



Does Crowd Noise Affect Penalty Kick Accuracy?

March 2026



Introduction

Fáilte go rang a sé!

We are 6th class students in Trinity Primary School, Tuam, Co. Galway

This study aims to explore the impact of crowd noise on the performance of young soccer players during penalty kicks.

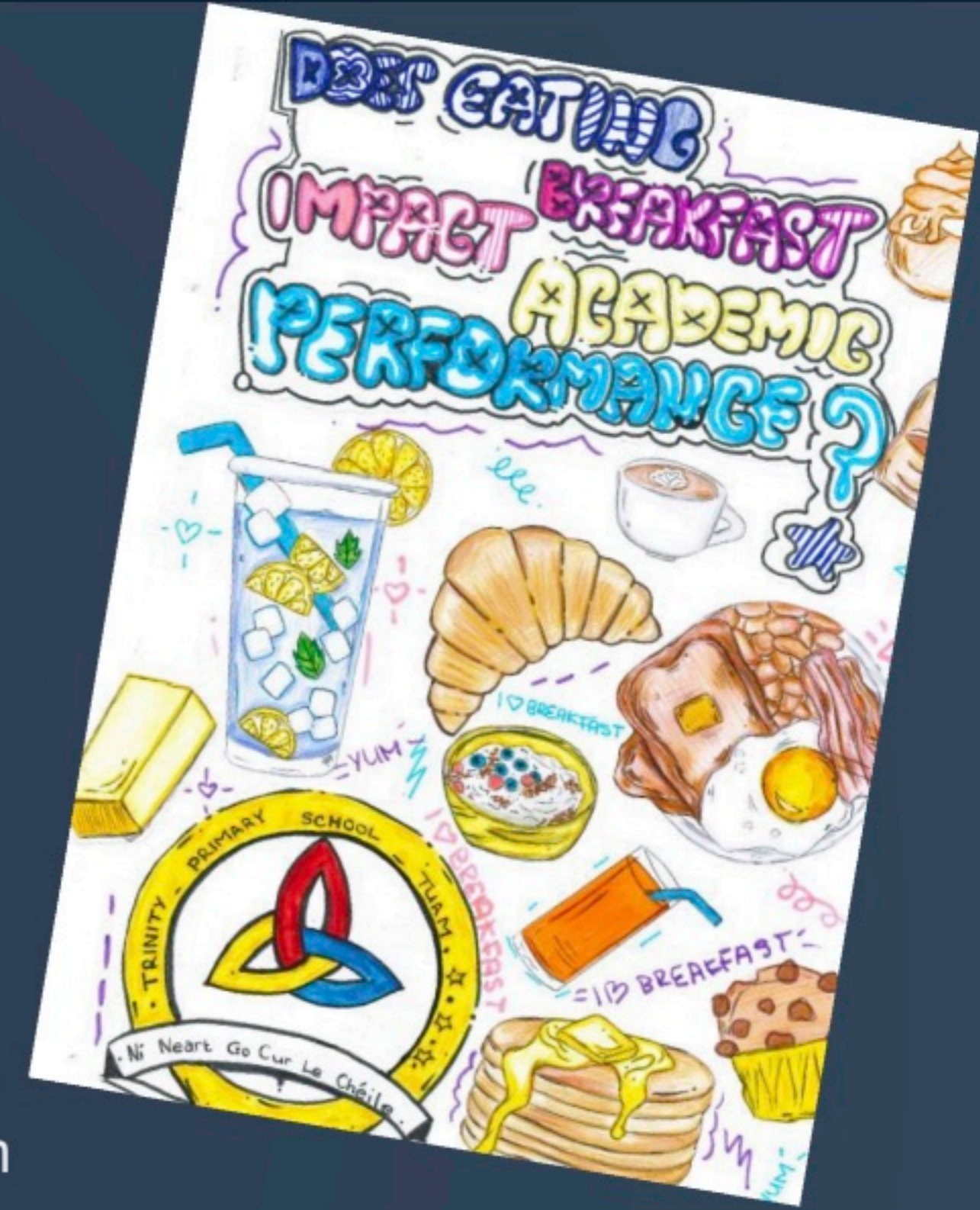
Understanding this influence is vital, as it can affect players' accuracy and overall performance in competitive environments.



Step 1: Registering our Trial

We heard about how well Ms Byrne's class from our school did last year in the Schools Teaching Awareness of Randomised Trials (START) competition. In fact, they were awarded 1st place in 2025. No pressure!!

We watched the Schools Teaching Awareness of Randomised Trials (START) information videos on their website to get an understanding of the project and how it is structured.



Step 3: Select Outcomes

We used START's KITE framework to help us select our outcomes:

Element	What It Means	
K Kids (or Key Group)	Who is taking part in the trial?	5th and 6th class students who have returned their consent slips.
I Intervention (or Idea to Test)	What change or new thing will we try?	Does Crowd Noise Affect Penalty Kick Accuracy?
T Testing and Comparison	What is the difference between the groups?	Group A will have people cheering for them. Group B will have people booing at them.
E Evidence of change	What do you think will happen?	We predict that Group A will increase their scores from the baseline. We also predict that Group B will decrease their score from the baseline.

Step 3: Select Outcomes

We used hula hoops as the targets because they gave a consistent and fair way to measure accuracy in our penalty kick trial.

We felt that dividing the goal into four segments would have been much less accurate because a ball could go anywhere in a big quarter of the goal and still “count,” which would not truly measure accuracy.

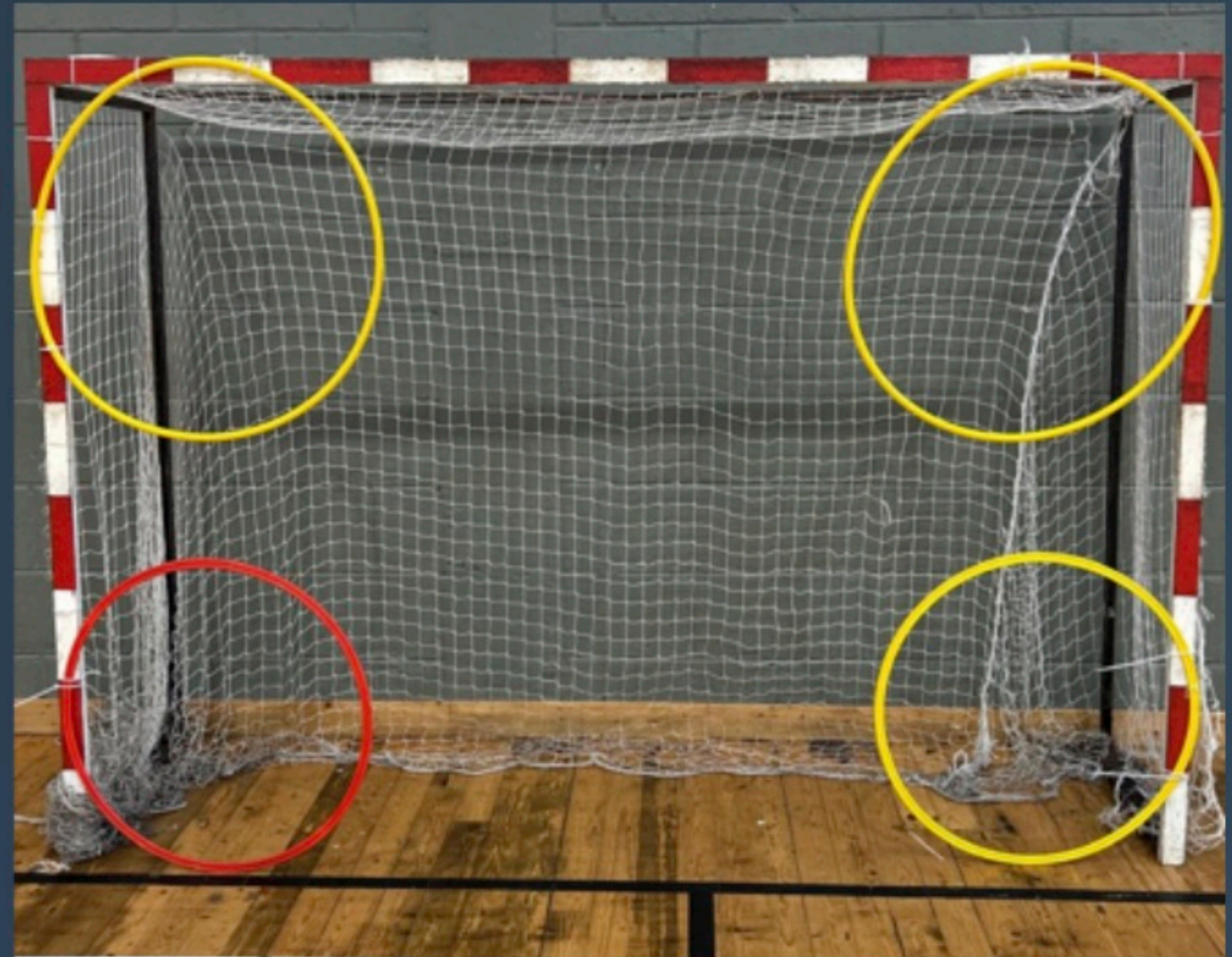
A hoop created a precise circular zone, so every player was aiming for the exact same-sized target, no matter how they approached the ball or how they shot.

This made our results more reliable because we could easily record whether the ball went into the hoop or not without any arguments or guesswork.

Step 3: Select Outcomes

Each participant would take the following shots:

- Bottom right (x3)
- Bottom left (x3)
- Top right (x2)
- Top left (x2)



Step 3: Select Outcomes

Using this set of ten penalties made the trial fair, balanced and scientifically useful.

By choosing three shots to the bottom corners and two to the top corners, every kicker followed the same pattern.

This means that the only thing that changed was the crowd noise, not the difficulty or type of shot.

This mix created a consistent, repeatable set of penalties that helped us measure the true impact of cheering or booing on performance.

Step 4: Participants and Consent

We initially planned to only use students in 6th class.

However, we quickly realised that some children in 6th class may not want to take part so we widened our net to include 5th class.

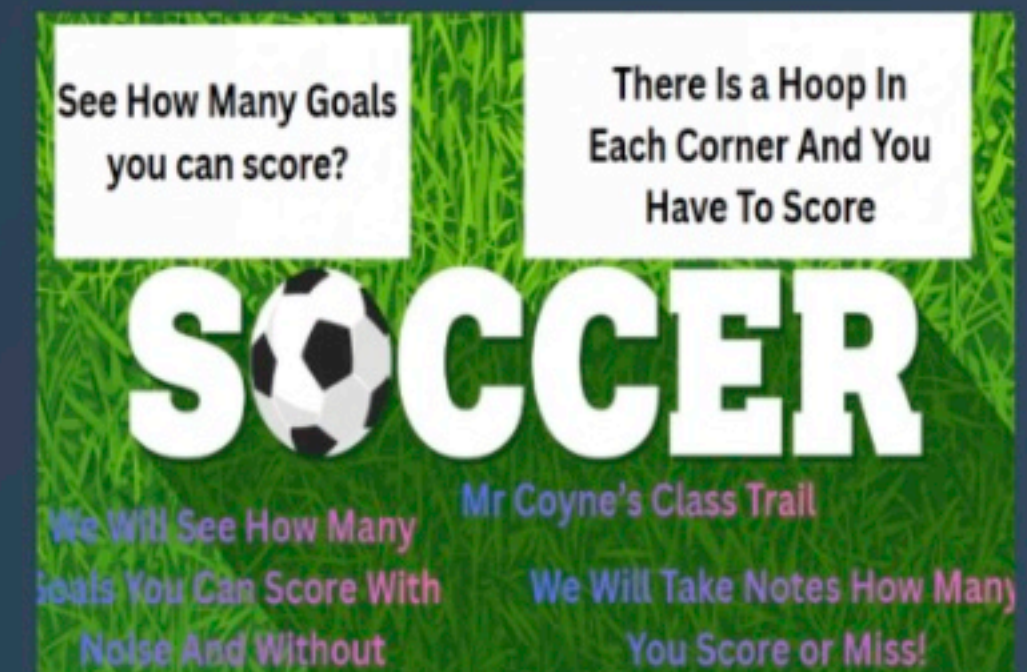
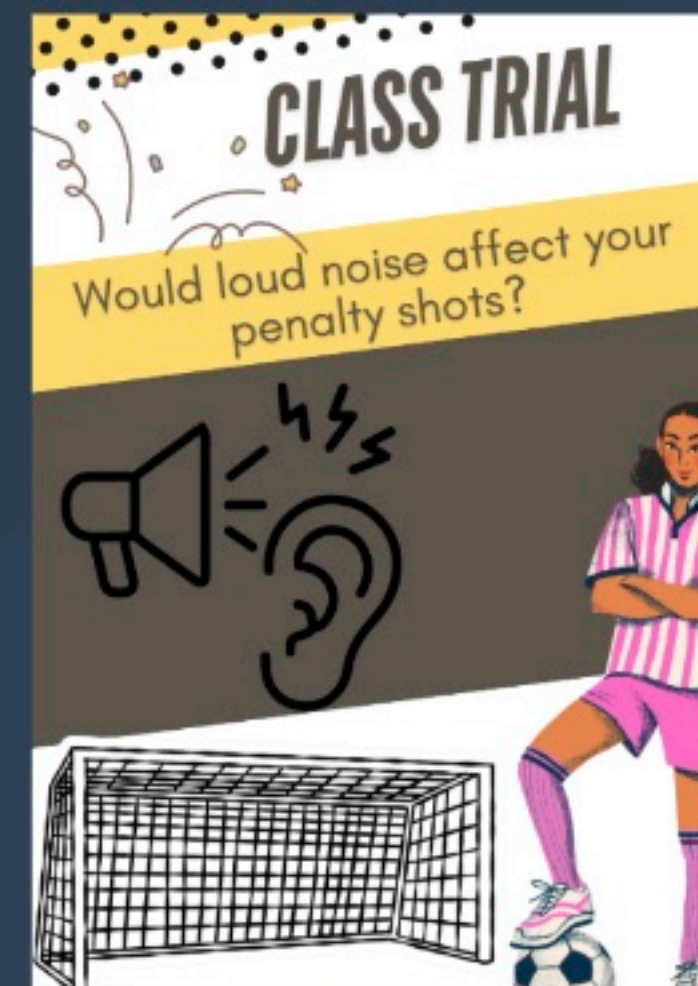
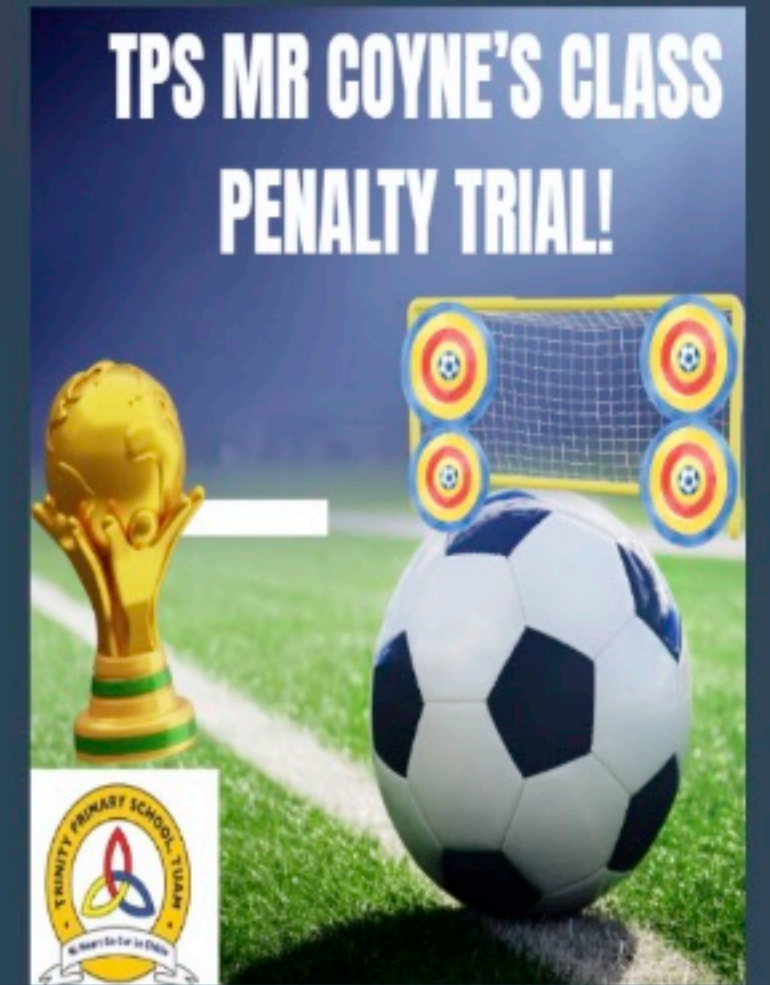
We visited the three other classes in 6th class and all four classes in 5th to explain how the trial would work and answered any questions that they had.



Step 4: Participants and Consent

We also posted information posters around the school so that everyone could understand what we were doing and feel part of the investigation.

The posters helped to explain our trial and why we were studying the impact of crowd noise, which made the project more visible and exciting.



Step 4: Participants and Consent

We needed to include consent forms because the trial involved recording pupils' performance and reactions so families had to agree to their child taking part.

Consent also ensured the project was carried out safely, respectfully and in line with school policies.



Consent Form

Welcome to Mr Coyne's class trial.

We want to find out if loud crowd noise changes how well people score penalties, compared to no crowd noise.

We are looking for participants to take part in this trial.

- I understand what this project is trying to do
- I understand that I can stop taking part in this project at any time
- I am happy to take part in this project

Your Name: _____

Class Teacher: _____

Parent/ guardian signature here: _____

Date: _____

Step 5: Randomisation

In total, thirty nine students (eight in 5th class and thirty-one in 6th class) signed the consent form. One person withdrew before the baseline penalties. That left us with thirty-eight participants.

All participants first completed the baseline trials. The only 'noise' was when the researchers were explaining what to do or telling them if they scored or not.

Step 5: Randomisation

The thirty-eight participants were randomly selected to go in either Group A or Group B. We did this using an interactive spinning wheel.



Step 6: Blinding

As it would be obvious once a participant started their experimental trial, it was not possible to be fully blinded in this trial.

Due to other classes using the hall, it was not possible to have consistent times to carry out the trials. We had to do it then as and when the hall was available.

Step 6: Blinding

However, we wanted to keep the test as scientifically fair as possible.

We set these consistent parameters:

- Neither control group knew their group until they arrived for their experimental trial.
- The goal size and location in the hall
- Same distance from the penalty spot to the goal
- Each child had to kick the ball off a cone
- The words/ phrases that could be said to participants as they took their penalties.

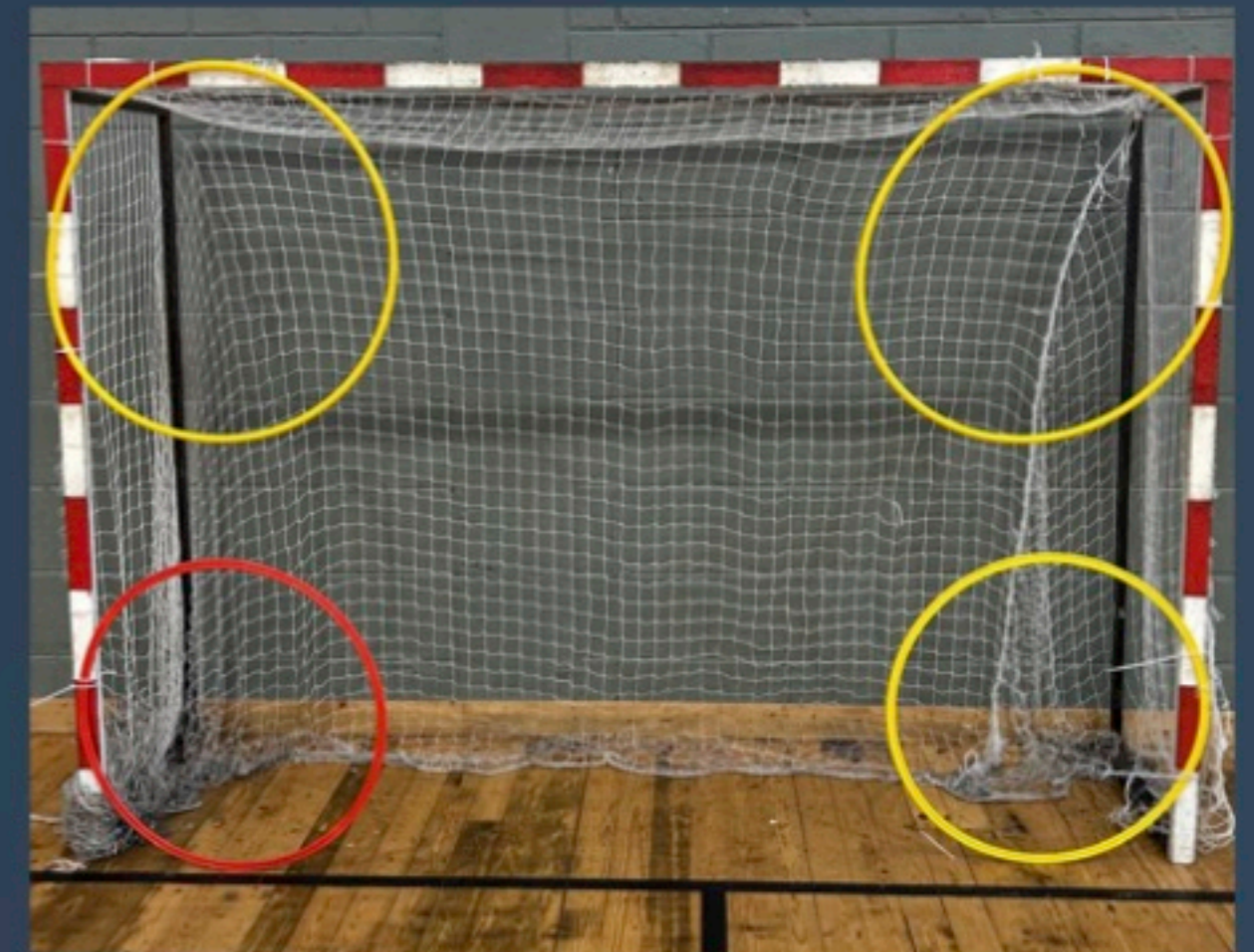
Step 7: Conducting our Survey

Getting started:

We set up the goal with the hoola hoops in advance of the baseline testing.

We asked Mr Birmingham, our Deputy Principal, if we could leave the hoops attached for the full school week, rather than having to take them down each time.

He very kindly allowed us to do that.



Step 7: Conducting our Survey

Getting started:

We created our trial record sheet.

We did not want to use people's name or initials so we assigned each person a 'Participant Number.'

Participant Number: _____ Control Group: _____	
Baseline	
Bottom <u>right</u> (x3):	
Bottom <u>left</u> (x3):	
Top <u>right</u> (x2):	
Top <u>left</u> (x2):	
Total scored:	
Re-test	
Bottom <u>right</u> (x3):	
Bottom <u>left</u> (x3):	
Top <u>right</u> (x2):	
Top <u>left</u> (x2):	
Total scored:	
Change in score:	

Step 7: Conducting our Survey

Baseline Trials:

All participants first completed the baseline trials. The only 'noise' was when the researchers were explaining what to do or telling them if they scored or not.

At the end, we explained that the experimental trial would be either cheering or booing.

Step 7: Conducting our Survey

Experimental Trials:

As mentioned, we had two groups for the experimental trials:

- Group A: cheered
- Group B: booed

Step 7: Conducting our Survey

Experimental Trials:

- Group A: cheered

For this group, our class tried to encourage the participants by cheering them.

We set up a line of people either side of the participant as they lined up their penalty.

We agreed in advance that we could shout 'Yes,' 'You can do it,' and 'C'mon ___' and clap for the participants.



Step 7: Conducting our Survey

Experimental Trials:

- Group B: booed

For this group, our class tried to distract/ put off the participants by booing them.

We set up a line of people either side of the participant as they lined up their penalty.

We agreed in advance that only the word 'boo' or 'ahh' were allowed along with a thumbs down or a fist shake.

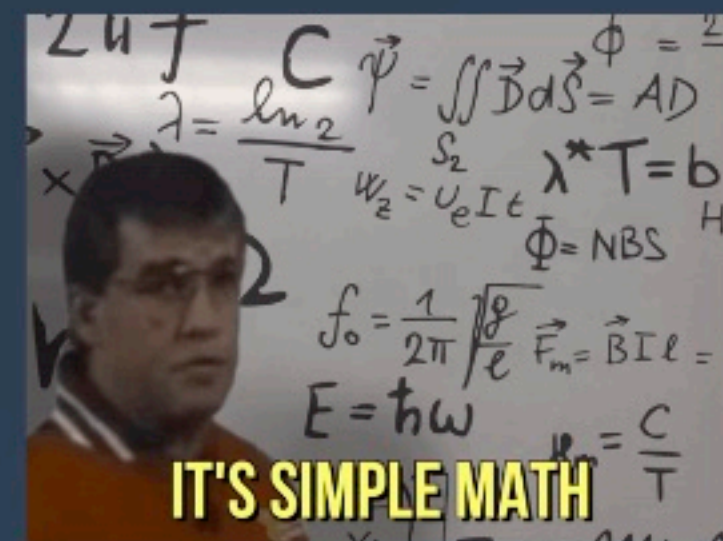


Step 8: Reporting our Findings

Analysis of the Data:

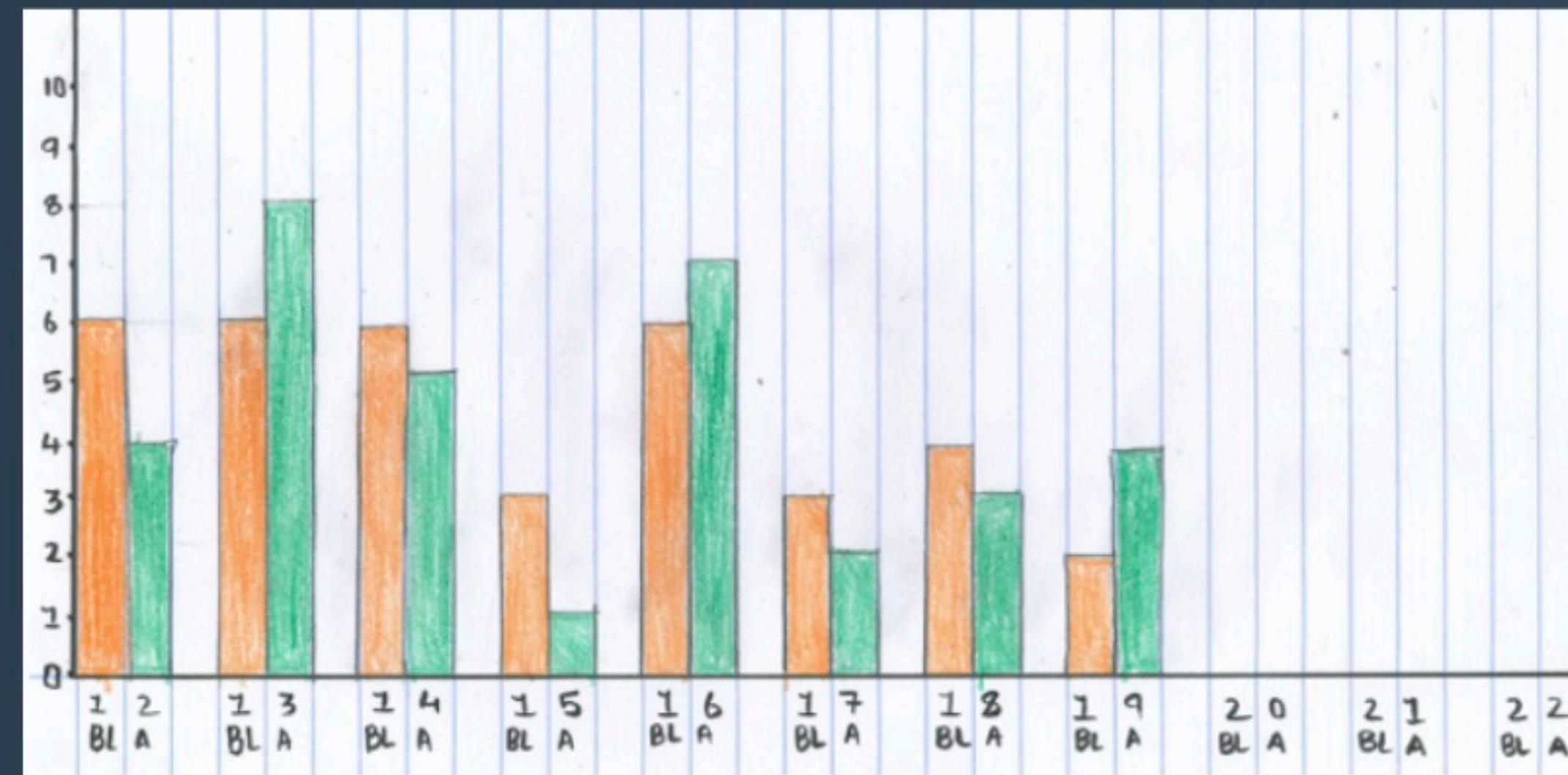
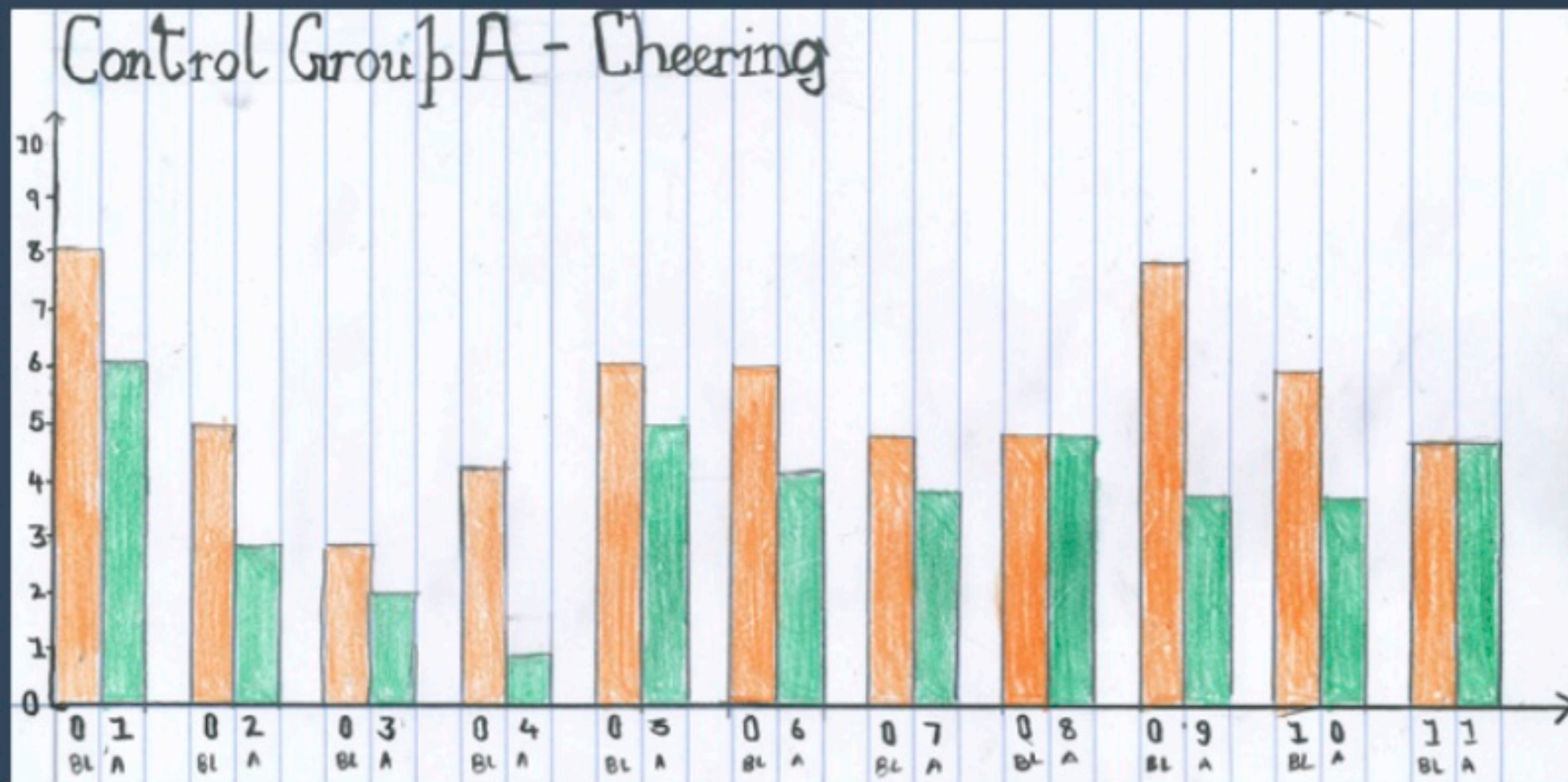
We converted the raw scores (10 penalties) into percentages.

We rounded these percentages to the first decimal place.



Step 8: Reporting our Findings

Control Group A:

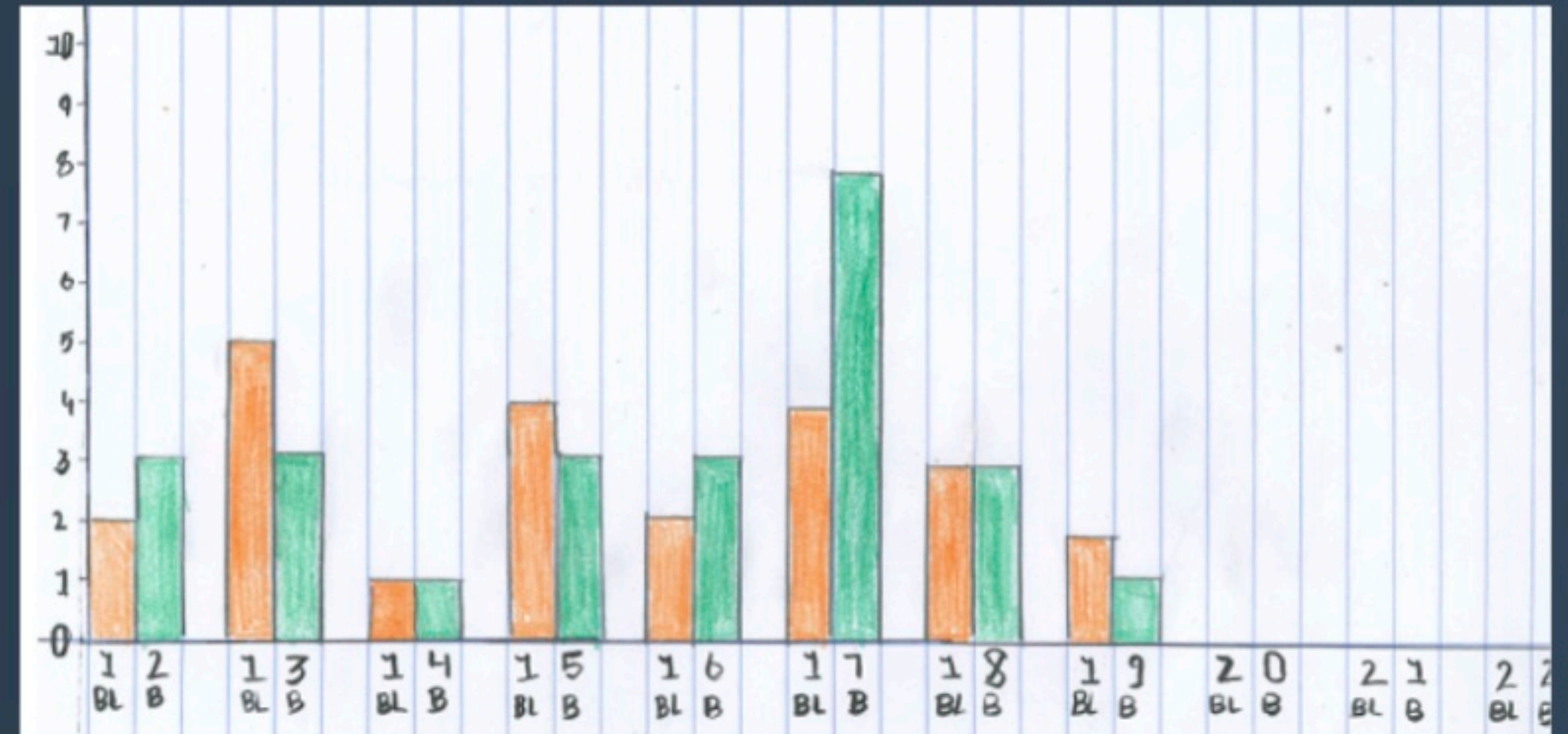
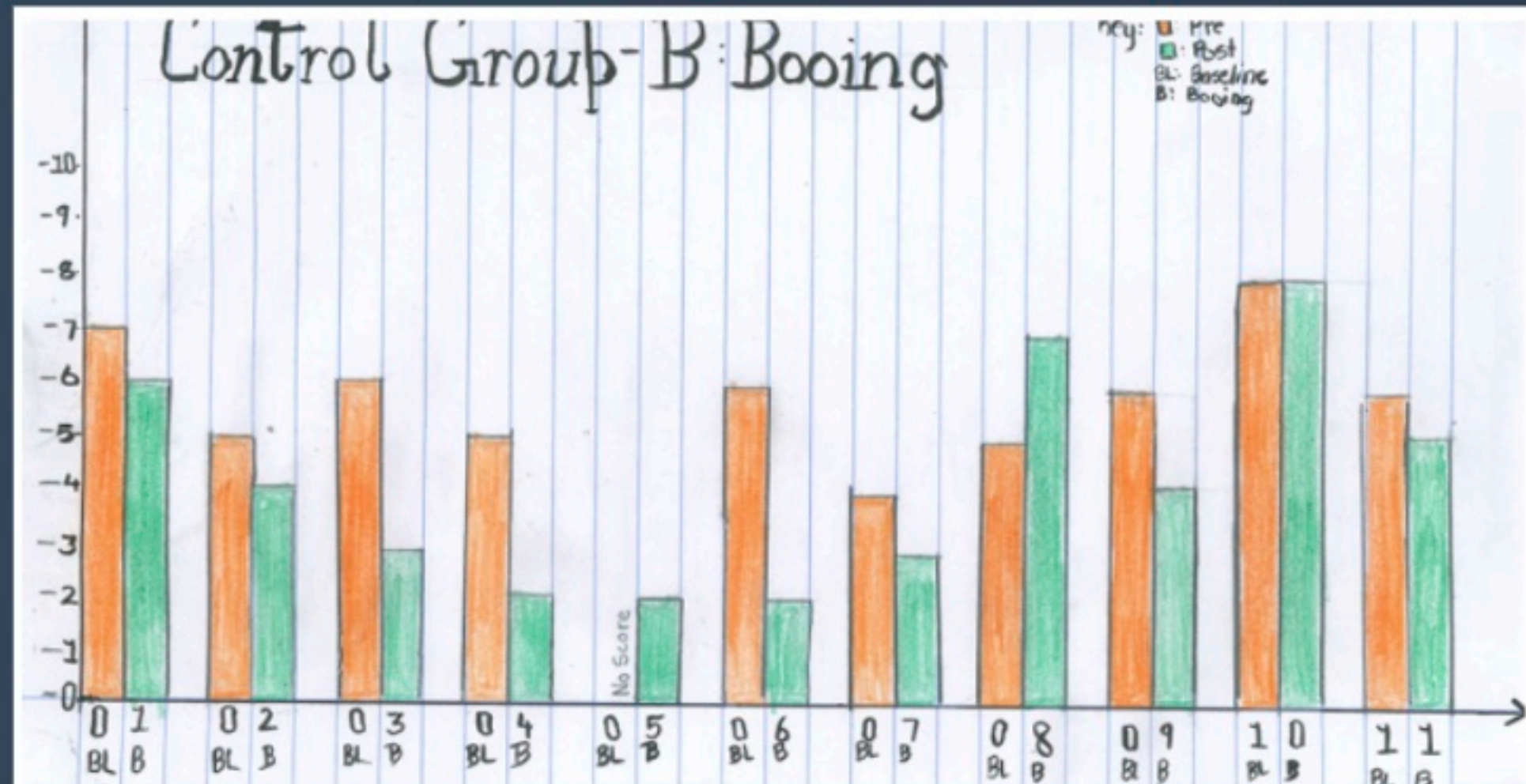


Out of the nineteen participants:

- Fourteen (74%) **decreased** their penalty kick accuracy.
- Three (16%) **increased** their penalty kick accuracy.
- Two (11%) had their penalty kick accuracy remain the same.

Step 8: Reporting our Findings

Control Group B:



Out of the nineteen participants:

- Eleven (58%) **decreased** their penalty kick accuracy.
- Five (26%) **increased** their penalty kick accuracy.
- Three (16%) had their penalty kick accuracy remain the same.

Step 8: Reporting our Findings

Analysis of the Data:

Group A:

Baseline trial: Average success rate: 51%

Experimental trial: Average success rate: 40.5%

10.5%

Group A:

Drop of 10.5% in penalty kick accuracy when participants were cheered on.

Step 8: Reporting our Findings

Analysis of the Data:

Group B:

Baseline trial: Average success rate: 42.6%

Experimental trial: Average success rate: 37.4%

5.2%

Group B:

Drop of 5.2% in penalty
kick accuracy when
participants were booed.

Step 8: Reporting our Findings

Analysis of the Data:

Participants in **Group A** had a significant drop (**10.5%**) in their penalty kick accuracy when **cheering** was introduced.

Participants in **Group B** had a less significant drop (**5.2%**) in their penalty kick accuracy when **booing** was introduced.

Step 8: Reporting our Findings

Reflections:

We felt that this was a fun and engaging project.

We realised how important it is to control variables — even small changes in distance, ball placement or timing could affect the results.

We noticed that collecting data in real time can be tricky. We had to make sure that every score was recorded accurately.

Step 8: Reporting our Findings

Reflections:

Our predictions do not always match the results; many of us expected cheering to help but the evidence showed the opposite.

We saw how emotions and pressure can influence performance, and it helped us understand why fair testing matters in real sports too.

We discovered that being “investigators” means staying open-minded — the results are the results, even if they surprise us.

Step 8: Reporting our Findings

If we were to repeat the trial:

We would establish clearly defined roles (such as recorder, ball collectors, ball resetters, and noise-makers) to ensure the trial runs with greater efficiency and consistency.

Use recorded crowd noise coming from speakers, both cheering and booing. This would ensure 100% consistency rather than when we did the cheering and booing. We prioritised engagement and fun when doing this.

Step 8: Reporting our Findings

If we were to repeat the trial:

- We would aim to use larger groups or increase the number of kicks per participant so that our results are based on a wider set of data, strengthening the reliability of our data.
- We would aim to carry out the trials at the same time each day. This is important because childrens' energy and concentration levels can change throughout the day.

Step 8: Reporting our Findings

Next steps:

We will share the results of this trial at an upcoming school assembly as we are sure that lots of people, especially the participants, who will be keen to learn about the outcomes.

We will share the results with our school football coaches. They could then build penalty practice into their training session to prepare players better for penalty shoot outs.

Results

The data reveals a significant difference in penalty kick accuracy between quiet and noisy environments.

10.5%

Group A:

Drop of 10.5% in penalty kick accuracy when participants were cheered on.

5.2%

Group B:

Drop of 5.2% in penalty kick accuracy when participants were booed.

Go raibh maith agaibh as léamh faoinár dtrial.

Thank you for reading about our trial.

We hope you enjoyed it!

