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A Magic Trick On Thermal Expansion

If you want to learn a magic trick, try the Magic Jumping Coin Experiment! Gather your friends and show them something their eyes might not be able to believe but science can explain!



Magic Jumping Coin Experiment, jin.thai

Here's what you'll need to do the trick:

- Cold water in a container
- Glass soft drink/soda bottle with a small mouth
- Coin slightly bigger than bottle opening

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Procedure

Allot 15 to 20 minutes to complete the Magic Jumping Coin experiment.

First, fill a container with ice cold water. Put the bottle in the water upside down, so the bottleneck is in the ice cold water. Put the coin in with the bottle. Chilling both the glass bottle and the coin in the ice cold water is important, do not fill the bottle with water. Chilling the bottleneck and the coin will allow the top of the bottle to have that airtight seal when you place the coin on the mouth of the glass bottle.

Next, wrap both your hands around the body of the bottle and observe the behaviour of the coin. Afterwards, release the bottle from your grip and observe what happens to the coin.

Discussion

As observed, the coin began to jump up and down about 15 seconds after you wrapped your hands around the body of the bottle. Even after you removed your hands, notice that the coin still vibrated and jumped up and down on the opening of the bottle.

The behaviour of the coin can be explained by the concept of thermal expansion. Thermal expansion happens when heat is applied to matter. When subjected to heat, the matter changes in volume as its particles begin to move around. This is when we notice that matter expands.

In the beginning of the Magic Jumping Coin experiment, both the air and the bottle are cold because of the cold water. As soon as you placed your hands around the body of the bottle, the air started to heat up causing thermal expansion to take place. As the air molecules expand, it pushes its way out of the bottle thus causing the cover, in this case the coin, to vibrate or jump up and down. This is what makes your coin magically jump! The coin will only stop jumping when the air inside the bottle eventually cools down.

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