

# STEM Student Packet

## PUMPKIN STAND



YOUR Name \_\_\_\_\_

Section \_\_\_\_\_



# Vocabulary

## matter

the “stuff” everything is made of  
matter takes up space  
matter can be a solid, liquid, or gas

## physical property

what we can see or measure

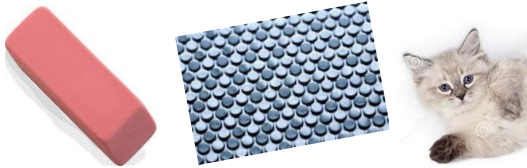
examples:

color, length, weight, texture, hardness, strength, shape,  
flexibility, size, smell

## texture

how something feels

example: smooth, rough, furry, pointy



## hardness

describes the surface of an object

soft OR hard



## Flexibility

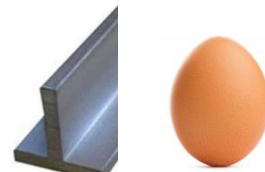
the ability of a substance to *bend*  
without breaking.

A substance that isn't flexible is  
rigid or stiff



## strength

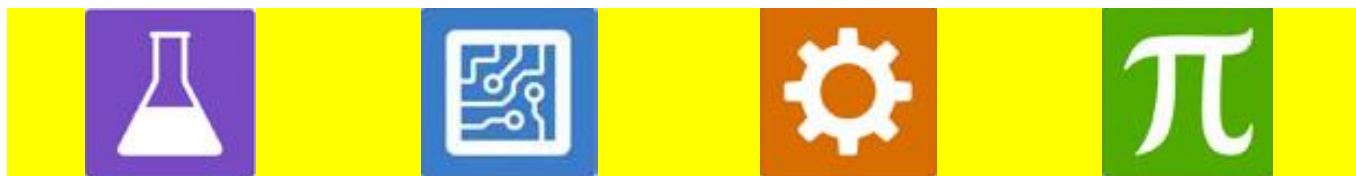
the material of an object: how  
much force can the material handle



## elasticity

allows the object to bend and stretch when force is  
applied, and to return back to the original shape  
when the force is no longer applied





## STEM- PUMPKIN STAND

**Building Background Knowledge**

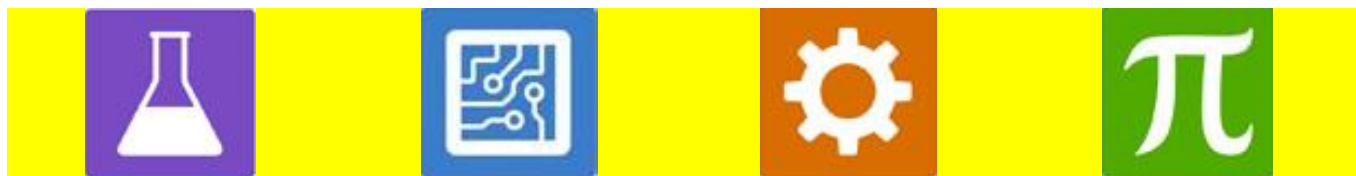
**Working Packet**

### **Directions:**

Watch the Video: Properties of Matter, by USATestPrep and answer the questions below.

### **Respond**

1. What is a property of matter?
2. What properties of matter would be important to use in building a stand that holds weight? Why are these properties important?



## STEM- PUMPKIN STAND

Research

Working Packet

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

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

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

Partner's Names: \_\_\_\_\_

\_\_\_\_\_

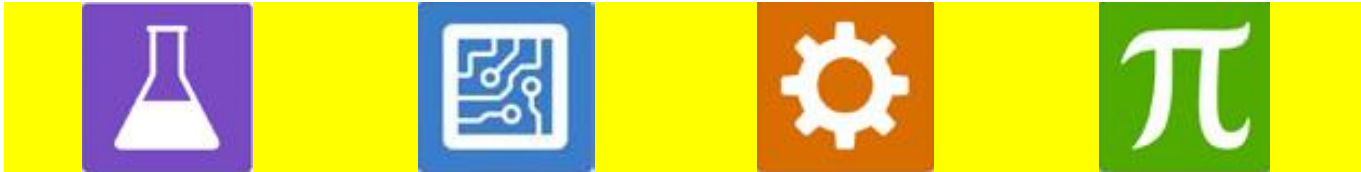
### Challenge:

Construct a rectangular base stand with either wooden craft sticks, OR, plastic straws, OR toothpicks and that has

- a minimum of two floors (layers),
- a rectangular base of minimum 120 square cm and maximum 220 square cm, and
- the ability to support the weight of a pumpkin on the second floor for at least 10 seconds

### Research

(Sources: **Science Notebook, Elevate Science Textbook, and/or Discovery Education**. Note the **sources** you used, including **page numbers, titles, and/or links** in the provided space below.)



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

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

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

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

Give your project a title:

\_\_\_\_\_

Design the Prototype

(Create a labeled diagram of your prototype.)

Materials

Tape Scissors	
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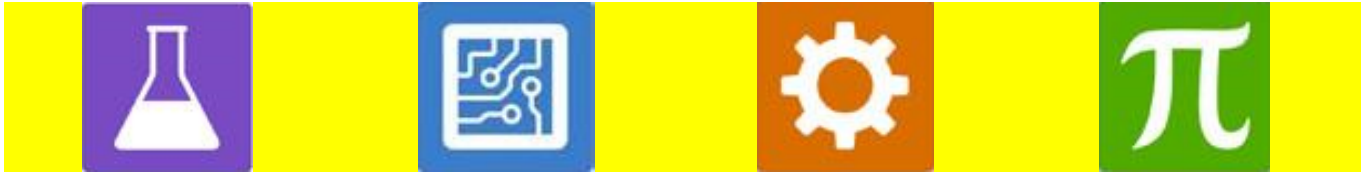


Group # \_\_\_\_\_ Section: \_\_\_\_\_  
Student Name: \_\_\_\_\_  
Partner's Name: \_\_\_\_\_  
\_\_\_\_\_

**Test your Prototype - Collect your Data**

**Record your data in this table**

<b>LENGTH OF BASE</b>	
<b>WIDTH OF BASE</b>	
<b>AREA OF BASE</b>	



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

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

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

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

Improve the Prototype

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

Materials

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**PLAN**

**ASK**

**BUILD**

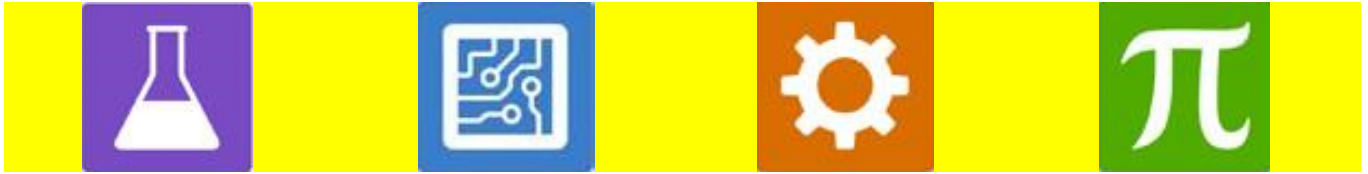
**TEST**

**IMPROVE**

Engineering  
Design  
Process







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

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

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

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

Reflection Questions

1. As you were building and testing, what were 2 specific changes your group made to improve the design? Explain the reasoning behind each of the changes.

2. If you had to do this process again, what would you do differently?

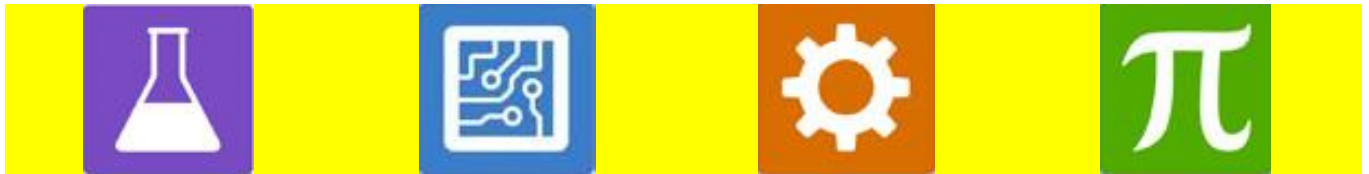
3. What did you learn? Discuss your success or lack of success and reasons for it.



**Make a Keynote Presentation**– Use Keynote to create a presentation following the instructions below. Share the presentation on **Seesaw**.

**Instructions:** Create a Keynote Presentation that has the following:

1. At least 5 slides
2. A title slide
3. Slides must have a transition
4. At least 1 image per slide that conveys the topic
5. A slide that describes what the project is about
6. A slide describing the STEM Process
  - a. You can use the Engineering Process page in this packet!
7. A slide describing the material picked for building, the physical properties of the material, and why the material was picked
8. An image of your drawing of the initial prototype
9. At least one slide stating whether your prototype passed the challenge. Include pictures of
  - a. the process of building the stand (beginning, middle, end)
  - b. your prototype with the pumpkin on it, even if it failed



10.If your prototype did not pass the challenge, a slide explaining what changes had to be made, and whether you passed the challenge after these changes

- a. include a picture of your new prototype