

# Wind-up Rover

Create a classic wind up toy out of our rover. The rover records the number of seconds that it is held upside down and once placed right way up on a surface it will move forward. The longer the rover was held upside down the longer it will move forward and the faster it will go. For more interesting wind up rovers, incorporate the LEDs and Buzzers to also respond and change to the wind up time.

## Relevant Coding Skills

Iteration (X) Variables  $\frac{+}{x} \frac{-}{x}$  Maths

## Relevant Rover Concepts

Motors ✦ Accelerometer



## Exercise Setup

The only requirement for this exercise is there be a long enough space for the rover to move in. If you've got limited space you can add a limit to wind up time.

## Here's Our Approach

### Stage 1

Firstly we create a **variable** for our wind up time. Then we create a **repeat while true loop** so that our wind up and wind down code will repeat. Inside the loop we add an **IF statement** with the condition that checks the most important detail, if our **rover is upside down** or not.

### Stage 2

When the rover is upside down we **set all LEDs red** and begin **increasing** the wind up time. We do this by adding 1 and then **delaying** our code for 1 second. This means each second our variable wind up time increases by 1.

### Stage 3

When our rover is right way up and the wind up time is greater than zero we enter the unwinding branch. Firstly we **set our LEDs green**. Then we do our **sound** and **motor commands** (feel free to do your own thing here). We then **decrease wind up time by 1** and **delay**. Once this reaches 0 we will enter the **ELSE** branch where we turn everything off.

```
Start
set windUpTime to 0
repeat while true
do
  if Robot is upside down
  do
    Set all LEDs to red
    increase windUpTime by 1
    Delay for 1 seconds
  else if windUpTime > 0
  do
    Set all LEDs to green
    Play sound at windUpTime x 100 Hz
    Start moving forward at speed 30
    decrease windUpTime by 1
    Delay for 1 seconds
  else
    Stop all sounds
    Turn LEDs off
    Stop all motors
```