Science fair projects with sports balls: bounce, temperature and grip

Peabody blog · Science · updated 2026-10-31

Six sports science fair projects that test the ball and the shoe, never the player: which ball bounces highest, does a cold ball bounce lower, which shoe grips a slope.

The best sports science fair projects test the equipment, not the athlete: which ball bounces highest, whether a ball dropped from higher bounces higher, whether a cold ball bounces lower than a warm one, and which shoe grips a slope best. Six of Peabody's projects test a ball or a shoe, from kindergarten to 8th grade. Each takes under an hour, four cost nothing, and the only equipment is a tape measure taped up a wall.

I gathered them on Peabody's sports page, each with the hypothesis frame, the steps, a results table and a board plan. Here's the list, how to get a bounce height you can trust, and why the player stays out of it.

Six projects with balls and shoes

- Project: Which ball bounces the most times? · Grades: kindergarten · Testing: 20 min · Cost: free · What changes: tennis, rubber and foam ball, bounces counted
- Project: Which floor makes a ball bounce highest? · Grades: 1st–5th · Testing: 40 min · Cost: free · What changes: carpet, hard floor, a folded towel
- Project: Does a ball dropped from higher bounce higher? · Grades: 1st–5th · Testing: 40 min · Cost: free · What changes: dropped from 25, 50, 75 and 100 cm
- Project: Which kind of ball bounces highest? · Grades: 1st–4th · Testing: 40 min · Cost: about $3 · What changes: tennis, rubber, foam and ping-pong ball
- Project: Which shoe grips a slope best? · Grades: 4th–8th · Testing: 40 min · Cost: free · What changes: a sneaker, a boot and a sandal
- Project: Does a cold ball bounce lower than a warm one? · Grades: 4th–8th · Testing: 60 min · Cost: about $3 · What changes: cold from the fridge, room, warm from warm water

Getting a bounce height you can trust

All the bounce projects (except kindergarten's, which counts bounces) measure the same thing: how high the ball comes back up. That number is easy to get wrong, so the steps are the same in every one:

1. Tape a tape measure up a wall, with 0 at the floor.
2. Hold the ball with its bottom at the mark (100 cm in most of them).
3. Let go. Don't throw it. Opening your hand is the only way every drop starts the same.
4. Stand on the floor. Never climb to get higher. Every project's safety strip says so.

5. A helper crouches by the tape and watches the bottom of the ball at the top of its first bounce. Eye level matters: from above, the ball looks higher than it is.
6. Three drops at every level, then the middle number, or the mean from 4th grade.

The cold ball: the one for older kids

Does a cold ball bounce lower than a warm one? is the most interesting of the six, and it fits 4th to 8th grade. Read the room's thermometer and drop the ball three times from 100 cm. Then seal it in a zip bag and leave it in the fridge, next to the thermometer, for 15 minutes; take it out and drop it three times in under a minute, before it warms up. Then float it, still in its bag, in a bowl of water warm like a bath (never hot) for 15 minutes, and drop it three more times. Write each temperature down: the line graph has degrees along the bottom and bounce height up the side.

Cold rubber is stiffer and less springy, and the air inside a cold ball pushes back less, so it usually bounces lower. For 7th and 8th grade, the second test adds a second kind of ball at the same three temperatures and graphs each one's bounce height divided by its drop height, so balls of different bounciness can be compared fairly.

The shoe on a slope

Which shoe grips a slope best? measures grip without anyone running or slipping. Tape one end of a big piece of stiff cardboard to a table, set a sneaker on it pointing down the slope, and lift the free end very slowly. The moment the shoe starts to slide, hold still, and a helper measures straight up from the table to the lifted end. The higher the board goes before the shoe slides, the better the grip. Three tries each for a sneaker, a boot and a sandal, then a bar graph. The second test puts 20 pennies in each shoe: does more weight change the slope?

The ball, never the player

It's tempting to time a sprint in different shoes, or count how many catches someone makes with each ball. Those projects test a person, and people as the thing being tested need a review before the project starts. The UNM STEM-H Center's K–5 fair rules (revised 11 August 2022, read 31 October 2026) say every project with human subjects needs a review board's approval first, and signed consent from everyone in it. Testing the shoe on a board and the ball against a wall gets the same science without any of that, and without anyone getting hurt chasing a result.

Try tonight

Tape a tape measure up a wall with 0 at the floor. Hold a ball with its bottom at 25 cm and let go; a helper crouches by the tape and reads how high the bottom of the ball gets on its first bounce. Three drops from 25 cm, then three each from 50, 75 and 100 cm. That's Does a ball

dropped from higher bounce higher?, and a 1st grader can do every drop.

Questions grown-ups ask

Which ball should we use?

For the single-ball projects, whatever bounces well on your floor: a tennis ball or a rubber ball. Use the same ball for every drop. For the ball-kind project, the four balls are the thing you change.

Can we use a basketball?

Any ball works if it's the same ball for every drop and light enough to hold steady with its bottom at the mark. A tennis ball or a rubber ball is easiest for a young child to let go of cleanly.

Is this physics?

Yes: energy, springiness and friction. The physics projects post has more in the same family.

Peabody (peabody.kids) is free through the end of 2026, with no ads and no sign-up, and nothing a child taps on the science fair pages is sent anywhere. The library has stories by reading level for after the balls go back in the cupboard.

Free at peabody.kids/blog/science-fair-projects-with-sports-balls