

Lighthouse

Aims

- Through this activity students will learn to use sparkles and motors. They should be able to make them flash at the same time as the motor turning. As they progress there are several variations and ways to make it more challenging (see bottom of page).

Basic Code

To make the light flash while the motor spins

```

program start
do forever
  motor 1 FORWARD at 75 %
  set sparkle 0 to 1
  wait 1 seconds
  turn sparkle 0 off
  wait 1 seconds
loop
  
```

Resources

- Crumble board
- Sparkle x1
- Battery box
- Batteries x3
- Motor x1
- Wires x5
- USB Cable
- Wheel x1
- Clear sphere/marble

Construction Tips

Use an elastic band to secure the crumble board, battery pack and motor together. The wheel will form the base on which the light will spin. Use a cardboard cylinder to hold the light up vertical and make an outer cardboard 'shell' to cover the light. Secure the marble over the sparkle.



Suggested Uses

- Each pair of students has to research their own lighthouse and make it – how does the flashing and stripes on the lighthouse change with location?

Challenge Questions

- How does the sequence of lights flashing change with location? How many location sequences can you make?
- Can you integrate the intermediate and basic codes so the intermediate codes include individual light sequences?

Basic Code

To make the light flash with different intervals as the motor spins

```

program start
do forever
  motor 1 FORWARD at 75 %
  set sparkle 0 to 1
  wait 1 seconds
  do 3 times
    turn sparkle 0 off
    wait 200 milliseconds
    set sparkle 0 to 1
    wait 200 milliseconds
  loop
  wait 1 seconds
loop
  
```

Intermediate Code

To make the lights flash and motor spin only when it is dark enough, using an LDR

```

program start
do forever
  let (t) = analogue A
  if (t) < 100 then
    motor 1 FORWARD at 75 %
    set sparkle 0 to 1
    wait 1 seconds
    turn sparkle 0 off
    wait 1 seconds
  else
    motor 1 STOP
    turn sparkle 0 off
  end if
loop
  
```

Intermediate Code

To make the lights flash when an object is a certain distance away – whilst constantly spinning (using a distance sensor)

```

program start
do forever
  motor 1 FORWARD at 75 %
  let (t) = distance (cm) T:A E:B
  if (t) < 50 then
    set sparkle 0 to 1
    wait 1 seconds
    turn sparkle 0 off
    wait 1 seconds
  else
    motor 1 STOP
    turn sparkle 0 off
  end if
loop
  
```