



Smart Agriculture

# Gardening Robot



**WORKSHEET**

For Teachers

Ver. 1.0.1

HOUR  
OF  
CODE

Name: \_\_\_\_\_

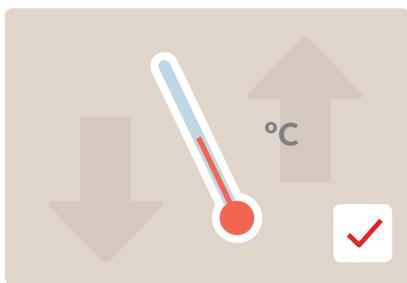
Class: \_\_\_\_\_

WORKSHEET

# Gardening Robot

## Part 1: Growing a plant

1. What does a plant need to grow? Tick the correct things.

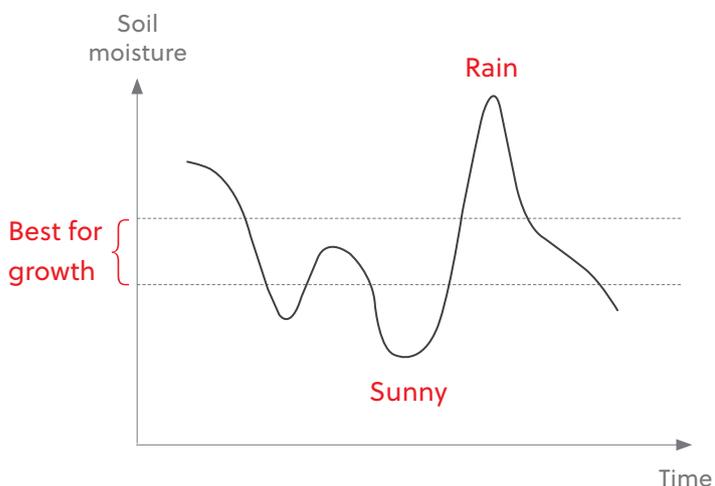


2. What will happen if one of the factors for plant growth is missing? How can we ensure the plant grows well?

We should control the factors to ensure the plant grows well.

## Part 2: Watering timing

Read the soil moisture graph. The dotted lines show the desired range of soil moisture for the plant.



1. Give plausible explanations for the peaks and troughs in the soil moisture graph.

The soil moisture will be high after rain, and

low in sunny or dry days.

2. Identify and mark the appropriate timings to water the plants in the soil moisture graph.

### Part 3: Smart watering in Barcelona

Read the following excerpt from a news article.

#### **Smart watering for Parks and Gardens**

Barcelona's Parks and Gardens gardeners will soon control watering operations in the city's green areas using a tablet. This device will allow them to control the city's new tele-management watering system, a smart platform where they can open and close the electronic valves controlling the watering process, to give plants the exact amount of water that they need.

Setting up the system involved first making an inventory of all the species in each park and their water needs, checking the watering systems and installing water and humidity sensors, placed underground at different points in every green area. Data from the sensors, combined with data from the city's meteorological stations and rain gauges, make it possible to adjust the quantity of water used and lower the municipal water bill by up to 25%. This means an estimated annual savings of nearly 425,000 euros.

— Info Barcelona (2014). Retrieved from [https://www.barcelona.cat/infobarcelona/en/my-new-post-1498\\_25404.html](https://www.barcelona.cat/infobarcelona/en/my-new-post-1498_25404.html)

1. What benefits does the smart watering system in Barcelona bring about?

Keep green areas in parks and gardens healthy and watered as needed. Hence saving water and cost of water.

2. What challenges are there in making and operating the smart watering system?

Maintenance and cost of underground components, susceptible to damage by nature and pests.

### Part 4: Smart watering system and control

Learn about the soil moisture sensor.



A soil moisture sensor



A soil moisture sensor in soil

Draw a diagram to show a smart watering system. Make sure to include the appropriate components and how they are connected.

