

# DESIGN A

# PENCIL HOLDER !

How would you design your ideal pencil holder?



## TO THINK ABOUT



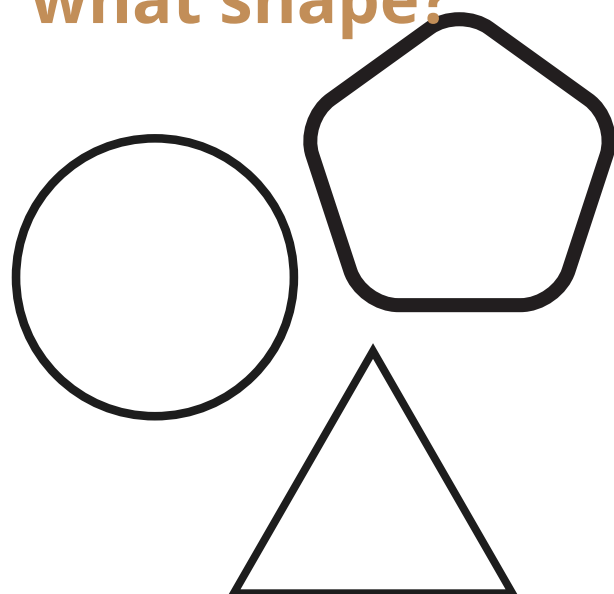
how tall?



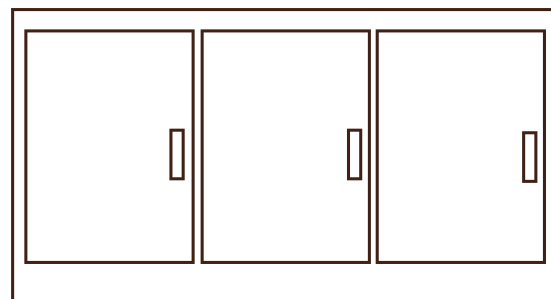
how wide?



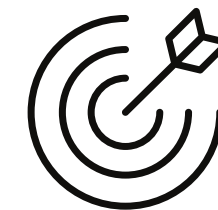
what shape?



how many compartments?

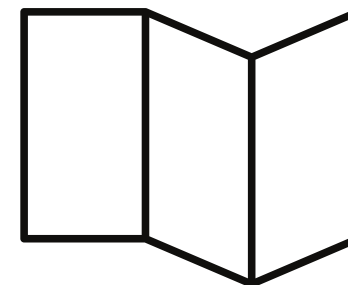


## YOUR GOAL

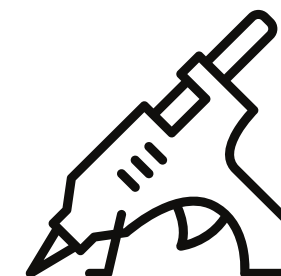


Create a pencil holder that can hold at least 4 writing utensils.

## WORKING WITH CARDBOARD



Bend it!



Hot glue it!

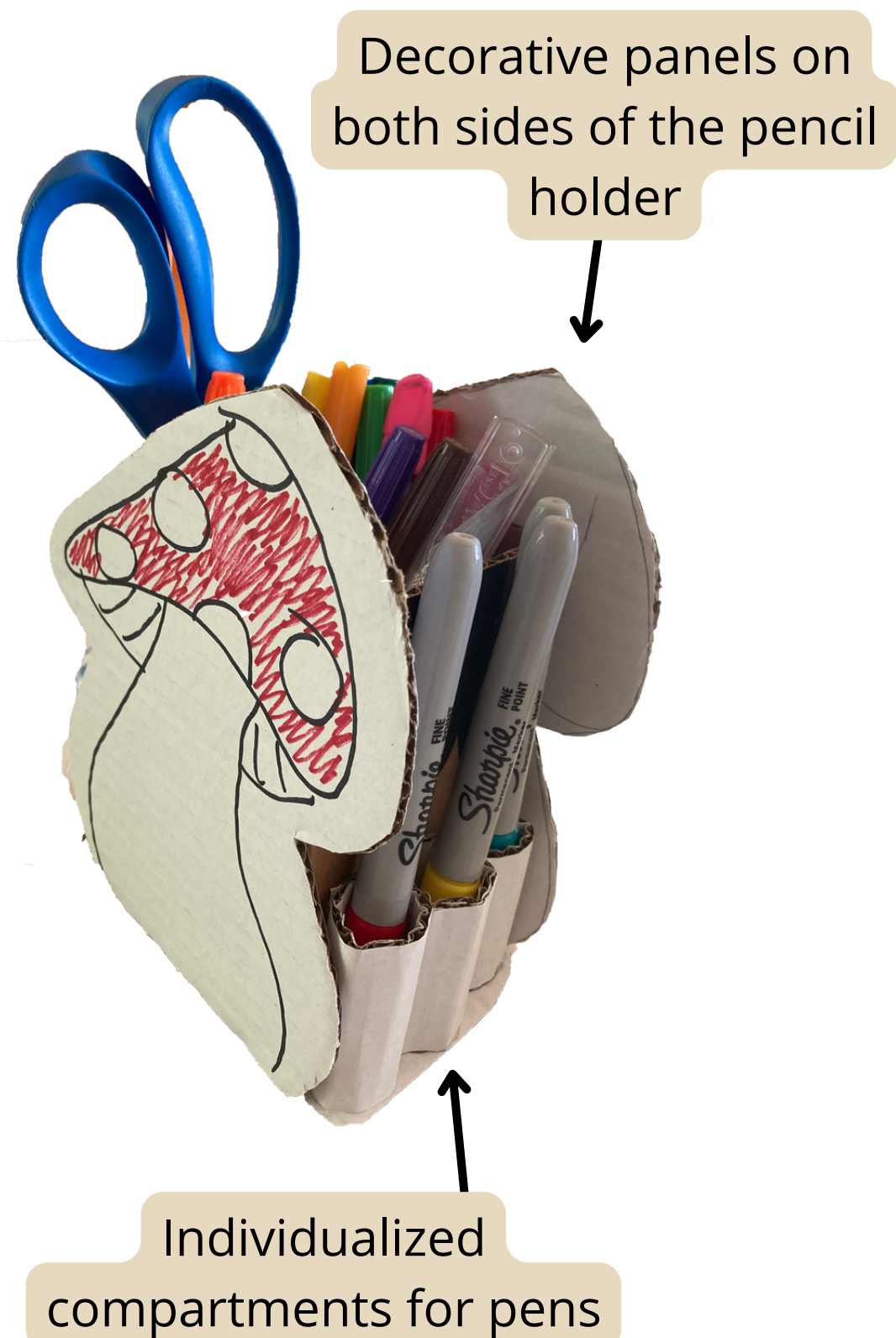
Roll it!



Cut it!



# HERE ARE SOME EXAMPLES !!



# BUILD A CHAIR

## FOR MX. BEAR



How can you design a comfortable chair for your favorite stuffed animal?



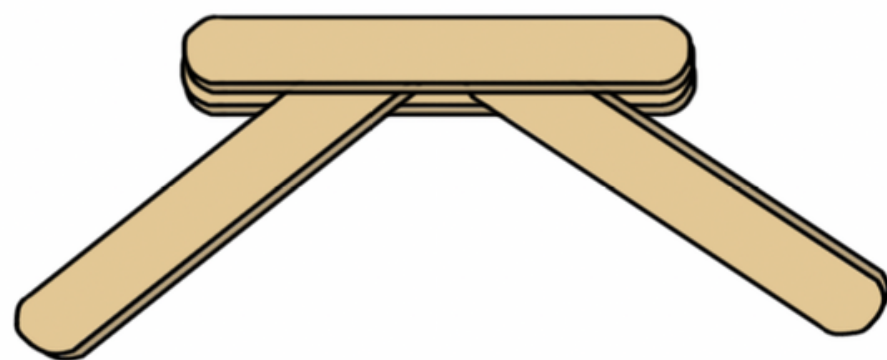
### YOUR GOAL



Build a chair that your favorite stuffed animal can sit in.

### NEED HELP WITH CHAIR LEGS?

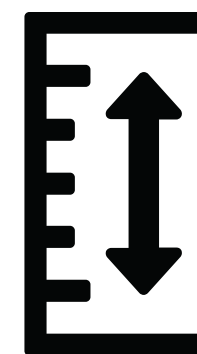
Get some help from the "Chair legs" instructions of the Constructopedia.



### CONSIDER...

Diffe

How tall?



Diffe

Arm rests?



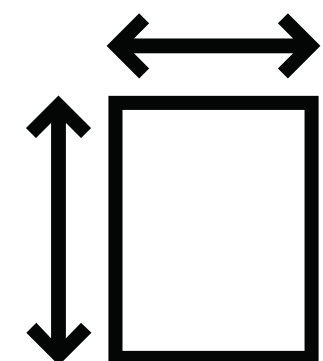
Diffe

How much weight should it support?



Diffe

How wide?





*HERE ARE SOME*

**EXAMPLES !!**



Folded cardboard

4 paper tube chair legs



Cut and folded  
cardboard glued  
together

Popicle stick supports



# ***BUILD THE TALLEST TOWER YOU CAN !!***

## ***YOU WILL GET:***



Paper



Tape

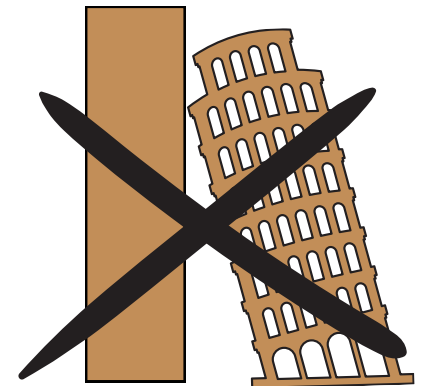


## ***RULES:***

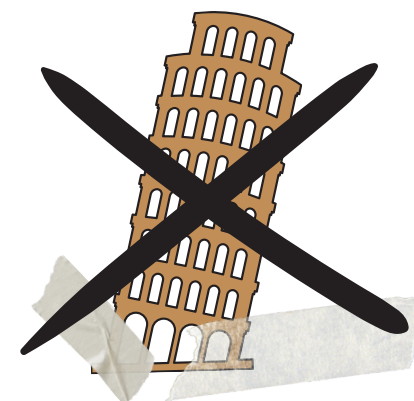
**1) Your tower must stand on its own:**

You can not hold it up with your hand.

It can not lean on something.



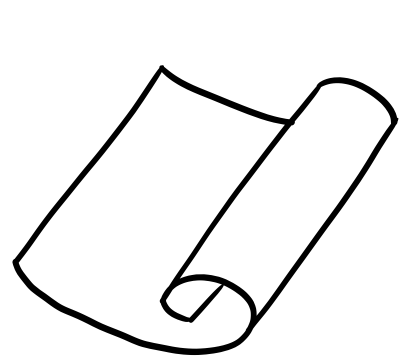
**2) Your tower can not be attached to the surface it is on**



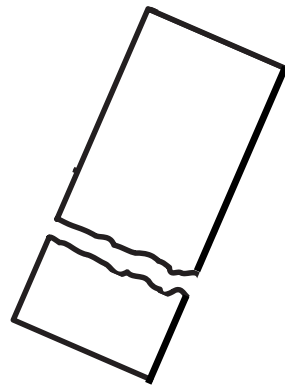
Your tower can not be taped to the floor or table.



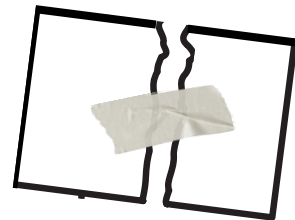
**WHAT ARE SOME DIFFERENT  
WAYS YOU CAN USE PAPER?**



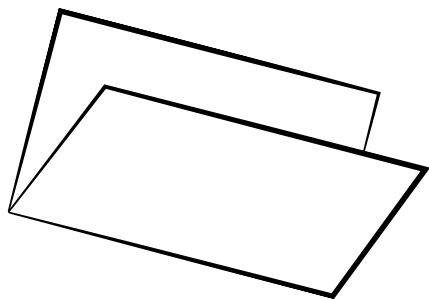
Rolling it?



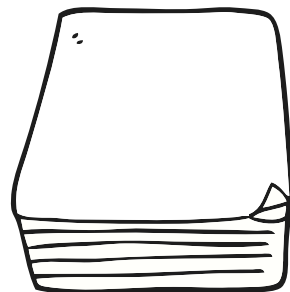
Tearing it?



Taping it?



Folding it?



Stacking it?

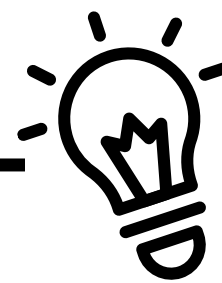


**LET'S THINK ABOUT IT!**



**What components do towers have?**

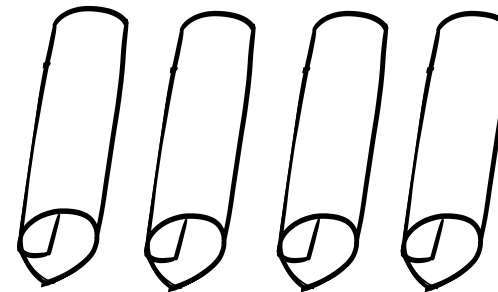
Supports? Base?



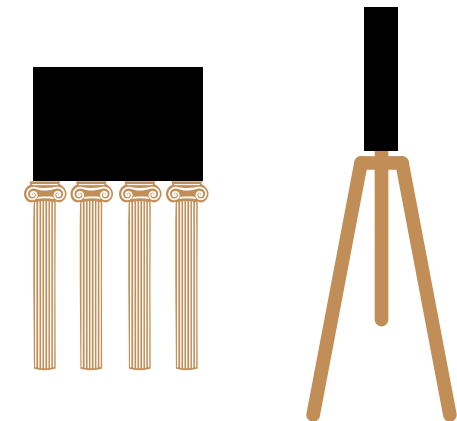
**WHAT CAN THESE DIFFERENT  
WAYS OF USING PAPER DO?**



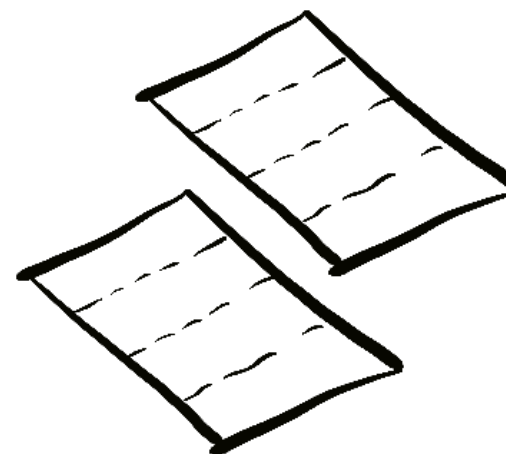
**HERE ARE SOME EXAMPLES:**



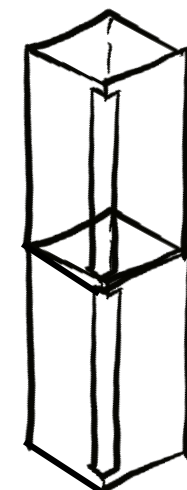
Rolled paper



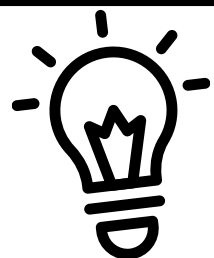
Tower supports?



Folded paper



Stack and tape  
folded paper for  
height?



**TEST IT:**

**Gently shake the table!**

Does your tower wobble? Stand still? Fall over? Why?  
Parts of your tower are the weakest?



# MAKE A PAPER BALL LAUNCHER!!

## YOUR GOAL



Design a mechanism to launch a paper ball as far as possible.

You will use a half sheet of paper crumpled into a ball.



## RULES:

1) Your mechanism must sit flat on the table.

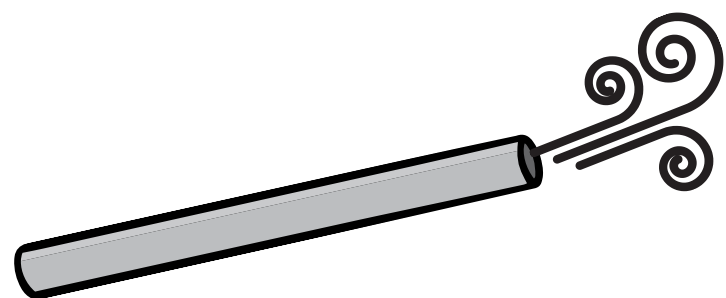
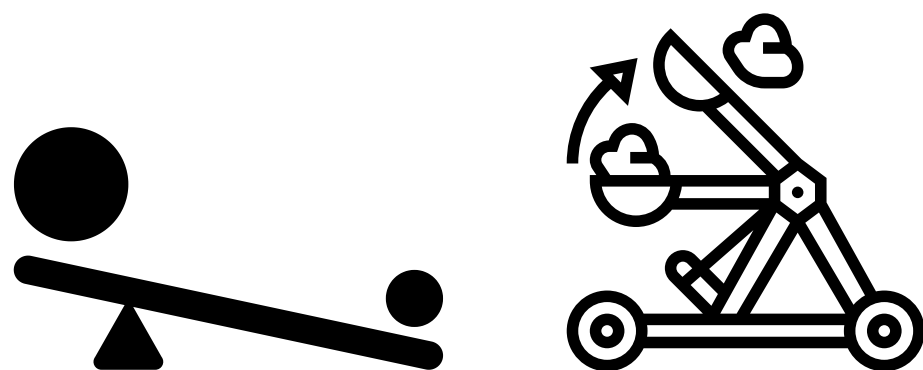
You can't throw anything.



2) You can't alter the paper ball.

That means you can't add anything on or take any paper off.

## DIFFERENT WAYS TO LAUNCH?



*HERE ARE SOME*

**EXAMPLES!!**

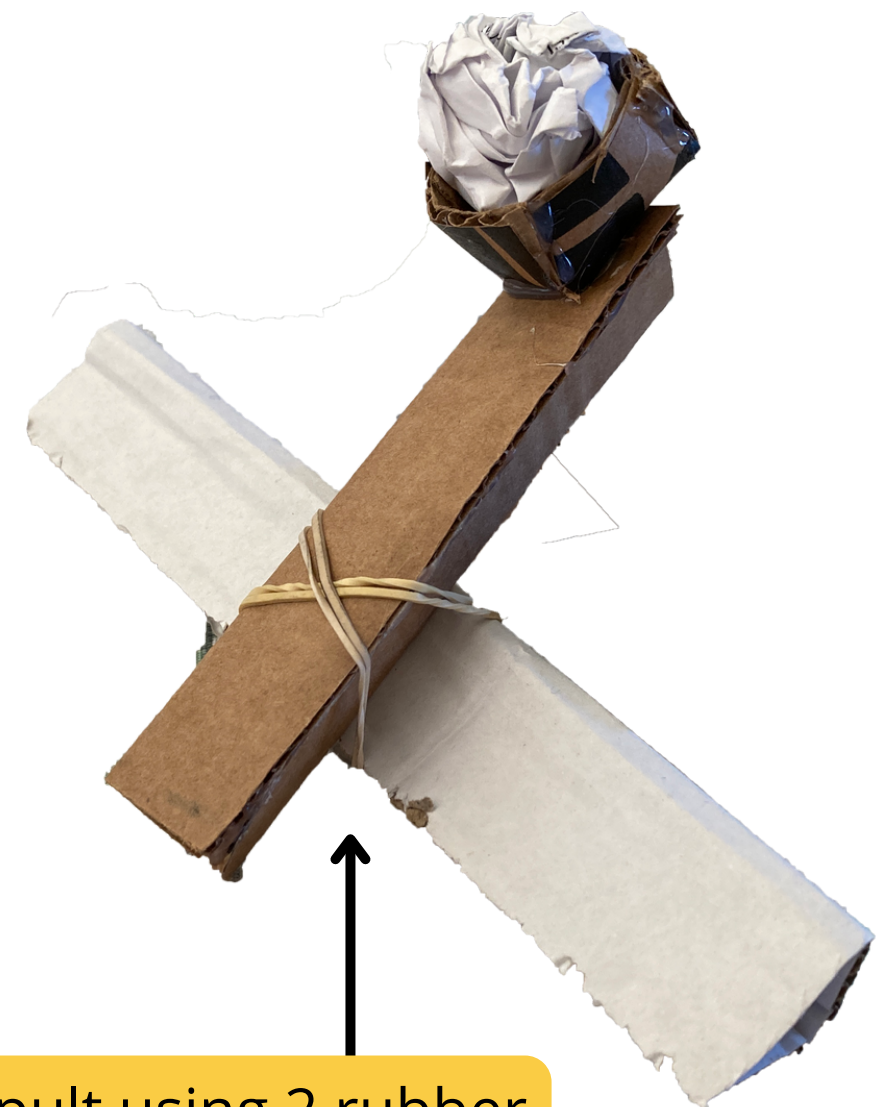
Cardboard tube with table stand. Blow through the tube to launch the ball.



See-saw with ball basket on one side



catapult using 2 rubber bands and two triangular prisms





# MAKE A BACKPACK

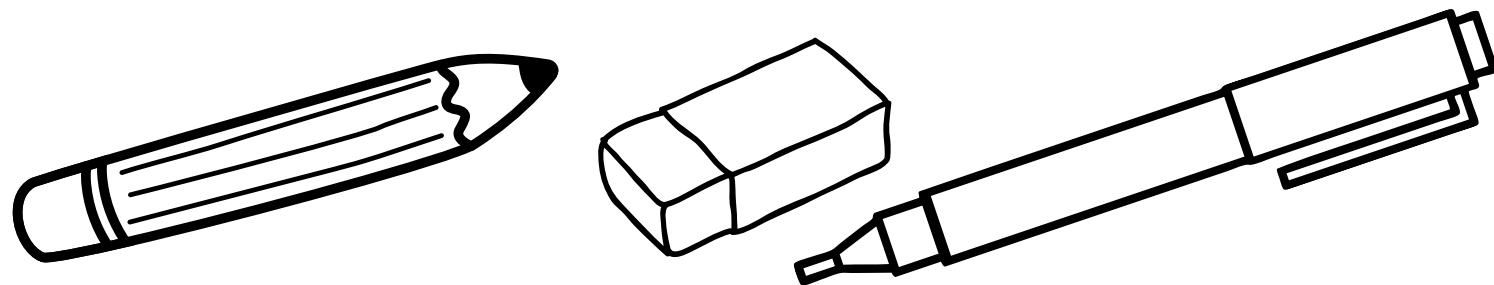
## FOR MX. BEAR

### RULES:

#### 1) The backpack must be able to close.

That way nothing gets lost when your stuffed animal uses the backpack!

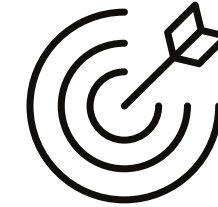
#### 2) The backpack must be able to hold at least 1 pen, 1 pencil and 1 eraser.



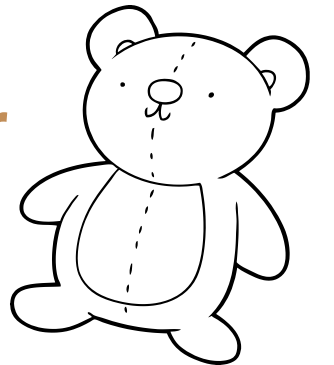
#### 3) The backpack must be removable.

Don't directly attach anything to the stuffed animal!

### YOUR GOAL



Make a comfortable backpack for your favorite stuffed animal.

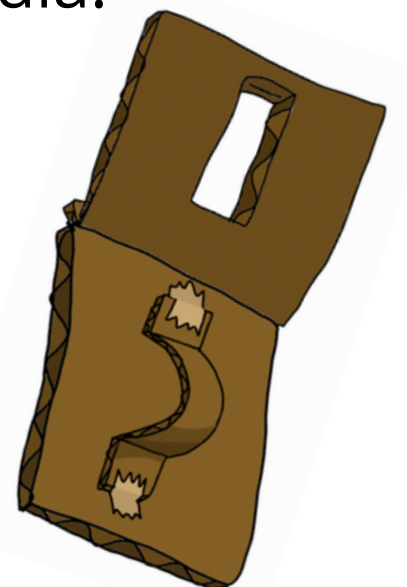
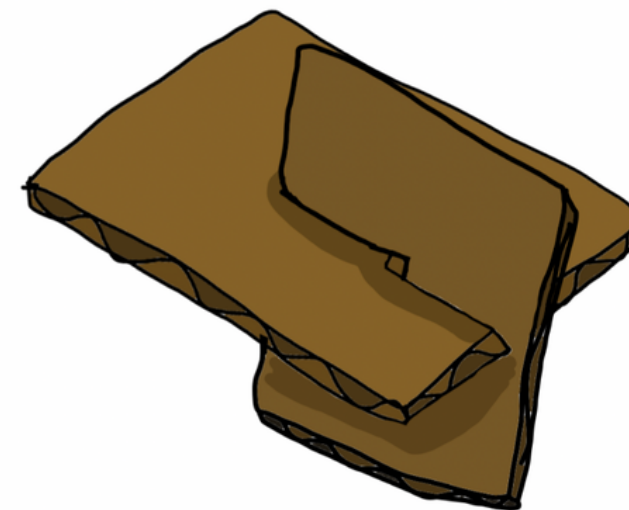


What makes a backpack comfortable?  
How can you keep the backpack from falling off?



### HOW TO MAKE IT REMOVABLE?

Get some help from the "Removable connections" section of the Constructopedia.



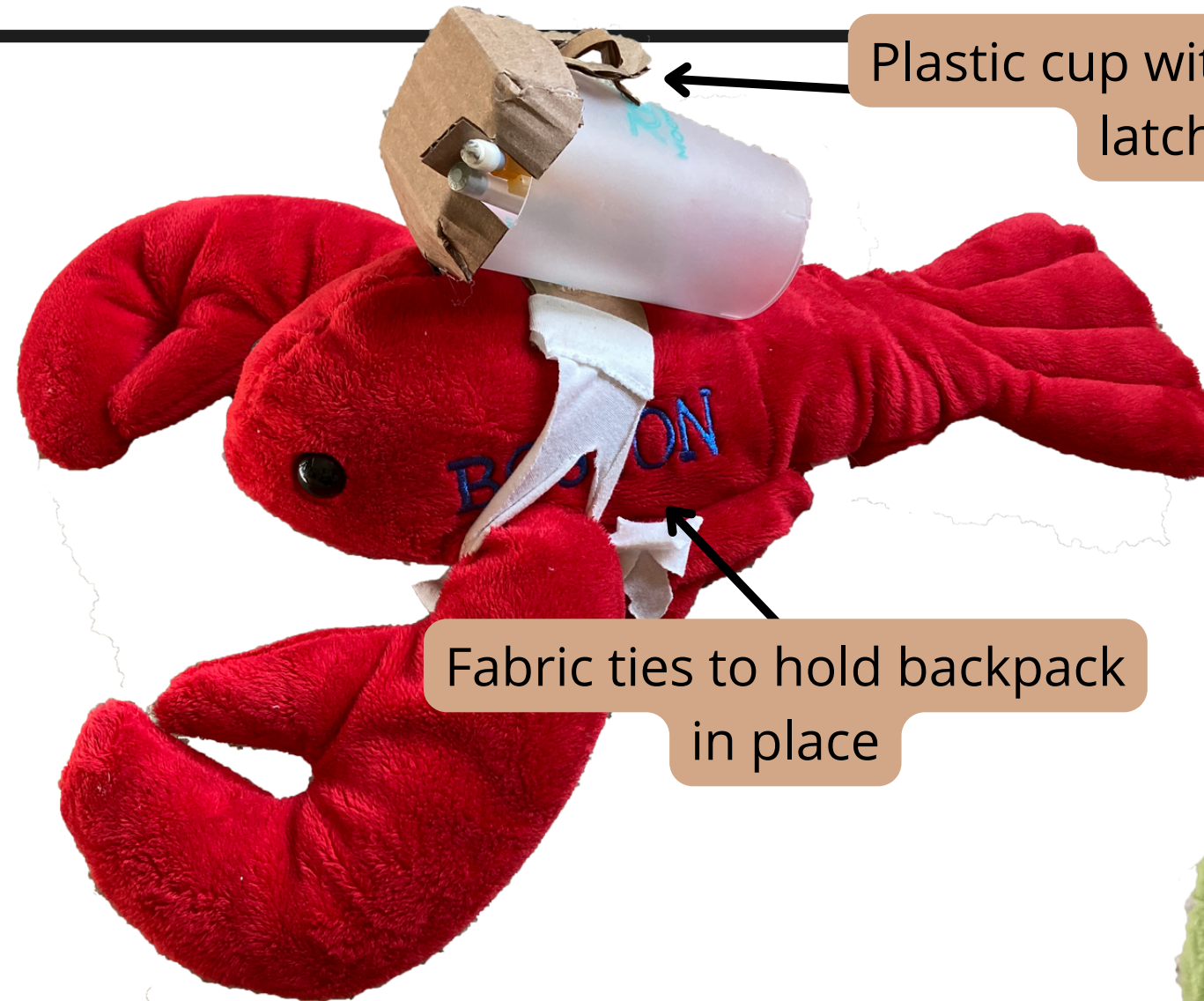


*HERE ARE SOME*

**EXAMPLES!!!**



cardboard bag with  
string straps

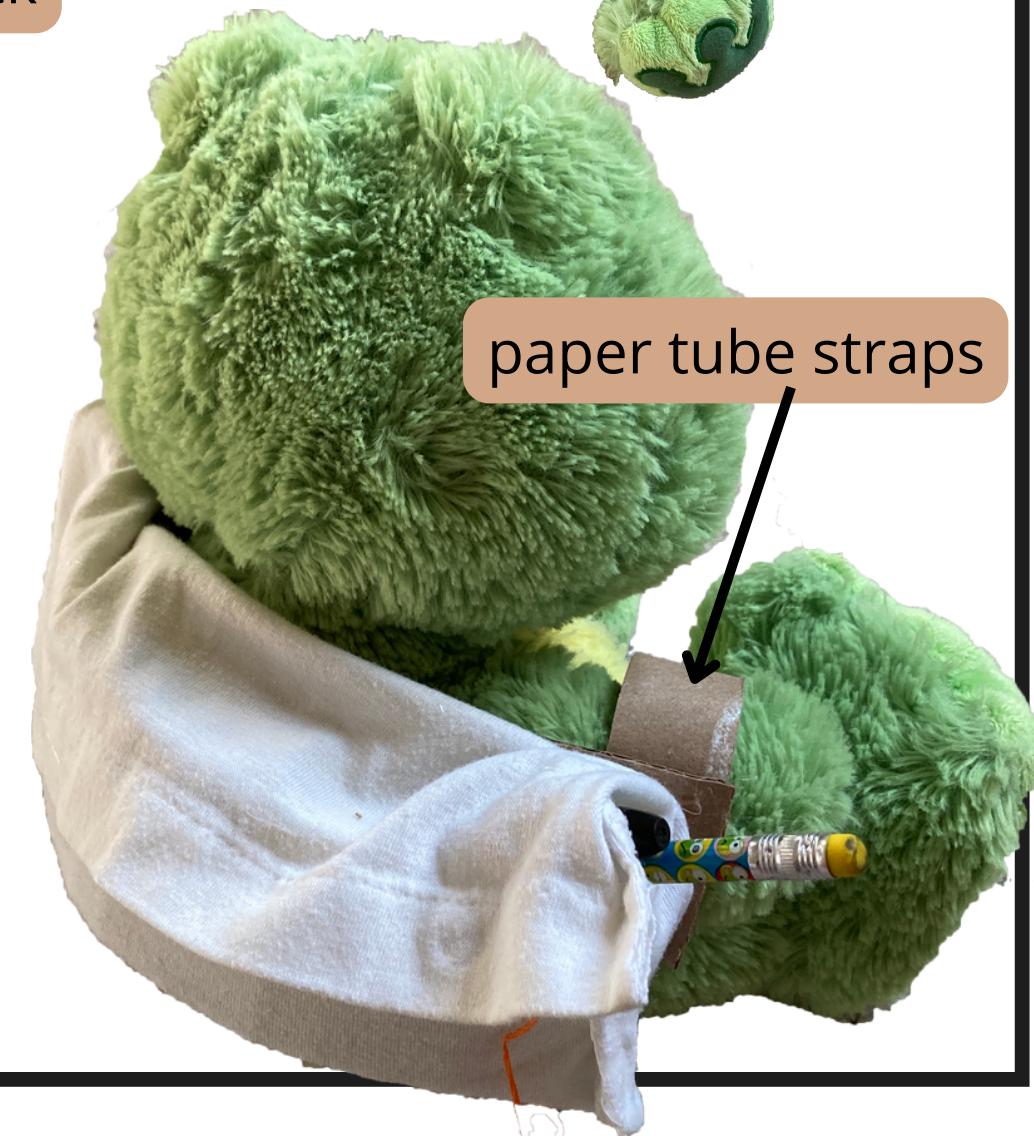


Plastic cup with cardboard  
latch lid

Fabric ties to hold backpack  
in place



paper tube straps



fabric bag with  
cardboard supports



# PROTECT

## YOUR CANDY !!

### YOUR GOAL



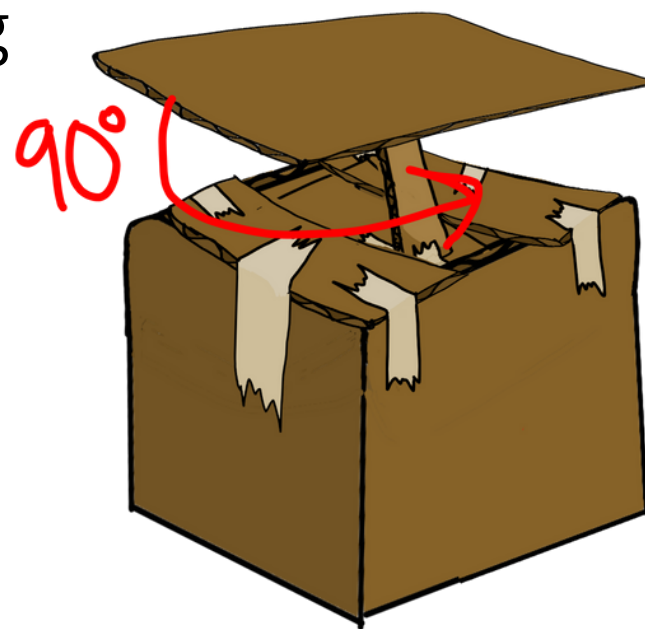
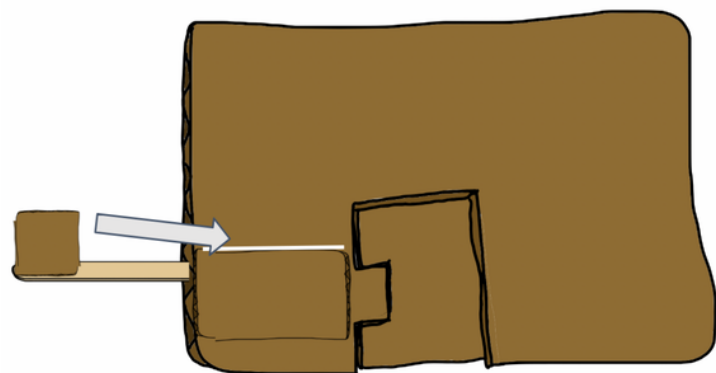
**Design a lock-box for your candy to protect against your family eating it!**

This means you need to make the lid stay shut unless something is done to open the box.



### LOCK INSPIRATION

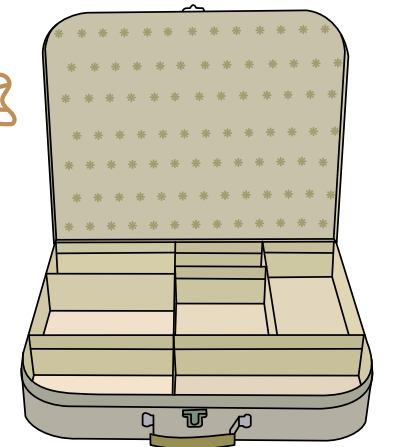
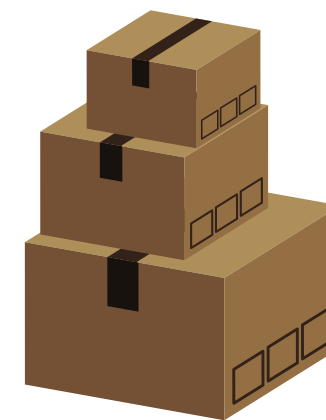
Get some help from the "Locking mechanisms" section of the Constructopedia.



### CONSIDERATIONS...



**how big?**



**any compartments?**

**how many locks?**



**what materials are most sturdy?**



***HERE ARE SOME***

**EXAMPLES!!**



Maze on side  
connected to lid

90 degree twist top lock



Latch on lid goes over  
loop on side to lock



# CAN YOU SAFELY

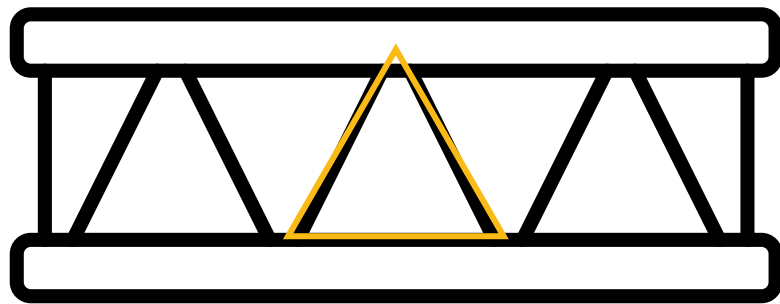
# SPAN A GAP ?



How can you design a structure that supports a plastic bottle over a 1-foot gap?

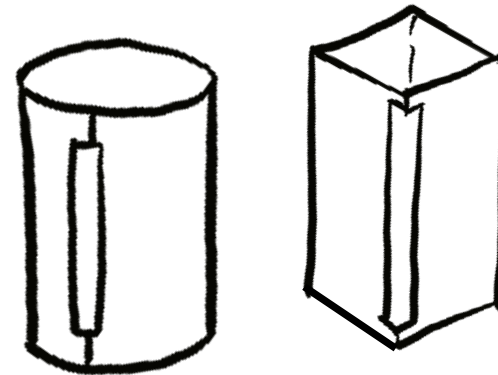


## WHAT STRUCTURES CAN SUPPORT HEAVY THINGS?



"**Trusses**" are triangular supports.

Towers and columns can be good supports!



## DESIGN THE DECK!

The deck of your structure is where the plastic bottle will be placed.

What material? What does it look like?  
What supports it?

## RULES:

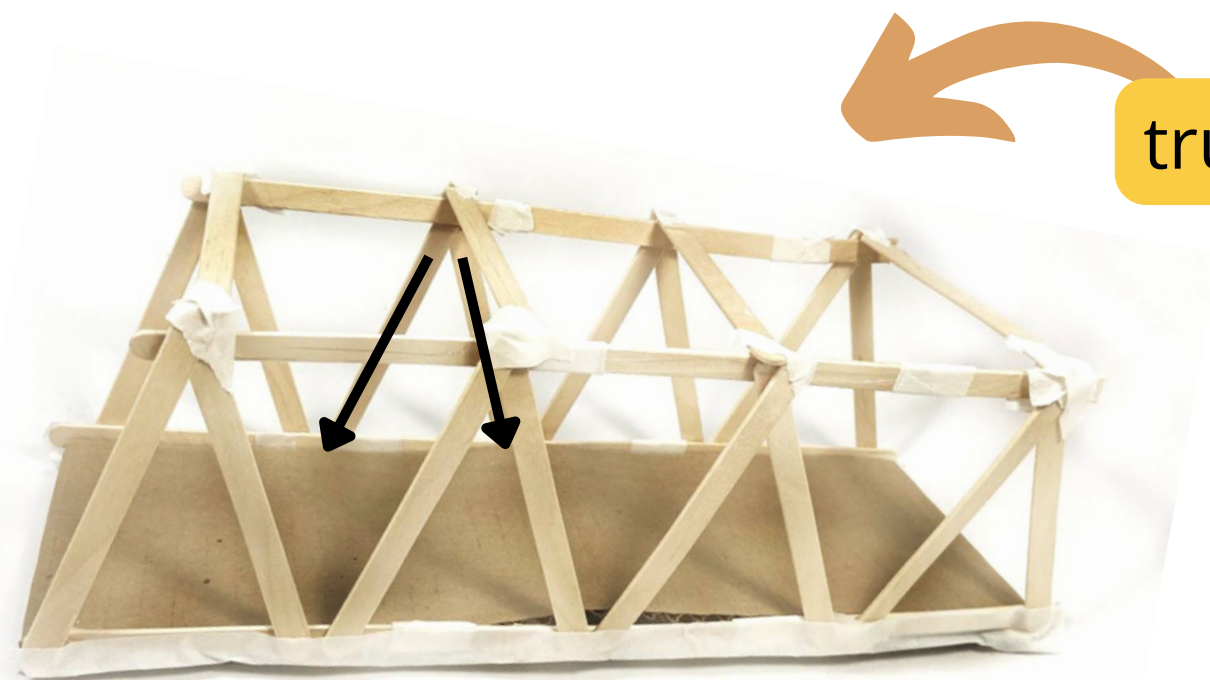
**1) The deck must be suspended or supported in some manner.**

This means the deck cannot be a straight plank or a simple box.

**2) Minimize the materials you use by pushing yourself to be creative.**

How can you make a strong structure while minimizing what you use?

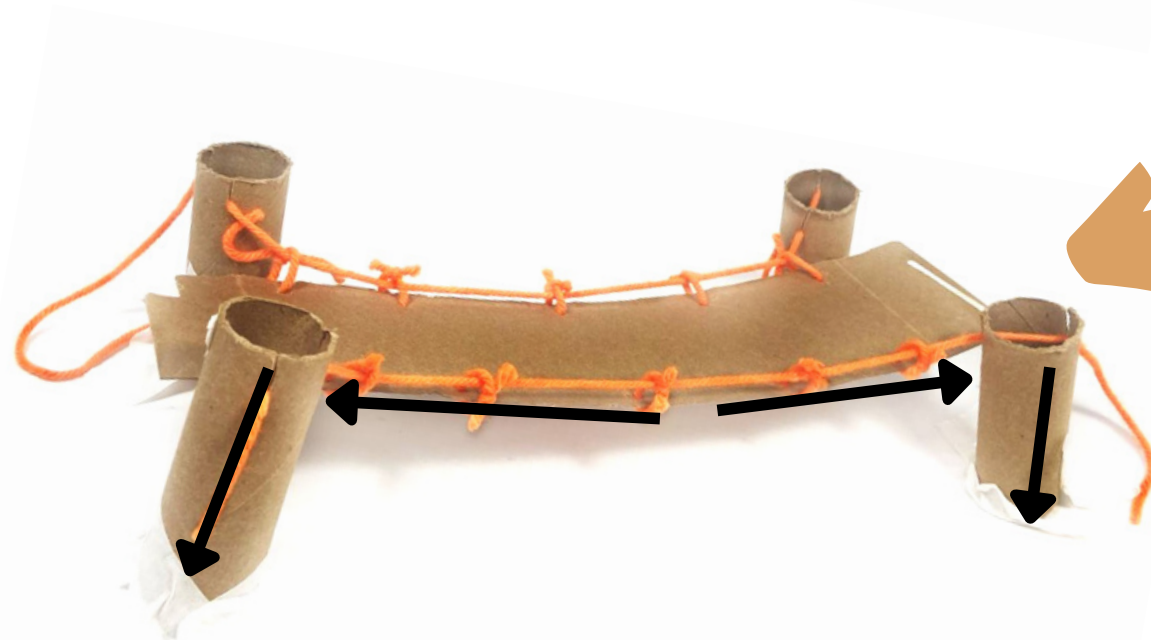
# HERE ARE SOME EXAMPLES !!



trusses



triangular prism legs

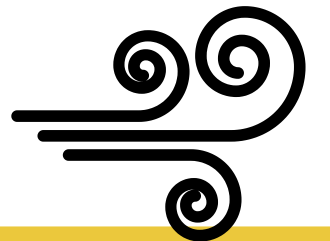


strings hold up the deck



# LIFT A MARBLE WITH THE WIND!

How can you use the wind to lift a marble?



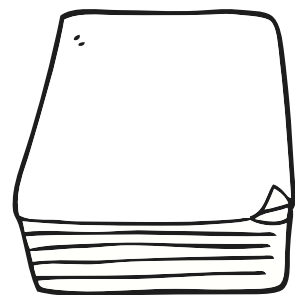
## YOUR GOAL



**Design a propeller to raise a marble.**  
(see back of card for example)

## POSSIBLE PROPELLOR MATERIALS

paper/cardstock



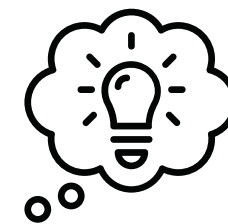
plastic cups water bottles



cardboard



manila paper

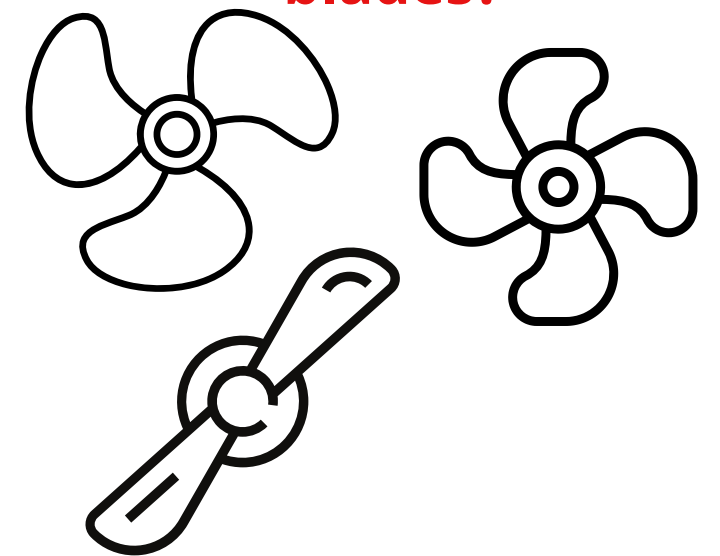


## PLAN THE PROPELLERS

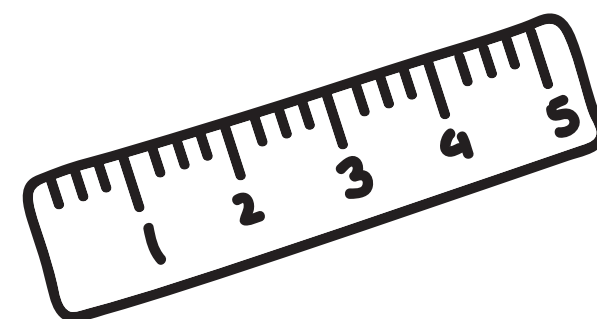
different shapes?



different number of blades?



different lengths?



different materials?





