



What Surfaces Affect A Basketballs Bounce

I will be testing what kind of materials will make a basketball bounce higher! Here are some things to note! Each ball will be dropped at 76 inches (6 feet and 4 inches). Each drop will be measured in feet. (These test will not apply any force to the basketball.)

Something to know before you read this presentation is the size of the basketballs (29.5, 28.5, and 22) are all measured by the circumference of the basketball. The basketball were all the same material and they were all an outdoor balls because of some of the circumstances. And the last and finally thing to note is that we were not able to measure the basketball's air pressure but the were all about the same.



Introduction

I will be testing what kind of things make a basketball bounce higher! I will be observing different materials like grass, brick, foam, and etc..., and the size of a basketball! Here is some of the research done for this project.

- **What I looked up is will a bigger basketball bounce higher or lower than a smaller basketball? A heavier basketball will bounce higher because it has more kinetic energy and it has more air pressure.**
- **The next thing I looked up is If you bounce a basketball on cardboard will it make it bounce higher? It says a basketball will bounce significantly lower than usual because most of the energy is absorbed into the cardboard.**
- **The next thing I looked up is will a basketball bounce higher if it bounces on wood metal or brick? Says that metal and brick bounce higher because it has less absorption than wood.**
- **The final thing I looked up was will a basketball bounce higher on grass? This is kind of surprising what I found but it says it would bounce lower because it absorbs most of the energy.**



Question/Problem

- How will it affect a basketballs bounce on the size of a basketball?
- What materials will make a basketball bounce higher? For example: cardboard, foam, wood, brick, grass, and metal.



Predictions

- Question: Will a 29.5 size ball bounce higher than 28.5 size basketball or a 22 size basketball?
 - Prediction: I think a 29.5 size basketball would bounce higher than a 28.5 size basketball because a 29.5 sized ball could store more kinetic energy but I also think the smaller basketballs could bounce higher because they have less mass.
- Question: Which of the three basketballs (29.5, 28.5, 22 size basketball) bounce higher on cardboard.
 - I think a piece of cardboard would help most basketballs bounce higher because it's not as solid as the brick, wood, and metal, it's a lot squishier so I think it will give it a little boost.
- Question: Which of the three basketballs (29.5, 28.5, 22) will bounce higher on wood, brick, and grass
 - I think a any of these sized basketballs will bounce the same height from wood, brick, and grass because it kinda has the same material because they're both pretty hard and I don't think basketball all bounce higher on either of those materials. They may have a little change but I doubt that there will be a major change.

Materials



- Basketball (Use sizes 29.5, 28.5, and 22)
- Backyard
- Basketball court
- Wood
- Fake grass
- Bricks
- Air pump
- Tape
- Cardboard
- Phone
- Helper
- Pen





Procedure

- 1. Prepare materials that are shown above.**
- 2. Grab a tape measure and start taping a wall with the measurements up to four to five feet.**
- 3. Lift the ball as high as you can above your head over your choices material.**
- 4. Drop the basketball over your chosen material while having someone film it.**
- 5. Watch it back a couple of times and add the measurements onto a paper, graph, table, or whatever you would like to add your data in.**



Variables to be tested

Manipulated Variable: Every material that will make the basketball bounce a different height each time.

Responding Variable: The height that the basketball will bounce.

Controlled Variables: The basketball will be dropped from the same height every single time.

Data Table and Graph

	A	B	C	D	
1		Full Size Basketball 29.5	Youth Size Basketball 28.5	Mini Basketball	
2	Optimal PSI	7.5 to 8.5			
3	Measurement tool	Feet			
4	Wood Flooring	3.8	4	3.6	
5	Outdoor Brick	4.1	4.1	3.8	
6	Outdoor turf	3.1	3.7	3.1	
7	Cardboard	3.7	3.8	3.6	
8	Average	3.675	3.9	3.6	



Conclusion

The conclusion for this test is that softer material will absorb the ball's energy making it not jump as high. Overall a 29.5 size basketball will bounce higher on outdoor bricks at 4.1 feet. A 28.5 size basketball will bounce higher on bricks at 4.1 feet. And lastly a mini size basketball will bounce higher on bricks at a height of 3.8. The average bounce of a 29.5 size basketball is 3.675. The average bounce of a 28.5 size basketball is 3.9 ft. The average bounce of a mini basketball was 3.6. The brick definitely had the greatest impact on the basketball bounce and the 28.5 size basketball had bounced the highest in these tests.



Implications and ideas for future research

This research is valuable to players, coaches, and parents trying to get their kid started. It can tell these people whether do their dribbling drills on grass or a material that's a little more harder. It also tells these people where to practice at or if they are practicing on a softer material it helps them adjust how hard they are dribbling.

Scientists can use this research for when they're inventing a basketball. This research tells them how they invent the basketball. For example, how they need to make the texture to prevent the ball not bouncing as high on soft surfaces.

Journal

My Science Project Journal:

Ideas of things I would like to investigate: *Please list all topics that interest you*

How will it affect a basketball's bounce on the size of a basketball? What materials will make a basketball bounce higher? For example: cardboard, wood, brick, grass, and maybe metal.

Question I am going to test:

I am going to test What Factors Affect a Basketball's Bounce. How will it affect a basketball's bounce on the size of a basketball? What materials will make a basketball bounce higher? For example: cardboard, foam, wood, brick, grass, and metal.

Research:

The third thing I looked up is will a bigger basketball bounce higher or lower than a smaller basketball? A heavier basketball will bounce higher because it has more kinetic energy and it has more air pressure. The fourth thing I looked up is If you bounce a basketball on cardboard will it make it bounce higher? It says a basketball will bounce significantly lower than usual because most of the energy is absorbed into the cardboard. The 5th thing I looked up is will a basketball bounce higher if it bounces on wood metal or brick? Says that metal and brick bounce higher because it has less absorption than wood. The sixth and final thing I looked up was will a basketball bounce higher on foam or grass? This is kind of surprising what I found but it says it would bounce on foam higher because it's harder than grass and it won't absorb as much energy.

My variables:

Manipulated Variable: Every material that will make the basketball bounce a different height each time.
Responding Variable: The height that the basketball will bounce.
Controlled Variables: The basketball will be dropped from the same height every single time.

My Hypothesis:

I think a piece of cardboard would help it bounce higher because it's not as solid as the brick, wood, and metal. I think If you had foam under basketball and bounced it I think it would bounce higher because it is a lot squishier than all the other materials. I think a basketball will bounce the same height from wood, brick, grass and metal.

Materials List:

- Basketball (Use sizes 29.5, 28.5, and 22)
- Backyard
- Basketball court
- Wood
- Fake grass
- Bricks
- Air pump
- Tape
- Cardboard
- Phone
- Helper
- Pen

Procedures:

1. Prepare materials that are shown above.
2. Grab a tape measure and start taping the wall with the measurements for up to four to five feet.
3. Lift the ball as high as you can above your head over your choices material.
4. Drop the basketball over your chosen material while having someone film it.
5. Watch it back a couple of times and add the measurements onto a paper, graph, table, or whatever you would like to add your data in.

Timeline of Experiment:

October: Research and my hypothesis

November: Collect Materials

December: Test my hypothesis

January: Build and Present my presentation

Journal

	A	B	C	D	
1		Full Size Basketball 29.5	Youth Size Basketball 28.5	Mini Basketball	
2	Optimal PSI	7.5 to 8.5			
3	Measurement tool	Feet			
4	Wood Flooring	3.8	4	3.6	
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6	Outdoor turf	3.1	3.7	3.1	
7	Cardboard	3.7	3.8	3.6	
8	Average	3.675	3.9	3.6	

Data Paragraph:

Overall a 29.5 size basketball will bounce higher on outdoor bricks at 4.1 feet. A 28.5 size basketball will bounce higher on bricks at 4.1 feet. And lastly a mini size basketball will bounce higher on bricks at a height of 3.8. The average bounce of a 29.5 size basketball is 3.675. The average bounce of a 28.5 size basketball is 3.9 ft. The average bounce of a mini basketball was 3.6.

Analysis of data:

The brick definitely had the greatest impact on the basketball's bounce and the 28.5 size basketball had bounced the highest in these tests.

Conclusion:

The conclusion for this test is that softer objects absorb the ball's energy making it not jump as high. Overall a 29.5 size basketball will bounce higher on outdoor bricks at 4.1 feet. A 28.5 size basketball will bounce higher on bricks at 4.1 feet. And lastly a mini size basketball will bounce higher on bricks at a height of 3.8. The average bounce of a 29.5 size basketball is 3.675. The average bounce of a 28.5 size basketball is 3.9 ft. The average bounce of a mini basketball was 3.6. The brick definitely had the greatest impact on the basketball's bounce and the 28.5 size basketball had bounced the highest in these tests.



Bibliography

Resources used

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