

Force and Friction Mini Labs

1. **Jenga** – Each person takes turn removing a piece from the Jenga stack of blocks. You cannot take a piece that is on the top 2 floors. After you remove a piece, you must place it on the very top. After playing a game answer the following questions:

- a. What makes the stack unstable or unbalanced?



2. **Balance Eagle with magnets on wings**

- a. Move the magnets to make the eagle “nose dive”.
Where did you put the magnets?



- b. Move the magnets around to make the eagle flat.
Where did you put the magnets?

3. **Red Solo Cup Activity** – Each person uses a string to pull the rubber band so that they can place it over a cup and pick up the cup. Pick up each cup and place them into a pyramid.

- a. What happened if one person pulls too hard on the string?



- b. What type of force does your team need to be able to pick up a cup?



4. **Cooperation Bands** – Each partner gets into the band and use your body to keep the band from falling. Have each person pull as hard as possible one direction and the other person pulls the other direction. Note what type of shoes each person is wearing and the average size of each person. **Who wins?**



5. **Balance Games/Activities** – Play with the **various** balance games.



- a. What makes them unbalanced?

6. **House of Cards** – Build the tallest house of cards that you can.

- a. What is the tallest house of cards you built?

- b. What does it take to build the tallest house?



7. **Balanced and Unbalanced Forces** - Put on the **Oculus Quest** and run the app. The purpose of the game is to get the orange blocks on top of each other in a balanced manner to make a very tall tower. What is the tallest tower you created?

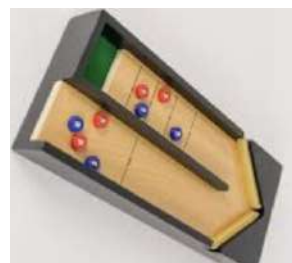
8. **Self-balancing boards** - Turn on the hoverboard by pushing the button. Stand on the hoverboard.



- What happens if you slightly push one of your feet forward (front of foot downwards)?
- What happens if you push both of your feet forward (front of feet downwards)?
- What happens if you push both of your feet backwards (heel downwards)?

9. **Friction Games/Activities** – Play with the various friction games

- How is friction helpful in these games?



10. **Frictional Forces - Hovercraft** - Turn on the leaf blower. Stand on the hovercraft and try to get it to balance. Have a partner give you a small push. What's happening?



11. **Field Force - Iron Filing/Magnets** – Place magnets under a piece of clear plastic and sprinkle iron filings to see the magnetic field.

- Draw the magnetic fields



- Use the mini rake to move around the iron filings and the magnets in the “magnetic garden”.

What do you observe?



12. **Field Force – Van De Graaf** – Get your arm hair near the Van De Graaf. What do you feel?

