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.

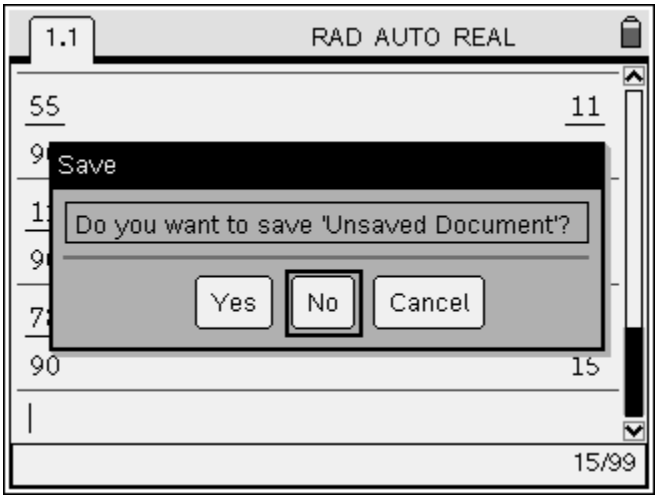
Equipment:

For this activity you will need:

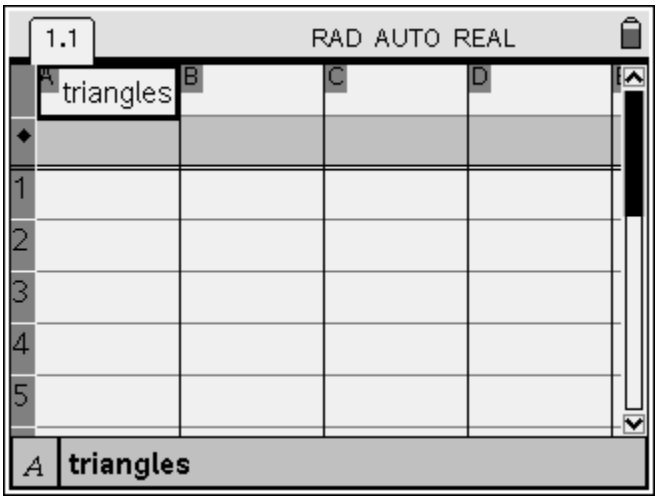
- TI-nspire CAS
- 30 Icy-pole sticks

Activity:

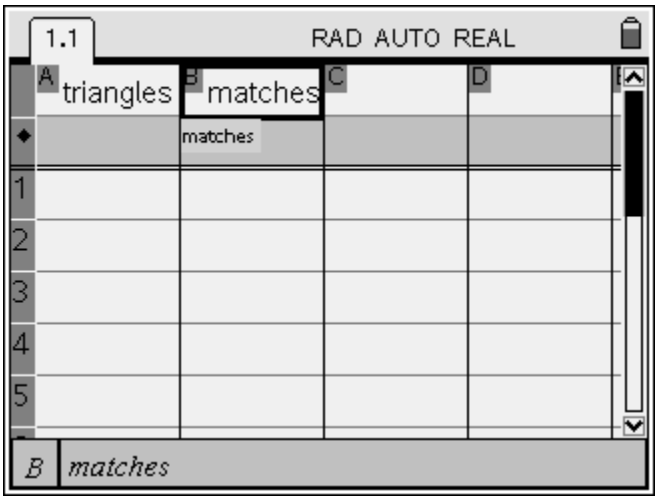
Start a new document and insert a spreadsheet.



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

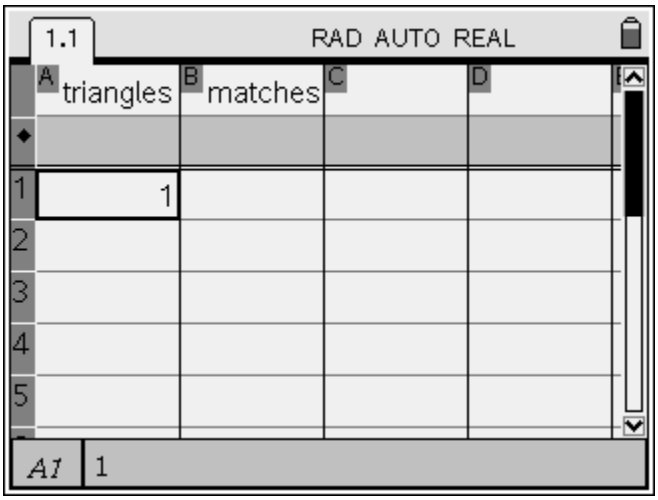


Navigate to the top of second column and enter the column name: Matches



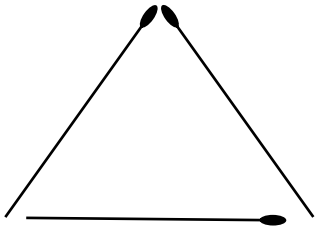
Type in the first value for the Triangle column: 1

This equates to one triangle.



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

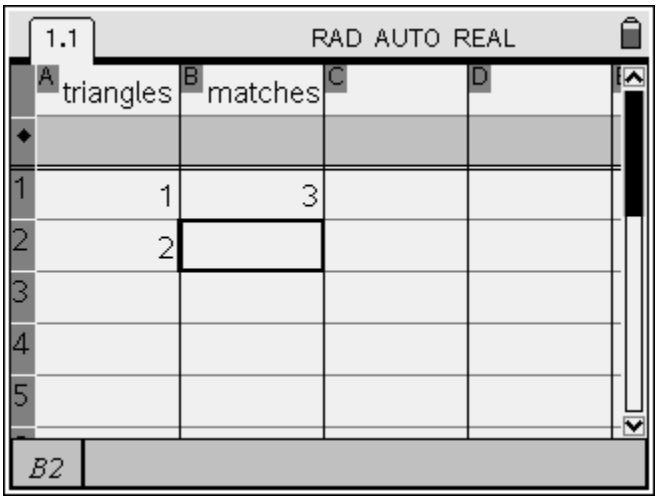
An example is shown here.



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".

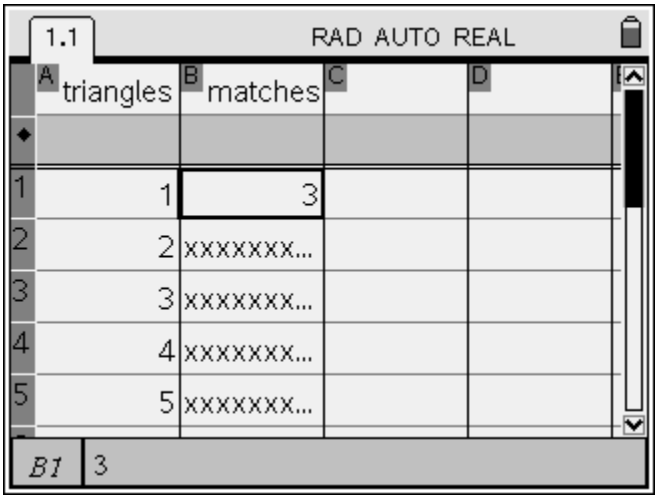


- Create a second triangle, of equal size, with the minimum number of icy-pole sticks possible. Enter this quantity in the "Matches" column.
- Repeat this process until you have constructed 5 triangles, recording the number of matches for each group of triangles.

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

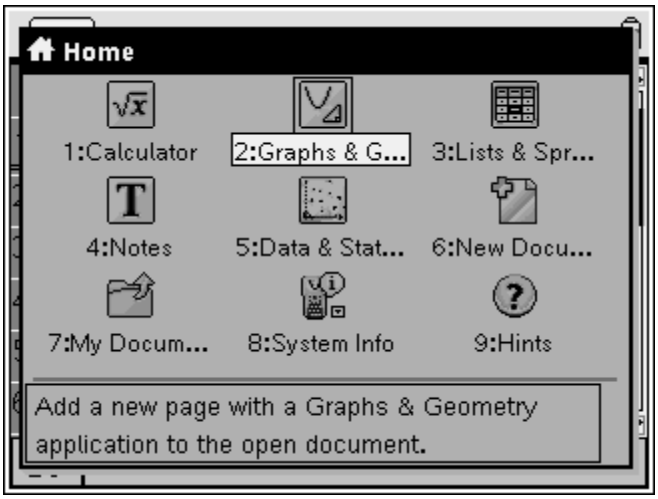
Note:

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.

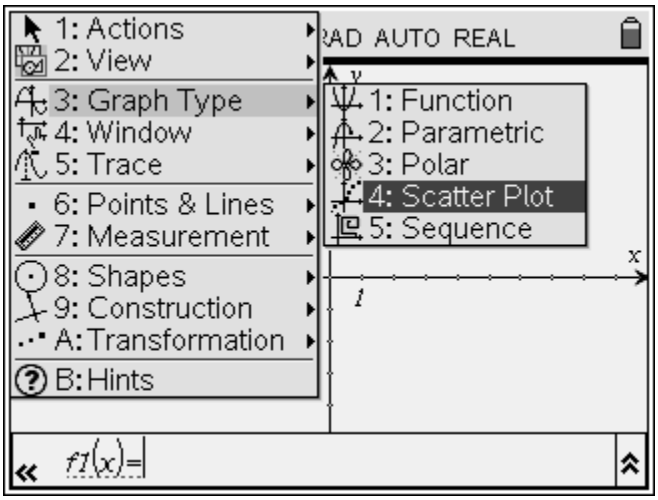


The next step is to represent the relationship between matches and triangles graphically.

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



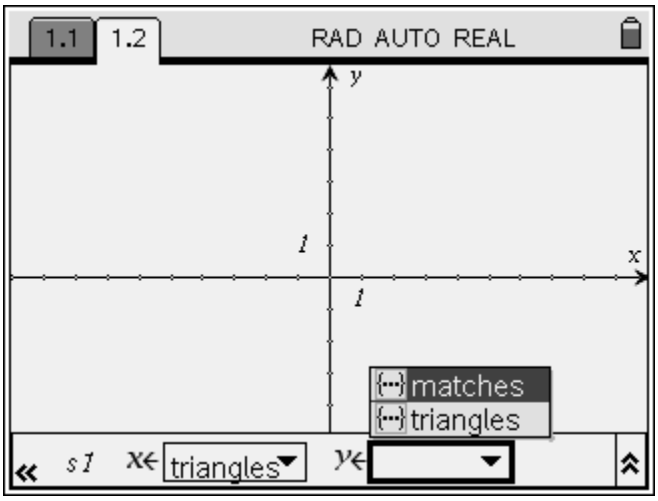
Change the graph type to a **Scatter Plot**.



Select the drop down lists for the 'x' and 'y' axis.

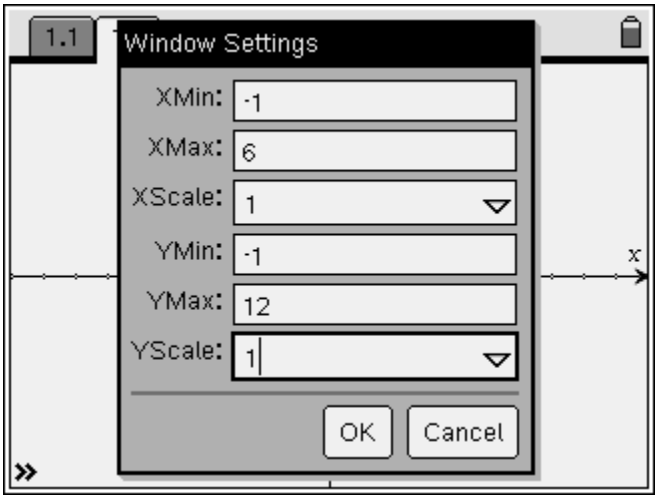
The number of triangles will be plotted on the x axis.

The number of matches will be plotted on the y axis.



Use the **menu** to change the **window settings**.

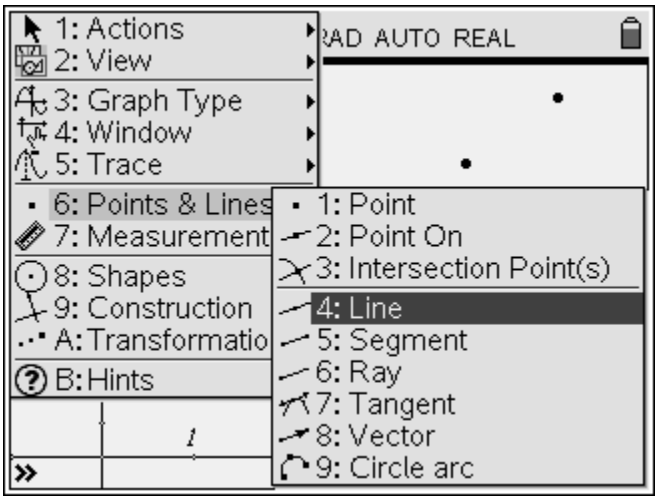
Match the settings shown opposite.



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.



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

Notice that the line tool says “point on”.