Next project:

Rube Goldberg Machine

Forces / Newton's Laws

Arduinos & circuits

Forces:

- Pushes or pulls
- Can change motion of an object
  - Balanced forces don't change an object's motion
  - Unbalanced forces DO change an object's motion

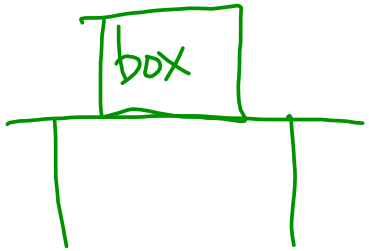
Free body diagram (Force Diagram)

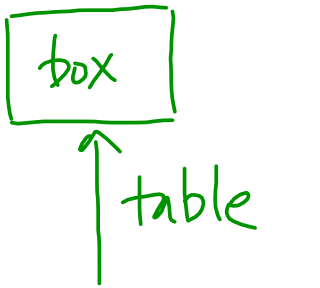
- Shows all forces acting on one object
- Draw the object as a box
- All forces are shown as arrows
  - Pushing forces should be arrows pointing toward the object
  - Pulling forces should be arrows pointing away from the object
  - All arrows should be labelled
  - The length of the arrows indicate the size of the forces (if possible)
  - The direction of the arrow should show the direction of the force (if possible)

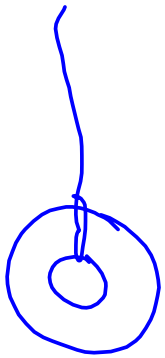
To draw a F.B.D. (free body diagram)

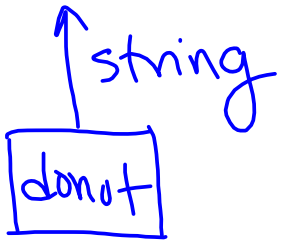
- Draw a box for the object
- Draw arrows for any forces specifically described/shown
- Draw a downward arrow for gravity (if present)
- Draw a pushing force perpendicular to any surfaces supporting an object... "The Normal Force"
- Draw a pushing force for friction
  - If the object is sliding along a surface, friction will be a pushing force in the opposite direction of the object's motion
  - If an object is still, but it would be moving if there was no friction, friction will be a pushing force in the opposite direction of the way the object would move

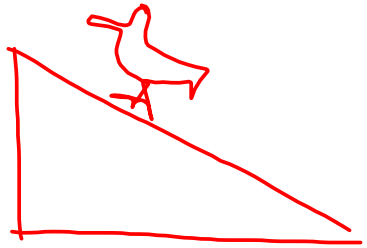
Normal Forces:

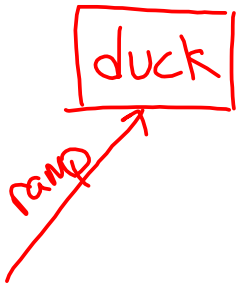


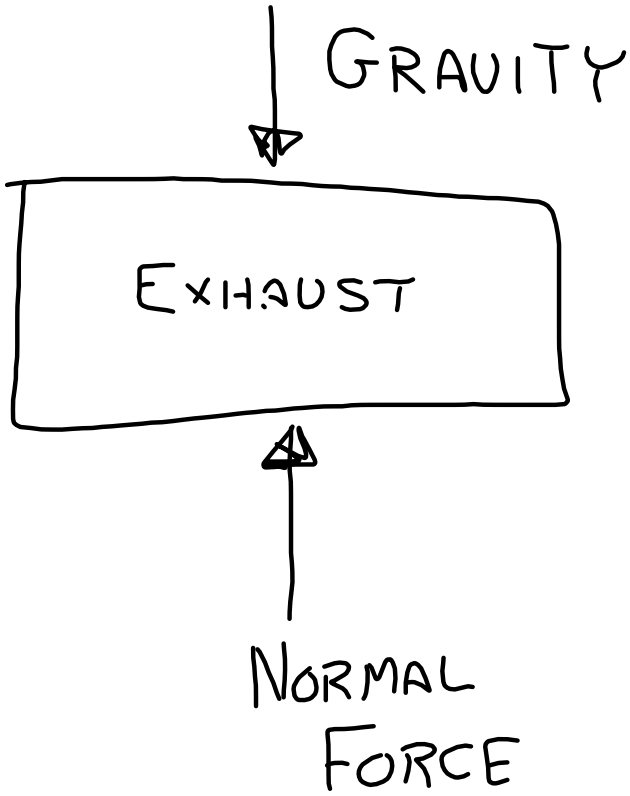


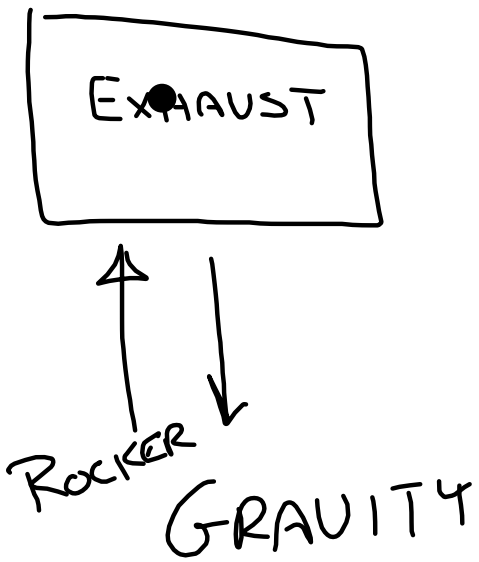


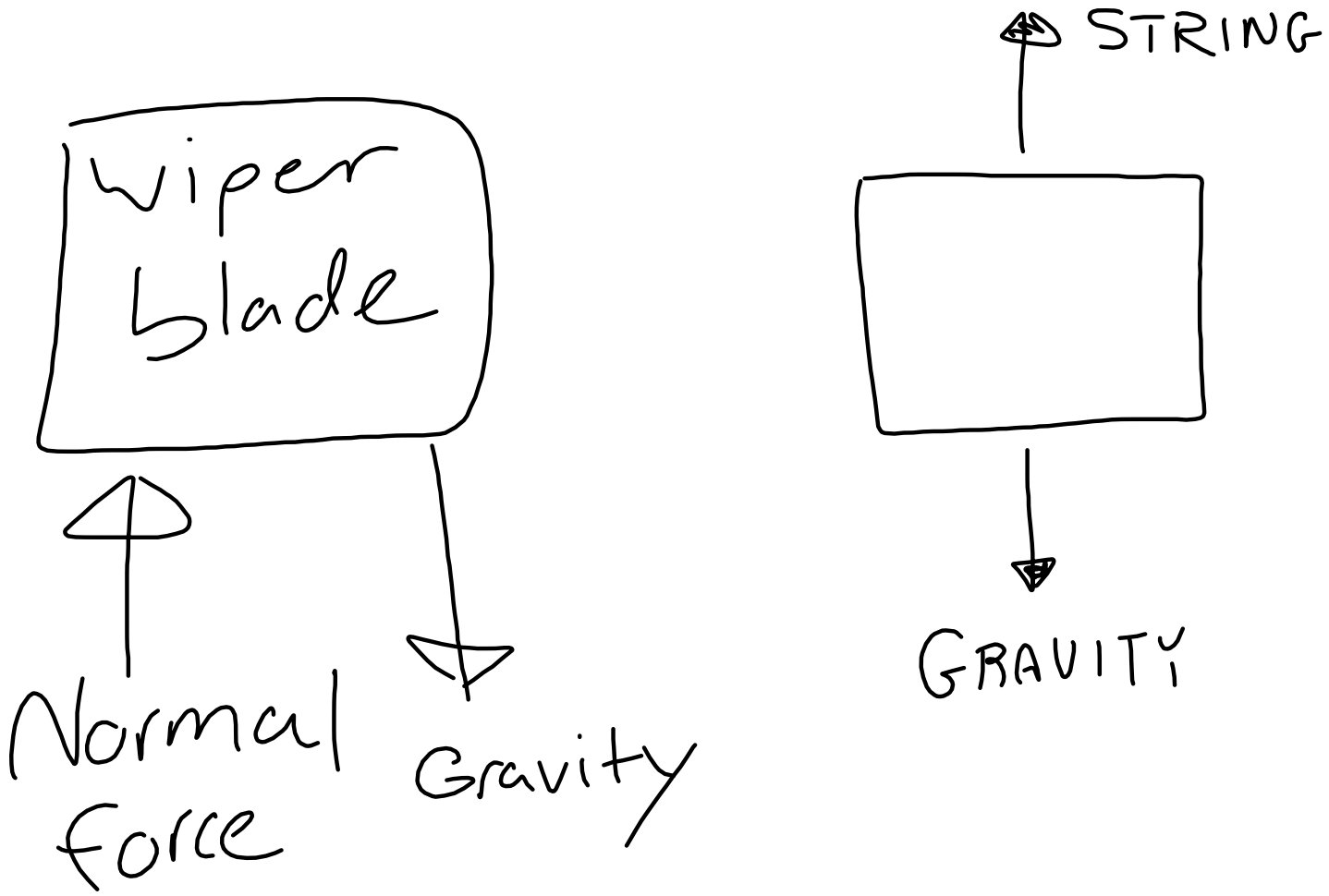







GRAVITY
EXHAUST
NORMAL FORCE


EXHAUST
ROCKER
GRAVITY


Wiper blade
Normal Force
Gravity
STRING
GRAVITY

Your Rube Goldberg Machine

- Controlled By An Arduino.
- You Will Use A Marble To Activate A Piezo Element On The Next Group's RGM.
- Your Arduino Will Activate A Servo Motor That Will Release Your Marble.

Base = 16" x 16"
Nothing can hang over edges.

Marble ends to hit the Piezo of the next device.

- Can Use Multiple Marbles.
- It Must Incorporate 5 Simple Machines, With @ least one Pulley, 1 Lever, & 1 Ramp
- It Must Have A minimum of 1 meter of Track