

What is going on ?

Weightlessness is a condition in which a body experiences no gravitational weight. But that does not mean there are no forces working. A body only then is really weightless when it falls freely under the influence of the gravity.

When you hold the plastic tube and lead ball assembly hanged over the pulley (step 2), you will be able to see the lead ball through the opening of the plastic tube, as the spring gets stretched due to the gravitational pull of the lead ball.

when you release the tube and lead ball assembly, gravity accelerates the tube, spring and lead ball with the same rate, towards the ground. There is no force that acts on the spring. Therefore spring contracts. The ball hides itself in the tube. This proves weightlessness of the ball when it falls freely.



Seven astronauts – Rick Husband, William McCool, Ilan Ramon, Michael Anderson, David Brown, Kalpana Chawla, and Laurel Clark



WEIGHTLESSNESS

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WEIGHTLESSNESS Freely falling bodies do not experience weight.

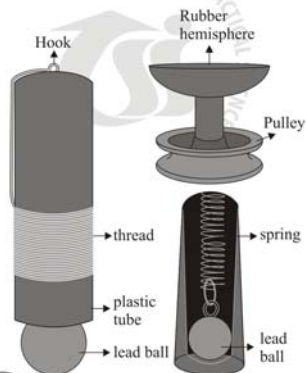
Assembly:

1. Pulley & hemisphere assembly

Consists of a rubber hemisphere of diameter 55 mm, handle of length 20 mm and of dia 12 mm. A pulley of 50 mm in diameter, is fixed to the handle of the hemisphere using a bolt.

2. Plastic tube and lead ball assembly.

Consists of a plastic tube of dia 35 mm and 90 mm in length. A lead ball of 50 gm wt. is fixed inside the closed end of the tube using a spring (of dia 15 mm x length 15 mm). Also a thread of 2 m in length is fixed on the outside the closed end of the tube using a hook.

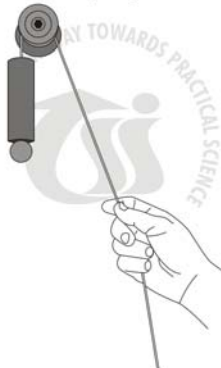


To do and observe :

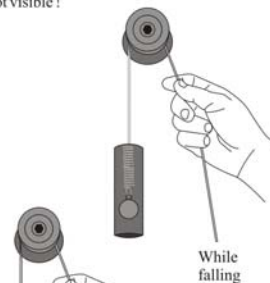
Step 1 : Fix the pulley and hemisphere assembly on any smooth surface (smooth wall, black board or door panel) by pressing the hemisphere against that surface.



Step 2 : Hang the plastic tube and lead ball assembly on the pulley using the thread (as shown below) by holding the free end of the thread in your hand. Observe that the lead ball is visible from the opening of the tube.



Step 3 : Now release the thread suddenly and allow the tube and lead ball assembly to fall, through maximum possible length. While falling you will observe that the lead ball is not visible !



While falling



At the end

Note : Repeat step 3 several times, so that students can observe it.