

# Topic 6: Challenge 2: Building and Testing a Robot

# Lesson 5.0 Before you start you challenge

- In this Topic you will work on the practical part of your challenge.
- It will implement a Prototype of a Robot to solve a concrete problem in Agriculture called "FarmingBot"
- This challenge fits perfect for you if you are interested in technology and would like to tinker with something.



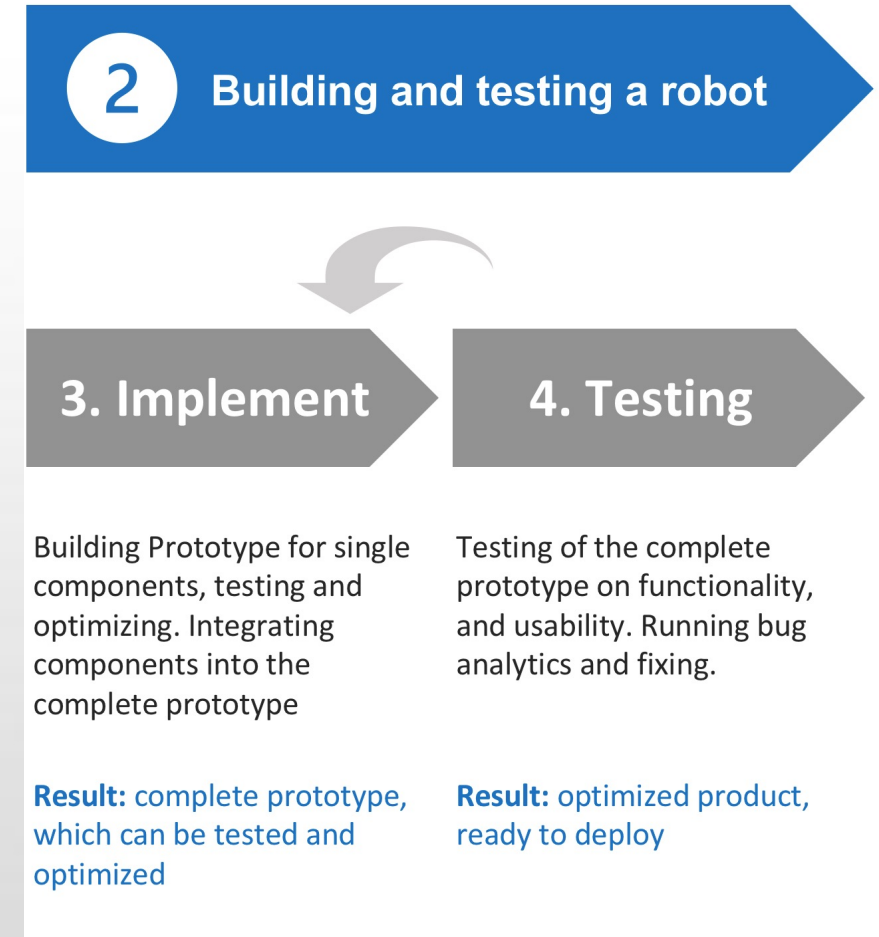
# What you need for this challenge: The Basic robot kit

- For this option you should purchase the basic robot kit first.
- You will find all specific information you need in this topic in the Script provided in this Lesson material.

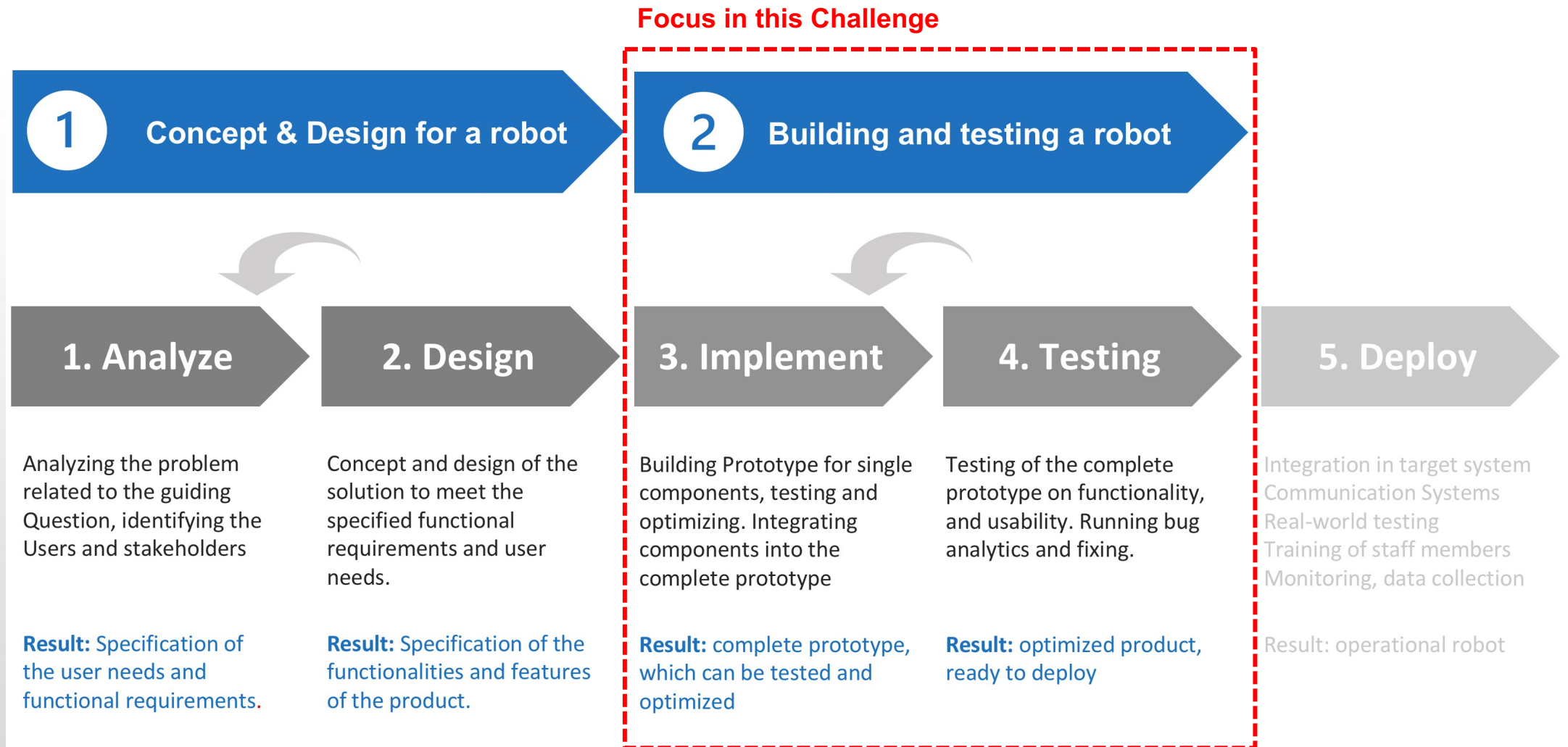


# You will be guided through your Challenge

- To develop your robot solution, you can orient yourself by the standardized process model that was briefly introduced in chapter 4.
- As you will focus on Building & Testing a robot you will start in the **phase 3 (Implement)** and go on to the **Phase 4 (Testing)**.
- In each phase you will be asked some guiding questions to ensure that all aspects are considered.
- To build your Robot you have then to follow the Instructions and the recommendations described in this lessons.



# You will be guided through your Challenge



# Programming without coding

The screenshot shows the Makeblock mBlock software interface. The main workspace contains a panda sprite on a stage. The left sidebar has categories: Audio, LED, Display, Motion, Sensing, and LAN. The right sidebar has: Events, Control, and extension. The main workspace is filled with various command blocks. Callouts point to specific features:

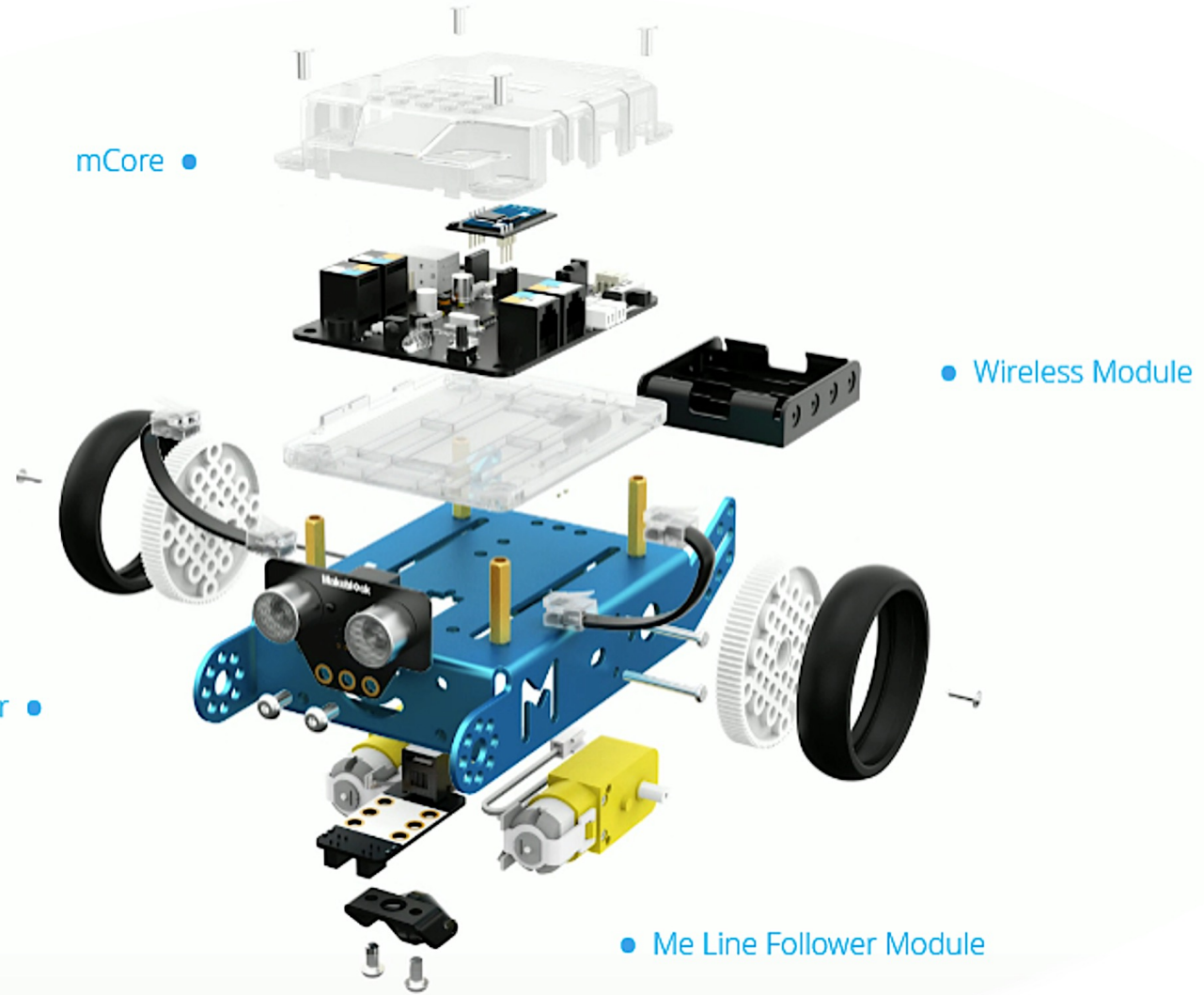
- stage (A)**: Points to the panda sprite on the stage.
- command catalog (B), (B)**: Points to the left sidebar categories.
- skript -area (C)**: Points to the main workspace area.
- Ad new board**: Points to the 'Add' button in the 'Devices' section.
- object-Library (D)**: Points to the 'CyberPi' device icon.
- Blocks (Commands)**: Points to the main workspace area.
- Connection menu**: Points to the 'Connect' button at the bottom.

```
when clicked
say Hello!
```

```
when clicked
set speed to 10
forever
  if touching mouse-pointer ? then
    say Hello! for 2 seconds
  else
    move 10 steps
    turn 10 degrees
```



# Build your Robot



# connect your Robot to the programming tool



mBot – Robot



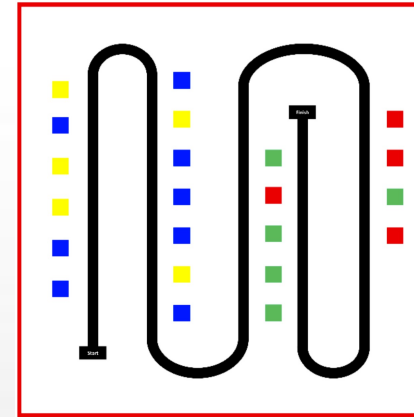
mBlock – Non Code Programming tool



# Your Challenge

To do this, they must first be able to follow a set track. Your goal in this challenge is to build a simple miniature bot, your mBot, and program it yourself so that it follows a set track. In this challenge this track will be a line parkour (see illustration) Your challenge will be finished, when you mBot follows from the start to the finish on the black line.

- To accomplish this task, you will have to overcome **four sub-challenges**:
- First you will learn how to program a robot. Don't worry, you will use a simple tool to program your mBot without writing any code just by dragging and dropping. You will start with simple programming exercises before you start programming a robot.
- Secondly you will assemble your mBot and test his basic functions.
- You will then connect your mBot with your programming tool and program it.
- At last you will test your programmed Farming Bot on the test parkour.



# Start Your Challenge

- Now it's time to start your Challenge first building the robot by assembling the mBot Kit.
- Start reading the Script which guides you step by step through the assembly procedures and the programming part of your Farmingbot
  
- We wish you much fun and success in your Challenge