#16 | SECTION 12.2 : 12.3

NEWTON'S LAWS OF MOTION

• NEWTON'S 1ST LAW

- OBJECTS AT REST, STAYS AT REST
  OBJECT IN MOTION, STAYS IN MOTION
  UNLESS ACTED UPON BY AN OUTSIDE FORCE

- PUSHING MY CART EXAMPLE

• INERTIA:

- OBSECTS RESIST CHANGES IN MOTION

CAR CRASH: CAR SLOWS, BUT YOU KEEP MOVING. YOU HAVE INERTIA.

NEWTON'S 3RD LAW

- FOR EVERY ACTION THERE IS AN EQUAL & OPPOSITE REACTION
- FORCES COME IN PAIRS
  ACTION/REACTION FORCES

NEWTON'S 2ND LAW:

$$\text{ACCELERATION} = \frac{\text{FORCE}}{\text{MASS}} \Rightarrow \boxed{a = \frac{F}{m}}$$

WEIGHT VS. MASS:

WEIGHT-
- MEASURE OF THE FORCE OF GRAVITY ON AN OBJECT

MASS
- THE AMOUNT OF MATTER
- MEASURE OF INERTIA

$$\text{WEIGHT} = \text{MASS} \times \text{GRAVITY}\ (9.8\ m/s^2)$$

$$W = m \times g \qquad m = \frac{w}{g} \qquad g = \frac{w}{m}$$

* ASTRONAUT HAS MASS OF 112 kg, WHAT IS HIS WEIGHT ON EARTH?

$W = 112\ kg \times 9.8\ m/s^2 = \boxed{1100\ N}$

AST. ON EARTH M=88kg W=860N

AST. ON MOON M=88kg W=[redacted]