**Name:** _____ **Date:** _____

# You're a Pushover! Activity – Worksheet

## Part 1: You're a Pushover

After listening to directions from your teacher, answer the following questions:

1. What did the wall do when you pushed on it?

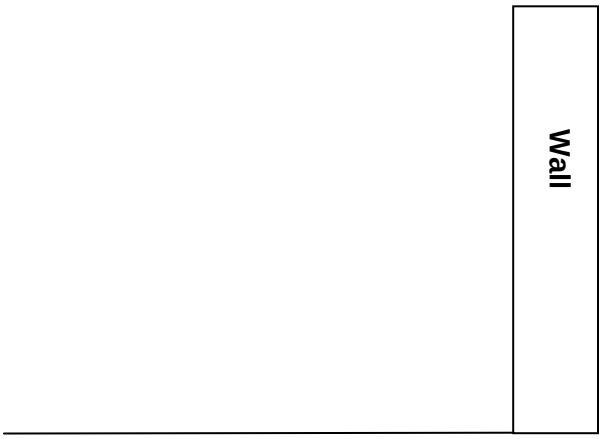
_____

_____

2. On the diagram below, draw yourself pushing on the wall.

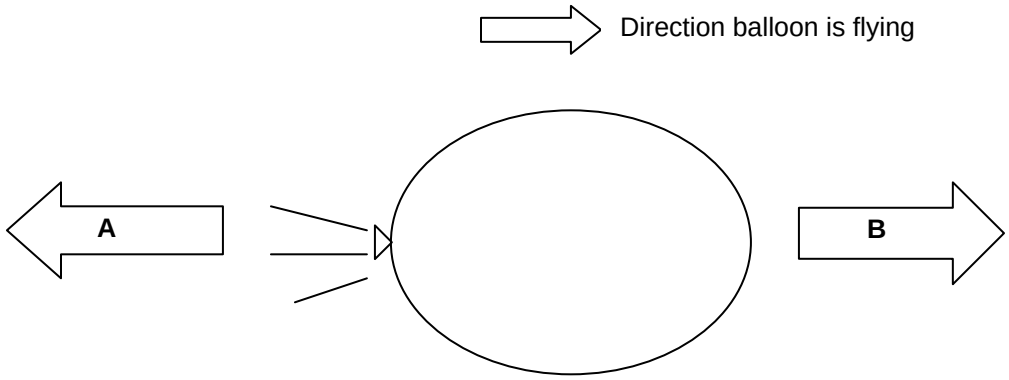
3. Draw an arrow indicating the force you are applying to the wall.

4. Draw and arrow indicating the force the wall is applying to you.




## Part 2: Pushing on Air!

Complete the balloon activity and answer the following questions.



1. Which force arrow, A or B, is the force of the balloon on the air? _____

2. What is Newton's 3rd Law of Motion?

_____

_____

3. How do airplanes make use of Newton's 3rd Law?

_____

_____

## Part 3: Gotta be Equal

Newton's 3rd Law can be written as :

*the mass of object 1 x the acceleration of object 1 =*
*the mass of object 2 x the acceleration of object 2.*

Or more specifically as: $m_1 \times a_1 = m_2 \times a_2$. This means that if we know information about 3 of the 4 pieces, we can calculate the fourth. For example if:

Mass 1 = 3
Acceleration 1= 2
Mass 2 = 1
Acceleration 2 = ??

Using our equation for Newton's 3rd Law, we know that 3 x 2 = 1 x ??.
Since 3 x 2 = 6, then 1 x ?? must be equal to 6. This means, then, that Acceleration 2 must be 6.

Complete the missing numbers (shaded squares) in the chart below:

| Mass 1 (in kg) | x | Acceleration 1 (in m/s$^2$) | = | Mass 2 (in kg) | x | Acceleration 2 (in m/s$^2$) |
|---|---|---|---|---|---|---|
| 2 | x | 10 | = | | x | 5 |
| 10 | x | 10 | = | | x | 5 |
| | x | 10 | = | 10 | x | 5 |
| | x | 25 | = | 2 | x | 50 |
| 10 | x | | = | 2 | x | 25 |
| 4 | x | | = | 2 | x | 6 |
| 4 | x | 4 | = | 2 | x | |
| 6 | x | 6 | = | 4 | x | |