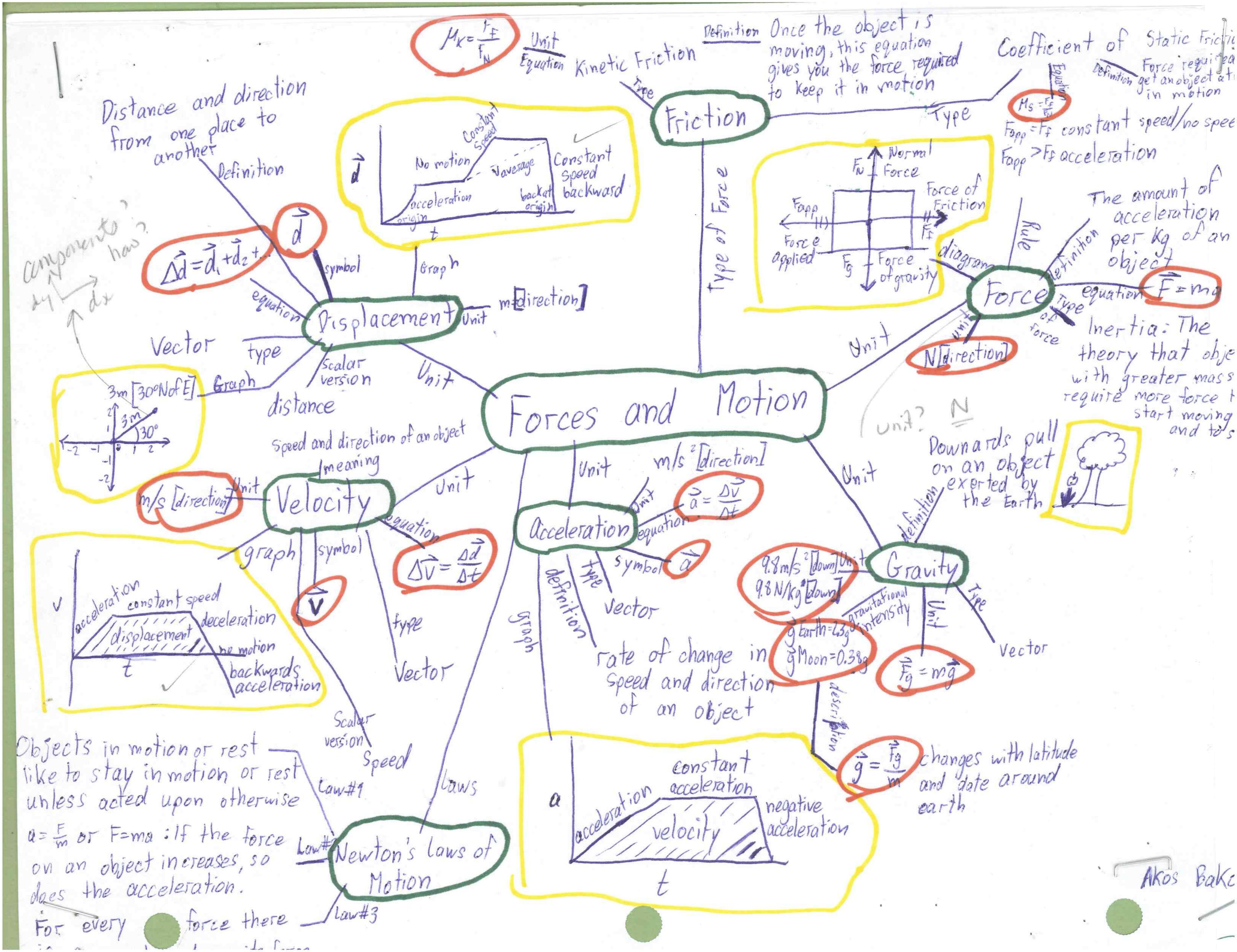
Forces and Motion
Displacement
Definition
Distance and direction from one place to another
symbol
$\vec{d}$
equation
$\Delta\vec{d}=\vec{d}_1+\vec{d}_2+...$
type
Vector
Scalar version
distance
Graph
3m [30°N of E]
3m
30°
components? how?
dy
dx
Graph
$\vec{d}$
No motion
Constant speed
$\vec{v}$average
Constant speed backward
acceleration
back at origin
origin
t
Unit
m [direction]
Velocity
meaning
Speed and direction of an object
Unit
m/s [direction]
symbol
$\vec{v}$
equation
$\Delta\vec{v}=\frac{\Delta\vec{d}}{\Delta t}$
type
Vector
Scalar version
Speed
graph
v
acceleration
constant speed
deceleration
displacement
no motion
backwards acceleration
t
Acceleration
Unit
m/s^2 [direction]
equation
$\vec{a}=\frac{\Delta\vec{v}}{\Delta t}$
symbol
$\vec{a}$
type
Vector
definition
rate of change in speed and direction of an object
graph
a
acceleration
constant acceleration
velocity
negative acceleration
t
Newton's Laws of Motion
Laws
Law#1
Objects in motion or rest like to stay in motion or rest unless acted upon otherwise
Law#2
$a=\frac{F}{m}$ or F=ma : If the force on an object increases, so does the acceleration.
Law#3
For every force there
Friction
Type of Force
Type
Kinetic Friction
Unit
Equation
$\mu_K=\frac{F_F}{F_N}$
Definition
Once the object is moving, this equation gives you the force required to keep it in motion
Type
Coefficient of Static Friction
Definition
Force required to get an object at rest in motion
Equation
$\mu_s=\frac{F_F}{F_N}$
$F_{app}=F_f$ constant speed/no speed
$F_{app}>F_f$ acceleration
Force
diagram
Normal Force
F_N
Force of Friction
F_f
F_{app}
Force applied
F_g
Force of gravity
Rule
definition
The amount of acceleration per kg of an object
equation
$\vec{F}=m\vec{a}$
Type of force
Inertia: The theory that objects with greater mass require more force to start moving and to s
Unit
N [direction]
Unit? N
Gravity
definition
Downwards pull on an object exerted by the Earth
Unit
9.8 m/s^2 [down]
9.8 N/kg [down]
gravitational intensity
g Earth = 2.6g
g Moon = 0.38g
Unit
$\vec{F_g}=m\vec{g}$
Type
Vector
description
$\vec{g}=\frac{\vec{F_g}}{m}$
changes with latitude and date around earth
Akos Bake