Unit 5: Rover's Sensors | **Application: The Winding Road**

In this application, you will use Rover's color sensor to follow a curved path on paper. **A curved path on paper like the one shown below is needed for this application.

Objectives:

- Use the color sensor to detect and follow a curved path on paper

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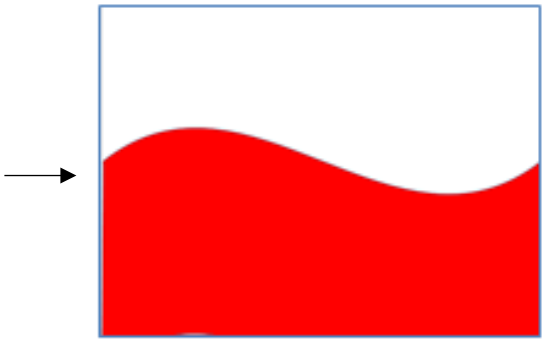
Teacher Tip: The curved path in red and white below is included in the Unit 5 Color Test Pages.pdf included in the Teacher Docs.

Write a program to keep Rover 'on track' to follow a curved path similar to this one:



Rover will start at the *left* edge of the page and travel to the right following the curved path across the paper.
When Rover 'sees' RED, it will turn to the left a little and move forward a little. When Rover 'sees' WHITE, it will turn to the right a little and move forward a little.

Experiment with the turning angle and the moving distance to see how the Rover reacts to the different colors.

If your page is red and white as in the image above, you can use **red_measurement()** to see what values are given by each side of the paper. If you use a different color such as black, you can use **gray_measurement()** (or **green_** or **blue_**).

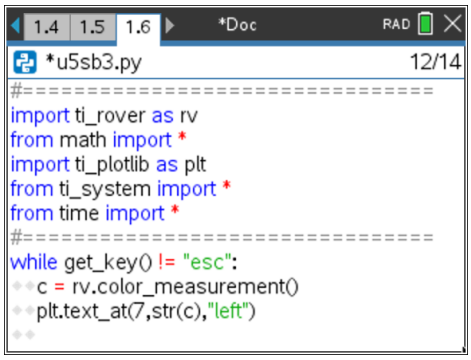
Teacher Tip: Students can make their own route. There should not be sharp corners in the path. The path is determined by two highly contrasting colors which make it easier to detect the color changes. Using a narrow colored strip like tape is more difficult because Rover has only one light sensor and therefore cannot tell whether it has gone too far left or right. With a contrasting path like the one shown above, Rover will 'know' which way to turn to stay 'on track'.

1. Here is the original short 'test' program from the last lesson to determine the values that the color measurement functions produce.

   Choose the color measurement type (**color_**, **red_**, **green_**, **blue_**, or **gray_**) that gives the greatest *variation* in values for your two different colors and the greatest *consistency* in values when looking at each of the colors separately.

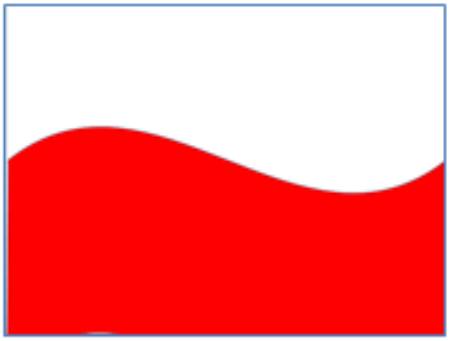
   You can also use a more descriptive variable such as **color** instead of **c** as you did in the previous lesson:

   color= rv.color_measurement()



2. For your path-following program:

   a. Start Rover on the left or right edge of this paper near the curved path
   b. Check the color
   c. If the color is red, then turn a bit toward the white side
   d. Otherwise, turn a bit toward the red side
   e. Move forward a short distance
   f. Repeat from step b until you reach the end of the path



Teacher Tip: The color sensor may not always give the exact same value for a given color. That's why it's best to use **red_measurement()** for the red/white curve in this lesson. Use contrasting colors (black and white work well) and look for large changes in the color value to decide when to turn. Test your colors first and see what threshold between the two works best for your environment.