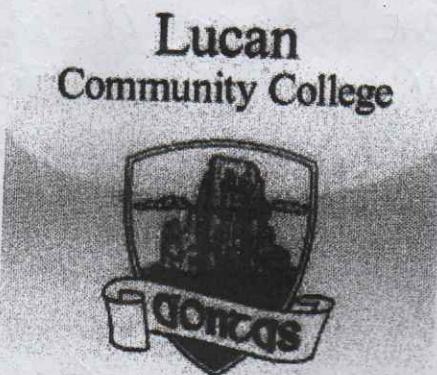


# **Lucan Community College**

## **2<sup>nd</sup> Year Science**

### **CBA 2026**



**Student Name:** Oisin Argand

**Class:** Armstrong

**Group members:** Ryan Wallace and Lee

**Descriptor Awarded:**

### A. Questioning and Predicting

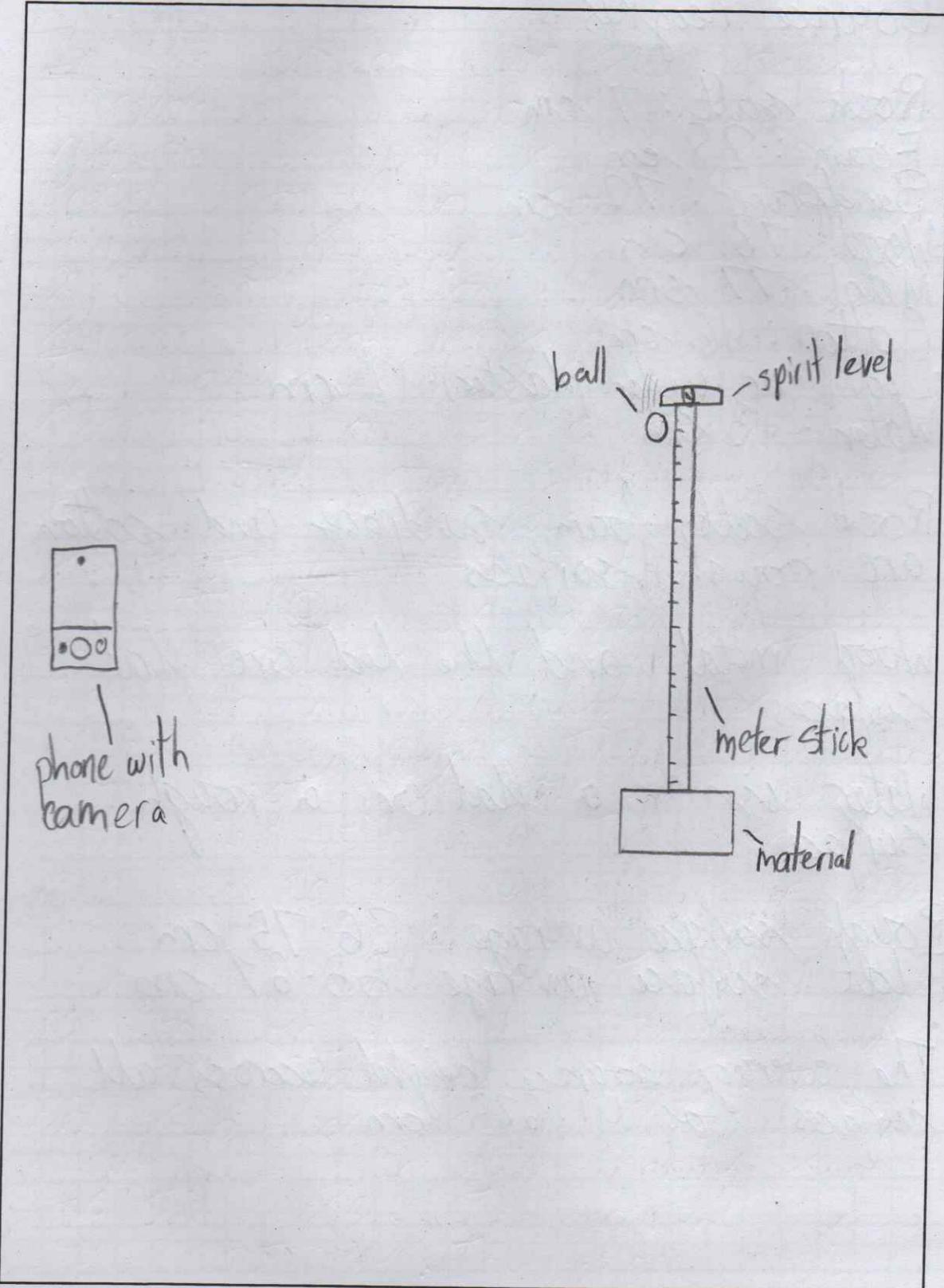
The topics I chose were forces and energy conversions. My question was "How does the surface of where a ball bounces effect how high the ball bounces." The reason that I was interested in this was because I was curious to see the difference in bounce height between different surfaces. My hypothesis was "If a ball bounces on a flat surface then it will bounce higher than if it bounces on a rough surface." The variables can be divided into three groups. The independent variable was the material that made up the surface that the ball bounced on because it changed if. The dependant variable was how high the ball bounced because I measured it. The controlled variables were the ball, how high I dropped it from and the conditions in the room because they stayed the same. We thought of the project ourselves, as a group (me, Lee and Rian).

## B. Planning and Conducting

In the project, we saw friction. Friction is the force that resists motion when the surface of one object comes in contact with the surface of another.<sup>1</sup> Rougher surfaces exert more friction than smoother surfaces<sup>2</sup> which helps my hypothesis. The equipment needed was a meter stick, a phone with a camera, rock salt, wood, foam, sandpaper, metal, cotton, a lid, a basin, water, a ball (~~and spirit level~~) and a spirit level. There was no risk involved so no precautions were needed. The first step in the method was to obtain the materials. They were gathered from school and home. The basin was filled with water. The second step was to set up the meter stick. Making sure to make it straight with the spirit level. The level was sat on top of the meter stick and the bubbles inside were aligned. The third step was to put the material beneath the meter stick making sure it was still upright. The fourth step was recording. The phone with the

camera was set up around 30cm from the material. A recording was started and the phone was held as upright as possible. The fifth step was to drop the ball from the top of the meter stick. After it bounded, the recording was stopped and rewinded to the point where the ball was highest. The sixth step was to mark down the number on the meter stick that the ball reached in its bounce. The seventh step was to subtract that number from 100, as 100 was at the bottom of the meter stick. The eighth step was to add two to that number to account for an extra two centimeters at the bottom of the meter stick, resulting in the final bounce height. The ninth and last step was to repeat steps three through eight, making slight adjustments for different materials, until all the materials had been tested.

## Diagrams



Recorded Data

Bounce heights:

Rock salt : 7 cm

Foam : 28 cm

Sandpaper : 72 cm

Wood : 78 cm

Metal : 77 cm

Cotton : 46 cm

Lid (air under plastic) : 12 cm

Water : 13 cm

Rock salt, foam, sandpaper and cotton  
are rough surfaces

Wood, metal, and the lid are flat  
surfaces

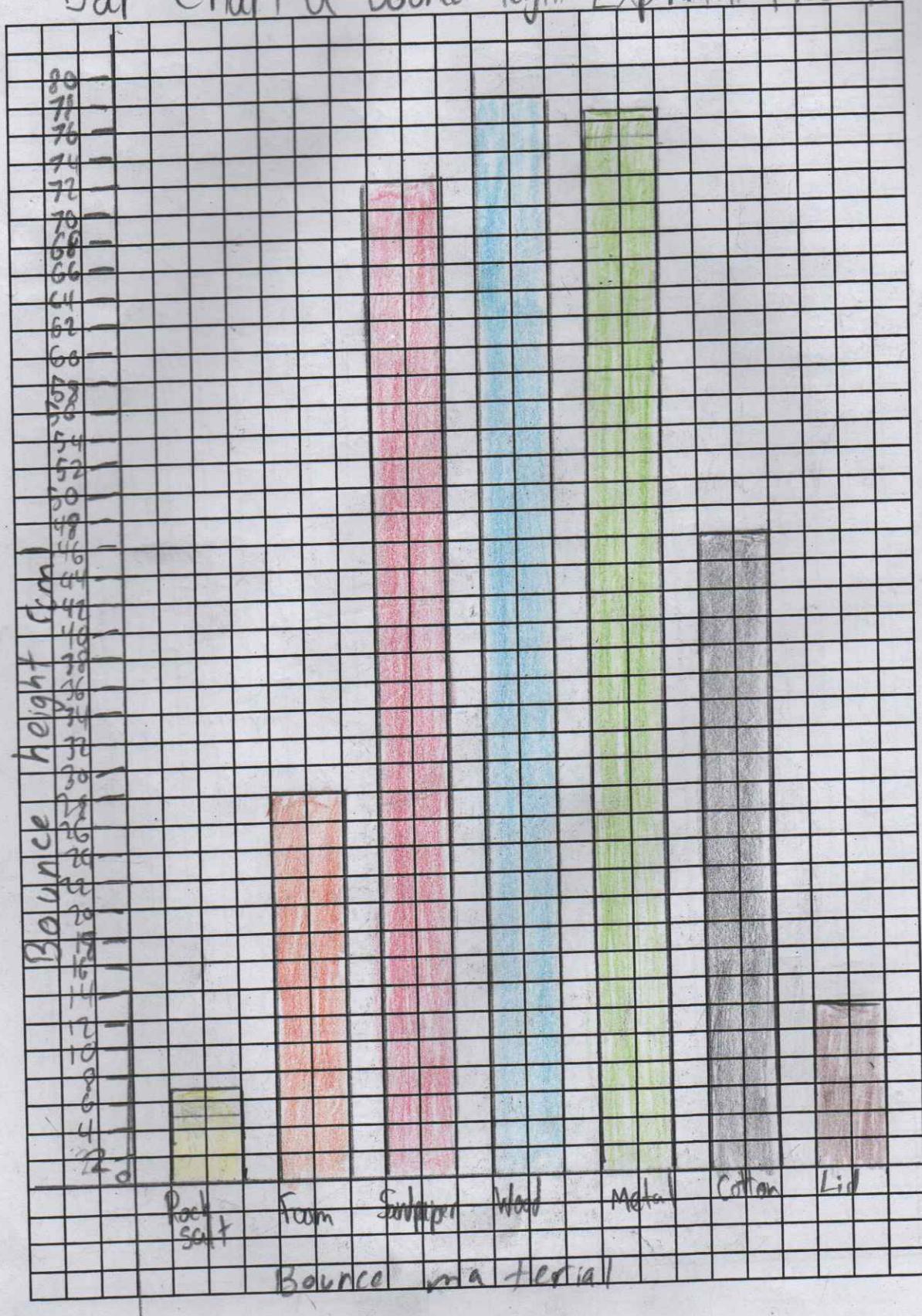
Water isn't a flat or a rough  
surface

Rough surface average : 36.75 cm

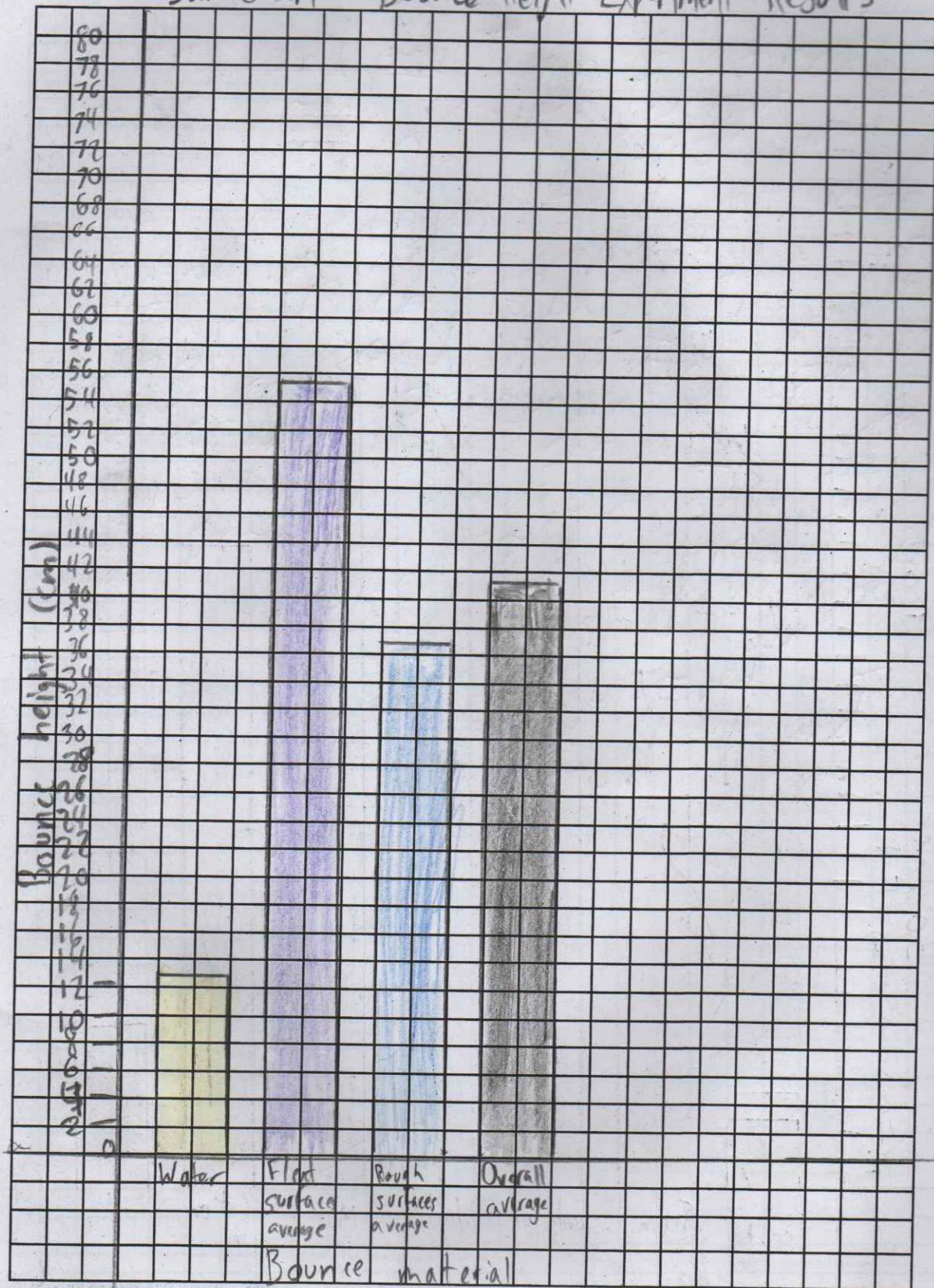
Flat surface average : 55.67 cm

The average bounce height across all  
surfaces was 41.625 cm

# Bar Chart of Bounce Height Experiment Results



# Bar Chart of Bounce Height Experiment Results



### C. Processing and Analysing

Many of the attempts resulted in the ball bouncing around 75 cm. This can be seen in the fact that the most common group of 10 was 70-79, with sandpaper, wood and metal all resulting in bounce heights within that range. There was a stark difference between the average bounce heights of flat versus rough surfaces. Flat surfaces on average resulted in a bounce height of 55.67 cm, whereas rough surfaces on average resulted in a bounce height of 36.75 cm, 18.92 cm less than the flat surfaces. Water produced an interesting result. It resulted in a bounce height of 13 cm, higher than one of the flat surfaces (lid) at 12 cm. Wood, a flat surface, bounced the highest at 78 cm, and ~~with salt~~ a rough surface resulted in the lowest bounce height of 71 cm. My hypothesis of "if a ball bounces on a flat surface then it will bounce higher than if it bounces on a rough surface" was correct as, on average, when the ball bounced on a ~~rough surface, the~~ flat surface it bounced higher than, ~~lower~~, on

average ~~height loss~~ when it bounced on a rough surface. This is easily seen in the results, as the flat surfaces tested, on average, resulted in higher bounce heights, with wood at 78 cm, metal at 77 cm, and lid at 72 cm. than rough surfaces, with rock salt at 7 cm, foam at 28 cm, sandpaper at 42 cm and cotton at 46 cm. It was interesting to see rock salt and lid score so poorly, especially lid as it was a flat surface, but it's understandable as the air beneath the plastic absorbed most of the ball's kinetic energy and turned it into sound energy.

#### D. Reflecting and Reporting

The investigation was successful and gave many nice statistics. One thing that went well was the recording of the data. Once we successfully implemented the method, it was very easy to set up the contraption to measure the bounce heights. One thing that didn't go very well was when the material we were measuring was water. It took multiple tries and the splash created by the ball wet us and the floor around us. One mistake that was made was not accounting for the two centimeters at the bottom of the meter stick, but we solved it as soon as we noticed it by adding two to the recorded bounce heights. If I had the chance to do it again, I would get more materials and test each one multiple times to ensure more accurate results. I enjoyed completing my investigation because I got to work with and help my friends. The results of the investigation aren't very useful in everyday life, but interesting nonetheless. The biggest thing I learnt while doing my investigation was how to organise and conduct a scientific experiment.

**References**

1 BYJUS

2 Blue Scientific

### Daily Log

Date	What I did that day in class
28/11/26	Braintested and decided on an experiment
3/12/26	Planned and did research
4/12/26	Conducted the experiment and wrote down results
10/12/26	Wrote out method used in detail
11/12/26	Began work on final draft
15/12/26	Completed final draft