 3. Draw a smaller cloud with shading to represent that it has a more dense core. Add arrows to show the cloud beginning to rotate on it's own axis in a counter clockwise direction. Add the following labels, nebula, gravitational force, axis and rotation.

5. Sketch 4. Create a sketch that illustrates that as the shrinking nebula it begins spinning faster and faster on its axis.

6. Most of the material along the axis of the cloud collapses into the center o the object. In sketch 5 draw a well defined central sphere. The outer material orbiting forms a ring that looks like a large disk. When enough mass accumulates and the friction causes the temperature to rise to 10 million degrees Celsius, fusion of hydrogen to produce helium begins and the star is born.

Sketch 5: Draw a small sphere and around it a large disk of material. Label the direction of rotation, temperature, and sun.

7. The material in the large disk around the sun now begins to collect because of gravity and roll into objects. The planets begin to form much like snowballs collecting snow rolling down a hill getting larger and larger.

Sketch 6 : Sketch the solar system as we know it.

PART 2

Evaluating the Solar Nebula Theory

What is Predicted	What we know	Does what we know support the theory?
Since all the planets began from the same rotating gas cloud, all planets should rotate on their axis in the same direction.		
All planets should be orbiting in the same direction		
All planets should orbit in the same plane		
Inner planets should have a thin atmosphere because it has been stripped off by solar winds		
Outer planets should have thick atmospheric shells		
Large planets should rotate faster because they have more mass		
Dust and rocks should remain from the original nebula cloud in the solar system		
The interior of the central star should be hot		
Other stars should have planetary systems		