

# Bouncing rubber

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Slime balls bounce better when cold. I wonder what rubber balls do? Do they bounce better after being in the fridge or after being put in hot water?



Two different rubber balls are on the table. The small solid transparent “bouncy ball” is made from a resilient synthetic rubber like Polybutadiene. The larger pink ball with the soft plastic cover is full of sponge-rubber.

We dropped the two balls at room temperature (25 °C) from the same height of 180 cm and noted the rebound heights.

The “bouncy ball” bounced back to 130 cm.

The sponge-rubber ball bounced back to 50 cm.

We half filled the jug with water and heated it to 65°C, the temperature at which adults drink tea. We floated both balls in the water for five minutes to warm them up, took them out one at a time with a spoon and quickly dropped them on the tiled floor from 180 cm.

The “bouncy ball” bounced back to 140 cm.

The sponge-rubber ball bounced back to 70 cm.

Both rubber balls bounced higher at the higher temperature, unlike slime which bounces higher at lower temperatures.

## Questions

Why did the sponge rubber ball show a bigger percentage change than the solid ball? Has that got anything to do with the air filling?

Do all rubber balls behave like this? What about solid balls made from natural rubber (latex), and what about hollow rubber balls like squash balls and basketballs?

What about plastic balls: solid plastic beads, hard hollow plastic balls, table tennis balls and soft inflated plastic beach balls?

Lead bells are said to ring, and small lead balls are said to bounce well when cooled in liquid air. If that is true do all metal balls bounce better when cold?

*There are lots of experiments we could do. Which ones might be the most interesting?*