

## Thymio VPL Lesson Synopsis

### Lesson 1: Getting to Know VPL

A brief introduction to VPL and basic concept of programming.

### Lesson 2: Events and Actions

How does Thymio work?

An introduction to events and actions of VPL and their functionalities.

Task: Get Thymio moving based on case studies.

### Lesson 3: Obstacle Detection

Find and avoid surrounding obstacles with proximity horizontal sensors.

Task: Program Thymio to detect and stop at obstacles.

### Lesson 4: Ground Detection

Program and utilize ground detection sensor.

Task: Make Thymio stop at the edge of a table to prevent falling.

### Lesson 5: Detecting Distance and Identifying Colors

Understand how Thymio determines obstacles and detects black and white colors on the ground and the concept of distance sensing.

Task: Color detection (black/white).

### Lesson 6: Detecting Distance (Advanced)

Understand how to use the sensor to determine the distance of the obstacle

Task: Adjusting sensor thresholds?

### Lesson 7: Recognizing Colors (Advanced)

Understand how to use a distance sensor to detect multiple colors. E.g. white, gray, black, etc.

### Lesson 8: Line Patrol

Program the robot to follow the line. Three situations of patrol line

Implement that Thymio can follow the black trajectory. Explore how it works.

Obstacle detection on the basis of line inspection.

Task: Sync line patrol with obstacle detection.

### Lesson 9: Line Patrol (Making Decisions on Fork Road)

Learn to program to choose a specific line/road at a three-way intersection

Analyze various scenarios in which the robot moves along the route.

Task: Fork road decision making

### Lesson 10: Wall Following

Enable to move Thymio along a wall.

How to continue if the wall has a corner

Analyze various scenarios of the robot when it is moving against the wall.

Task: Marching against the wall.

### Lesson 11: Timer

Learn to program Thymio to move forward and stop in 2 seconds and turn on red light in another 2 seconds.

Tasks: Delayed light, Go forward 20cm, Turn 90 degrees.

### Lesson 12: Complicated Task

Learn to combine multiple tasks

Tasks: Correct directions in line patrol; Avoid erroneous cycles

### Lesson 13: Extra Functions

Flap, Roll, Pitch, Clap and Play Music

### Lesson 14: Breaking Down Complex Actions

Learn to analyze a complicated action and break it down into basic actions.

Task: Dealing with obstacles on route.

### Lesson 15: A Guide to R2T2

An introduction to R2T2 international contest including rules and task explanation