Universal Gravitation and You
or
Your Chances of Using Physics to Get a Date for Valentines Day

Name _____ **Date** _____ **Block** _____

This is Newton's Law of Universal Gravitation: $F_g = \frac{Gm_1m_2}{d^2}$ and it tells us that all objects that have mass are attracted to one another. This means YOU are quite literally attracted to everyone (everything for that matter) in the room. Let's calculate just how attracted you are to the person of your choice. Fill in the following table:

Your Weight in lbs	Your Mass in kg (weight x 0.45)	Friend's Weight in lbs	Friend's Mass in kg	Distance between you and your friend in meters (use a meter stick)

The value of the gravitational constant is 6.67×10^{-11}. Use the data in the above table to calculate how attracted you are to your friend. It should be REALLY, REALLY tiny.

Now, imagine you are 25cm (0.25m) from a 5kg book. What is your force of attraction between you and the book? It'll still be REALLY, REALLY tiny.

In terms of physics, who do you have a better chance of getting a valentines day date with, the book or your friend?

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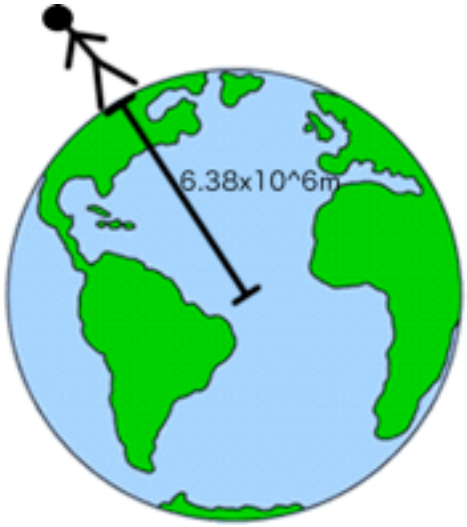
OK, lets find you a strong force of attraction so you can get a date. This is the mass of the earth: $5.97 \times 10^{24} kg$. You are here:



As you can see the radius of the earth is $6.38 \times 10^{6} m$, so that is how far you are from the center of the earth. I want you to calculate the force of attraction between yourself and the earth.

So, if you can't get a date with your friend, you can always hang out with the earth. It still loves you. Now, use your mass, the force of attraction between yourself and the earth, and Newton's second law (f=ma) to determine what the acceleration between yourself and the earth is.

Does that number look familiar? Where have you used it before?