

# STEM

## Alka- Rockets Working Packet

**Name:**

\_\_\_\_\_

**Section:**

\_\_\_\_\_

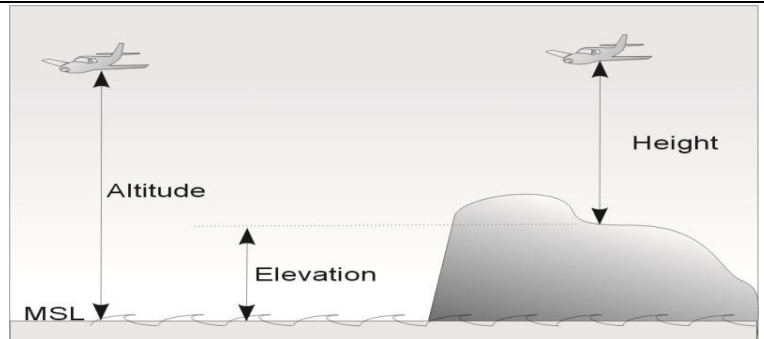


## STEM- Alka Rockets

### Vocabulary

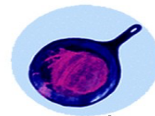
#### altitude:

height above a certain level



#### chemical energy:

energy that is stored in the chemical construction (bonds) of a substance and is released when the substance undergoes a chemical reaction (reacting with another substance when new substance(s) is/are produced



Iron Rusting



Burning Wood



Metabolism



Electroplating



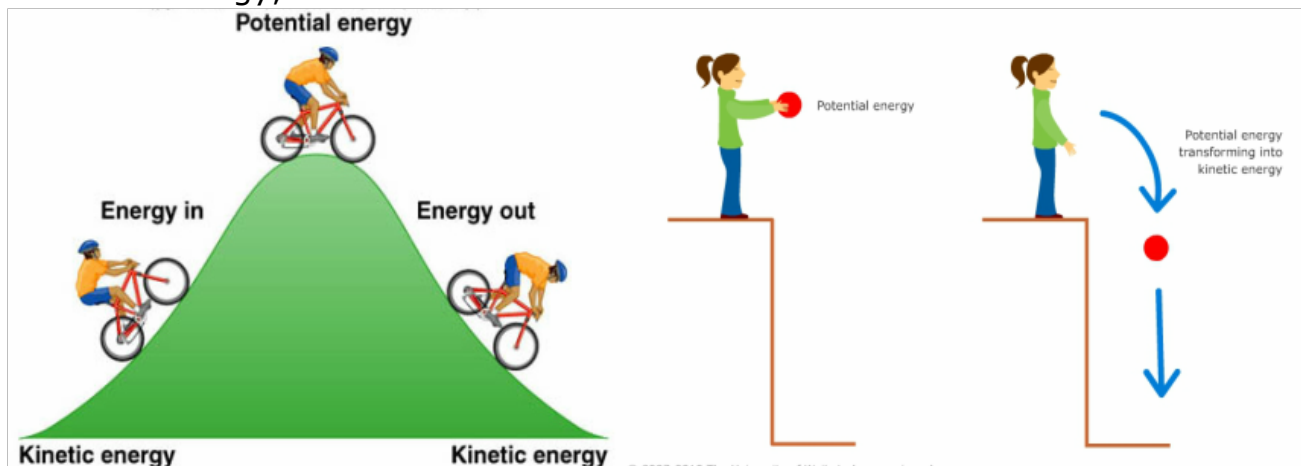
Rotting Banana



Vinegar and Baking Soda Mixture

#### mechanical energy: the sum of potential and kinetic energy of an object

- potential energy due to its position
- kinetic energy, due to its motion



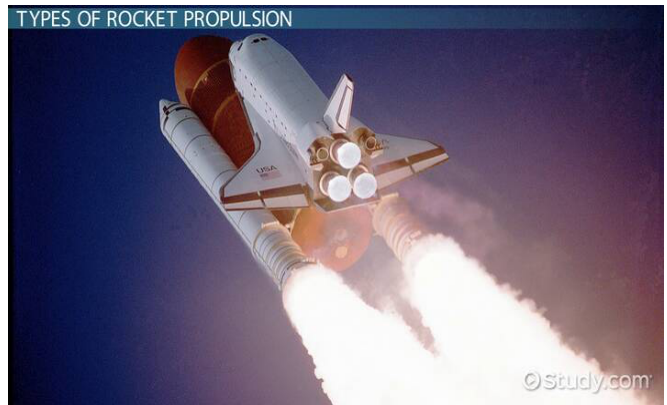


### **propulsion:**

the action of driving or pushing forward

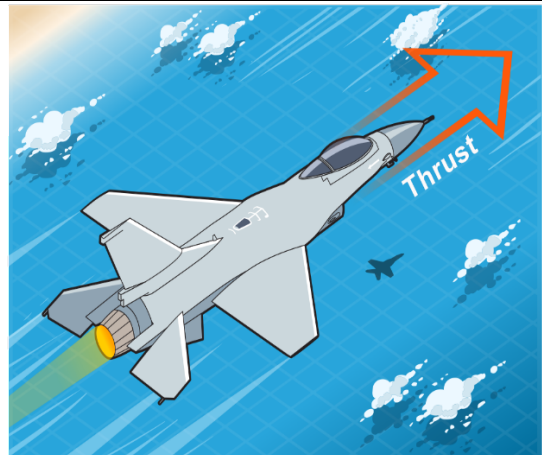


TYPES OF ROCKET PROPULSION



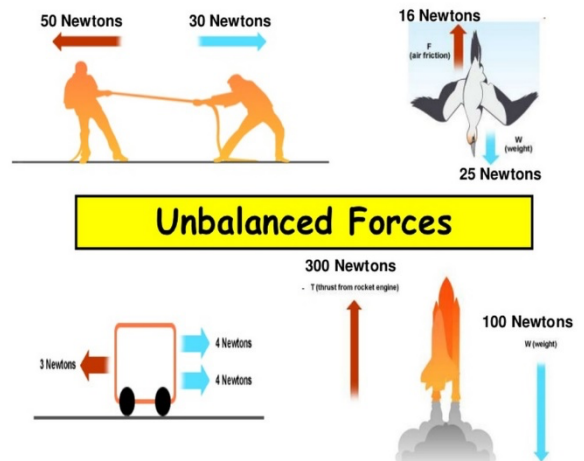
### **thrust:**

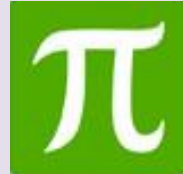
a propulsive force of a jet or rocket engine



### **unbalanced forces:**

two forces acting on an object that are not equal





## STEM- Alka Rockets

**Project**

**Working Packet**

**Group #** \_\_\_\_\_

**Section:** \_\_\_\_\_

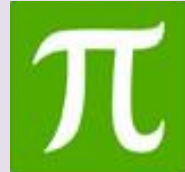
**Student Name:** \_\_\_\_\_

**Partner's Name:** \_\_\_\_\_

**Challenge:** "Design and construct a film-canister-paper-rocket which, when launched, will reach an altitude greater than 1m."

### Research

(Resources where you searched for information on how to build the most efficient film-canister-paper rocket.)



## Design the Prototype

(Create a labeled diagram of your rocket.)

### Materials

- |                                                                                                                                                |                                                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• 2 index cards 3"x5"</li><li>• 1 plastic film canister 35mm</li><li>• scissors</li><li>• tape</li></ul> | <ul style="list-style-type: none"><li>• Colors (pencils, markers, crayons)</li><li>• water (for the canister)</li><li>• ½ tablet Alka-Seltzer</li><li>• eye protection</li></ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



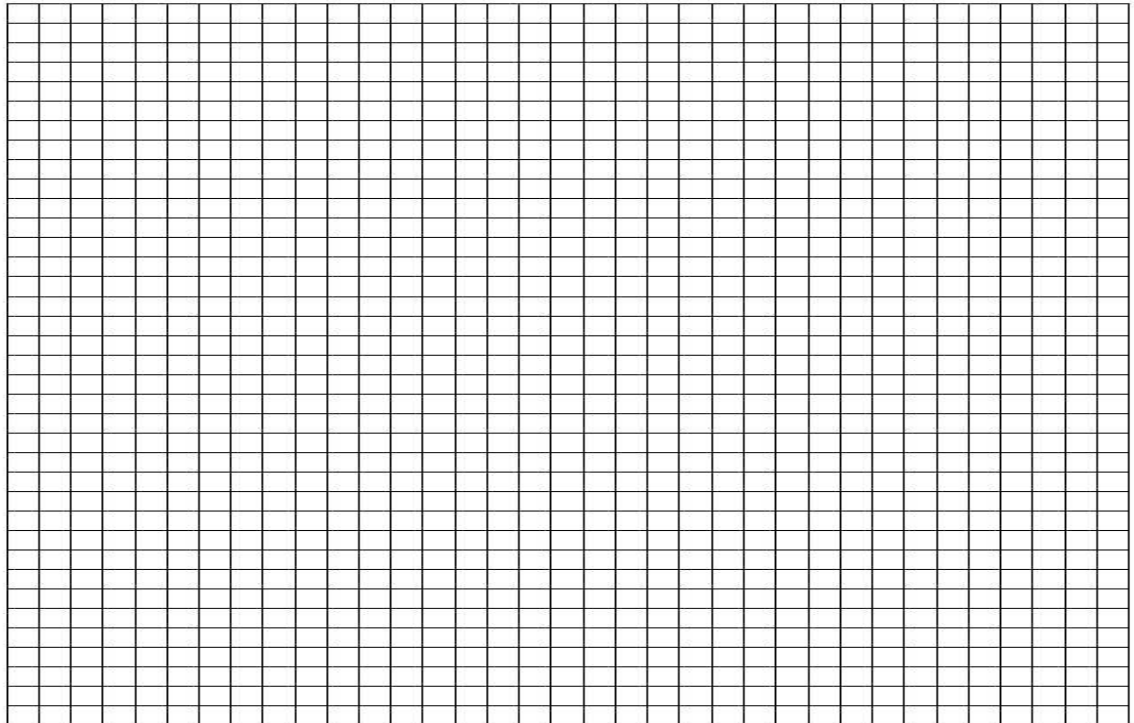
### Collect your Data

(Record the altitude that the rockets, of all groups, reached.)

Groups	1	2	3	4	5	6	7	8	9	10	11	12
Altitude (in cm)												
Groups	1	2	3	4	5	6	7	8	9	10	11	12
Altitude (in mm)												

### Graph your Data

(Graph the data you collected.)





**Solve the problem:**

Find the **average altitude** that the rockets in your section reached.



## STEM- Alka Rockets

Project

Working Packet – Re-design

Group # \_\_\_\_\_

Section: \_\_\_\_\_

Student Name: \_\_\_\_\_

Partner's Name: \_\_\_\_\_

### Improve the Prototype

(Re-design your Prototype. Create a labeled diagram of your rocket.)

#### Materials

- |                                                                                                                                  |                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• your Prototype</li><li>• 2 index cards 3"x5"</li><li>• scissors</li><li>• tape</li></ul> | <ul style="list-style-type: none"><li>• colors (pencils, markers, crayons)</li><li>• water (for the canister)</li><li>• ½ tablet Alka-Seltzer</li><li>• eye protection</li></ul> |
|----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



### Re-test the Prototype

(Collect your Data.)

	Initial Prototype	Improved Prototype
Altitude (in cm)		

### Reflection Questions

1. In what way did you improve your prototype?

2. Did the improved prototype pass the challenge, which was to reach an altitude greater than 1m?