Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Physics 11

**Worksheet 5.2**

**Little “g”**

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| 1) A particular student has a mass of 65 kg.  a) How much does the student weigh on earth?  b) If a UFO abducts them and deposits them on the surface of Mars, they notice that their weight is 245 N, what is the acceleration due to gravity on Mars? | 3) Aliens have transported you (and your bathroom scale) to an unknown planet. You remember that your mass is 80 kg. When you hop on your scale, it reads 1.648 kN.  a) What is the gravitational field strength on the mystery planet?         b) At what rate would the scale accelerate if you dropped it on this planet? |
| 2) A 72 kg astronaut finds himself on the surface of Pluto. He stands on a scale and it reads 30.2 N. What is the gravitational field strength on Pluto?    How does his mass on Pluto compare to his mass on Earth? (Circle one)  Mass on Pluto is Bigger Mass on Pluto is Smaller Mass on Pluto is the Same  How does his weight on Pluto compare to his weight on Earth? (Circle one)  Weight on Pluto is Bigger Weight on Pluto is Smaller Weight on Pluto is the Same | 4) Find the force that the Earth exerts on a 70 kg student when the student is  a) Standing on the ground.  b) Falling through the air.  c) At the top of his trajectory (i.e. vy=0) after being shot out of a cannon at the circus. |

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| 5) Name three things that you are attracted to (by gravity) while you are in Mr. Q’s classroom.  6) How many of the things listed above are also attracted to you (by gravity)?  7) Name one thing in Mr. Q’s classroom that you are not attracted to (by gravity). | 9) The HSS electric go-cart accelerates from 0 to 30 km/h in 3 seconds. How many horizontal g’s is the driver experiencing when he’s in the driver’s seat? |
| 8) Commercial jetliners can fly at an altitude of about 12 km.  a) What strength does the earth’s gravitational field have at this height?  b) What would your acceleration be if you fell out of one of these airplanes? | 10) What is the vertical g-force felt by the astronauts in the space shuttle, which accelerates at about 20 m/s2 upwards?  11) What is the vertical g-force felt by the observers on the ground watching the lift-off? |