



**LEARNING LAB**

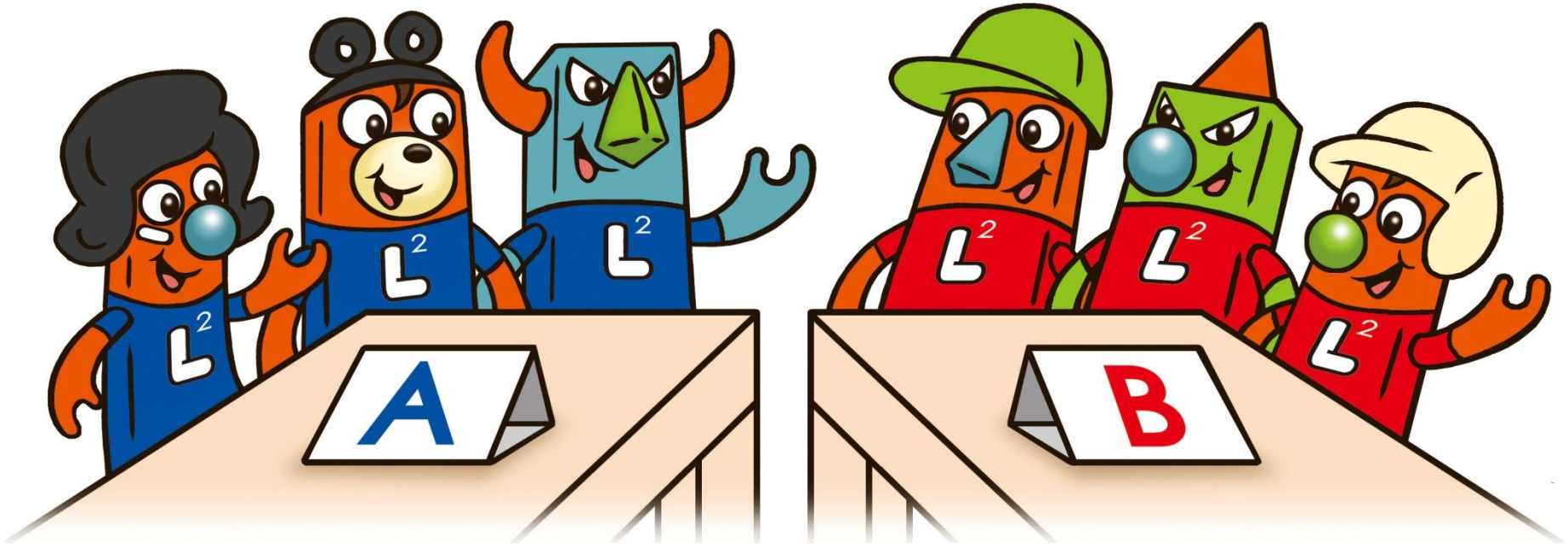
# LIGHT AND SOLAR ENERGY

Session 14

# SOLAR BICYCLE

# Team Up

Please find your partners and accomplish the activities cooperatively.



# Story Time

The semester was over, and today was the day for campus cleaning. Gigi was responsible for waste recycling. She saw some used batteries, mobile phones, and bikes, as well as a used solar panel from the lab. She sorted the different items for recycling and asked her teacher, “Where does this stuff go after it is recycled? And what will it become?” Her teacher explained, “These electronic and metal wastes are usually recycled for reuse. Some countries require that manufacturers recycle waste, usually there is some exchange of old goods for new ones, at a discount. There are businesses dedicated to the collection of waste, whose reusable components are then extracted and reused as auxiliary materials in other products, such as the silicon-containing textiles for water repellent jackets, and some can even be reused as anode materials in lithium batteries.”

# Story Time

Spotting an old bike with broken pedals and chains, alongside an old solar panel, the teacher suggested they renovate the used stuff by connecting the solar panel and a motor with the bike's rear wheel, so that at times when the sunlight is strong enough, the solar power will work to power the vehicle, and at other times the rider will have to push the bike along.



# Daily Application

Every product has its own life cycle. From production to waste, it's just like a human being from birth to death. Similarly, even though the solar power is green energy, the solar panel has to be manufactured using heavy-metals which creates waste. These toxins can damage the environment if not properly treated before being discarded and buried in a landfill. The life cycle of a solar panel is 25 years on average, and the optimal way to recycle old panels is a main focus of solar panel future development.



# Brainstorming

What are the advantages and disadvantages of using solar energy?



# Part List

Please find the parts according to the photo below.  
Check again that you acquire the same number of parts.

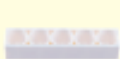
## Parts List

4



x5

8



x1

9



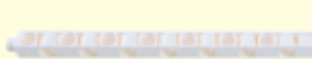
x4

10



x1

11



x1

16



x1

17



x1

19



x1

20



x1

22



x1

23



x2

25



x1

35



x2

37



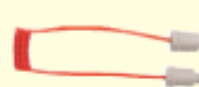
x1

40



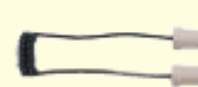
x1

42



x1

43



x1

44



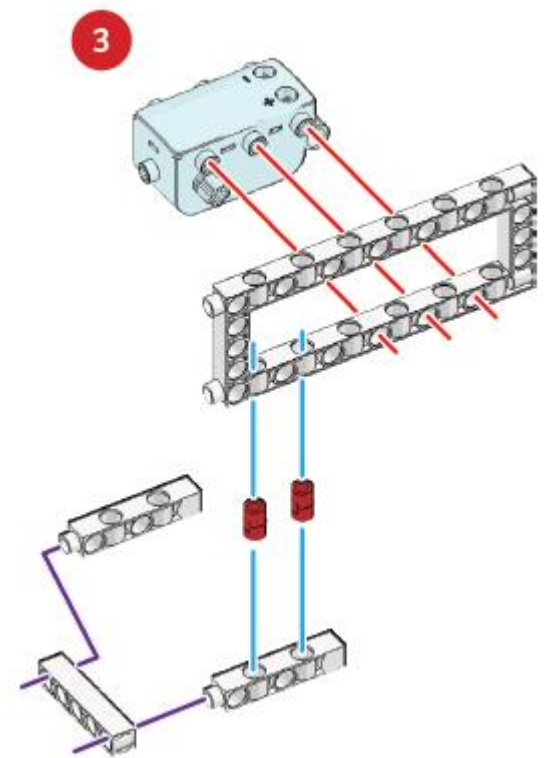
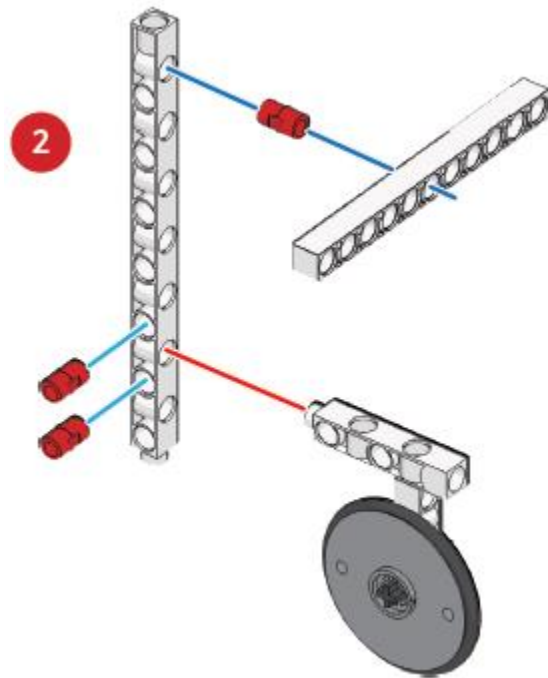
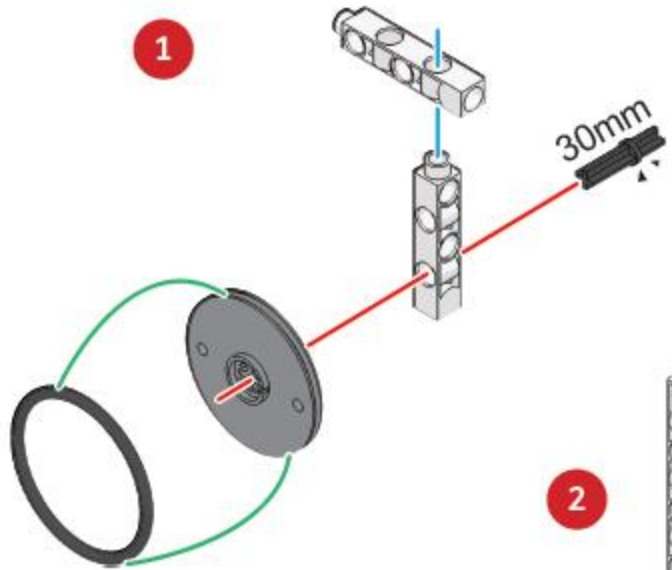
x1

# Solar Bicycle

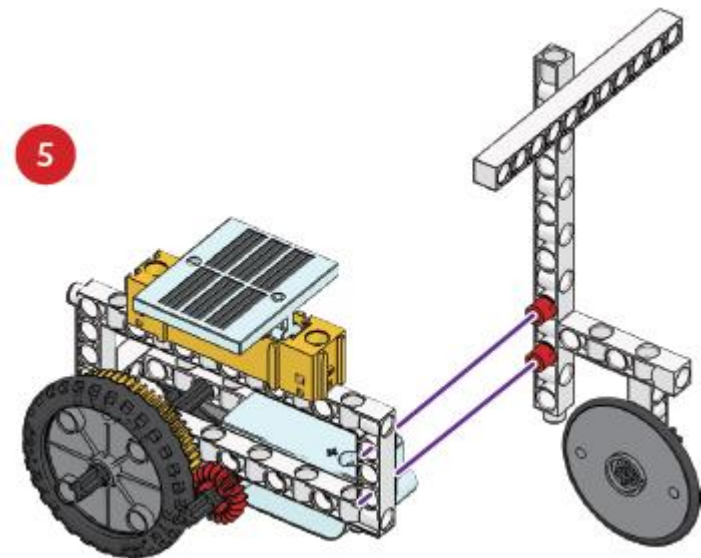
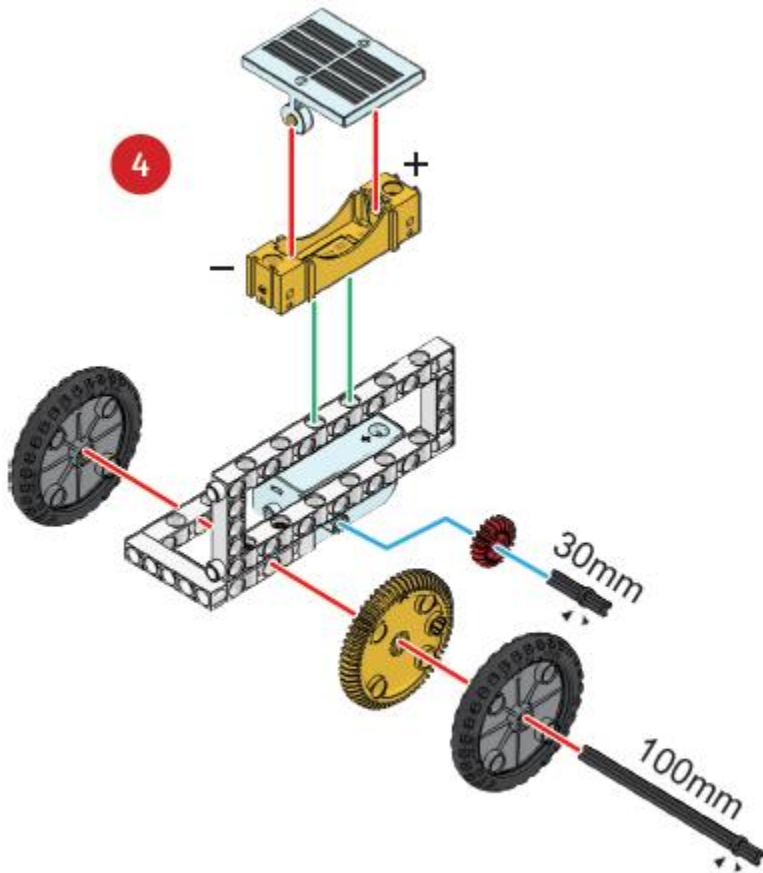




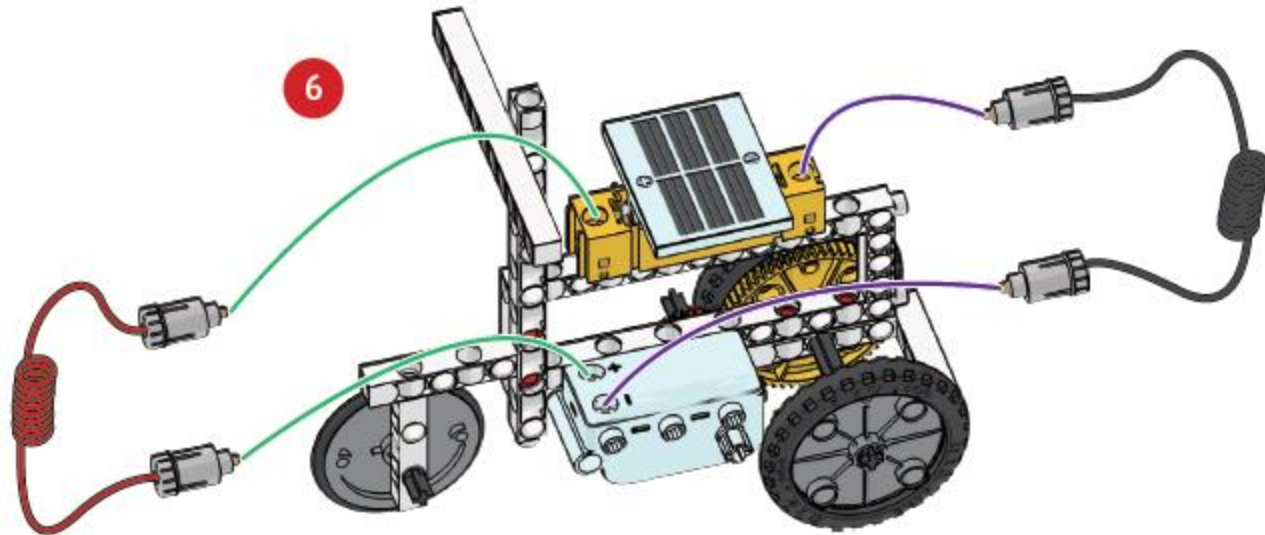
# Assembly Steps



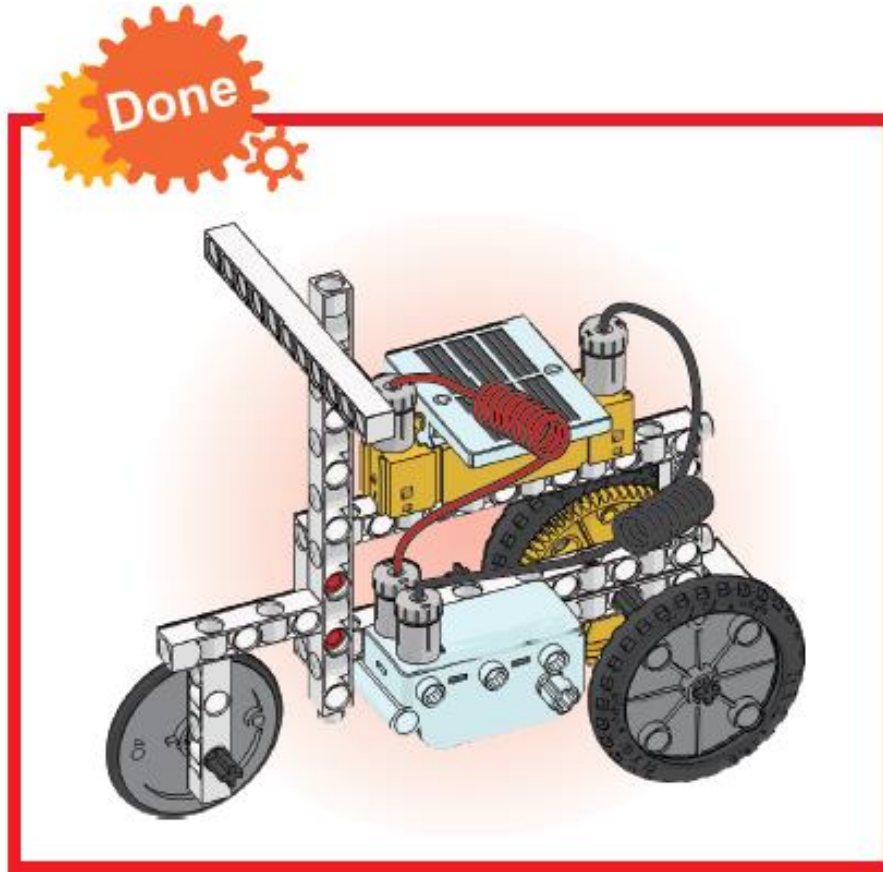
# Assembly Steps



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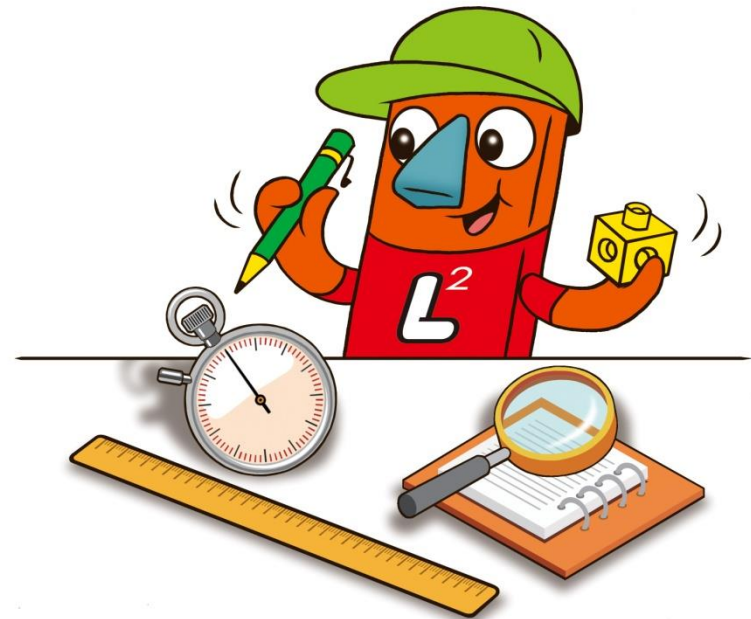
# Assembly Steps



Model Operation  
Video

# Hands-on Experiment

Compare the speed of the bicycle under different light sources.



# Hands-on Creativity

Try modifying your bicycle. Afterwards, hold a race!



# Evaluation

Let's score yourself. How many stars do you get today?



## Model Assembled

Good job! You can get the 1<sup>st</sup> star when you complete the assembly.



## Experiment Complete

Accomplish the experiment and get the 2<sup>nd</sup> star.



## Model Creation

Excellent! You make your own creation and get the 3<sup>rd</sup> star.



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