

DESIGN A

PENCIL HOLDER !

How would you design your ideal pencil holder?



TO THINK ABOUT



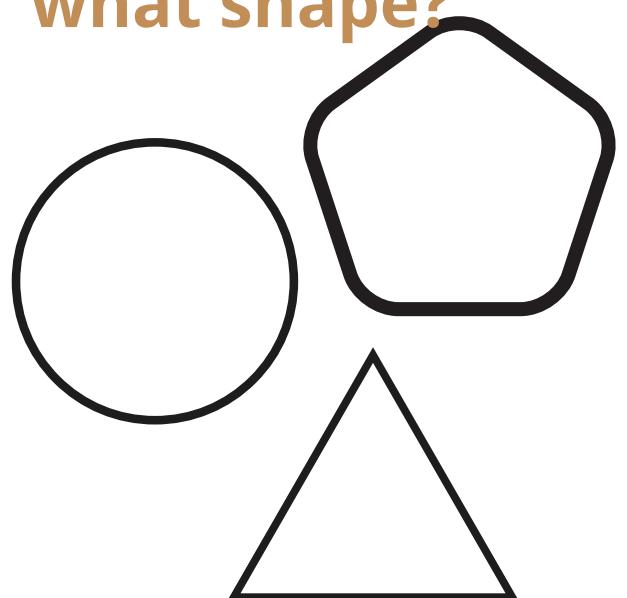
how tall?



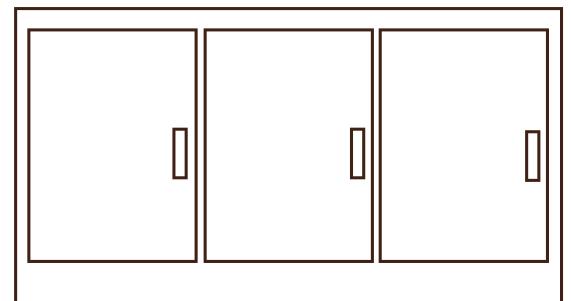
how wide?



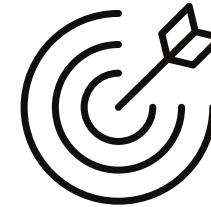
what shape?



how many compartments?

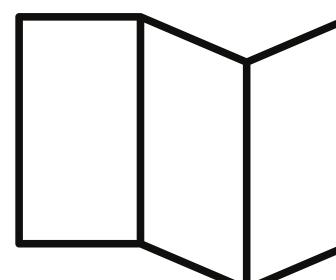


YOUR GOAL

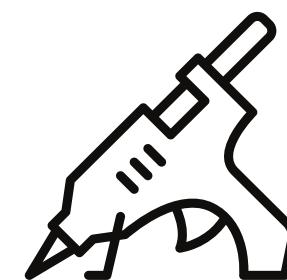


Create a pencil holder that can hold at least 4 writing utensils.

WORKING WITH CARDBOARD



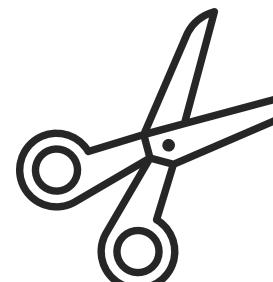
Bend it!



Hot glue it!



Roll it!



Cut it!

HERE ARE SOME

EXAMPLES !!



Individualized compartments for pens

Paper triangular prism

Two triangle compartments on a spinning base

Decorative panels on both sides of the pencil holder

BUILD A CHAIR FOR MR. BEAR



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



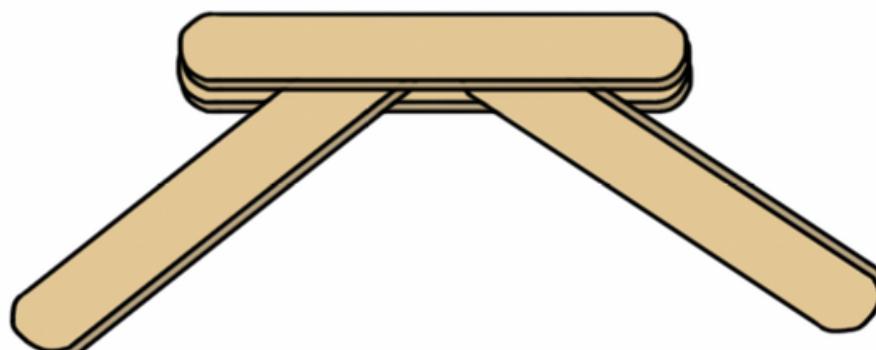
YOUR GOAL



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

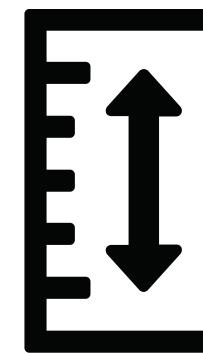
NEED HELP WITH CHAIR LEGS?

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



CONSIDER...

How tall?



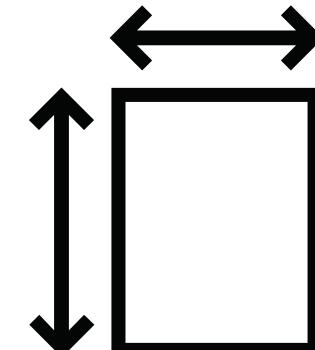
Arm rests?



How much weight should it support?



How wide?



HERE ARE SOME

EXAMPLES !!



Folded cardboard

4 paper tube chair legs



Cut and folded
cardboard glued
together

Popcicle stick supports

BUILD THE

TALLEST

TOWER YOU CAN

!!!

YOU WILL GET:



Paper



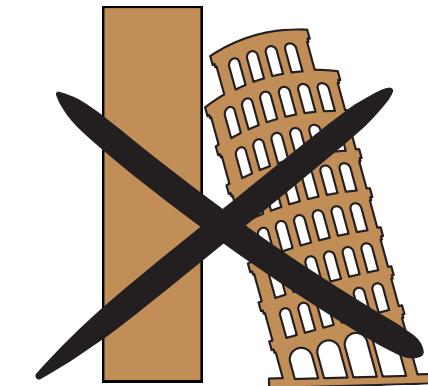
Tape

RULES:

1) Your tower must stand on its own:

You can not hold it up with your hand.

It can not lean on something.

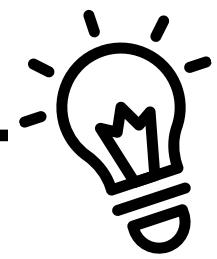


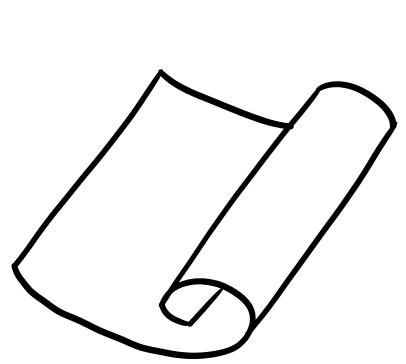
2) Your tower can not be attached to the surface it is on



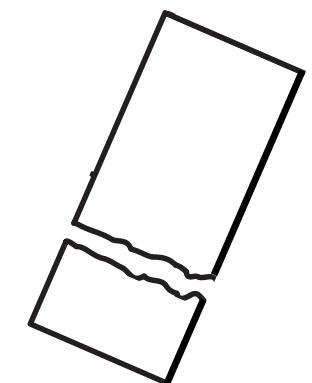
Your tower can not be taped to the floor or table.



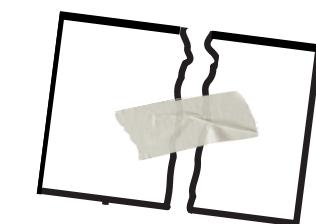
 **WHAT ARE SOME DIFFERENT WAYS YOU CAN USE PAPER?** 



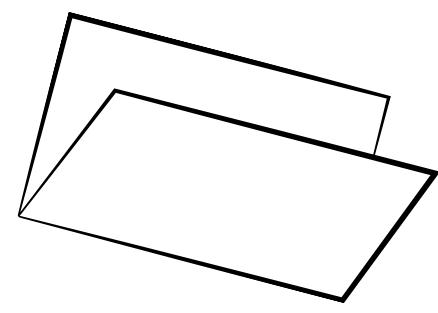
Rolling it?



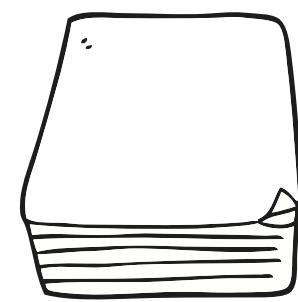
Tearing it?



Taping it?



Folding it?

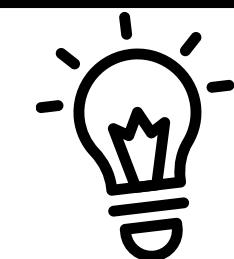


Stacking it?

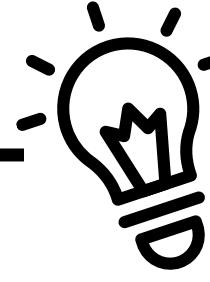
 **LET'S THINK ABOUT IT!** 

What components do towers have?

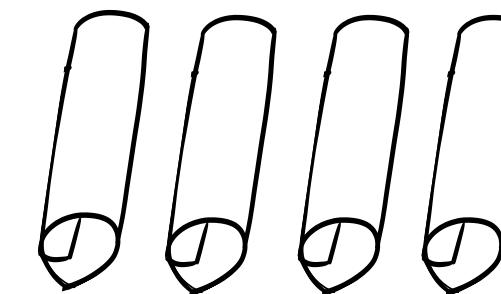
Supports? Base?



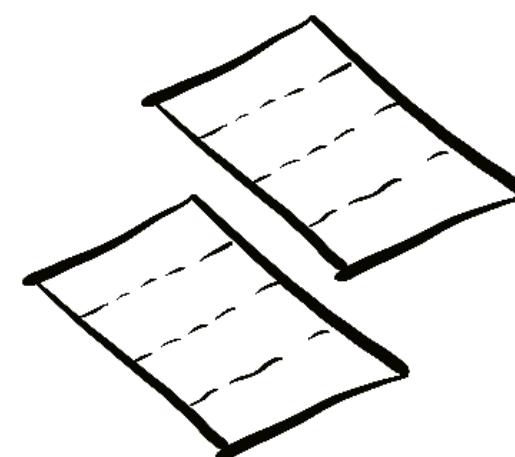
TEST IT:

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

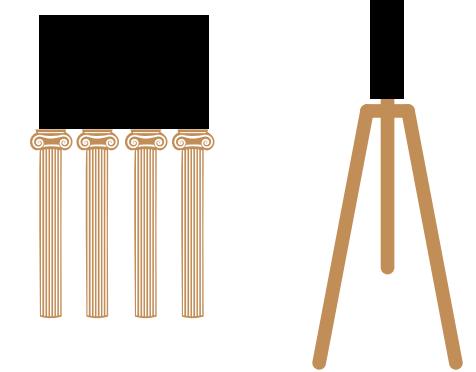
HERE ARE SOME EXAMPLES:



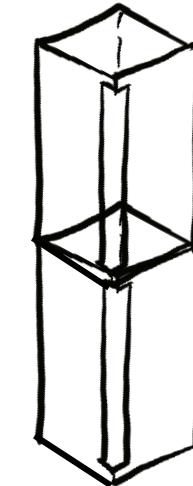
Rolled paper



Folded paper



Tower supports?



Stack and tape folded paper for height?

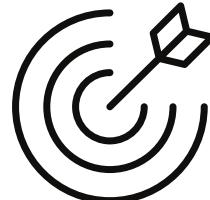
Gently shake the table!

Does your tower wobble? Stand still? Fall over? Why?

Parts of your tower are the weakest?

MAKE A PAPER BALL LAUNCHER!!

YOUR GOAL

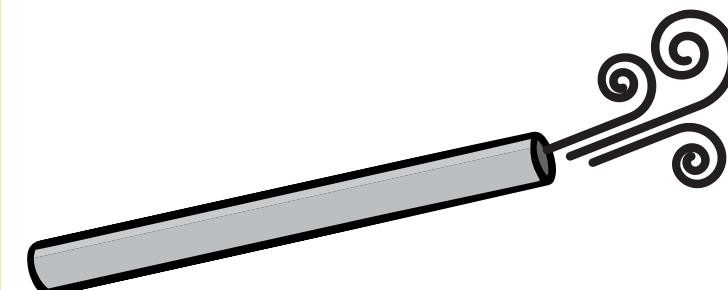
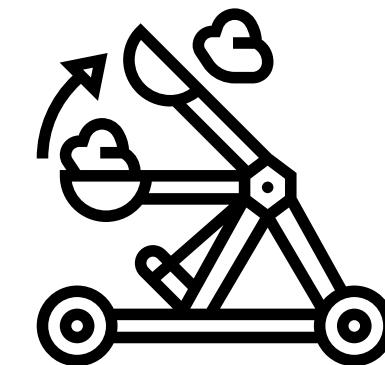
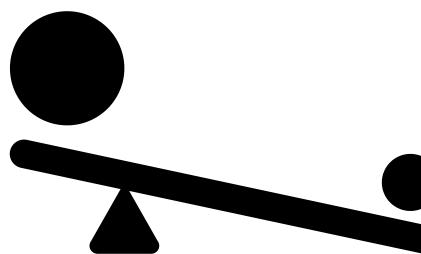


Design a mechanism to launch a paper ball as far as possible.

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



DIFFERENT WAYS TO LAUNCH?



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.



HERE ARE SOME

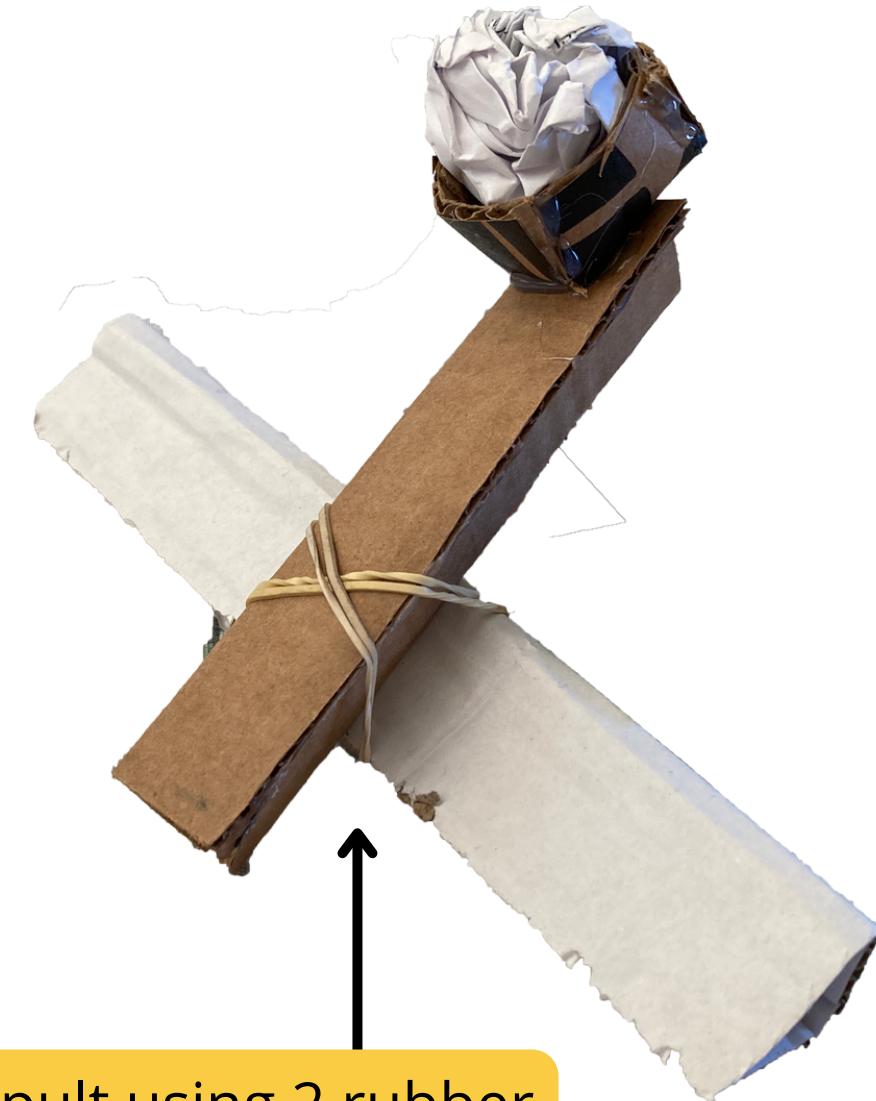
EXAMPLES!!

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



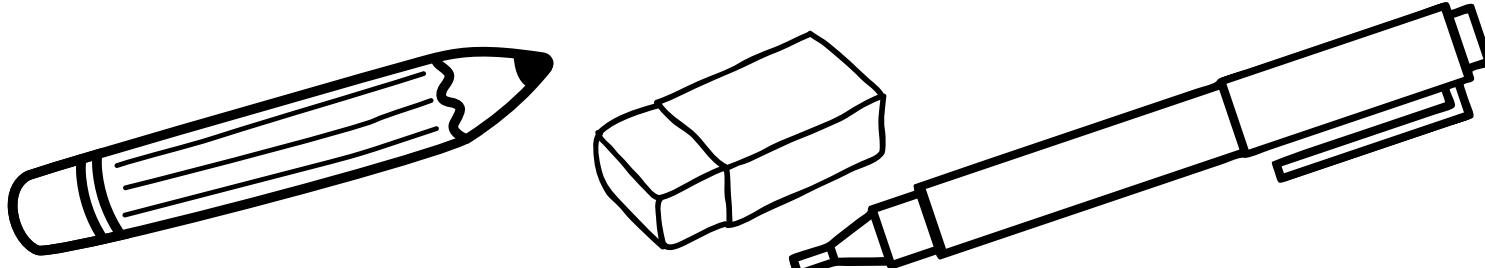
MAKE A BACKPACK FOR MR. BEAR

RULES:

1) The backpack must be able to close.

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

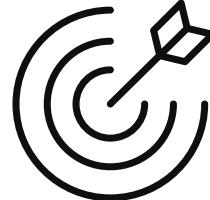
2) The backpack must be able to hold at least 1 pen, 1 pencil and 1 eraser.



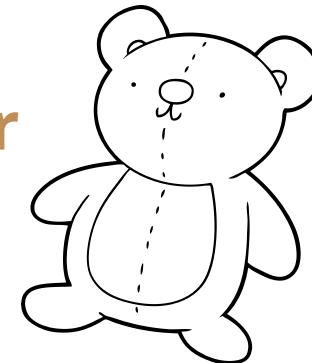
3) The backpack must be removable.

Don't directly attach anything to the stuffed animal!

YOUR GOAL



Make a comfortable backpack for your favorite stuffed animal.

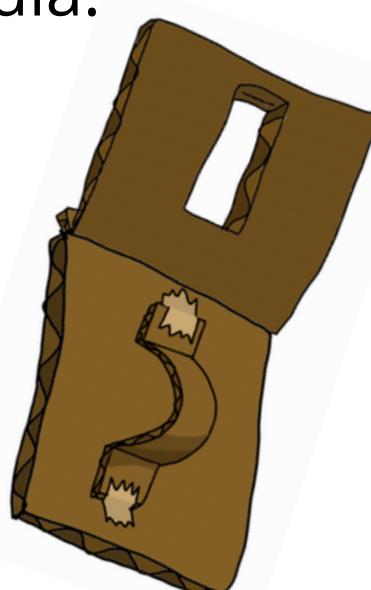
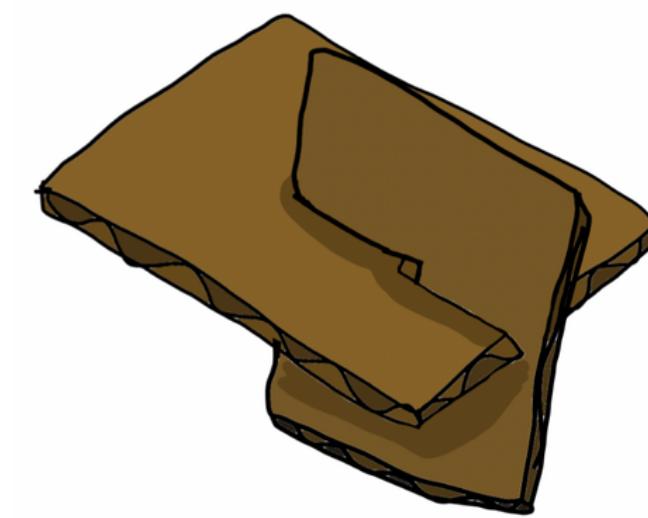


What makes a backpack comfortable?
How can you keep the backpack from falling off?



HOW TO MAKE IT REMOVABLE?

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



HERE ARE SOME

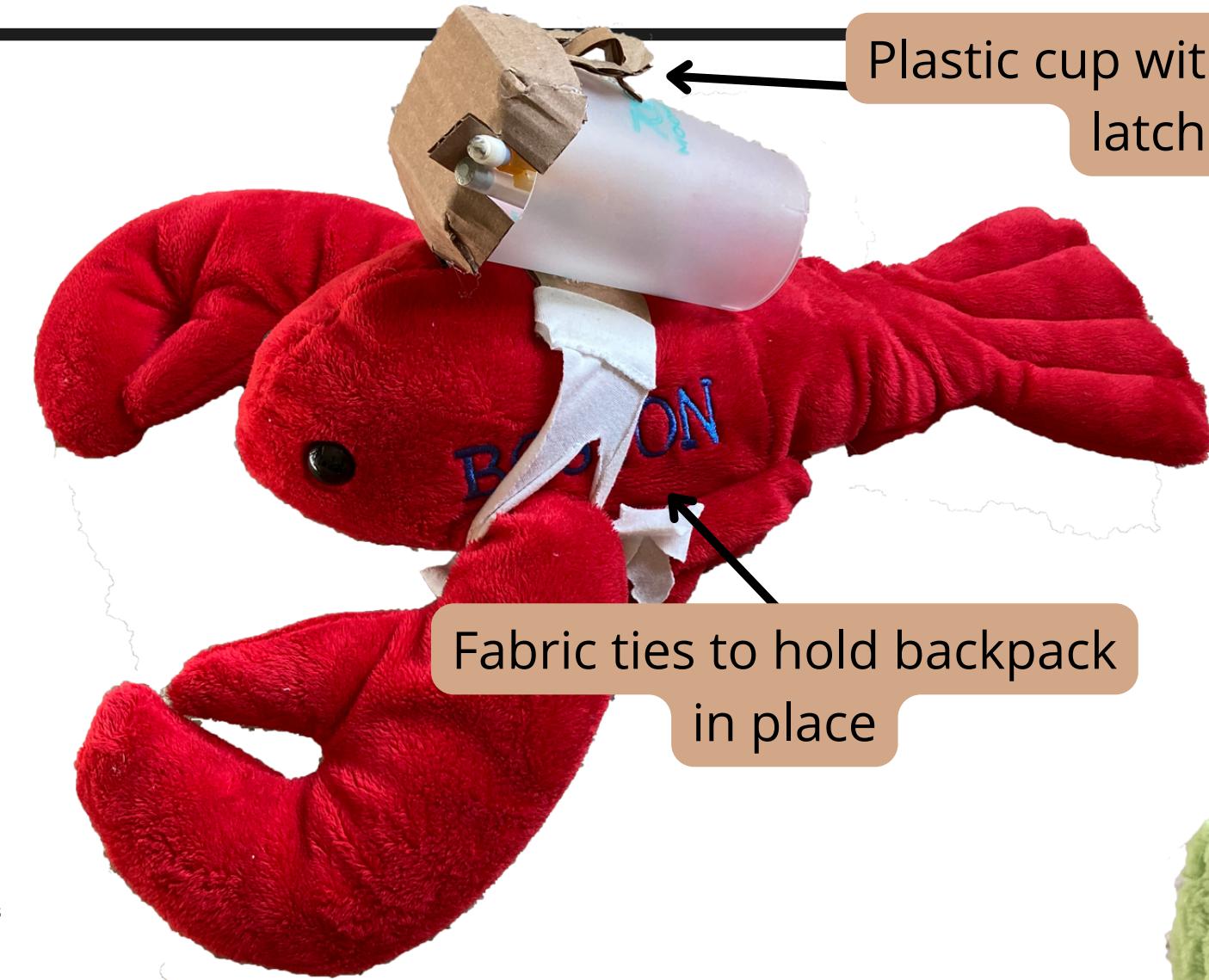
EXAMPLES!!!



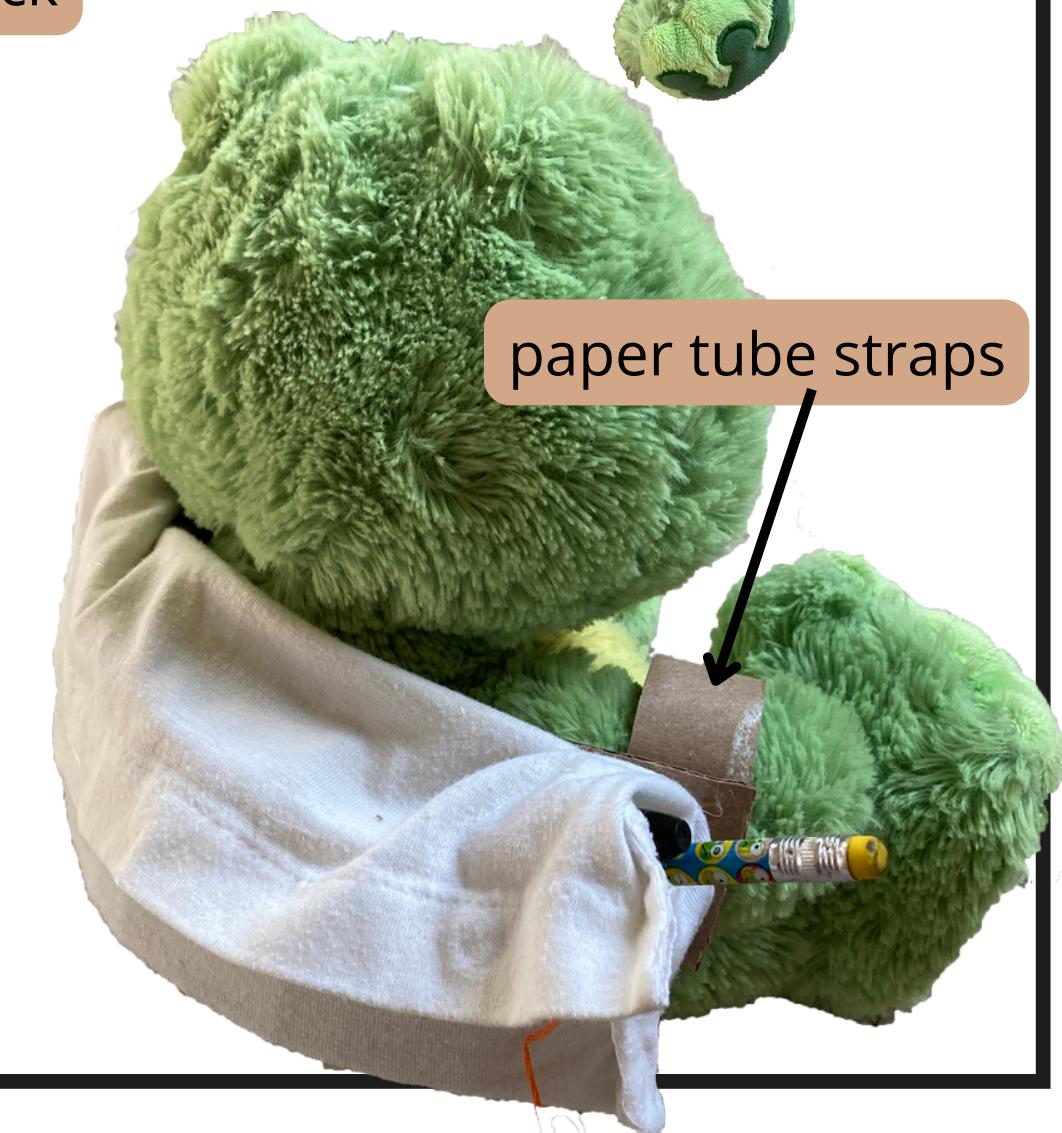
cardboard bag with
string straps



fabric bag with
cardboard supports



Fabric ties to hold backpack
in place



paper tube straps

PROTECT YOUR CANDY!!!

YOUR GOAL



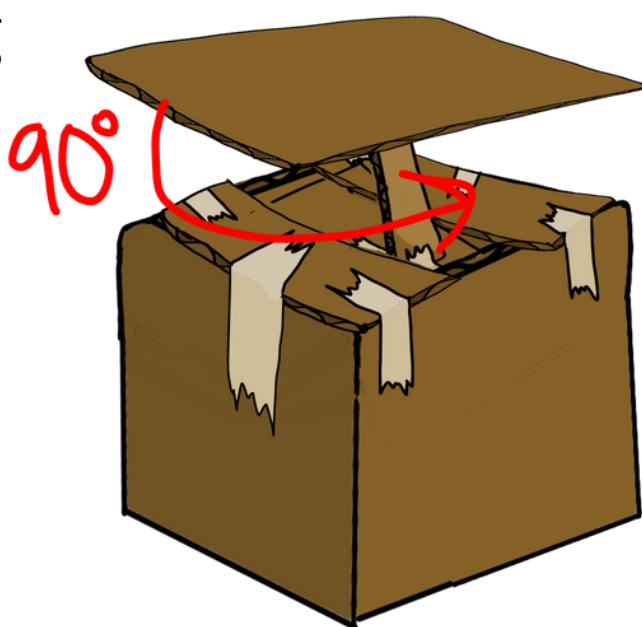
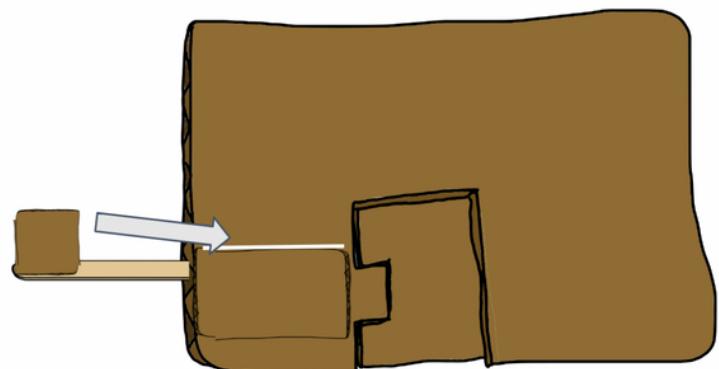
Design a lock-box for your candy to protect against your family eating it!

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



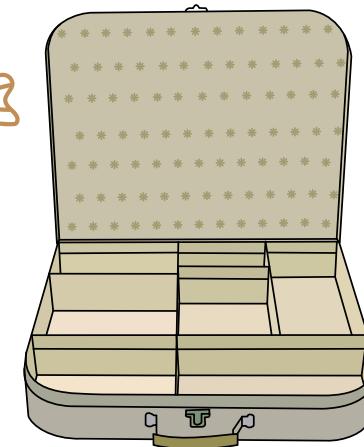
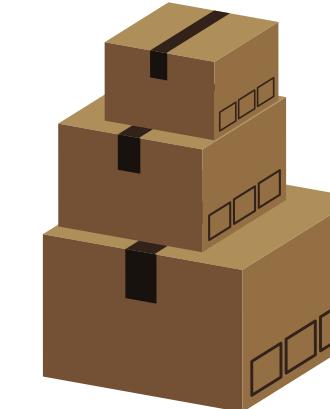
LOCK INSPIRATION

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

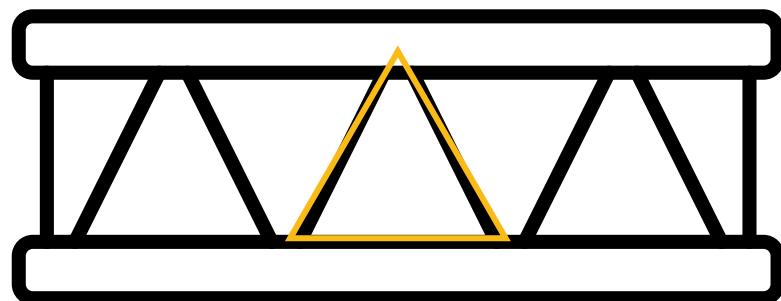
SPAN A GAP ?



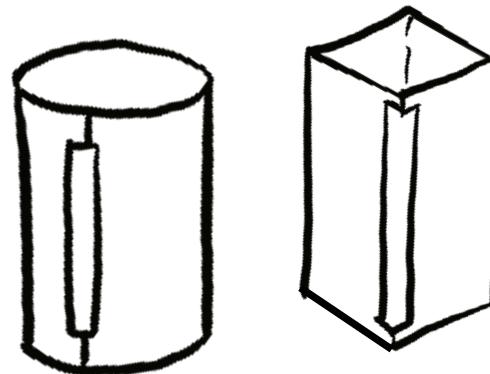
How can you design a structure that supports a plastic bottle over a 1-foot gap?



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.

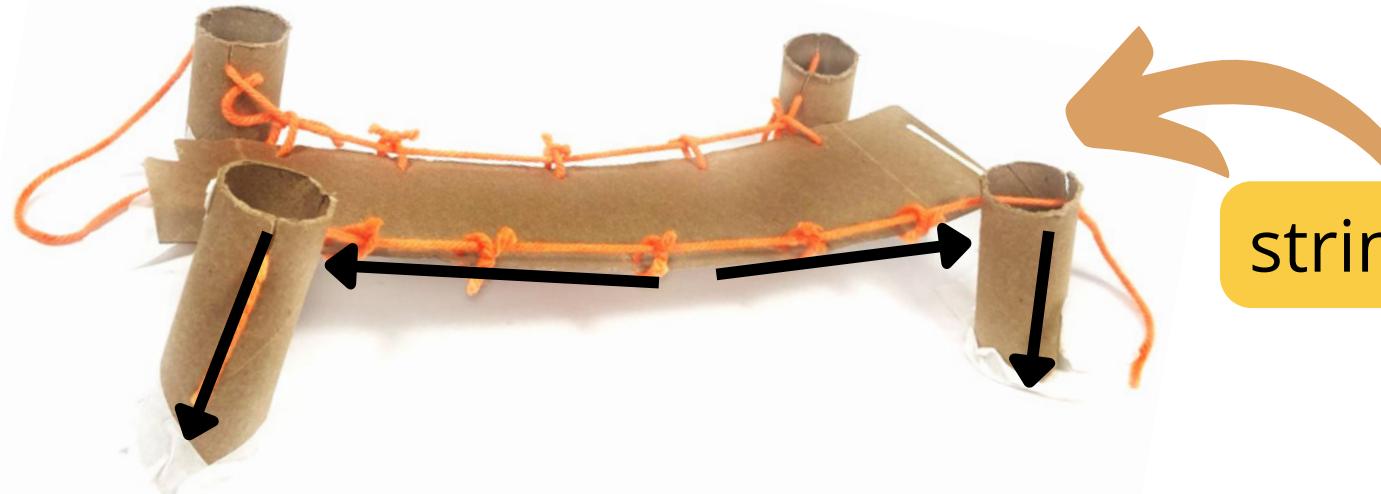
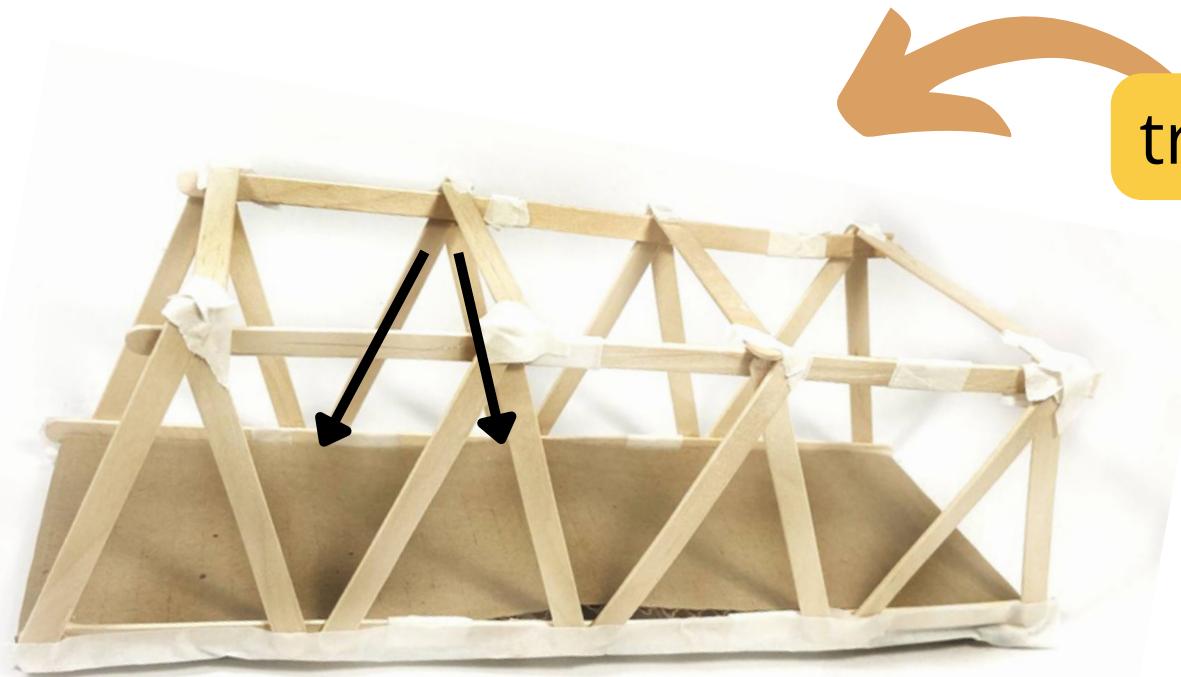
This means the deck cannot be a straight plank or a simple box.

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

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

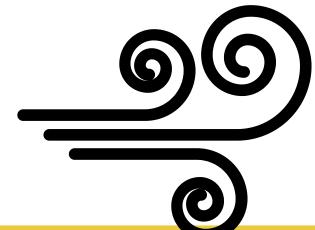
HERE ARE SOME

EXAMPLES !!

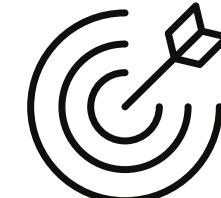


LIFT A MARBLE WITH THE WIND!

How can you use the wind to lift a marble?



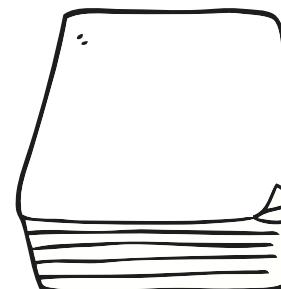
YOUR GOAL



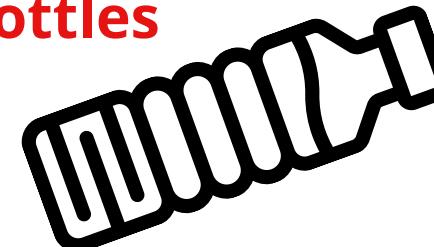
Design a propeller to raise a marble.
(see back of card for example)

POSSIBLE PROPELLOR MATERIALS

paper/cardstock



plastic cups
water bottles



cardboard



manila paper

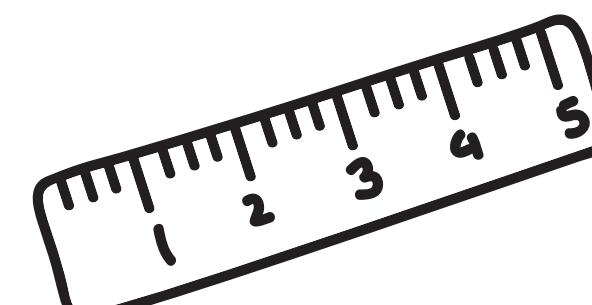


PLAN THE PROPELLERS

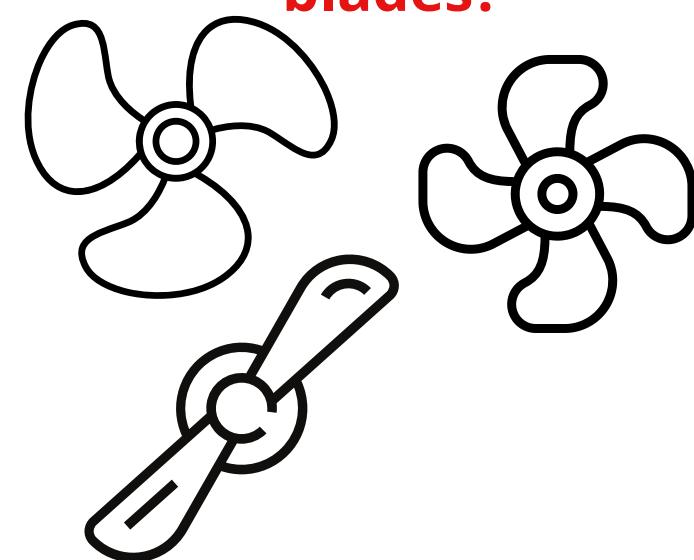
different shapes?



different lengths?



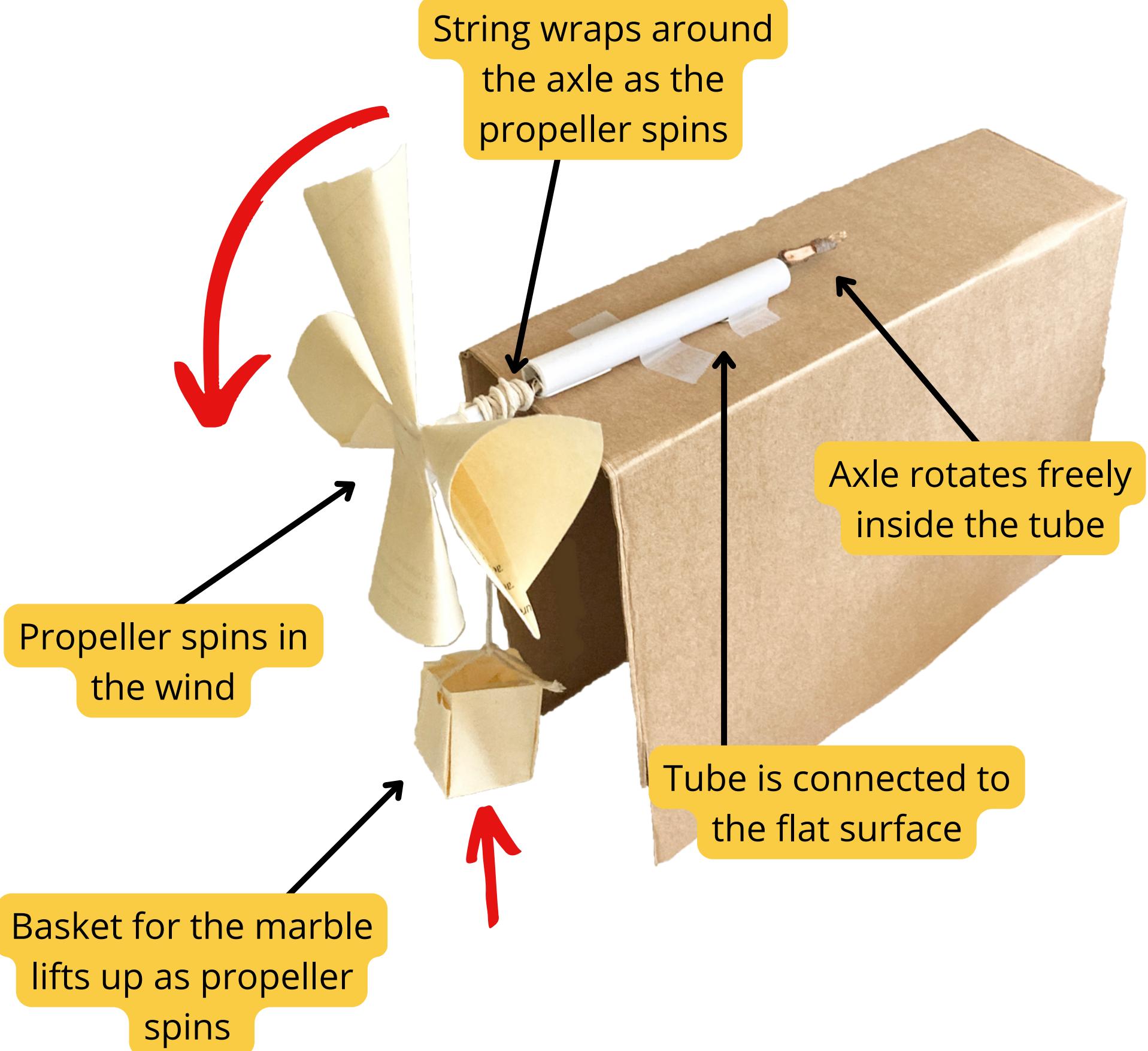
different number of
blades?



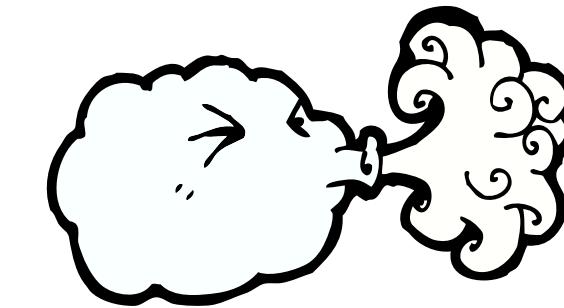
different materials?



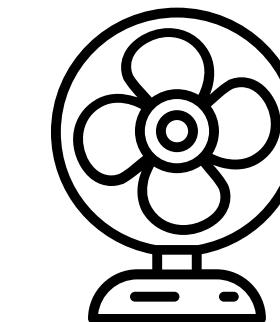
THINKING THROUGH THE PARTS



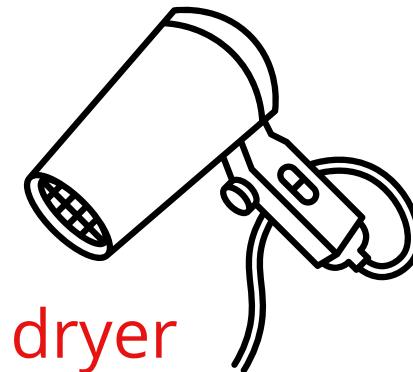
HOW TO TEST



Blow on the propeller



fan



hair dryer



put outside in the wind