1. object in motion tends to stay in motion
2. $F = ma$ force = mass × acceleration vector in same direction as acceleration
3. for every action there is an equal + opposite reaction

B	1. Weight	A. When all forces on an object are balanced.	E	1. Rolling friction	A. Resistance of a fluid on an object.
A	2. Equilibrium	B. The force of gravity on an object.	B	2. Air friction	B. Resistance of air pushing against an object.
E	3. Mass	C. The acceleration of gravity.	A	3. Viscous friction	C. Resistance of two objects pushing against each other.
D	4. Heat	D. The a product of friction.	C	4. Sliding friction	D. Any force that resists motion.
C	5. g	E. The measure of the matter in an object.	D	5. Friction	E. Resistance of a wheel or ball.

More, less, or the same as on the Earth

When an astronaut lands on the moon:

The astronaut's mass is: same

The astronaut's weight is: less

The astronaut's inertia is: same

(object's resistance to change in motion)

Which of Newton's Three Laws Applies? Law 1, 2, or 3?

1 Pushing a cart down the hall, when you try to turn it it tries to go straight.

2 More acceleration takes more force.

3 When you push your knuckles into a table, it hurts your knuckles.

3 A ball thrown into the ground bounces back up.

Using $g = 10\ m/s^2$, find the weight of a 4 kg object.

$F_w = mg = (4\ kg)(10\ m/s^2)$

$= 40\ \frac{kg \cdot m}{s^2} = 40\ N$

An object weighs 350 N. Find its mass.
Use $g = 10\ m/s^2$.

$F_w = mg$

$m = \frac{F_w}{g} = \frac{350}{10} = 35\ kg$

If 100 kg person weighed 400 N on the planet Zorg, what is the acceleration due to gravity on Zorg?

$F_w = mg$

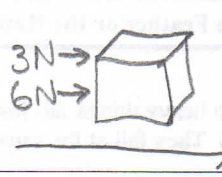
$g = \frac{F_w}{m} = \frac{400}{100} = 4\ m/s^2$

A sled is pushed with 30 N and sliding friction is 10 N. Find the net force on the sled.

$30 - 10 = 20\ N$

30 → Sled ← 10

Two boys push on a box with 3 N and 6 N to the right. The net force is 7 N. Find the force of friction.



$7 - (3+6) = -2N$

$2N$

A car's engine pushes with 45N to the right. If it is at equilibrium, how much air friction is there and what is the car's acceleration?

45N →

$a = 0\ m/s^2$

Air friction = 45N

A 25kg object accelerates at $5\ m/s^2$. Find the force.

$F_w = mg = (25)(5) = 125\ N$

A boat's motor pushes with 25 N of force and viscous friction resists with 5 N. If the boat is 100 kg, find its acceleration.

25N →

← 5N

$F_v = 20N$

$a = 0.4\ m/s^2$

$F_w = mg \quad g = \frac{F_w}{m} = \frac{20}{100}$