Maths Report
Pyramid Puzzle
Mr Howison
By: Hannah D

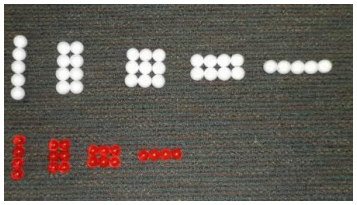
1) The problem was about discovering how many spheres were in each layer of the tetrahedron and finding solutions and formulas to determine how many spheres were needed to create a five and ten layer tetrahedron.

Comment [D1]: Diagrams are important in this section.

2) Firstly, we made the pyramid puzzle using the four pieces (1x4, 2x3, 3x2, 4x1).
From this, we discovered how many spheres are in each layer and the total number of spheres.
We then found a formula, which gave us the amount of spheres for each layer.
Using foam spheres, we created a five layer tetrahedron, in which we observed it takes thirty-five spheres.
Then using our same formula as the previous one, we exposed how to make a ten layer tetrahedron, which involved two-hundred and twenty-one spheres in total.

Comment [D2]: Report needs headings and subheadings.

3) We discovered there is a rule for the number of spheres in each layer, which can be used for the quantity of each layer. There is a structure to the pieces so that you can make any sized tetrahedron. An (n) layered tetrahedron can be made with (n) pieces that look like this.



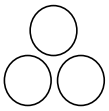
2) Layer 1 = 1
Layer 2 = 3
Layer 3 = 6
Layer 4 = 10

3) Layer 1 = 1
Layer 2 = 3
Layer 3 = 6
Layer 4 = 10
Layer 5 = 15

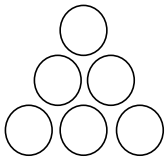
Comment [D3]: This information is better presented in a table.

4) Layer 1 = 1
Layer 2 = 3
Layer 3 = 6
Layer 4 = 10
Layer 5 = 15
Layer 6 = 21
Layer 7 = 29
Layer 8 = 36
Layer 9 = 45
Layer 10 = 55

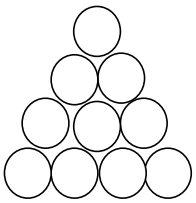
1=1 Layer 1



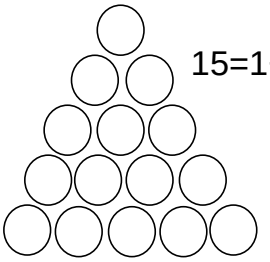
3=1+2 Layer 2



6=1+2+3 Layer 3

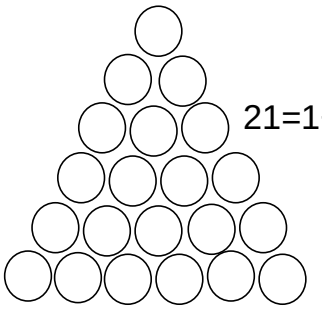


10=1+2+3+4 Layer 4

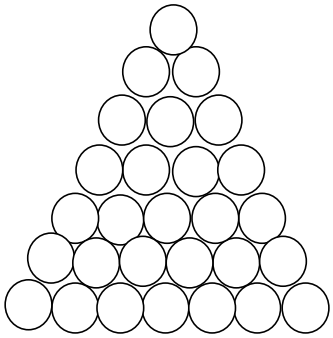


15=1+2+3+4+5 Layer 5

Comment [D4]: Good effort with your diagrams.

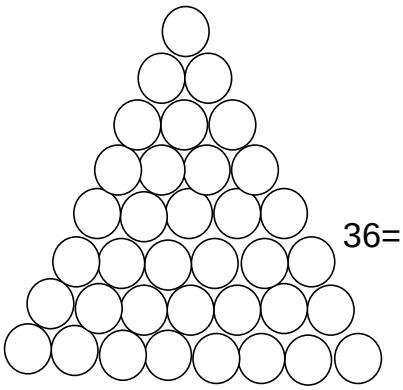


21=1+2+3+4+5+6 Layer 6

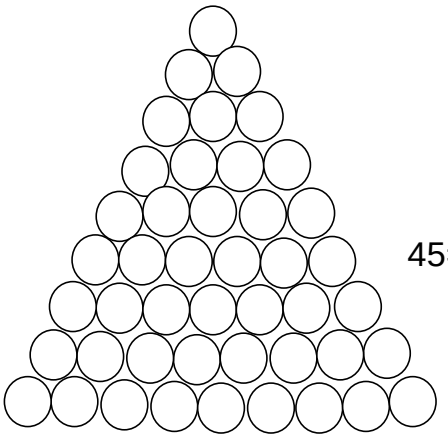


29=1+2+3+4+5+6+7 Layer 7

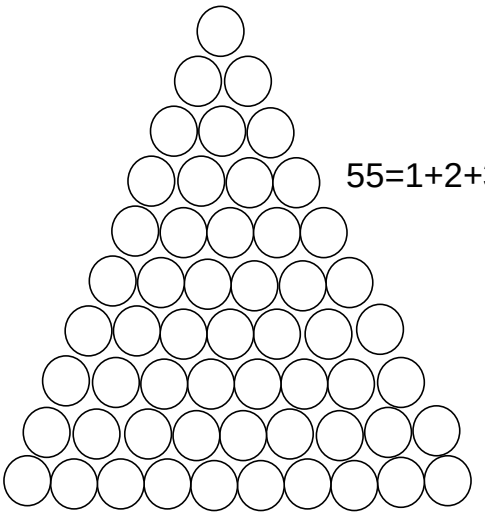
Comment [D5]: Check all calculations.



36=1+2+3+4+5+6+7+8 Layer 8



45=1+2+3+4+5+6+7+8+9 Layer 9



55=1+2+3+4+5+6+7+8+9+10 Layer 10

4 by 1 = 4	5 by 1 = 5	6 by 1 = 6
3by 2 = 6	4 by 2 = 8	5 by 2 = 10
2 by 3 = 6	3 by 3 = 9	4 by 3 = 12
1 by 4 = 4	2 by 4 = 8	3 by 4 = 12
	1 by 5 = 5	2 by 5 = 10
		1 by 6 = 6

Our rule for each layer was **n layer = nx1, 2(n-1), 2(n-2) etc.** This allows us to find each layer promptly, adequately and precisely.

Comment [D6]: Not sure what this means. An example of how it is used would help.

$$\frac{N(n+1)}{2} \quad \text{e.g.} \quad \frac{20x21}{2} \qquad \frac{20(20+1)}{2}$$

Number of Spheres	Number of Spheres in Layer	Number of the Spheres in the Pyramid
1	1	1
2	3	4
3	6	10
4	10	20
5	15	35
6	21	56
7	29	85
8	36	121
9	45	166
10	55	221

The Pyramid Puzzle task was about distinguishing formulas and discovering solutions to the specific problems that were given. At first, it was frustrating and confusing, as it took some time to figure out the rules needed to discover how many spheres were necessary for each layer. Although, it was a challenging activity, overall was a great way to test your knowledgeable thinking.

Hannah, you have made a great attempt to come to grips with a challenging task. You found out many things along the way including patterns, formulas and ways of understanding the parts of a pyramid. The structure of the report though is confusing and you needed to spend a little more time planning the publication before you started typing it up.