

Name _____ Hour _____

Gravity Notes

Newton believed that every object _____ every other object.

The force of the attraction depends on the _____ and _____ of the two objects.

The **Universal Law of Gravitation**:



$F_g =$ _____

$m_1 =$ _____ $m_2 =$ _____

$r =$ _____

$G =$ _____

Example: Calculate the gravitational attraction between you (70 kg) and the person sitting next to you (65 kg) if you are 1.2 m apart.

We can use the Universal Law of Gravitation to find the acceleration due to gravity at various distances from earth.

- As you go farther from the earth's surface, the acceleration (gravity) _____
- Two equations for gravitational force: $F = ma$ becomes $F_g = mg$

So:



$g =$ _____

$G =$ _____

$m =$ _____

$r =$ _____

Remember: r measures from the **CENTER** of the planet, not surface!

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Example: Find the acceleration due to gravity if you are 2.1×10^5 m above the earth's surface.

If you have a mass of 60 kg, what would your weight be at that height?

Geosynchronous Orbit: _____

Examples:

Satellites are _____. In order to not fall back to earth, they need to maintain a certain velocity...

In order for a satellite to stay in a consistent orbit:

_____ = _____



$g =$ _____

$v =$ _____

$r =$ _____

Example: Calculate the speed needed for one of the DirecTV satellites to orbit at an altitude of 320,000 m above the surface of the earth.