



# Year-Round Training Guide

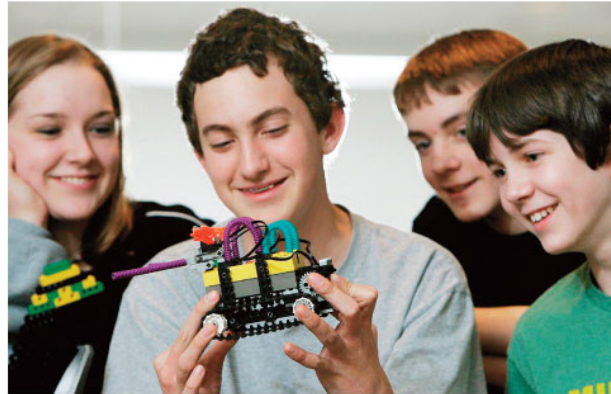
## MODULE 4: **LEGO® WeDo™** Introduction



MODULE 4: **LEGO® WeDo™**  
Introduction



**4-H Robotics:**  
*Engineering  
for Today  
and Tomorrow*





# **LEGO® WeDo™ Introduction**

*In this module you will learn about*

- Robotics in everyday use
- How you can use LEGO® WeDo™ to facilitate positive youth development
- The LEGO® WeDo™ Kit and Components
- The LEGO® WeDo™ Activity Pack (LEGO® Curriculum)



# **LEGO® WeDo™ Introduction**

*In this module you will*

- Gain hands-on experience with a LEGO® WeDo™ Kit
- Learn about valuable resources



# Everyday Robots

## *What is a robot?*

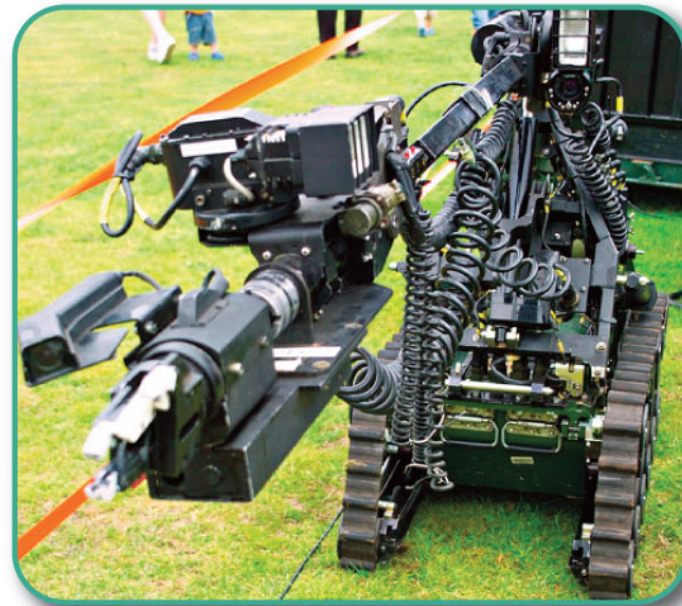
**1. a machine** that may look like a human being, that can perform complex acts (like walking), that is guided by automatic controls and automatically performs tasks which may be complicated or repetitive.

*Merriam-Webster Dictionary*



## Everyday Robots

**2. a device** that automatically performs complicated, often repetitive tasks

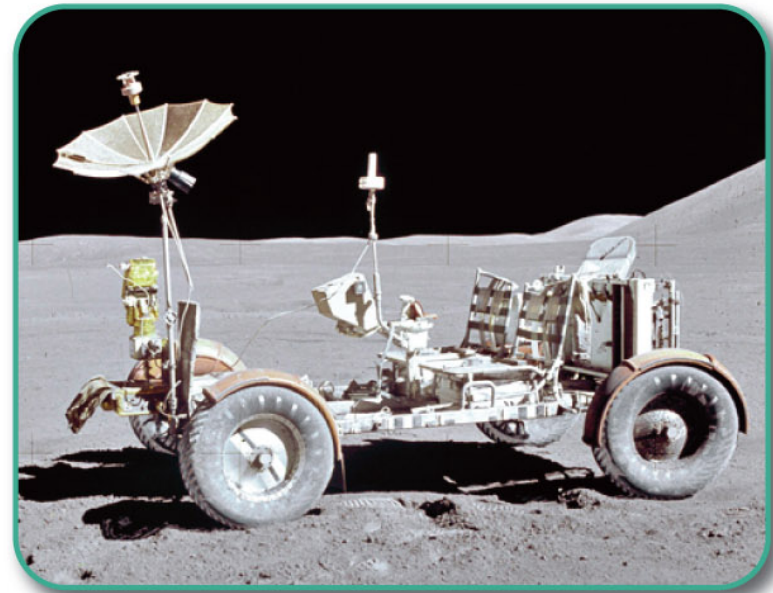


<http://www.merriam-webster.com/dictionary/robot>



## Everyday Robots

3. **a mechanism**  
guided by  
automatic  
controls

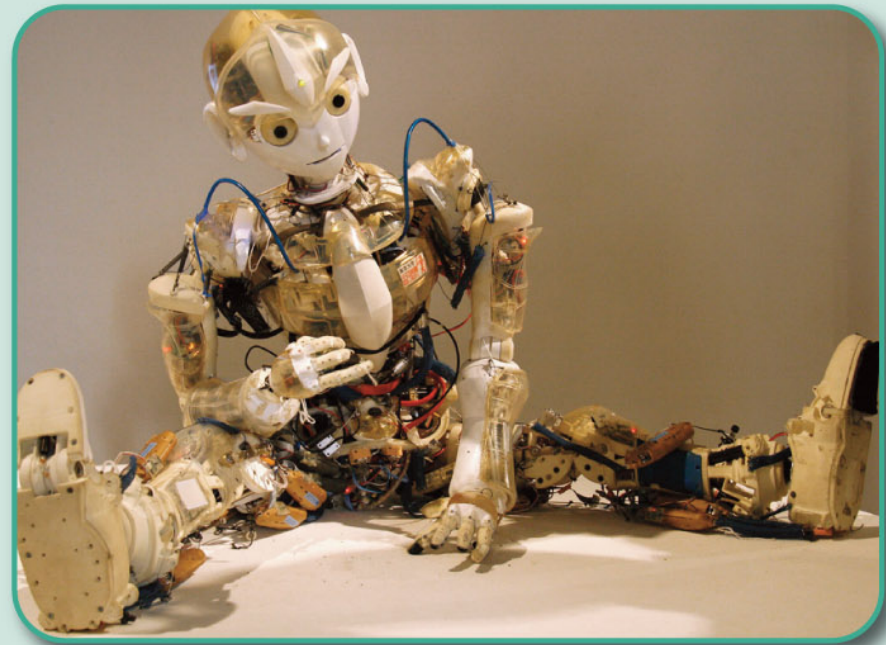


<http://www.merriam-webster.com/dictionary/robot>



## Everyday Robots

- What role do robots play in our daily lives?
- What is a career field where people work with robots?
- What is your favorite fictional robot?







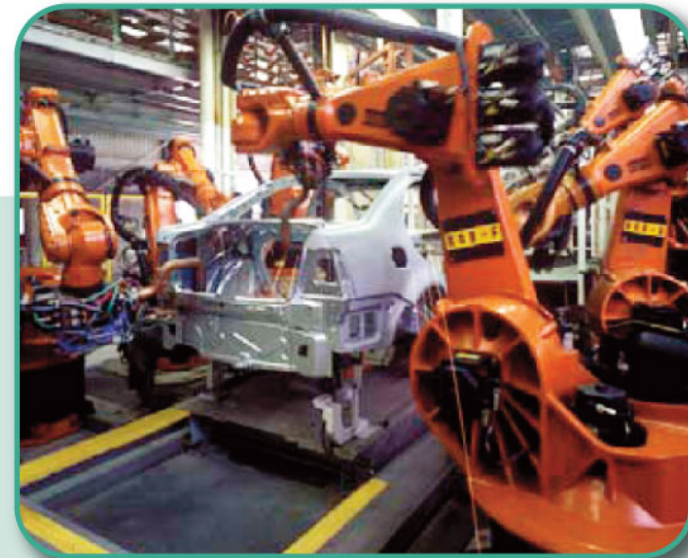
# Everyday Robots

Military Robots



*Industrial:*

Car Manufacturing



*Examples of Robots in Use Every Day*



# Everyday Robots

*Space Exploration:*  
Mars Rover



*Medical Robotics:*  
daVinci



*Examples of Robots in Use Every Day*



## Everyday Robots

*Toys:*

Robotic Hamster



*Household Robots:*

RoombaVacuum

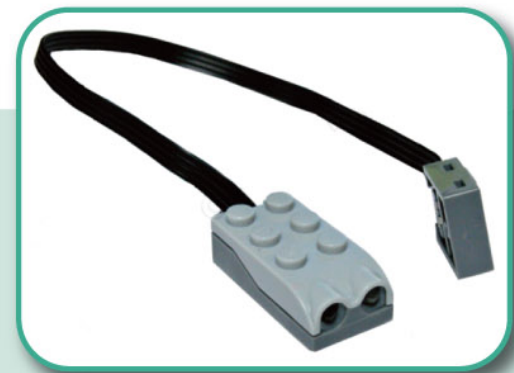


*Examples of Robots in Use Every Day*



## Everyday Robots

- Robots are a part of everyday life.
- Components of robotics such as sensors are in many devices we use daily.
- Robots are used by most people daily to offer convenience and security.



*Example:*

Motion sensors are used to open automatic doors.



MODULE 4: **LEGO® WeDo™**  
Introduction



# The **LEGO® WeDo™** Introduction



## MODULE 4: **LEGO® WeDo™** Introduction



# What is a **LEGO® WeDo™**?



- WeDo™ is a LEGO® product that allows elementary-aged youth to build robots using LEGO® pieces.
- Robots are connected to a computer and programmed to perform specific functions using the LEGO® WeDo™ Software.



# What Do **LEGO® WeDo™** Robots Look Like?



## Amazing Mechanisms

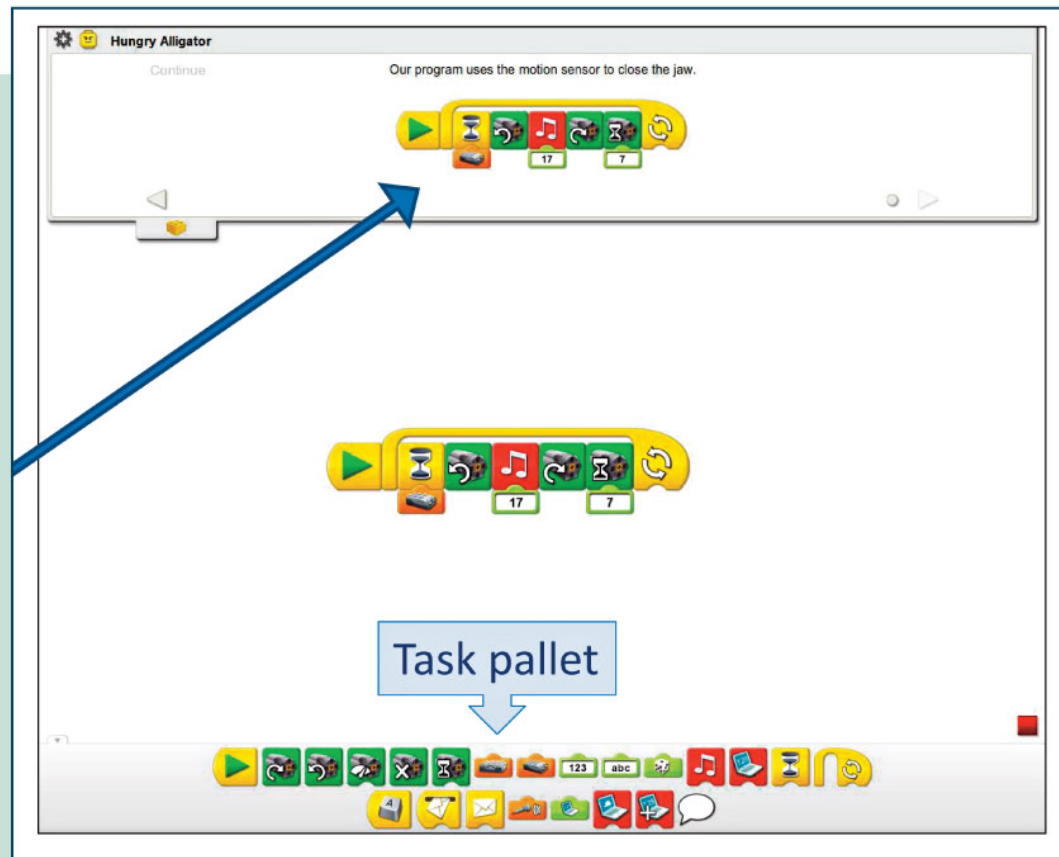


- Each individual kit has plans for 12 different LEGO® Robots.
- More building resources are available through LEGO®.



# LEGO® WeDo™ Programming Software

*Great introduction to icon programming with friendly step-by-step directions on the screen.*







MODULE 4: **LEGO® WeDo™**  
Introduction



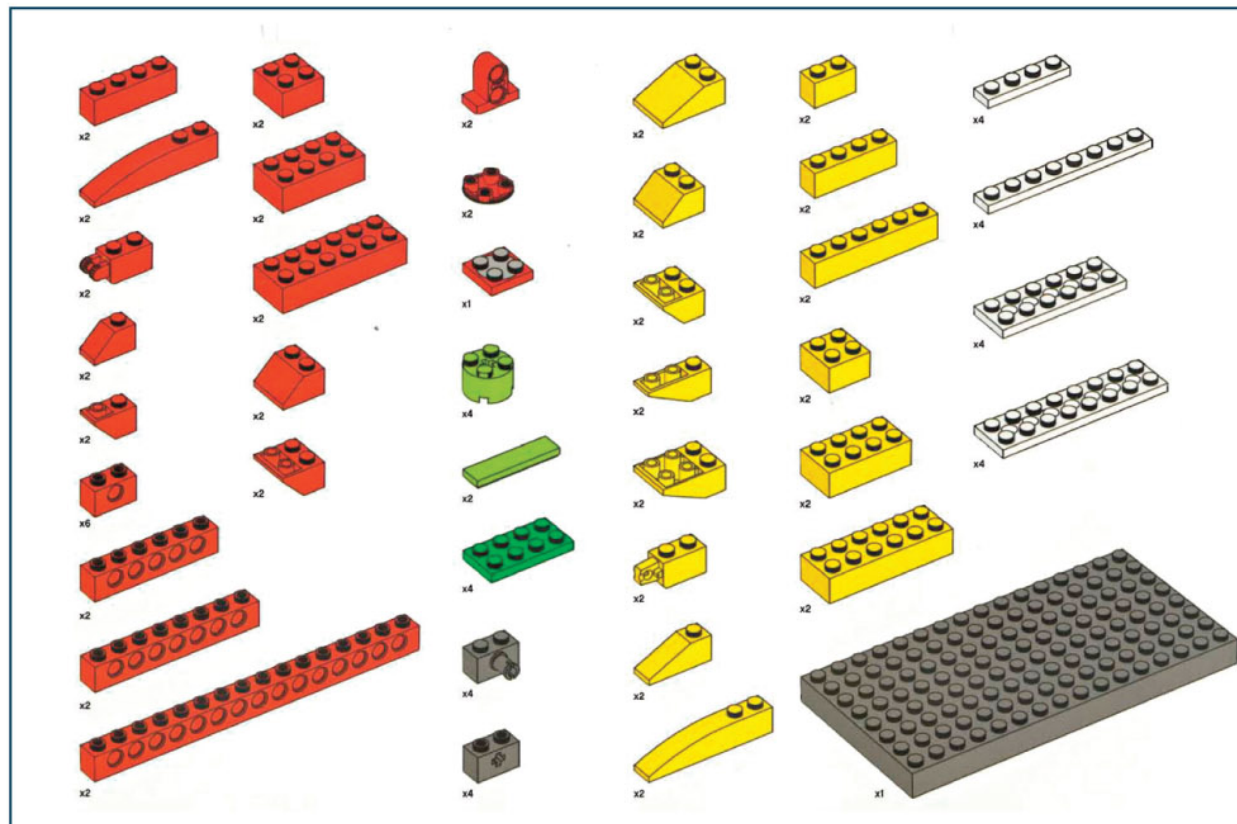
**Let's Do**  
**LEGO® WeDo™**



MODULE 4: **LEGO® WeDo™**  
Introduction



# Inside the **LEGO® WeDo™ Kit**



**LEGO® Bricks**





# Inside the **LEGO® WeDo™** Kit

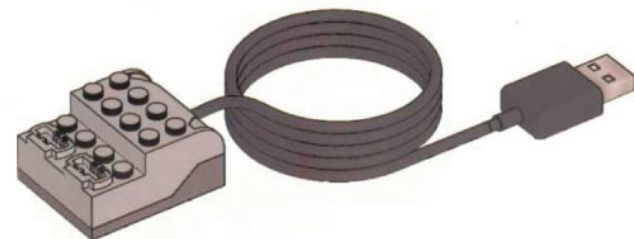
- Sensors  
*Light Sensor*  
*Tilt Sensor*



- Motor



- USB Hub





MODULE 4: **LEGO® WeDo™**  
Introduction



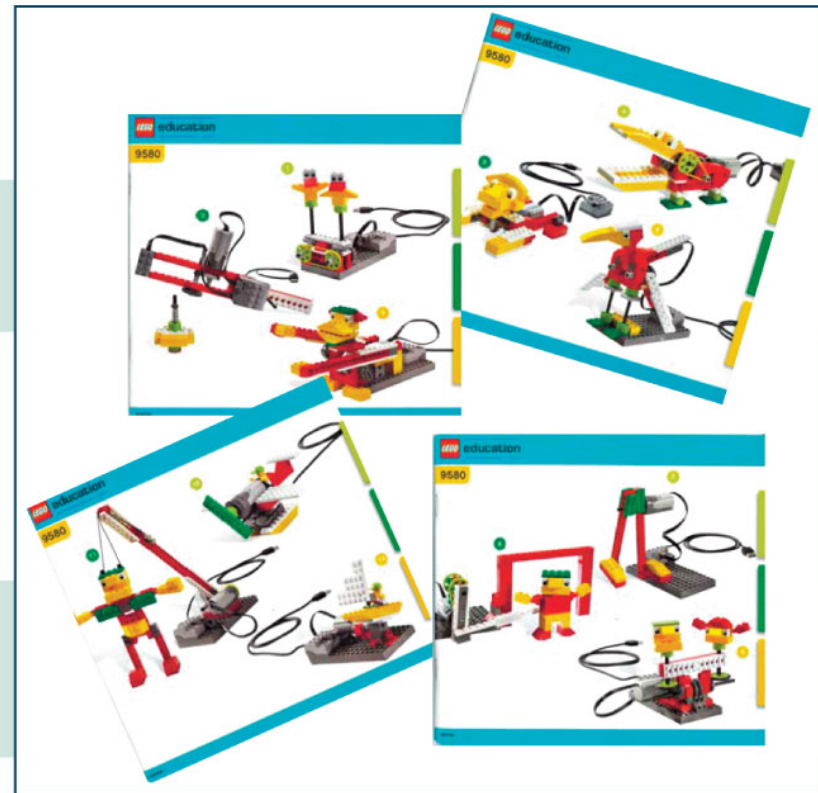
# The **LEGO® WeDo™** Kit Building Guides and the Alligator Build





# The Building Guides

- Easy-to-follow building process
- Full-color pictorial guide
- Similar to most LEGO® Build Kit instructions
- Very user-friendly





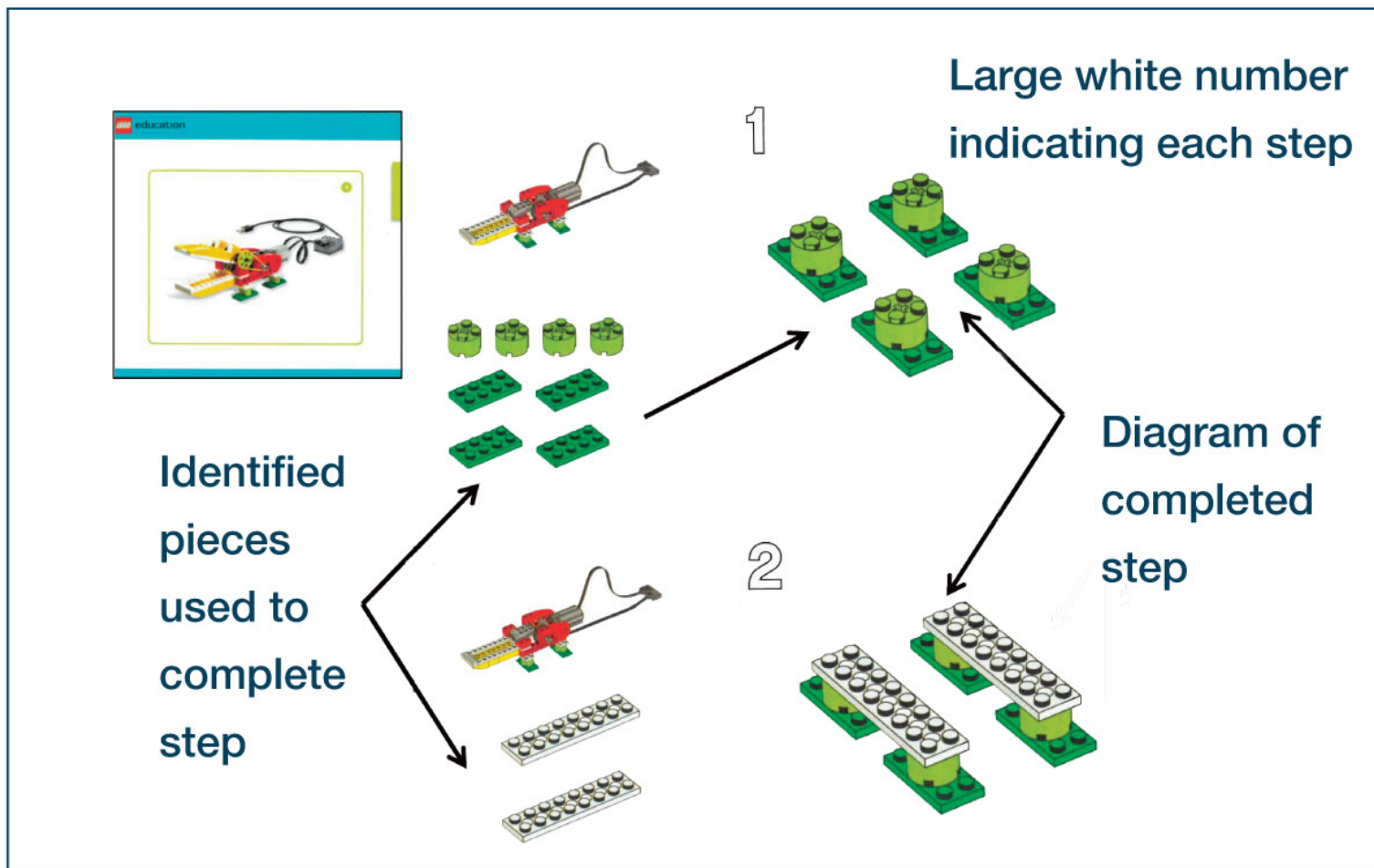
# The Building Guides

- Amazing Mechanisms
- Wild Animals
- Play Soccer
- Adventure Stories





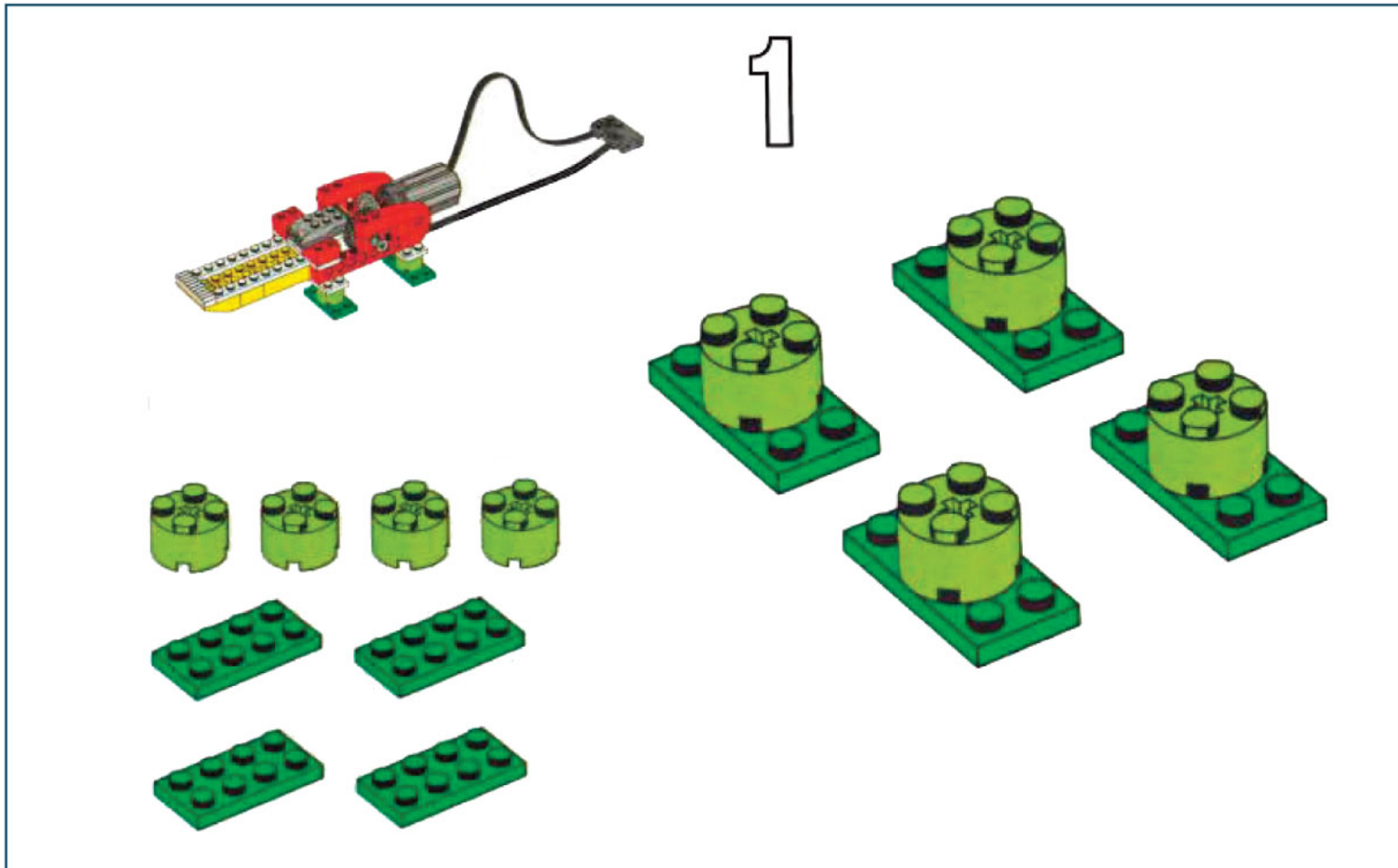
# Building the Alligator







# Building the Alligator





# The Finished Alligator

## The Check List



Is the gear is facing the correct direction?



Are rubber bands connected securely?



Is the motion sensor lined correctly?



Does the mouth open and close? Test Gear.



# The Finished Alligator

## The Check List



Are sensors securely attached to the USB hub?



Are all LEGO® bricks attached securely?



Look over entire build and make sure it is identical to the guide.



# The **LEGO® WeDo™** Activity Pack

- Teacher's Guide
- Curriculum
- Add-on Software
- Step-by-step on-screen instructions in building and programming
- Classroom-type activities and handout materials for each build





# Review the Activity Pack

Page 80: Objectives

Page 81: Animated Movie and Discussion Questions

Page 82: Construct, Overview of Mechanisms and Process

Page 83: Basic Functions of Software

Page 84–86: Lesson Plan





# Programming with the **LEGO® WeDo™** Software

- If you **are** using the LEGO® WeDo™ Software Demonstration Video, show the video now.
- Then continue to slide 35.
- If you **are not** using the video, continue with the slides as you demonstrate the LEGO® WeDo™ software.



# LEGO® WeDo™ Software Introduction

- Drag-and-drop icon-based software
- Provides an intuitive and easy-to-use programming environment





# LEGO® WeDo™ Software Introduction

- Software automatically detects motors and sensors when they are attached to the LEGO® USB Hub

- Includes a Getting Started Guide with simple building tips and programming examples



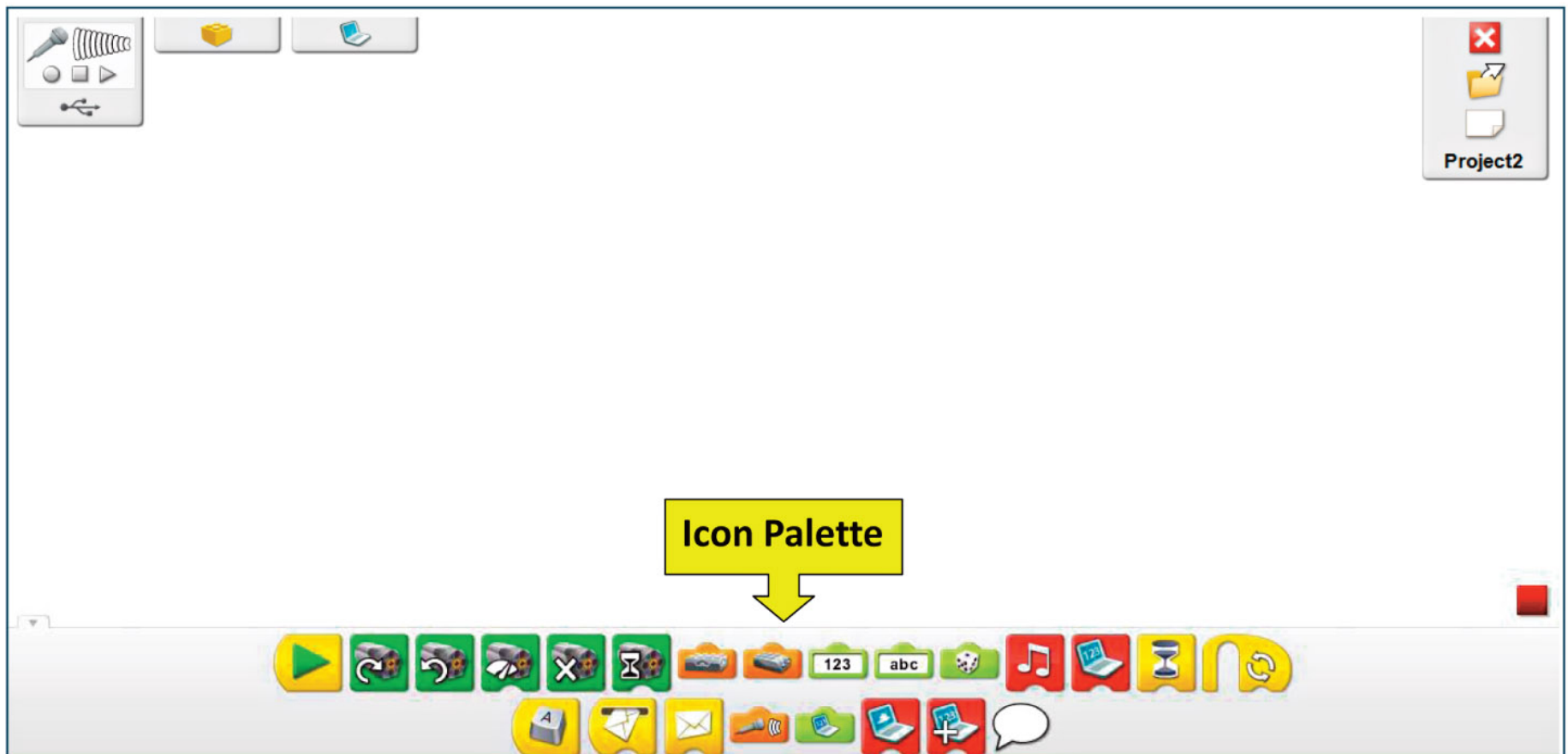




MODULE 4: **LEGO® WeDo™**  
Introduction

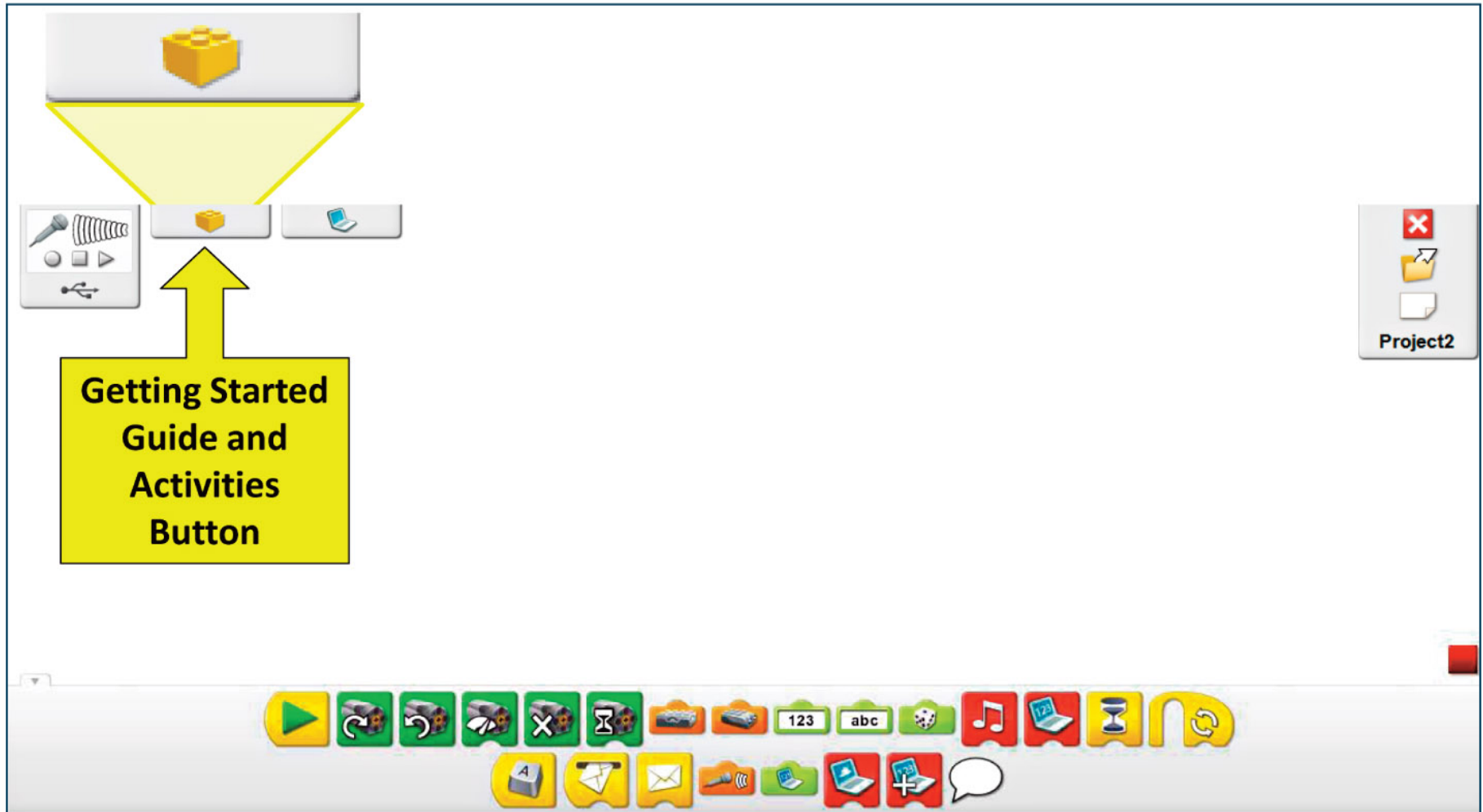


# LEGO® WeDo™ Software Introduction





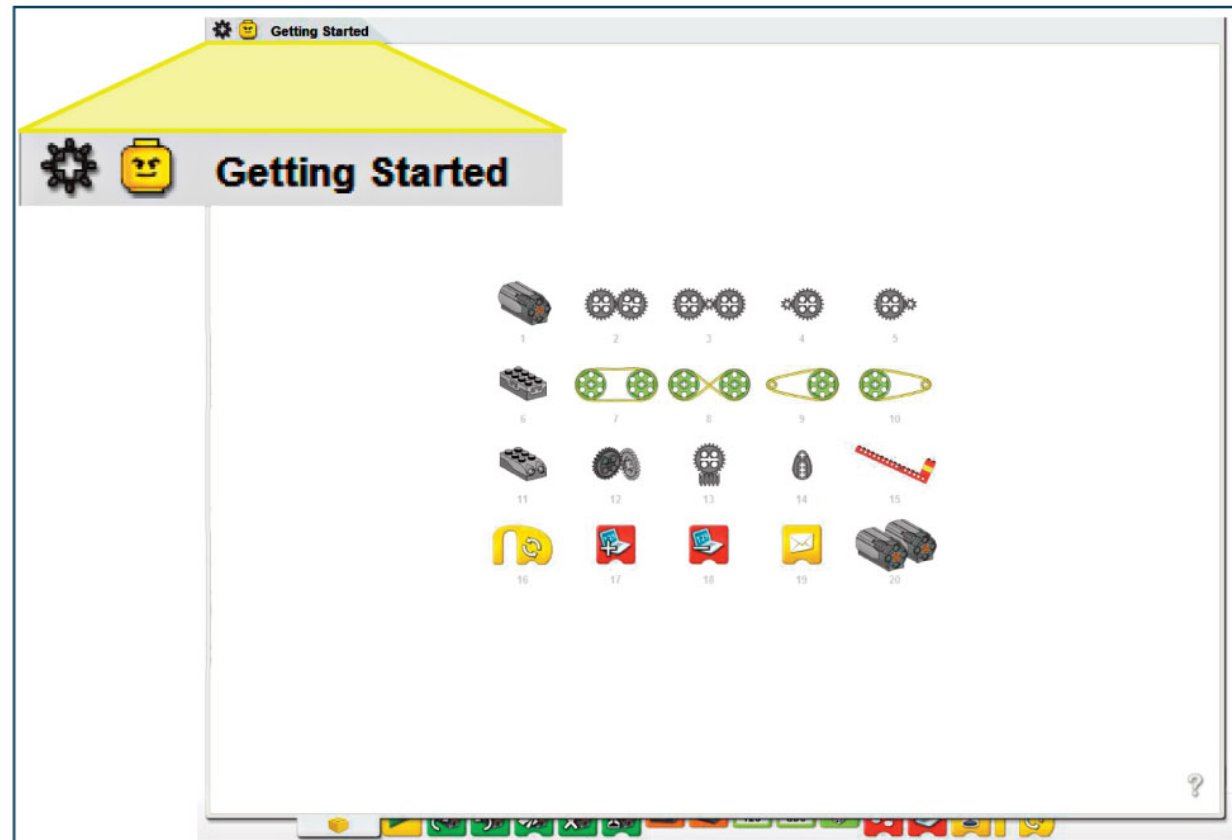
# LEGO® WeDo™ Software Introduction





# Getting Started Guide

*Each  
component  
icon is clickable.  
Clicking leads  
to further  
instructions.*





MODULE 4: **LEGO® WeDo™**  
Introduction




# Activities






# The Alligator

 **Hungry Alligator**


Connect



Mia and Max are careful as they walk by the alligator. It looks hungry!  
Can you create an alligator that closes its jaw when it eats?

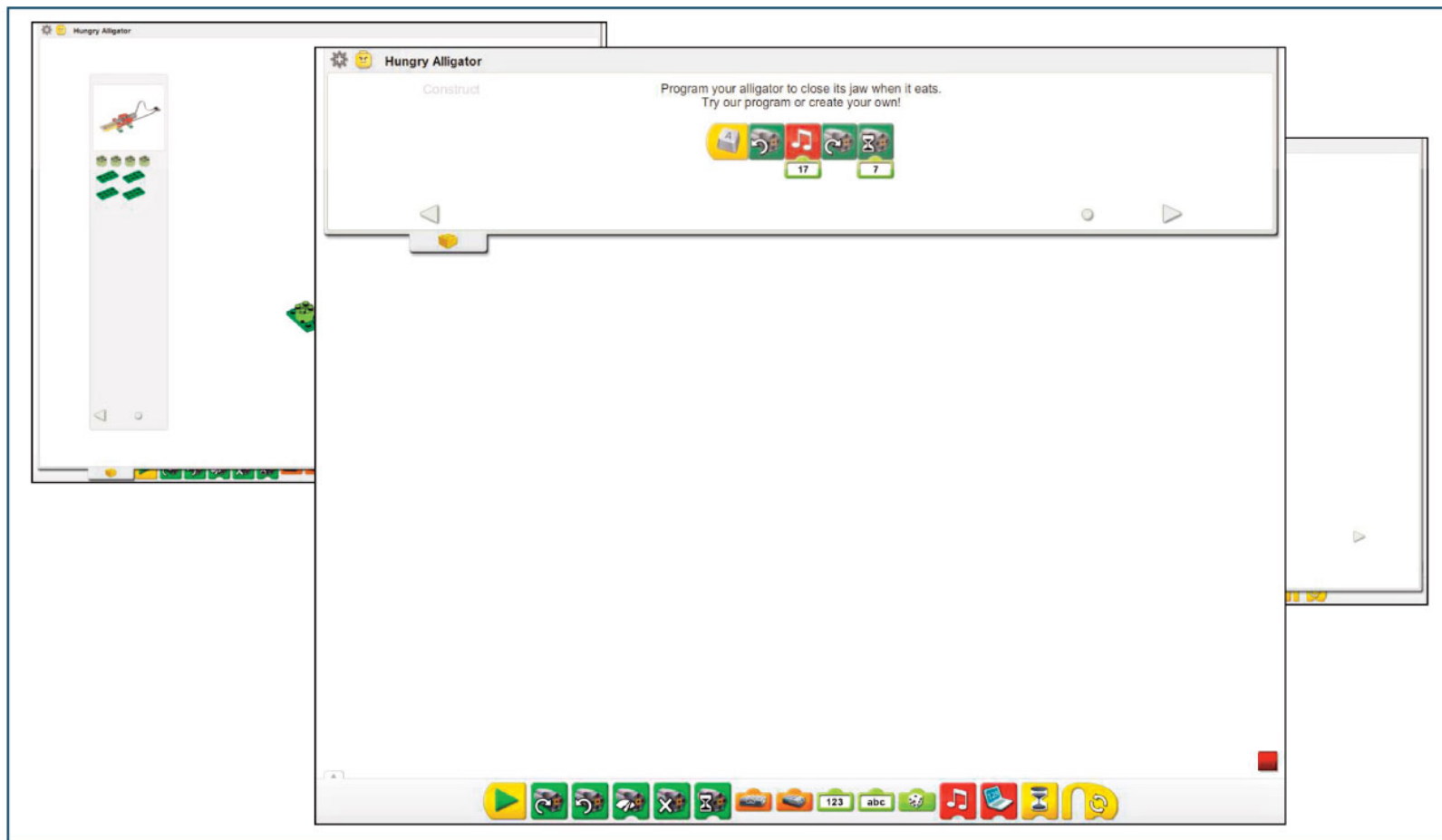
**Advance Button**

**Advance Button**





# On-Screen Building Instructions





## Start Programming

Once the USB is connected a sensor icon may appear in the upper left hand corner. This icon will depend on which sensor was used during the build.

*For example: Light Sensor or Tilt Sensor may appear.*





# Experiment with the Programming



*Experiment with the program  
by adding additional icons  
such as sound, backgrounds,  
text or change the motor directions.*





# Programming Discussion

- What was a challenge you encountered while building?
- Were there any challenges using the software?
- Was this easier or harder than you thought it would be?  
Explain.



MODULE 4: **LEGO® WeDo™**  
Introduction



# LEGO® WeDo™ Resources

LEGO® Education Resource for Teachers  
[www.legoeducation.us/](http://www.legoeducation.us/)

Additional Activity Packs can be purchased to add on to the four theme-based builds.

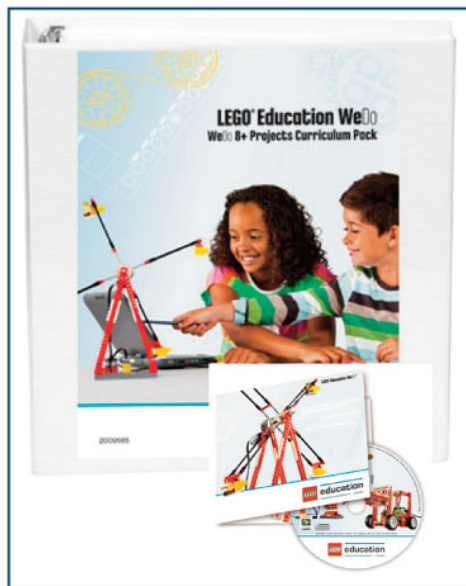




## MODULE 4: **LEGO® WeDo™** Introduction



# More Resources from **LEGO®**



**LEGO®**  
Education  
WeDo™  
STEM  
Expansion  
Activity Pack

**9585 LEGO® Education  
WeDo™ Resource Set**



**9585 LEGO® Education WeDo™ Resource Set** Features extra and new elements for building large WeDo models that provide even more learning opportunities. Combine with 9580 WeDo Construction Set to build four new models: Ferris Wheel, Crane, Car or House. Includes new elements such as wheels, rotors and a door. Download free building instructions and programming samples right here by clicking on the Crane, Ferris Wheel or House and Car boxes below.



MODULE 4: **LEGO® WeDo™**  
**Introduction**



# **Additional Robotics Resources**

*For Inspiration and Recognition  
of Science and Technology  
(FIRST®)*

**[www.usfirst.org](http://www.usfirst.org)**

Jr. FIRST® LEGO® League

**[www.usfirst.org/roboticsprograms/jfll](http://www.usfirst.org/roboticsprograms/jfll)**



MODULE 4: **LEGO® WeDo™**  
**Introduction**



# **Additional Robotics Resources**

*FIRST*® LEGO® League

[\*\*www.usfirst.org/roboticsprograms/fl\*\*](http://www.usfirst.org/roboticsprograms/fl)

KISS Institute for Practical Robots:

Robotics Laboratory: Wheels and Navigation Activity

[\*\*http://www.kipr.org/\*\*](http://www.kipr.org/)



# Additional Robotics Resources

STOMP Sample Units, Activity Database

<http://sites.tufts.edu/stomp/resources/>

Carnegie Mellon University – Robotics Academy

[www.education.rec.ri.cmu.edu/roboticscurriculum/  
index\\_to\\_robotics.htm](http://www.education.rec.ri.cmu.edu/roboticscurriculum/index_to_robotics.htm)



# Additional Robotics Resources

Look for new contacts and volunteers  
to help build your program.

Older, more experienced youth can make great mentors.



# Youth Development Applications

*The following skills can be developed through  
LEGO® WeDo™ projects and the Activity Pack projects*

- Youth are encouraged to use creativity, teamwork and problem solving: life skills!
- Youth develop language and literacy through narrative and journalistic writing, storytelling, explaining, interviewing and interpreting.

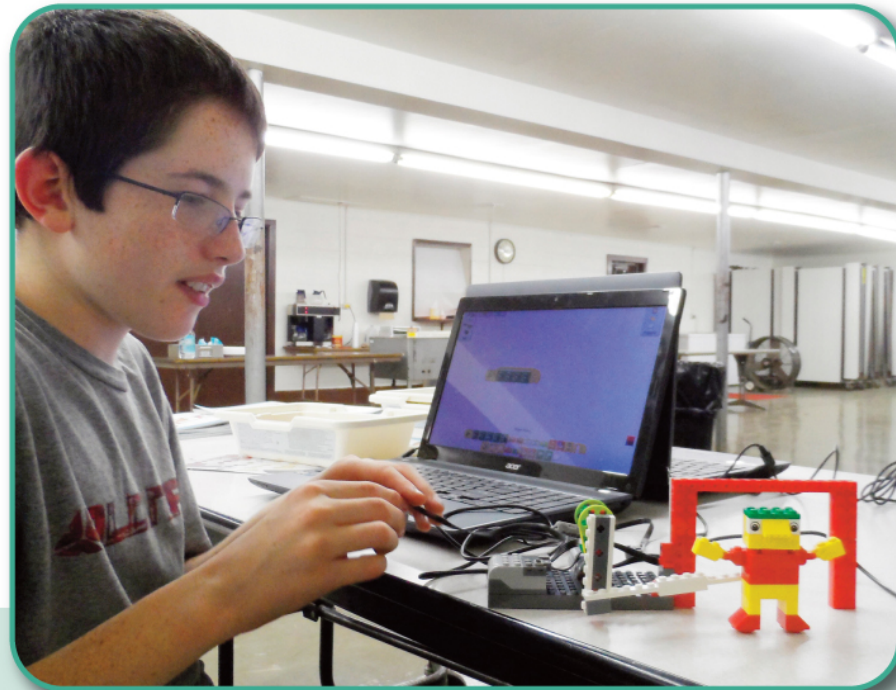






# Youth Development Applications

- Youth experience mathematics when measuring time and distance; adding, subtracting, multiplying, dividing, estimating, and using variables.





# Youth Development Applications

- Youth experience science through working with simple machines, gears, levers, pulleys; and experimenting with transmission of motion.
- Youth discover technology when programming; using software media; and designing and creating a working model





# Youth Development Applications

- How could youth use LEGO® WeDo™ Robots to perform service learning?

*(For example: providing a LEGO® WeDo™  
Workshop for 4-H members)*

- How could a club use LEGO® WeDo™ Kits to fundraise?



# Youth Development Applications

- How could a 4-H member use a LEGO® WeDo™ Kit in a traditional 4-H activity, such as a county fair or communications contest?
- How could a teen leader use LEGO® WeDo™ Kits to do an activity with junior members?

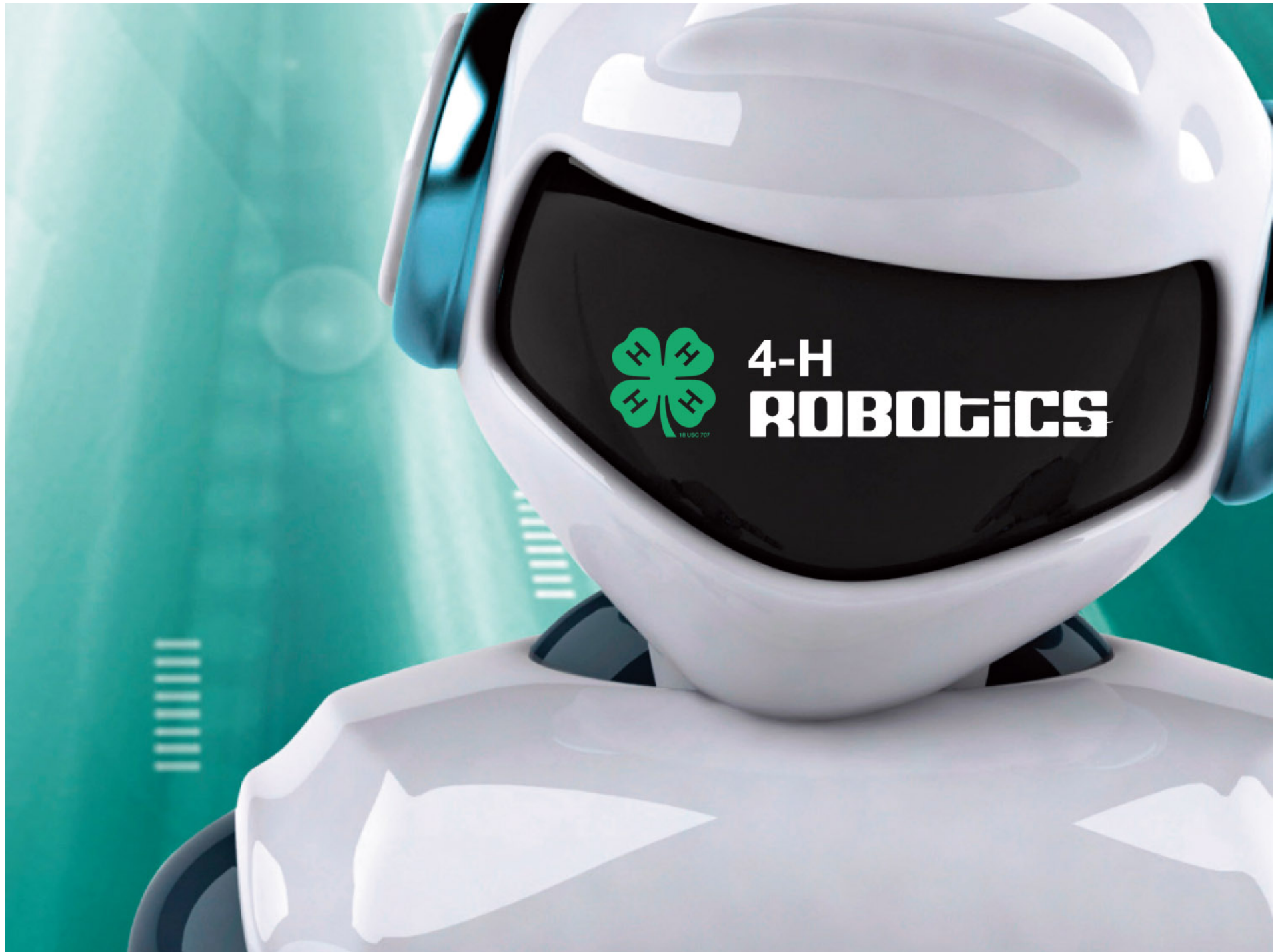




## Closing and Questions

- Identified the main LEGO® WeDo® components and learned how they are used
- Viewed a demonstration and built a robot using the Activity Guide
- Programmed the robot and explored LEGO® WeDo® Programming Software
- Discussed ways to share LEGO® WeDo® activities with young people





4-H  
**ROBOTICS**