Match Triangles – Investigation Guide

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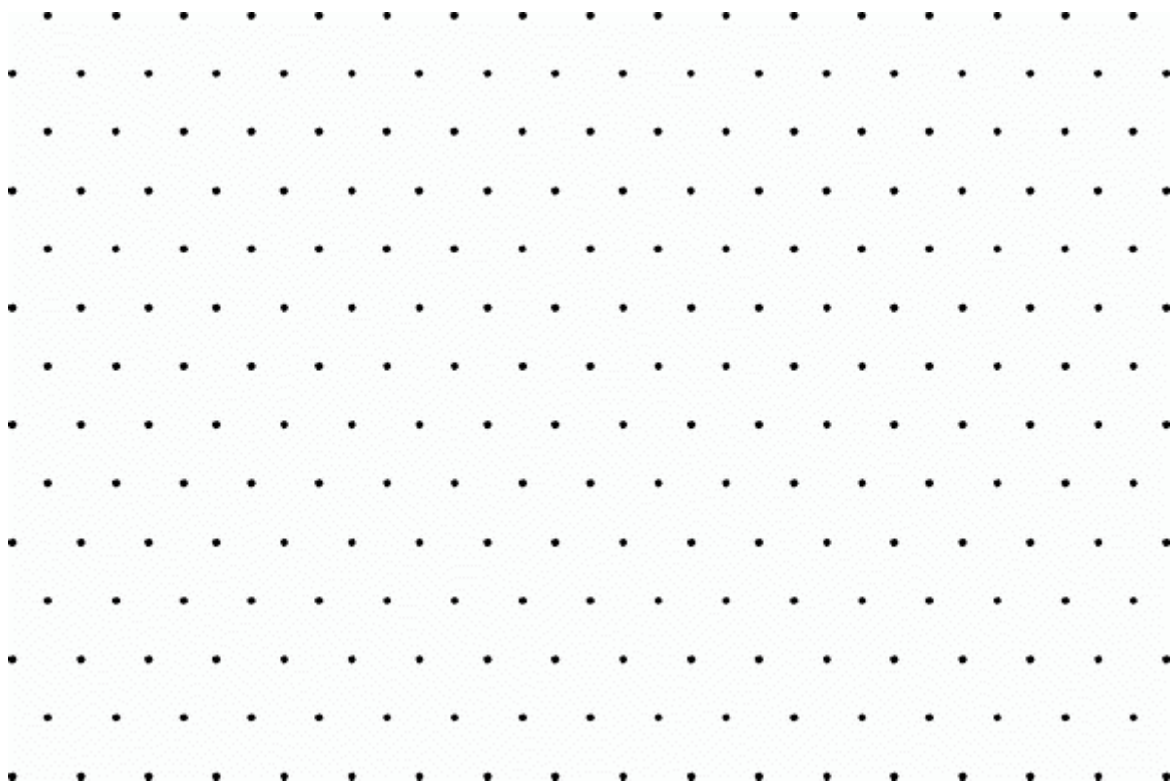| 1 Triangle
...3 Matches | 2 Triangles
...5 Matches | 3 Triangles
...7 Matches | 4 Triangles
...9 Matches |

Task 1 – Draw the number of matches needed for 10, 17, 22 and 31 triangles

Task 2 – Put the information you have into a table and see if there is a pattern

Triangles	Matches
1	3
2	5
3	7
4	
10	
17	
22	
37	
50	

Task 3 − Generalising

a) The chain has 50 triangles. Explain how to find the number of matches.

_____
_____
_____
_____

b) Explain in a different way if you can.

_____
_____
_____
_____

c) If someone told you **any number** of triangles in the chain, explain how you would find the number of matches

_____
_____
_____
_____

d) Write an equation that shows how **M** (number of **M**atches) is found from **T** (number of **T**riangles)

_____
_____
_____
_____

Task 4 − Substituting
Complete the table

Triangles	Matches
19	
20	
35	
128	
319	
1000	

Task 5 − Working Backwards (solving)
Complete the table

Triangles	Matches
	25
	39
	57
	71
	513
	1009

Explain as much as you can about how to find the number of triangles if someone tells you any number of matches.

_____
_____
_____
_____
_____
_____
_____
_____
_____

Task 6 – Making Pairs

a) Choose any five numbers up to 20 for the number of triangles. For each number find the total of matches and make five number pairs like this: (T,M)

_____
_____
_____
_____

b) Choose any five numbers up to 100 for the total of matches. For each total find the number of triangles and make five more number pairs like this: (T,M)

_____
_____
_____
_____

c) If you do the same calculation in each pair the answer is always 1. Explain the calculation.

_____
_____
_____
_____
_____
_____
_____
_____

Task 7 − **Graphing Pairs**

    a) Show your ten pairs from Task 6 on a graph and explain what you see.

_____
_____
_____
_____
_____
_____