

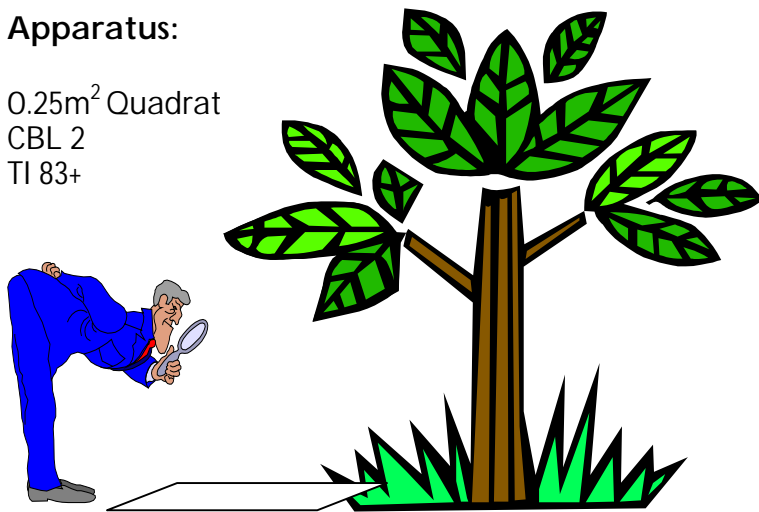
## To investigate the effect of light intensity on the distribution of daisies

In any ecosystem, the distribution of organisms is affected by various *non-living* factors such as temperature, light intensity, available water and soil type. In this investigation, we will examine the effect on one of those factors on the distribution of daisies.

Daisies are sun-loving plants, so are more likely to grow where there is plenty of sunlight. Starting at the base of the tree, we will measure and record light intensity every 0.5m until we are outside the canopy of the tree. Using a 0.25m<sup>2</sup> quadrat, we will count the numbers of daisies at each point. There should be a correlation between the number of daisies and the light intensity.

### Apparatus:

0.25m<sup>2</sup> Quadrat  
CBL 2  
TI 83+



### METHOD

Select a suitable tree; one with a good canopy, and with plenty daisies growing around it.

Place the quadrat at the base of the tree. At this point, The distance from the tree = 0

Set up the CBL to take light intensities when prompted

Press APPS

Keep pressing **ENTER** until the following screen appears

```
CH 1:LIGHT      .009

MODE:TIME GRAPH-9

1:SETUP      4:ANALYZE
2:START      5:TOOLS
3:GRAPH      6:QUIT
```

Screen 1

Press 1: Set up

```
CH 1:
CH 2:
CH 3:
DIG :
MODE:TIME GRAPH-9

1:OK      3:ZERO
2:CALIBRATE
```

Screen 2.

Select 2: Cal i brate.

Then, from the calibration screen

Select 2: Cal i brate now

Screen 3 will appear

```
CALIBRATE SENSOR

MONITOR VOLTAGE, WHEN
STABLE, PRESS [ENTER].
          VALUE  VOLTAGE
POINT 1:      0
POINT 2:
```

Screen 3

Cover the end of the light probe. The voltage at point 1 on the calculator screen should be close to zero. Press **ENTER**

Type in the value 0 when prompted, and then press **ENTER** again.

Hold the light probe out turned towards the sun. Press **ENTER** when the voltage reading at point 2 stabilises.

Type in the value 100 when prompted And then press **ENTER**.

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The following screen should appear.

```

      CALIBRATION
LIGHT
CALIBRATION:LINEAR
SLOPE      INT
675.18072  -2.300007

1:OK
2:CALIBRATE NOW
3:MANUAL ENTRY
    
```

Screen 4

To change the mode:

Select 1: OK


The following screen should appear

```

▶ CH 1: TILIGHT PROBE
CH 2:
CH 3:
DIG :
MODE: TIME GRAPH-9

1:OK      3:ZERO
2:CALIBRATE
    
```

Screen 5

Move the black arrow down to MODE: by using the blue  arrow as in screen 6

```

CH 1:
CH 2:
CH 3:
DIG :
▶ MODE: TIME GRAPH-9

1:OK      3:ZERO
2:CALIBRATE
    
```

Screen 7

Press **[ENTER]** The select mode screen will appear.

```

      SELECT MODE
1:LOG DATA
2:TIME GRAPH
3:EVENTS WITH ENTRY
4:SINGLE POINT
5:SELECTED EVENTS
6:RETURN TO SETUP SCREEN
    
```

Screen 8

Select 3: events with entry. Then select 1: OK to return to the main screen

\*Hold the light probe out turned towards the sky. Make sure that it is directly over the quadrat

Press 2: Start. The following screen will appear

```

PRESS [ENTER] TO COLLECT
OR [STO] TO STOP
1      14.2
    
```

Screen 9

When the light intensity reading has stabilised, press **[ENTER]**. The calculator will ask you to enter a value. Type in the distance you are from the base of the tree and press **[ENTER]** record the number of daisies in each quadrat  
Move the quadrat out 50 cm and repeat the process from\*

Keep going until you are well beyond the edge of the canopy.

When you are finished, press **[STO▶]** to stop and graph.

### RESULTS

Distance from tree (Meters)	Number of daisies In Quadrat
0	
0.5	
1.0	
1.5	
2.0	
2.5	
3.0	
3.5	
4.0	

Transfer your graph of light intensity vs. distance to the computer, or use the values on the calculator to draw a graph manually of light intensity vs. distance.

Using the same graph paper, plot a graph of numbers of daisies vs. distance.

Examine relationship between numbers of daisies and light intensity.