Newton in Space: What would I weigh on another planet?

At the Clark Planetarium there was a machine that would display your weight on other planets. Using Newton's equations for the force of gravity, you can calculate it yourself!

PLANET SIZE INFORMATION Source: < http://nssdc.gsfc.nasa.gov/planetary/factsheet/ >

Planet	Mass (kg)	Radius (m)	Planet	Mass (kg)	Radius (m)
Mercury	3.3×10^{23}	2.4×10^{6}	Jupiter	1.9×10^{27}	7.0×10^{7}
Venus	4.8×10^{24}	6.0×10^{6}	Saturn	5.7×10^{26}	5.8×10^{7}
Earth's Moon	7.3×10^{22}	1.7×10^{6}	Uranus	8.7×10^{25}	2.5×10^{7}
Mars	6.4×10^{23}	3.4×10^{6}	Neptune	1.0×10^{26}	2.4×10^{7}

$$Force\ of\ gravity = \frac{(gravitational\ constant) \cdot (one\ object\ mass) \cdot (other\ object\ mass)}{(distance\ between\ objects)^2}$$

$$Force\ of\ gravity = \frac{G \cdot m_1 \cdot m_2}{d^2}$$

The massive objects are you and the planet you're standing on.
The distance between you and the planet's center of mass is simply the radius of the planet.
The value of the gravitational constant: $G = 6.673 \times 10^{-11}\ \frac{m^3}{kg \cdot s^2}$

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1. What is your mass in kilograms? _____ [1 pound = 0.453 kilograms]
If you are not sure, just estimate (Mr. Bennion is around 70 kg).

2. Pick one of the planets (or moon) from the table above to apply in the following questions: _____

3. If you traveled to _____,what force of gravity (in Newtons) would you feel on its surface? Remember exponent rules!

4. What is the acceleration due to gravity (in meters/second^2) on _____?

Newton's 2nd law: $Acceleration = \frac{Force\ of\ gravity}{Mass}$

5. Solve for your weight (in kilograms) on _____ using the following formula:
[Remember that acceleration due to gravity on Earth = 9.8 m/s^2]

$$Weight\ in\ kilograms = (object\ mass) \cdot \left(\frac{acceleration\ due\ to\ gravity\ on\ chosen\ object}{acceleration\ due\ to\ gravity\ on\ Earth}\right)$$

6. If astronauts arrived on _____, in what ways would life be different there?