

Mathematical investigation: Easter Egg Hunt

Learning outcomes in focus

Students should be able to:

U.4 represent a mathematical situation in a variety of different ways, including: numerically, algebraically, graphically, physically, in words; and to interpret, analyse, and compare such representations

U.7 make sense of a given problem, and if necessary, mathematise a situation

U.8 apply their knowledge and skills to solve a problem, including decomposing it into manageable parts and/or simplifying it using appropriate assumptions

U.9 interpret their solution to a problem in terms of the original question

U.10 evaluate different possible solutions to a problem, including evaluating the reasonableness of the solutions, and exploring possible improvements and/or limitations of the solutions (if any)

U.13 communicate mathematics effectively: justify their reasoning, interpret their results, explain their conclusions, and use the language and notation of mathematics to express mathematical ideas precisely

N.3 investigate situations involving proportionality

GT.1 calculate, interpret, and apply units of measure and time

GT.1 investigate 2D shapes and 3D solids

Learning intentions

We are learning to:

- break problems down into parts
- draw scale drawings
- make 2D representations of our environment
- look for patterns and make conjectures
- validate our conjectures
- solve problems involving proportionality
- draw conclusions from our work
- use representations to communicate and justify mathematical ideas clearly

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Teaching and learning context

First year students were learning about measurement and this task was designed as their first introduction to a mathematical investigation. Students were given the problem (to hide 10 eggs). They were instructed where to locate 6 of them and they had to decide where to hide the remaining 4 eggs in order to design the fastest route. Students undertook this task over a two-week period which facilitated the planning, recording or measurements and the writing of the report. Students were encouraged to justify their decisions.

Task

Design a route map in your groups for an Easter Egg Hunt around the school.

- You must hide **10 eggs**.
- One egg must be hidden in each of the following areas: **Gallery (Upstairs), Reception, Gym, Hall, Basketball Court, Library** and you must hide the remaining 4 eggs in **4 different locations**.
- Estimate the fastest time that the hunt could be completed in.

Hint! Once you have designed your map. You may need to calculate several route options. Document all of your workings. It may be useful to demonstrate trial and improvement.

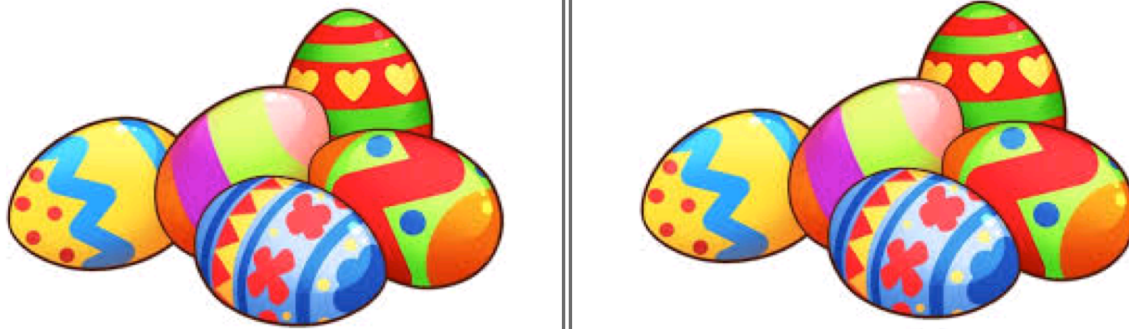
You can use a variety of Mathematical strategies or topics to try and solve this problem.

Success Criteria

I can

- SC1** recognise proportion in real life situations
- SC2** break a problem down into manageable parts
- SC3** make simplifying assumptions
- SC4** carry out calculations involving proportion
- SC5** make a 2D representation of my school environment
- SC6** adjust my solution strategy if necessary
- SC7** justify decisions I make with mathematics
- SC8** draw and interpret scale drawings

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1st Year Egg Hunt!

What We Had To Do

- The whole point of this investigation is to design a Easter Egg Hunt in the shortest possible distance we would have to set up a maths riddle at each room to get a hint to the next room / egg (there is 10 eggs / rooms) so we would try a route then see if we can change this route to get a shorter distance we also had to put 6 eggs in Library (Rm 1) , Gym , Reception , Hall , Basketball court and in any room upstairs in the gallery and the other 4 eggs you could pick to put anywhere.

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Route

- Start : Rm 1 (Library)
- 2nd Rm : Rm 5
- 3rd Rm : Gym
- 4th Rm : Reception
- 5th Rm : Rm 16
- 6th Rm : Sports Hall
- 7th Rm : Rm 19
- 8th Rm : 1st Year Lockers
- 9th Rm : Basket Ball Court (Beside Gallery)
- 10th Rm : Rm 41

SC.2 Breaks
problem down
into manageable
parts

Measurements

- From Rm 1 to Rm 5 it was 23m
- From Rm 5 to the gym it was 43m
- From the gym to reception it was 32m
- From reception to Rm 16 it was 27m
- From Rm 16 to the Hall it was 16m
- From the hall to Rm 19 it was 26m
- From Rm 19 to the first year's locker it was 11m
- From first year lockers to the basketball court it was 35m
- From the basketball court to Rm 41 it was 64m

- In total it was 277m

SC.2 Breaks
problem down
into manageable
parts

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Average time it will take

- The average humans walk pace is 1.4m per second which will take around 3 minutes and 30 seconds to do our route.
- Our average walk pace to walk through our route was 3m 20 seconds.

SC.4 Carries out calculations involving proportion

Why we chose the other rooms

- We chose Rm 5 because it was on the way to the gym and it was in a more open area than Rm 4 , 3 and 2.
- We chose Rm 16 because it was on the way to the hall.
- We chose Rm 19 because it was on the way to the basketball court and it was also in an open area.
- We chose the 1st year lockers as this was in a very open area and it was on the way to the basketball court.

SC.3 Makes simplifying assumptions

SC.7 Justifies decisions

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Things We Changed

- At first we had Rm 19 as Rm20 we then changed it as Rm 20 was too close to the first year lockers.
- At first we had Rm 41 as Rm 46 we then changed this to Rm 41 as Rm 41 was closer.
- At first we had a route from Rm 5 to reception to the gym we then changed it to Rm 5 to gym to reception as we found out there was a corridor leading up to the gym which would take up less time.

SC.6 Adjusts solution strategy when necessary

Our Route We Took


- As you can see we started at Rm 1 (Library) and ended at Rm 41.
- We placed the 4 you could put anywhere Rm 5, Rm 16, Rm 19 and the first year's lockers.





SC.8 Draws scale drawing

SC.5 Makes a 2D representation of school environment

Overall judgement:  In line with expectations

 Exceptional

 Above expectations

 In line with expectations

 Yet to meet expectations