Note: many of you are still using the diagonal fraction bar: get in the habit of the horizontal one!

1. Why is a massive cleaver more effective at chopping vegetables than a lighter knife that is just as sharp? Greater mass, more inertia
2. Write the equation for force (include units!):

   F=ma F(N)= m (kg) $\cdot a\left(\frac{m}{s^2}\right)$

3. Write the unit of Newton in its base units

   1 N = kg $\frac{m}{s^2}$

4. How much force does a 20,000 kg jet plane develop to achieve an acceleration of $1.5\frac{m}{s^2}$? (write equation with units, solve)

$$F = 20{,}000\,\text{kg}\left(1.5\frac{m}{s^2}\right) = 30{,}000\frac{kg\cdot m}{s^2} = 30{,}000\,\text{N}$$

5. A jet has a mass of 250,000 kg. Its engines thrust with 1,000,000 N of force. What is its acceleration?

$$a = \frac{F}{m} = \frac{1{,}000{,}000\,\text{N}}{250{,}000\,\text{kg}} = \frac{1{,}000{,}000\frac{kg\cdot m}{s^2}}{250{,}000\,\text{kg}} = 4\frac{m}{s^2}$$

6. What is the acceleration of gravity on Earth, at sea level, at the equator? INCLUDE UNITS!! (round value to nearest whole unit)

   $10\frac{m}{s^2}$

7. Fill out this table for the average speed over each time interval for a freely falling object (use the acceleration in question 5):

Time elapsed (s)	Speed at that time $\left(\frac{m}{s^2}\right)$
0	$10\frac{m}{s^2}\cdot 0s = 0\frac{m}{s}$ (my bad)
1	$10\frac{m}{s^2}\cdot 1s = 10\frac{m}{s}$
2	$10\frac{m}{s^2}\cdot 2s = 20\frac{m}{s}$
3	$10\frac{m}{s^2}\cdot 3s = 30\frac{m}{s}$
4	$10\frac{m}{s^2}\cdot 4s = 40\frac{m}{s}$
5	$10\frac{m}{s^2}\cdot 5s = 50\frac{m}{s}$

8. A rocket becomes progressively easier to accelerate as it travels toward space. Why is this so? (There are several reasons.)

Less air resistance because atmosphere is less dense)fewer molecules per meter of air, Less mass because fuel is burned and fuel container jettisoned, and Less gravity because it is further from Earth's center of mass