SCIENCE

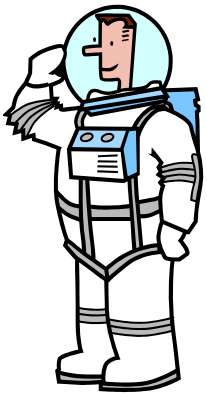
NAME: PERIOD: DATE:

Mass & Weight Thinking Problems

On board the starship, *Starblazer*, Navigator Spudd accidentally broke the gravity controls. Now the *Starblazer* has no gravity. Answer the following questions.

1. Normally Spudd has a **mass** of 80 kg. When the gravity turns off, what does his **mass** become?

Explain how that works.



2. Spudd **weighed** 80kg before the gravity went off. What is his **weight** now?

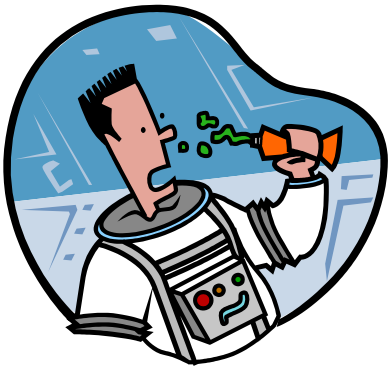
Explain how that works.

3. Engineer Fudd was eating a Tic Tac just as the gravity went off. Each Tic Tac normally has a mass of 2 grams (that's 0.002 kg), and Fudd **weighed** 58 kilograms before the gravity went off. How much does Fudd **weigh** now that she has eaten the Tic Tac?

Explain how that works.

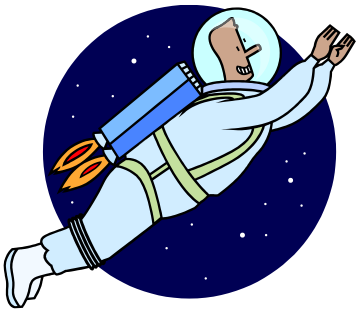
4. Since Engineer Fudd ate the Tic Tac, did her **mass** change?

Explain how that works.



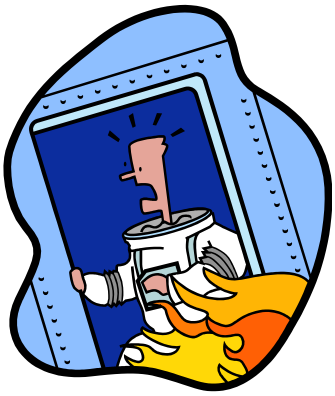
BONUS: Isaac Newton showed that Force = ***Mass*** x Acceleration. Now that you know that, will Navigator Spudd have to use *less* or *more* force to move himself across the ship's bulkhead to float over and talk to Engineer Fudd than he would if gravity was on?

Explain how that works.



6. Sub-commander Dudd fixes the gravity controls without alerting the crew. Suddenly, the gravity comes back on and the crew members are crashing to the bulkhead. What is Engineer Fudd's weight now?

Explain how that works.



BONUS: Sub-commander Dudd realizes the gravity of the situation. He's forced to think about how he may have injured his shipmates by turning the controls back on without warning the crew. He now faces a massive decision of whether to tell the first mate, or wait for them to figure it out.

Circle the four mass and weight related words in the paragraph above. (One is a homonym.)

In the space below, explain why each of the words you circles is a mass or weight related word.