

Investigation Plan for the Extended Experimental Investigation

Student name:

Date:

Class:

Research Question:

How does the surface effect how a bouncy ball bounces

Equipment and materials request:

Sand plastic ruler
Water wood Camera
Concrete Bouncy ball

Proposed method:

Get a ruler and start recording, drop it from the top of the ruler while the ruler is straight up. Then put the video into slow motion and see how high it bounces



Approved by:

Date:

Extended Experimental Investigation Report

Name: Oisín Argand

Start Date 29 / 1 / 20

Circle the appropriate Topic You are working under

Water

Earth/Moon/Sun system

Food

Plant growth and behaviour

Chemical reactions

Plastics

Forces

Energy conservation

My Question:

How does the surface effect how (high) low
high a bouncy ball bounces

The Reason that YOU are interested in this question is

I would like to see how (the) different materials
would affect how a ball bounces

leave blank if there is no reason

My Hypothesis:

An idea you can test based on a reasoning you made.

If it bounces on flatter surfaces then it will
bounce higher

Variables (things you can measure & control)

What measurements will you make

How high the ball bounces

What factors will you change

The material it

What factors will you keep the same

How high the ball is bouncing from, the ball
itself

Where did you hear about this project

We thought of it as a group

Background Research:

what research on this investigation did you do, and how did you do it?

List all your sources, be as detailed as possible!

E.g. I saw this experiment in our science book 'Nature of Science' by Clougher, Fleming and Bean.

I saw a video of experiments on youtube: https://youtu.be/4JDWv_ZE4A

Then i searched for other videos that featured the bit i liked and found this video

<https://youtu.be/a2meoKToPi4> that told me what i needed to do.

We see friction in this project. Friction is the force that resists motion when the surface of one object comes in contact with the surface of another (BYJU'S). Rougher surfaces exert more friction than smoother surfaces (Blue Scientific)

Equipment Needed:

meter stick, camera, ~~rock~~ rock salt, wood, water, concrete, metal, bowl

Risk Analysis (is there any possible danger to you or others)

No risk

Method 1 : List the tasks you need to complete to test your hypothesis.

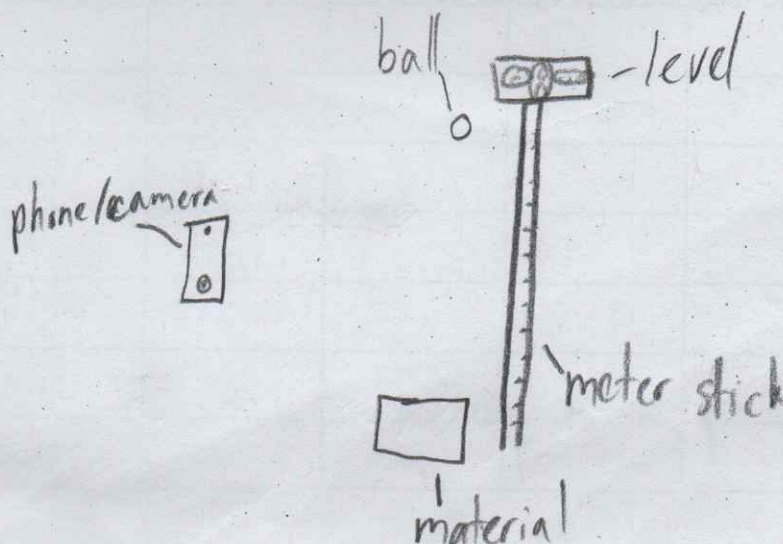
(Plan how you intend carrying out the investigation) NUMBER these TASKs

1. Obtain the materials
2. Set up the meter stick up straight using the level
3. Place in the material
4. Begin the recording on the camera
5. Drop the ball from the top of the meter stick
6. Record the number it bounces to
7. Subtract that number from 100 as you have
8. Add 2 to see how high it bounced
9. Repeat with new material

Managing risk, what PRE-CAUTIONS will you observe before attempting this investigation

Not much risk, no pre-cautions needed

Space for Labelled diagram of progress so far



Method (write it out this time in detailed, numbered steps)

The first step was to obtain the materials. We gathered materials in school and at home. For the water, we filled a basin with water. The second step was to set up the meter stick, making sure it was straight with ~~the~~ the level. We sat the level on top and made sure the bubbles were aligned. We also double checked by looking at it from different perspectives. Thirdly, then, we put the material beneath the meter stick, making sure it was still straight. The fourth step was recording. One of us sat around 20 cm away from the ball and recorded using their phone camera, making sure to keep it as upright as possible. The fifth step was to drop the ball, which we did from the top of the meter stick. After it had bounced, we stopped the recording and rewinded to the point where the ball was the highest, allowing us to complete the sixth step of marking down the bounce height. ~~The~~ The seventh step was to subtract that number from 100, as 100 cm was at the bottom of the meter stick. In the eighth step, we added two to that number because there were an extra two centimeters at the bottom of the stick, giving us our final bounce height. The ninth and final step is to repeat steps three through eight until there were no new materials left.

Space for Labelled diagram of progress so far

Results: Put your results into tables

R	Rock Salt	5 cm	+ 2 cm	7 cm			
R	Foam	26 cm	+ 2 cm	28 cm			
R	Sandpaper	70 cm	+ 2 cm	72 cm			
F	Wood	76 cm	+ 2 cm	78 cm			
F	Metal	75 cm	+ 2 cm	77 cm			
R	Cotton	46 cm	+ 2 cm	48 cm			
F	Lid	10 cm	+ 2 cm	12 cm			

tot	Water	11 cm	+ 2 cm	13 cm			
	Flat surfaces	18	77	12	WPA		55.67
	Rough surfaces	5	26	70	46		36.75

Results Explained: (What do your tables /graphs show?)

Many of the attempts ended with the ball bouncing around 75 cm. Sandpaper, wood and metal were all very close to that. Flat surfaces on average bounced nearly 92 cm higher than rough surfaces.

Conclusion: (Restate the hypothesis to show your findings)

My hypothesis was correct. Flat surfaces had a higher bounce height than rough surfaces by an average of 20-92 cm.

Comments/Observations: (Did you notice anything interesting when doing your investigation? This will help your reflection later on)

Water bounced pretty high. A lot of them bounced around 75 cm.