Investigation Sheet: Mirror Patterns 2 (#159)

Use the mirrors to make regular polygons. For each polygon, measure the angle between the mirrors.

Use a table to organise your data.

sides	3	4	5	6	7	8	9	10
angle								

Make a line graph of angle v sides.
You could use graph paper or an Excel spreadsheet.
What do you see?
Your graph may make you want to check some of your angle measurements.

A pattern
Can you find a pattern that connects the angle to the number of sides in the polygon?
Try multiplying the number of sides by the angle between the mirrors for each polygon you made.
This may make you want to check some of your angle measurements again!

A 100-sided polygon?
It would seem very difficult to use the mirrors to make a 100-sided polygon. But what if you could? Can you find a rule for working out the required angle between the mirrors?

A collection of polygons
Suppose you want only regular polygons based on using a *whole number* of degrees between the mirrors. Which polygons can be made in this way?

Why is it so?
Can you work out why the pattern is there? Try photographing and printing a picture of one of your polygons.
(It may help to know about the sizes of the interior angle of any given regular polygon.)

Alternatively, ask for the *Mirror Patterns Prompt Sheet* if you would like to find out why the pattern is there.

Another table . . . . another pattern.

Sides	3	4	5	6	7	8	9	10
Angle between mirrors								
Internal angle of polygon								

