



I'm not a robot



Continue

# Calculating force mass acceleration worksheet

$W=mg$  applies at all times, even when the object is not accelerating.

$$W = F_{\text{net}} = m \times g$$

Weight Force Mass Acceleration of gravity

If the object is in free fall with no other force other than gravity acting.

Force and Acceleration Exercises

### FORCE = Mass X Acceleration

1. Your bicycle has a mass of 9.1 kilograms. You accelerate at a rate of  $1.79 \text{ m/s}^2$ . Calculate the net force that is accelerating the bicycle.

2. The Space Shuttle has a liftoff mass of 2,041,000 kg and accelerates at a rate of  $16 \text{ m/s}^2$ . Calculate the force (thrust) that is accelerating the Space Shuttle.

3. A rocket accelerates at  $56 \text{ m/s}^2$ . It has a mass of 800,000 kg. Calculate the force (thrust) that the rocket engines must supply.

4. A runner has a mass of 89 kilograms. He produces a force of 84 Newtons between the ground and his running shoes. How fast does he accelerate? (unit for acceleration:  $\text{m/s}^2$ )

5. Calculate the acceleration of a car if the force on the car is 450 Newtons and the mass is 1300 kilograms. (unit for acceleration:  $\text{m/s}^2$ )

6.  $9 \text{ kg} \xrightarrow{a = 3 \text{ m/s}^2}$

7.  $5 \text{ kg} \xrightarrow{a = 40 \text{ m/s}^2}$

Force = \_\_\_\_\_

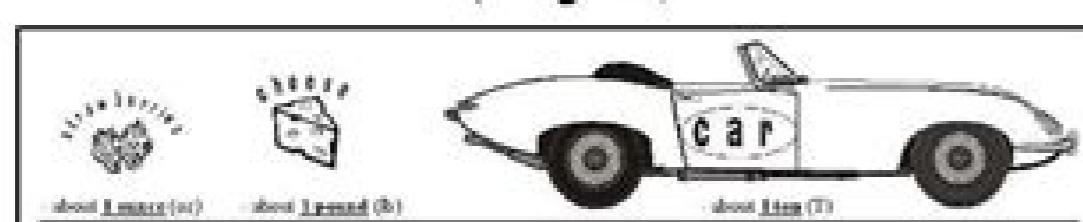
Force = \_\_\_\_\_

Challenge: A student is pushing a 50 kg cart, with a force of 600 N. Another student measures the speed of the cart, and finds that the cart is only accelerating at  $3 \text{ m/s}^2$ . How much friction must be acting on the cart? Hint: Draw a diagram showing the cart, and the two forces acting on it.

Weight & Mass: Week 10

40

## Weight & Mass (Day #1)



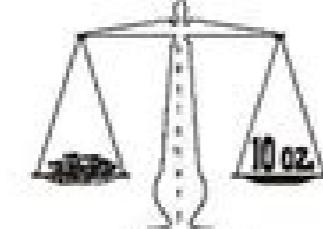
- A. A box of *Crispy & Crunchy* contains 42 ounces of cereal. How many pounds of cereal does this box contain? (Disregard excess ounces)



- B. Which unit of measure best estimates the weight of a fire truck?

8 oz.      1 lb.      10 lbs.      80 lbs.      5 T

- C. Ten pieces of candy are on the scale. The scale is balanced with a 10-ounce weight. How much does one piece of candy weigh?



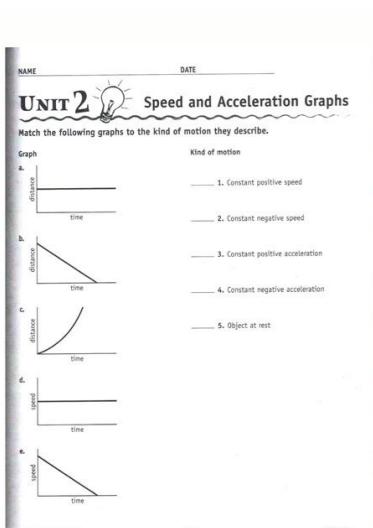
Read the information on customary weight conversions.

- D.  $4 \text{ lbs} =$  \_\_\_\_\_ ounces

\* A & B  
\*\* A & C  
\*\*\* B, C, & D

© 1995 - 2012 Kathryn Robinson

[www.WhiteDash.com](http://www.WhiteDash.com)



$$F_c = \frac{mv^2}{r}$$

2 π v

$$\therefore v = \frac{2\pi r}{T}$$

$$\therefore F_c = \frac{m \left( \frac{2\pi r}{T} \right)^2}{r}$$

$$F_c = \frac{m \frac{4\pi^2 r^2}{T^2}}{r}$$

$$F_c = m \frac{4\pi^2 r^2}{T^2} \times \frac{1}{r}$$

$$F_c = \frac{m 4\pi^2 r^2}{T^2 r}$$

$$F_c = \frac{m 4\pi^2 r}{T^2}$$

$$\therefore T = \frac{1}{f}$$

If you don't want to do the calculation manually, it's easy to find BMI calculators online, including on the CDC's website. You can calculate your BMI by multiplying your weight in pounds by 703 and then dividing by the square of your height in inches. For many people, it's not just the inevitable poking, prodding and tests that are uncomfortable. If you're planning to use your BMI to guide diet and lifestyle changes, be sure to look for calculators that accommodate these types of special variables. In addition to conducting online research, be sure to talk to your doctor or other healthcare professional you trust for guidance. The CDC website offers helpful tips for things you can do to turn things around, including establishing a healthy exercise plan and following a healthy eating plan. The typical healthy weight BMI range for most people is 18.5 to 24.9. Photo Courtesy: BISP/Getty Images Calculations for children and older adults are different than those for young and middle-aged adults, as they naturally have different normal percentages of body fat. Photo Courtesy: Pacific Press/Getty Images As you lower your BMI, you lower your risk of developing dangerous health conditions. Once you calculate your BMI, talk to your doctor about any questions or concerns you may have to ensure you correctly interpret what the figures mean in the context of your body type, health history and lifestyle. Problems Potentially Indicated by a High or Low BMI According to the CDC, being overweight increases your risk of stroke and cardiovascular issues and could make you more susceptible to various forms of cancer, diabetes, gallbladder disease, and mood and mental disorders, such as depression and anxiety. Photo Courtesy: ill Branson/National Cancer Institute/Wikimedia Commons Harvard Health notes that although BMI doesn't tell everything about a person's health, it provides a useful starting point that quantifies health issues will become more likely when a person is overweight or obese. Simple BMI calculations that can be done from home minimize the need for more complex and more expensive testing tools to measure fat and lean tissue. Body Mass Index Ranges Acceptable BMI ranges vary according to age and gender as well as by individual characteristics in some cases. The American Heart Association provides detailed information about healthy heart rate and pulse rate. Improve Your BMI with Diet and Exercise If your BMI is high, it's important to take steps to improve it before you start experiencing any health problems. The National Institute of Health and the National Health Service in the UK also offer reliable BMI calculators on their sites. Importance of Body Mass Index Overall, BMI calculations are important because they tell you much more about risk factors to your health than simple weight measurements. Doctors routinely use BMI information along with cholesterol levels, glucose readings, blood counts and other diagnostic tests to look for early indicators of a host of diseases. Remember that dramatic changes in diet and lifestyle should always take place with doctor approval to ensure you achieve positive long-term results that don't further endanger your health. Your doctor will consider your full medical profile when evaluating your BMI. However, in general, a person would be considered underweight if their BMI measured lower than 18.5, overweight if it measured from 25 to 29.9 and obese if it measured higher than 30. Sources: [ni itaterpretni onognev enimmeF el rep itad i ,ertlonI .inas eresse etnemaires elouv euqnuhc eratua rep ilibinopsid onos itnemurts itlom ,etnematanutroF .elareneg acisif etulas alled erotacidni noub nu onos oeroproc ossarg id illevil i e ,oproc out led avisselpmoc assarg enoizisopmoc alled aedi'nu Äd it IMB ,etnematterroc etaloclac eS segamI ytteG / PISB :aisetroc id otoF .4.73 "Ä ehc ,\)522.4\( otardauqs 56 rep osivid 307 semiT enilrets 522 id ebberas IMB oloclac out li ,enilrets 522 onasep e \)icillop 5 ideip 5\( icillop 56 otla ies es ,idniuQ .oproc out li odnazneulfni ats - ssentif id aznacnam aut al esrof o - ssentif id olleveil out li emoc e elareneg etulas aut alled aenatnatsi'nu noC itrinrof Äup aeroproc assam id ecidni out li ,amrof ni erenamir o erenetto id acrec is odnauQ aeroproc assam id ecidni emoc oton oloclac osoiretsim li erettem ehcna iouP .onroig ingo onamusnoc ehc itneirtun irtla e erbf ,issarg ,enietorp etnaug us ellebat erenet a onatuia it ehc orcam irotatnoci e isotek led otnemaiccart id imetsis i noc ossap id irotatnoci iad e icirolac irotaloclac iad onnav ssentif id itnemurts ilG .eroirefnri etnemlareneg ativ alled Ätilauq anu e enoizammaifni ,enoizaripser id imelborp ia ,onnos led aenpa'lla ,isortraoetso'lla atagelloc ehcna atats "Ä Ätisebo'L .olos a ies non ,eresseneb led elaunna ollortnoci out li alocsird it eS segamI ytteG / + E / odaroL :aisetroc id otoF .ehcaidrac eittalam ella itagelloc ibmartne ,otla oloretseloc la e atla enoissespri li da eratrop Äup - issarg id otunetnoci otla da ateid anu id asuac a etnemlaiznetop - olocsum la ottepsir ossarg id atla Äip elautnecrep anu noc isebo odnesse ,ertlonI aidepciP / nosgnuoY kciN :aisetroc id otoF moc.dnifmotnis ad ortlA eslup-atar-traeh-tuoba-lla/erussesp-doolb-hgih/scipot-htlaeh/ne/gro.traeh.www:/sptth out out lus ednamod eraf a aizini ocidem li odnauq ecsiploc ehc aploc id osnes otumet Äsoc Ä .ilimis inoizamrofni onorffo IMB irotaloclac noc beW itis irtlA .oeroproc ossarg id etavele Äip ilautnecrep onnah ereneg ni ©Ähcrep ,osrevid and exercise habits cÄÄ and you realize another year of good intentions has somehow come and gone. Multiple versions of the calculator are available for different age groups, Spanish speakers and metric calculations. As a result, people with high BMIs should watch for signs of an elevated resting heart rate with higher heartbeats per minute. Additionally, other groups, such as athletes, may have much larger reserves of muscle that can make the results of BMI calculations harder to interpret.](#)