

Grade 7 Science – Activities for Stability

Name: _____ Class: _____ Date: _____

There are several concepts to what provides stability for structures. We will do a few activities that will show each one.

Activity #1 In this activity, we will test the stability of different stances in teams of two or three. Please be careful with one another as this is an activity that could result in injuries if not done correctly.

For each of the following positions, predict the ease with which a person can be tipped over (i.e., how stable are they). Try to explain why you think that. When finished, test to see if you were right.

Position	Predicted stability	Actual Stability – Why?
Standing – feet together 		
Standing – feet apart 		
Standing – on one foot 		
Crouching feet apart 		

Activity #2 For the next activity, we will have one student in the team sit in a chair and another student will place their hand gently on the seated student's forehead. The seated student will try to stand up. With a slight force, the student will be prevented from sitting up since they must lean forward to sit up.



Using the terms *balance*, *force*, and *centre of gravity*, Why is it difficult to stand up from the seated position with a person's hand on your forehead?

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Activity #3 Stick-slip phenomenon – here we will use a ruler balanced on either end on a finger. Slowly bring your fingers together and see what happens. What did you notice and why?

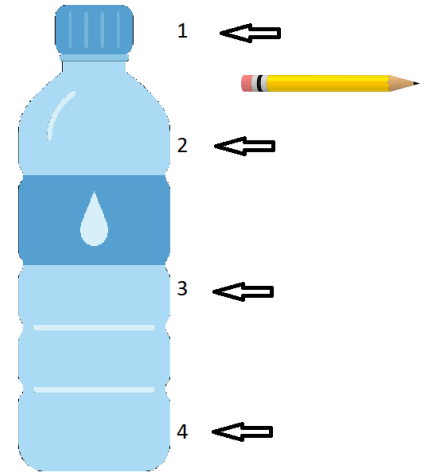
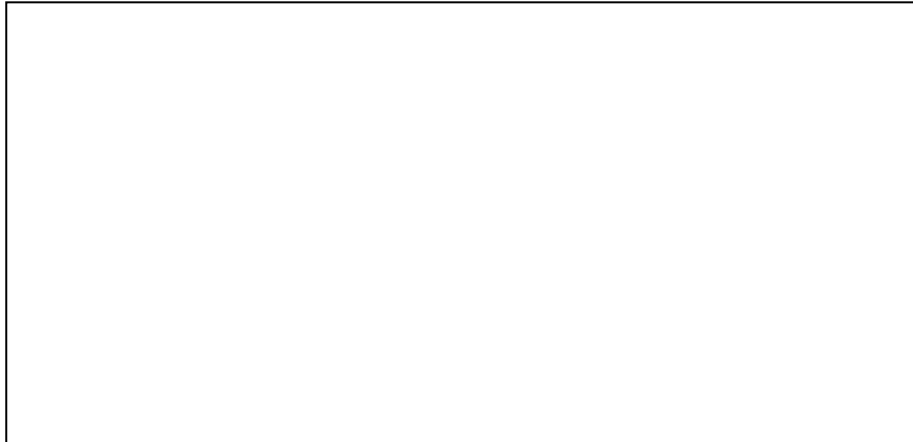


What did you observe?

What is your explanation bases on *friction*, *force*, *balance* and *centre of gravity*?

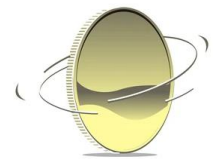
Activity #4 Point of application of force push a full bottle of water bottle at the points indicated in the picture.

What happens as you move the application of force from the bottom to the top of the water bottle (from point 4 to point 1)? Explain using your understanding of *center of gravity*, *forces* and *balance*.



Activity #5 Stability from spinning (Gyroscope) A spinning object has more stability than a stationary object.

Take a coin and try to balance it on its edge.
Next, spin the coin and see if it will stay up longer.
Do this with a spinning top or a basketball and see what happens.



Does this surprise you? How can you explain this with respect to *balance*, *symmetry*, *forces* and *center of gravity*?

