ORBITS AND GRAVITY LAB /31 NAME _____

Go to the website: https://lab.nationalmedals.org/gravity.php

Play around with the simulation tool, perform the activities, and answer the questions. If at any point a collision of objects makes them disappear, just make the items bigger the next time. Sometimes a collision should make the resulting object bigger, but it actually becomes smaller and has more pieces. This is not true to life, but rather a fault in the simulation.

1. What determines how big the space object becomes?

   _____

2. Create 3 objects in a straight line, one big, one medium, and one small. What happens?

   _____

3. When a big object "swallows" another object, how does that affect its size?

   _____

4. When a big object "swallows" another object, how does that affect its movement?

   _____

CREATE A MEDIUM SIZED OBJECT IN THE MIDDLE OF THE SCREEN. THIS IS YOUR STAR. NOW TRY TO CREATE A SMALLER PLANET AND "FLING" IT IN THE DIRECTION OF THE STAR USING YOUR MOUSE.

5. What happens if your planet flings straight toward the object?

   _____

6. What happens to your star if the planet collides with it?

   _____

7. What happens if your planet flings too far away from the star?

   _____

8. What happens if you fling it toward the side of the star, but it is too fast?

   _____

9. What happens if you fling it toward the side of the star, but it is too slow?

   _____

10. Keep playing around with it until you get a planet to orbit your star. Call me over and get my initial here: _____

11. Now make a tiny moon and try to fling it at your planet so that it orbits your planet. Show me your orbiting moon and have me initial here: _____

12. Try to put 3 planets in orbit around your star. Is your star still in the middle of the screen? _____ If not, why not? _____

13. "Your universe has reached critical mass and collapsed." What does this mean? How did it happen?

_____

_____

THROUGHOUT THE SIMULATION, THERE ARE OBSERVATIONS MADE. COMPLETE THESE AS YOU SEE THEM DURING YOUR EXPERIMENTATION (17PTS)

Typically _____ have elliptical orbits. These dirty _____ come from the outer edge of the solar system, pass near the sun where they start to _____ and produce a long tail, then return to the edge of the solar system where they refreeze.	Some collisions don't break things apart but leave impact _____. Mars has been shaped by impact. Its _____ half is smooth and low, its _____ half mountainous and rough – so different they're like two separate planets!
When slow moving celestial bodies _____, they might _____ together and enlarge, increasing from a few kilometers to a few hundred kilometers in diameter.	The sun is the _____ of planetary orbit in our solar system. But each planet has its own gravitational _____, and most have their own natural _____.
Everything in the universe- moons, planets, particles, _____, even light – is drawn towards everything else by the force of _____.	An orbit system is a _____ bound collection of celestial bodies.
Earth like planets begin as particles formed from the collision of gas and _____ and grow by _____. A mature planet can take _____ or even millions of years to form.	