



Match Sticks

The aim of this investigation is to determine a mathematical relationship between the number of matches and the number of shapes in a range of patterns.

Equipment:

For this activity you will need:

- TI-nspire CAS
- 30 Icy-pole sticks

Activity:

Start a new document and insert a spreadsheet.



Navigate to the top of the first column and enter the column name: Triangles

1.1	RAD AUTO REAL			
triangles	В	C	D	
•				
1				
2				
3				
4				
5				
A triangles				

Navigate to the top of second column and enter the column name: Matches

1.1	F	AD AUTO R	REAL	Î
A triangles	^e matches	C	D	
•	matches			
1				
2				
3				
4				
5				
B matches			11	

Type in the first value for the Triangle column: 1 *This equates to one triangle.*

1.1	F	AD AUTO R	EAL	Î
A triangles	^B matches	С	D	
•				
1 1				
2				
3				
4				
5				
A1 1				•

• Create a triangle with the minimum number of icy-pole sticks possible. Enter the number of matches required in the "Matches" column.





Type in the first value for the Matches column: 1

This equates to one triangle constructed from three matches

Enter the second value in the triangles column, "2".

1.1	RAD AUTO REAL			
A triangles	^B matches	С	D	
•				
1 1	3			
2 2				
3				
4				
5				
B2	1		I I	

- Create a second triangle, of equal size, with the minimum number of icy-pole sticks possible. Enter this quantity in the "Matches" column.
- Repeat this process until you have constructed 5 triangles, recording the number of matches for each group of triangles.

Once you have entered all your data, your spreadsheet should look like the one opposite.

Note:

The values for the number of matches have been crossed out here. You need to ensure you have your values entered according to the modelling task.

	1.1		RAD AUTO REAL			
Γ	A tri	iangles	^B matches	С	D	
٠						
1		1	3			
2		2	xxxxxxx			
3		3	xxxxxxx			
4		4	xxxxxxx			
5		5	xxxxxxx			
	B1	3				

The next step is to represent the relationship between matches and triangles graphically.

Press the HOME key and insert a Graphs & Geometry page .

l	ft Home			Î,
	\sqrt{x}			1
	1:Calculator	2:Graphs & G	3:Lists & Spr	Ш
4	Τ		6	
1	4:Notes	5:Data & Stat	6:New Docu	
2	Ê		?	
5	7:My Docum	8:System Info	9:Hints	
e	Add a new page	with a Graphs &	Geometry	1
l	application to th	e open document		ןנ

Change the graph type to a **Scatter Plot**.



Select the drop down lists for the 'x' and 'y' axis. The number of triangles will be plotted on the x axis. The number of matches will be plotted on the y axis.



Use the **menu** to change the **window settings**. Match the settings shown opposite.



Question.

- 1. Which one of the following best describes the relationship:
 - a. Linear (straight line)
 - b. Curved
 - c. No relationship (randomly located points)

Use the **menu** to draw a **line** through the points.

▶ 1: Actions 開 2: View	VAD AUTO REAL
4: 3: Graph Type 태 4: Window	•
1 5: Trace	• •
 6: Points & Lines 7: Measurement 	• 1: Point ···· ···· ···· ···
⊙8: Shapes	\geq 3: Intersection Point(s)
12-9: Construction	-4: Line
•• A: Transformatio	- 5: Segment
⑦ B:Hints	-6:Ray
ļ	7: Tangent
1	8: Vector
»	9: Circle arc

When drawing the line, make sure the line is placed on two of the points.

Notice that the line tool says "point on".

