



## What and Why?

Lego WEDO 2.0 is a set of legos and additional devices for programming and building a robot. You can make the robot to move by using a coding app on a mobile device. The set includes a small engine that makes the robot move and sensors for distance and angle. You need a Lego Wedo app for coding the robot.

Programming and coding develop problem solving skills and promote mathematical and logical thinking. Coding a robot helps you to understand the basics of programming that is used to create for example web platforms and computer/video games. Coding is also a fun and creative activity that can be done individually as well as in a group!



## How to use Lego WeDo 2.0



### Think and discuss:

#### Discuss with the group:

- Have you played with legos as a child?
- What did you build? Share memories!
- What was nice about them? What did you not like?
- Why did you/did you not like them?
- Was it fun?
- What did you learn?

**Tip!** Instead of just talking, use Jamboard to collect memories. This is a great way to revise an already studied tool!

#### Watch the instructional video on Vimeo.

- You can find the video on the SAID Vimeo channel with the name Lego WeDo.

#### Talk to your pair:

- How did the video make you feel? Does it look easy or difficult to build and code robots?
- What do you need to be able to use Lego WeDo 2.0 in a classroom with the pupils?





## Get started!

- **Prepare: get familiar with Lego WeDo set, take care of the set?**
- **In pairs or in small groups, start by going through the contents of a Lego WeDo set**
- **Find answers to following questions:**
  - Take a look at the box and its contents:
    - How are the contents organized? Can you find the pictures that help you to organize the contents?
    - Why are they organized like that? Why is it important?
    - How can you keep the box organized?
- **In addition to basic lego building blocks, what kinds of special parts can you find?**
  - Can you find the motor?
  - Can you find the sensors? What are the sensors? What do they do? Can you guess?
  - What is the smart hub? What does it do? Can you guess?  
Go through the answers together.
- **Take a look at the Lego WeDo app.**
  - Feel free to explore without having a specific goal OR
  - Can you find the selection of robots you can build with the apps' instructions? Which one would you choose?



- **Practice how to prepare the set for a lesson at school:**
  - Device for coding:
    - Make sure the battery of the device is charged
    - Check that there is Lego WeDo app on the device
  - Smart Hub:
    - Make sure you have power in the batteries OR the Power Pack is charged.
    - Practice how to charge the Power Pack OR how to change the batteries (depends on which set you have)
  - Make sure the other parts of the Lego WEDO set are organized in their own boxes so that they are easy to find.

Get familiar with the Digi Coach card for Lego WeDo. How does it help you with preparing for visits at school? See if you can access the instructional video by scanning the QR-code on the card



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## How does it work?

### Build your first lego robot and connect to the device:

- Choose the first project from the list in the Lego WeDo app OR let the learners choose from a couple of simple options (such as the Glowing Snail or Milo the Science rover which is presented in the video).
- **Build the robot (in pairs or in small groups):**
  - Open the LegoWeDo app on the device and click “Your first project” - button. Then choose the desired model from the library.
  - The program will guide you through the building process. You can skip the introduction (EXPLORE) and start building straight away by navigating to the section called CREATE.
  - Build the robot. Follow each step carefully and compare your work with the images of the instructions.
- **Practice how to connect the robot to your device:**
  - After the building instructions the WeDo app will show you how to connect the device.
  - Click CONNECT in the app.
  - Click the green button on the robot to turn it on. It is located in the Smart Hub.
  - Choose the Smart hub name from the list on the device and click it.
  - The robot is connected when the blue light next to the power button stays on continuously instead of blinking. Also the app tells you when the robot is successfully connected.
- **Note!** Repeat, repeat, repeat! Choose another robot model to build. It is good to practice building robots with the instructions before you learn to code and how to make the robot move. Also, this way you will get more familiar with the whole Lego WeDo set.





## How does it work?

### Program the robot

- A coding snack: Hungry little mouse
  - Draw/project a simple grid on the whiteboard.
  - Draw pieces of cheese in a few squares of the grid and tell a story about a hungry mouse called Max. He lost his food into a maze (add walls and bushes (obstacles) on the lines/squares of the grid.
  - Draw Max in one of the corner squares and ask learners to guide him to his cheese:
    - What does he have to do next? You can give a list of commands (forward, turn right, turn left...)
    - Example: Max should take three steps forward, turn right, take two steps forward... etc.
  - Draw the route on the grid as you go. You can also list the given commands to mimic the programming blocks that are later used in coding the robots.
- When the lego robot is ready and connected to the device, you can start programming it.
  - Learn the functions of the basic coding blocks:
    - On the Lego website ([education.lego.com](https://education.lego.com)) there are pictures of the different coding blocks.
    - OR
    - Display your own device screen on the whiteboard and show an example of coding a simple set of commands for a robot.
  - Go through at least the following green blocks:
    - Power of the motor, how fast it spins (speed meter)
    - Direction of the spinning (Clockwise/anticlockwise)
    - Duration of an action (hourglass)
    - Stop (x)
  - Give an example set of commands that everybody should copy: e.g.
    - Move at a certain speed for a certain time and stop
  - Explore:
    - How can you change the speed of the movement?
    - How can you change the duration of the movement?





## Get Creative!

- **Can you find new building instructions online?**
  - For example, YouTube has instructional videos! Find a project that interests you and see if you can build and program it.
  - This activity has endless opportunities to those who are inspired by the Lego WeDo set!
- **With a pair, plan and design your own robot.**
  - This activity requires little more understanding of the basic functions of the Lego WeDo set.
  - To make it more accessible, you can first build a ready designed model and modify it.





## Lesson plan examples

### Further reading /material :

#### Teacher guide:

<https://education.lego.com/en-us/product-resources/wedo-2/teacher-resources/teacher-guides/>

Includes for example:

Teacher resources: e.g. Introduction, Toolkit (pictures and descriptions of coding blocks and base models)

Downloads: e.g. building instructions, system requirements

Troubleshooting: e.g. How to connect to the Smart Hub

#### YouTube:

Lego Education channel

<https://www.youtube.com/@LEGOEducation>

Getting started with Lego WeDo 2.0

[https://www.youtube.com/playlist?list=PLXNn7QnqINpi4FxGDuQySokXqc9\\_a5zy9](https://www.youtube.com/playlist?list=PLXNn7QnqINpi4FxGDuQySokXqc9_a5zy9)

### Example lesson plans: 6 x 60min

#### Lesson 1 (60 minutes)

#### Goals:

- Introduction to Lego WeDo,
- learn how to take care of the Lego WeDo material,
- exploring Lego WeDo app.





## Prepare:

Bring Lego WeDo 2.0 kits and coding devices with you.

You can download the Lego WeDo app on the devices beforehand or ask learners to do it as practice.

Create a Jamboard file for collecting lego memories, if you wish to use it.

Find the instructional video on Vimeo and have it ready before the lesson.

15-20min **Think and discuss:**

### Discuss with the group:

- Have you played with legos as a child? What did you build? Share memories!
  - What was nice about them? What did you not like?
  - Why did you/did you not like them?
  - Was it fun?
  - What did you learn?
- **Tip!** Instead of just talking, use Jamboard to collect memories. This is a great way to revise an already studied tool!

15min **Watch the instructional video on Vimeo.**

You can find the video on the SAID Vimeo channel with the name Lego WeDo.

### Talk to your pair (and share with the group):

- How did the video make you feel? Does it look easy or difficult to build and code robots?
- What do you need to be able to use Lego WeDo 2.0 in a classroom?

Make a list of the things you need on the whiteboard or in Jamboard.

*Prepare: get familiar with the Lego WeDo set*

15min In pairs or in small groups, start by going through the contents of a Lego WeDo set. You can also use the internet for finding information.

Find answers to following questions:

- Take a look at the box and its contents:
  - How are the contents organized? Can you find the pictures that help you to organize the contents?
  - Why are they organized like that? Why is it important?
  - How can you keep the box organized?
- In addition to basic lego building blocks, what kinds of special parts can you find?
- Can you find the motor?
- Can you find the sensors? What are the sensors? What do they do? Can you guess?
- What is the smart hub? What does it do? Can you guess?

Go through the answers together.

10min Take a look at the Lego WeDo app.

- Feel free to explore without having a specific goal OR
- Can you find the selection of robots you can build with the apps' instructions? Which one would you choose?

## Lesson 2 (60 minutes)

### Goals:

- practice building a lego robot following step-by step instructions,
- practice how to connect the robot to the coding device

### Prepare:

- Bring Lego WeDo 2.0 kits and coding devices with you.
- Find the instructional video on Vimeo and have it ready before the lesson.

### How Does it work?

#### Build your first lego robot and connect to the device

10min Revise: Watch again the instructional video from Vimeo. Focus on the preparation and the instructions for building the robot and connecting it to the coding device.

Choose the first project from the list in the Lego WeDo app OR let the learners choose from a couple of simple options (such as the Glowing Snail or Milo the Science rover which is presented in the video).

25min

#### **Build the robot (in pairs or in small groups):**

- Open the LegoWeDo app on the device and click “Your first project” -button. Then choose the desired model from the library.
- The program will guide you through the building process. You can skip the introduction (EXPLORE) and start building straight away by navigating to the section called CREATE.
- Build the robot. Follow each step carefully and compare your work with the images of the instructions.

15min **Practice how to connect the robot to your device:**

- After the building instructions the WeDo app will show you how to connect the device.
- Click CONNECT in the app.
- Click the green button on the robot to turn it on. It is located in the Smart Hub.
- Choose the Smart hub name from the list on the device and click it.
- The robot is connected when the blue light next to the power button stays on continuously instead of blinking. Also the app tells you when the robot is successfully connected.



## Lesson 3 (60 minutes)

### Goals:

- revise building a robot by following step-by-step instructions,
- revise connecting the robot to the device

### Prepare:

Bring Lego WeDo 2.0 kits and coding devices with you.

Find the instructional video on Vimeo and have it ready before the lesson

5-10min Check that the Lego WeDo set is well organized. All the pieces should be in their designated section.

40-45min **Revise:**

Choose a new project from the Lego WeDo app.

Build the robot by following the instructions of the app.

Can you still remember how to connect the robot to the device?

10min Clean up and organise the set.



## Lesson 4 (60 minutes)

### Goals:

- Practice preparing the Lego WeDo set for a lesson,
- learn about the importance of taking care of equipment,
- understanding the basic idea of coding with command blocks

### Prepare:

Bring Lego WeDo 2.0 kits and coding devices with you.

Find the instructional video on Vimeo and have it ready before the lesson.

Get familiar with the “Coding snack” activity. You can also prepare the grid in advance, if you have the space on your whiteboard.

### 15min **Practice how to prepare the set for a lesson at school:**

- Device for coding: Make sure the battery is charged and has the Lego WeDo app
- Smart Hub: Make sure you have power in the batteries OR the Powered Pack is charged.
  - Practice how to charge the Power Pack OR how to change the batteries (depends on which set you have)
- Make sure the other parts of the Lego WEDO set are organised in their own boxes so that they are easy to find.

### 10min **Talk about the role of the digital coach:**

- Taking care of the devices and tools and preparing them for lessons is very important and makes learning possible and more fun.
- You can also make notes for taking care of the Lego WeDo set in your learning journal.



## How does it work? Code the robot

15-20min Coding extra:

### A coding snack: Hungry little mouse

- Draw/project a simple grid on the whiteboard.
- Draw pieces of cheese in a few squares of the grid and tell a story about a hungry mouse called Max. He lost his food into a maze (add walls and bushes (obstacles) on the lines/squares of the grid).
- Draw Max in one of the corner squares and ask learners to guide him to his cheese: What does he have to do next? You can give a list of commands (forward, turn right, turn left...)
- Example: Max should take three steps forward, turn right, take two steps forward... etc.
- Draw the route on the grid as you go. You can also list the given commands to mimic the code blocks that are later used in coding the robots.

15min Revise:

### Watch again the instructional video from Vimeo. Focus on the coding with blocks:

- Coding means giving a chain of commands to the robot.
- Each block represents a single command.

## Lesson 5 (60 minutes)

### Goals:

Learn the basics about coding blocks in Lego WeDo,

### Prepare:

Bring Lego WeDo 2.0 kits and coding devices with you.

Build a robot that you can use as an example, when teaching the functions of the coding blocks. Also, plan the example set of commands that everybody copies for practice.

If you can, save robots the learners built last time for this lesson.

15min Trainer's example:

- When the lego robot is ready and connected to the device, you can start coding.
  - Learn the functions of the basic coding blocks:
    - On the Lego website ([education.lego.com](http://education.lego.com)) there are pictures of the different coding blocks.
    - OR
    - Display your own device screen on the whiteboard and show an example of coding a simple set of commands for a robot.
  - Go through at least the following green blocks:
    - Power of the motor, how fast it spins (speed meter)
    - Direction of the spinning (Clockwise/anticlockwise)
    - Duration of an action (hourglass)
    - Stop (x)

20min Build an easy robot that you can use to practice coding. Choose a model that you are already familiar with. If you can save the robots from the previous lessons, it saves time.

25min

- Give an example set of commands that everybody should copy: e.g.
  - Move at a certain speed for a certain time and stop
- Explore:
  - How can you change the speed of the movement?
  - How can you change the duration of the movement?



## Lesson 6 (60 minutes)

### Goals:

- use already existing skills,
- look for inspiration in new projects,
- do something creative

### Prepare:

Bring Lego WeDo 2.0 kits and coding devices with you.

As an easy option, you can still continue to build ready designed projects from the app and practice coding the robots to move. There is a range of projects that vary in difficulty and options for coding.

### *Get creative!*

- Can you find new building instructions online?
  - For example YouTube has instructional videos! Find a project that interests you and see if you are able to build and program it.
  - This activity has endless opportunities to those who are inspired by the Lego WeDo set!
- With a pair, plan and design your own robot.
  - This activity requires little more understanding of the basic functions of the Lego WeDo set.
  - To make it more accessible, you can first build a ready designed model and modify it.

**Note!** Building and designing lego robots can be so much fun and naturally encourages learners to work together. There is also plenty of variety in the material (the set and the app, additional resources online). The options for coding also provide plenty of challenges for those who are inspired and want to learn more! Feel free to use more time exploring the possibilities and have fun with Lego WeDo!

