Forces & Motion Unit Outline (3/17)

I. Forces: a push or a pull

A. contact forces

1. friction (2 things rubbing together—opposite direction of motion)
2. direct push or pull (pull wagon, kick ball)

B. at a distance (have fields)

1. gravity
    a) attraction between any two masses
    b) more mass and closer to mass, more gravity

2. electromagnetism
    a) like poles/charges repel
    b) opposite poles/charges attract
    c) closer to the field source, stronger the field
    d) better domain alignment / more charges: stronger

C. force diagrams
    1) name force 2) arrow indicates direction of force
    3) size of arrow indicates strength of force

II. Newton's Laws of Motion (Isaac Newton English 1642-1727)

A. First law—Law of Inertia
1. objects at rest remain at rest unless forced to move
2. objects in motion remain in motion (in straight line, at constant speed) unless forced to change

B. Second law—F = ma
1. a **force** acting on an object is determined by the **mass** of the object and the **acceleration** of the object

    a) as mass increases, acceleration decreases
    b) as force increases, acceleration increases

C. Third law—Action/reaction
1. for every action there is an equal and opposite reaction (A pushes B; B pushes A)