

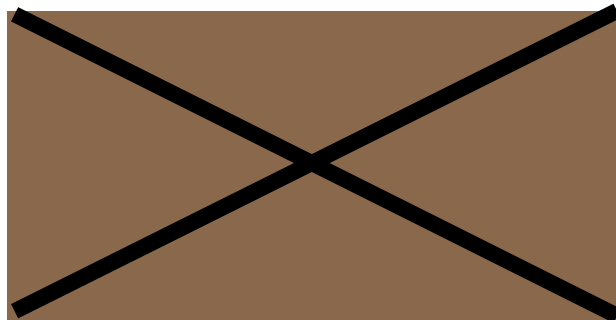
Exploring Forces

Introduction:

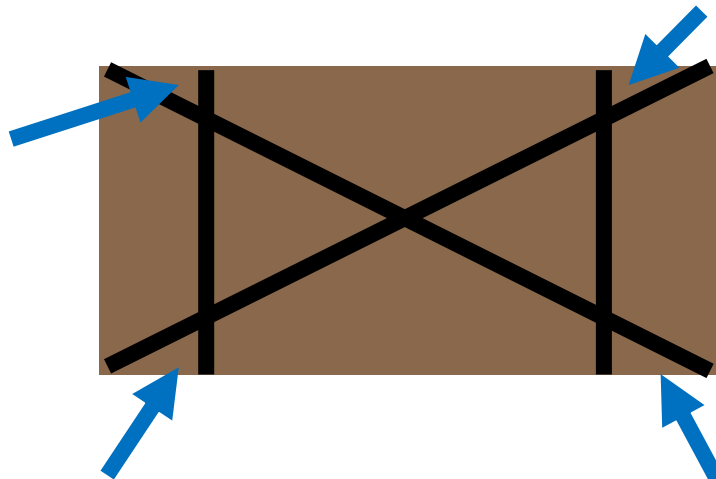
A **force** describes an influence of one object to another, such as a push or a pull or even gravity! The direction of forces and the strength behind them will determine the impact of a force. We are going to explore balanced vs unbalanced forces by creating a cardboard “popper”.

Activity:

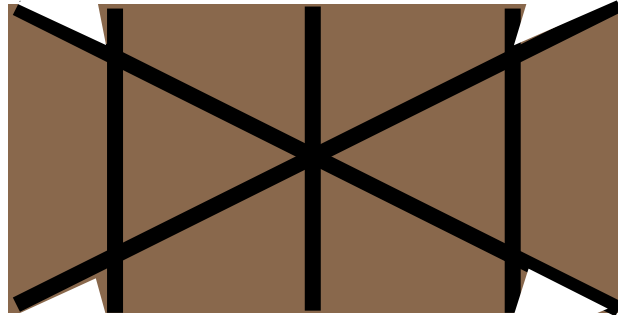
- Create a cardboard popper by grabbing a rectangular piece of cardboard (Mine was 8” by 5”), a pen or marker, scissors, and a rubber band.
- Using the marker, draw a large X across the cardboard reaching from one corner to its diagonal partner.



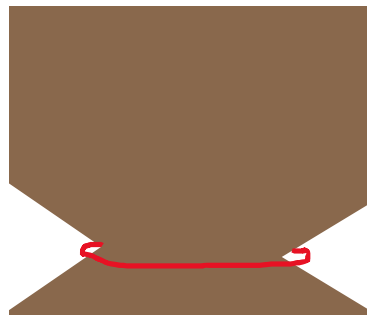
- Then draw 2 vertical lines on either end of the cardboard, creating small triangles in each of the corners.



- Next, use your scissors to cut out each of these small triangles and draw one more vertical line right down the middle



- Fold the piece of cardboard in half down the middle line. Then wrap the rubber band around the ends of all 4 cutouts cardboard cut outs.



- This is where we begin to USE THE FORCE. **Push** your popper down flat, by applying pressure. This force will cause the rubber band to stretch out. Once the force you are exerting down onto the popper is release, the opposing force of the rubber bands will cause the popper to contract and lift off into the air!

Observations:

How high did your popper go? Can you use a door frame or a stack of books to measure how high it popped into the air?

Can you explain if the forces acting on the popper are balanced or unbalanced when we are pushing down on it, causing the rubber band to

stretch? What about when we release and the popper lands? What force caused the popper to come back down?

Additional Challenge:

See if you can make your popper's jump height change. What are some ways you could make the popper jump higher?

What would happen if...

- You added a second rubber band?
- A thicker piece of cardboard?
- Make the popper smaller?