**Meeting Minutes – 24/02/2025**

In attendance: Noah, Ed, Max, Atticus, Sam, Joel, Will, Iestyn, Blossom

**Random Point:**

* Jan showed us his code to divide the balls into boxes! Did anyone take any “inspiration” (photo or copying)

**The grid of boxes:**

* Subdivide the square into a 4x4 grid
  + This will need to be proportional to the walls, as they move!
* For each particle:
  + Which box is it in?
  + Collisions with particles in the same box
  + Collisions with particles in the adjacent (including diagonals) boxes
* Output the number of particles in each box; density calculation.
* Optimise the number of boxes: Balancing number of particles to number/size of boxes.
  + He had sqrt(nx) by sqrt(nx) boxes. (i.e. 2^p boxes in each direction)

**What are we actually doing?**

* On the report:
  + Explaining (broadly) what the functions do, how does it work
  + Breakdown of the overall running procedure?
  + The experiments
    - What happens in the experiments
    - Quantitative data
    - Does this align with the expected theory? (wiki…)
    - Why does it or not? (Simplistic model is adequate or inadequate)
  + Adding in small code segments if it aids explanations
* Reasonable length for our report
  + If saying something doesn’t add value, don’t add it.

**The Experiments**

* Temperature fluctuations
  + How much does the temperature fluctuate?
  + Standard deviations
  + Plot fluctuation per number of particles (Logarithm?)
  + Law of Large Numbers?
* Velocities
  + How are the velocities distributed among particles
  + Use a histogram function
  + Slowly shrink box and report how distribution of velocities changes.
  + “We so got this”
* Gravity
  + Density/Distribution of particles.