## Lesson 12 – Activity Sheet

## Getting Started

* To be able to get round the track without a driver you are going to need to come up with an accurate algorithm to follow
* Look at the track section example below – there is a straight of 30cm leading into a curve of about 45 degrees
* Through our experimenting earlier we know that on a power of 600 for 1 second is about 30cm of movement and with the same power a spin of 100ms will give us approximately a 45 degree turn
* So, we could plan this section as below

|  |  |
| --- | --- |
| **Section** | **Commands** |
|  | Drive Forward at 600 for 1 second  Spin 600 for 100ms |

## Success Criteria

* Apply what you have learnt to make the car complete one lap autonomously
* Complete one safe lap as quickly as possible
* Create a section plan for each race section
* Combine to create a complete algorithm for the racetrack

## Pro-tip

* How fast you get round is not always about how quick the car is – a smooth run is often faster
* Look at the course in sections – get a different person in the team to be a section specialist
* Measure angles carefully and try to find a ‘racing line’
* Produce a section plan for each section of the course

|  |  |
| --- | --- |
| **Section** | **Commands** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

## Test Time

* Does each section work in isolation?
* Does applying the algorithm for two or more sections together still work?
* What happens with more than one car on the track

## Stretch Tasks

## Can you follow a racing line?

## Ensure you use iteration over sequence in your programming

* How could you avoid obstacles or other vehicles – which sensors would work best for which situations
* Is the autonomous car quicker than when you drove your car around the track using the remote? Why is this?

## Final Thoughts

* In today’s lesson we looked at the use of autonomous or self-driving cars and how we will need to produce an algorithm to automate our vehicle around the racetrack
* We have looked at the aspect of different sections of the course and then developed modular algorithms which we have combined to create a complete algorithm to safely traverse the course
* We have looked at testing and refining our algorithm to ensure it works consistently