

Center of Gravity Lab

Activity 1: Lifting a chair

Materials:

- A wall
- A chair

What to Do:

1. Stand exactly 2 foot lengths away from a wall.
2. Bend over with a straight back and let your head lean against the wall.
3. Lift a chair that is placed beneath you while your head is still leaning against the wall.
4. With the chair in the lifted position, attempt to straighten up.
5. Were you successful in lifting the chair? Why do you think this is so?

6. Observe your classmates attempting this activity. Are males or females typically more successful at this activity? Why is this?

Activity 2: Tipping the chapstick

Materials:

- A tube of chapstick

What to Do:

1. Kneel on the floor and stand the tube of lipstick up exactly 1 forearm length (from your elbow to the tip of your middle finger) away from your knee.
2. Sit up and lock your hands behind your back.
3. While keeping your hands locked behind your lower back, lean forward and knock the tube over with your nose.

4. Were you successful in tipping the tube? Why do you think this is so?

5. Observe your classmates attempting this activity. Are males or females typically more successful at this activity? Why is this?

Activity 3: Touch your toes

Materials:

- A wall to lean against

What to Do:

1. Stand with your heels and back against a wall and try to bend over and touch your toes.
2. Were you successful in touching your toes? Why do you think this is so?

3. Observe your classmates attempting this activity. Are males or females typically more successful at this activity? Why is this?

Activity 4: Leaning Through a Wall

Materials:

- A wall to lean against

What to Do:

1. Stand next to a wall with your right shoulder, hip, and foot against the wall.
2. Try lifting your left leg. What happens?

Activity 5: Sit Down Stand Up

Materials:

- A chair

What to Do:

1. Sit in a chair with your back straight, your arms hanging straight at your sides, and your feet flat on the floor.
2. Try to stand up without leaning forward and without using your hands.
3. How would you sit in a chair if you wanted to be prepared to get up quickly? Why?

Activity 6: The Football Lineman and the Ballerina

Materials:

- Pairs of people

What to Do:

1. Stand on one foot and try to keep your balance while someone gives you a gentle push. How easy is it to resist falling?

2. Now take a position supported by two feet spread apart and one hand in front – the three point stance of an offensive lineman in football. How easy is it in this case to resist the push and maintain a stable position?

Activity 7: Balance the Body

Materials:

- A wall to lean against

What to Do:

1. Stand on your toes. Put the tips of both feet against a wall and try to stand on your toes again.
2. Were you successful? Why or why not?

Activity 8: Birds and Widgets

Materials:

- Two center of gravity birds
- A widget
- A belt

What to Do:

1. Place the bird's beak on the tip of your finger.
2. Place the belt in the widget and place the widget on the end of your finger.
3. Why do both the bird and the widget balance on the end of your finger?

Activity 9: Center of Gravity of an Object

Materials:

- 2 irregular plastic shapes
- plumb bob
- Hanging stand
- Ruler

What to Do:

1. Trace one irregular shape in the space provided.

2. Place your shape on the hanging stand by a corner.
3. Place the plumb bob on the hanging stand.
4. Draw with a ruler the plumb bob line on your traced shape.
5. Hang your same shape from a different corner.
6. Repeat steps 2-4, each time hanging your mass from a different corner.
7. Locate the center of gravity of the irregular shape.
8. Why is the center of gravity of your object located where the lines intersect?

9. Can the center of gravity of an object be located outside of the object? Give at least three examples.
