🌌 Physics in Film: Gravity (2013) – Student Worksheet

Name: _____ Period: _____ Date: _____

Instructions: *Watch Gravity (2013), then analyze the accuracy of the physics shown. Use your knowledge of physics concepts including Newton's laws, orbital mechanics, and properties of space. Answer in complete sentences. You may also have to do some internet research but please try to answer the questions using your knowledge and best guess first. Really think about gravity and Newtons Laws.*

🔍 Analyzing the Physics of Gravity

1. How realistic is the movement of astronauts around the Hubble using jetpacks (MMUs)?

2. What is the Kessler Syndrome, and is it accurately portrayed in the film?

3. Stone gets blown back from the fire extinguisher as she tries to put out the fire. Is that realistic? Explain.

4. Could satellite debris realistically orbit back and strike again in 90 minutes?

5. Let's look closely at the scene where Stone and Kowalski are caught up in the ropes of the parachute. Talk about the physics involved in terms of motion. Ultimately does the scene make sense in a physics sense? Fully explain.

6. Is the depiction of Stone spinning in space realistic? What law applies? Could they stop spinning?

7. The Space Shuttle orbits Earth with its underside pointing away from Earth and the windows facing Earth (upside down) while they are working on the Hubble. Is this realistic? Why or why not?

8. When the characters are tethered together, do their motions reflect Newton's Third Law?

9. Is the sound of explosions and impacts in space accurate in the film? Explain.

10. Are the distances and travel times between orbital platforms realistic? Look up the orbits of the different platform (ISS, Hubble, Tiangong)

11. Could they really travel between space stations using just a jetpack or pod? Explain your thinking.

12. If you were going to do that, what would you have to do to change orbits? Explain.

13. Do you think fire behaves the same way in microgravity as shown on the ISS as it does on earth? Explain.