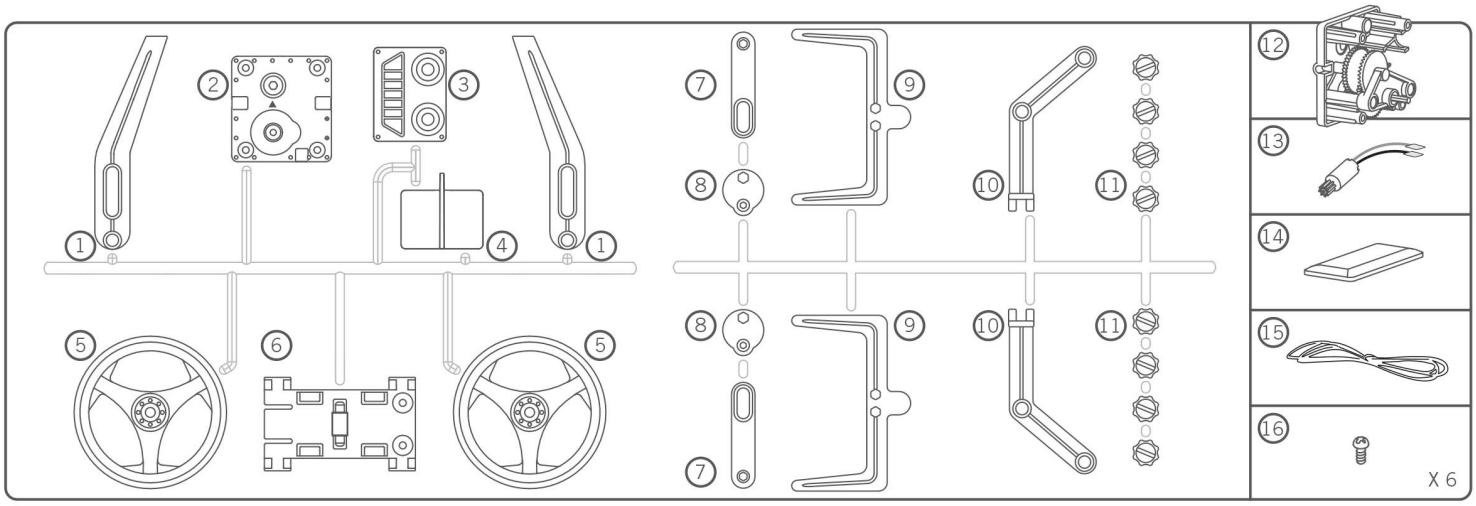
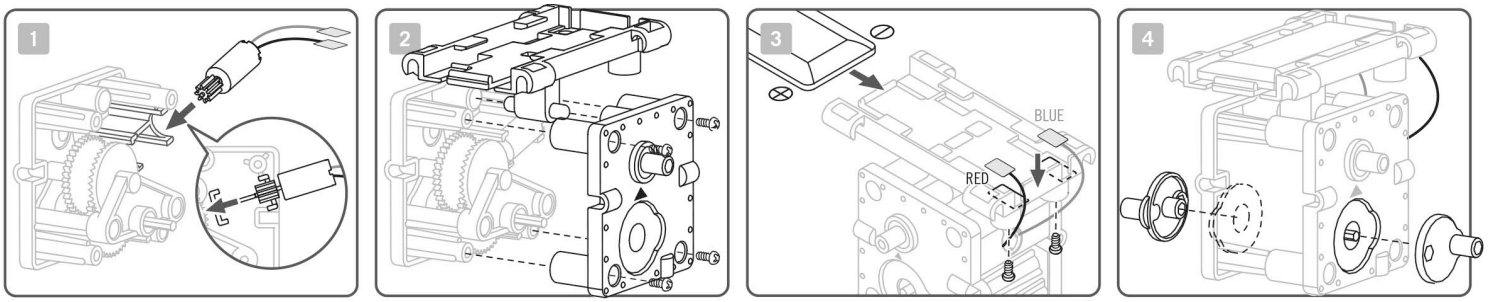
3-in-1 Mini Solar Robot

A. SAFETY MESSAGES:
1. Adult supervision and assistance are required at all times.
2. This kit is intended for children 8 years or older.
3. This kit and its finished product contain small parts which may cause choking if misused. Keep away from children under 3 years old.
4. Do not attempt to take the solar panel apart.
5. Never look directly at the Sun as it could damage your eyes.
6. If using a desk lamp as a source of light, be aware that this will be hot. Only use a desk lamp under adult supervision.



B. CONTENTS:
Part 1. Hook x 2,
Part 2. Gearbox cover,
Part 3. Faceplate,
Part 4. Baseplate,
Part 5. Wheel x 2,
Part 6. Solar panel support,
Part 7. Link arm x 2,
Part 8. Cam wheel x 2,
Part 9. Foot x 2,
Part 10. Leg x 2,
Part 11. Connector x 8,
Part 12. Solar gearbox,
Part 13. Motor with wires,
Part 14. Solar panel,
Part 15. String,
Part 16. Screws.
Also required but not included: a small crosshead screwdriver.



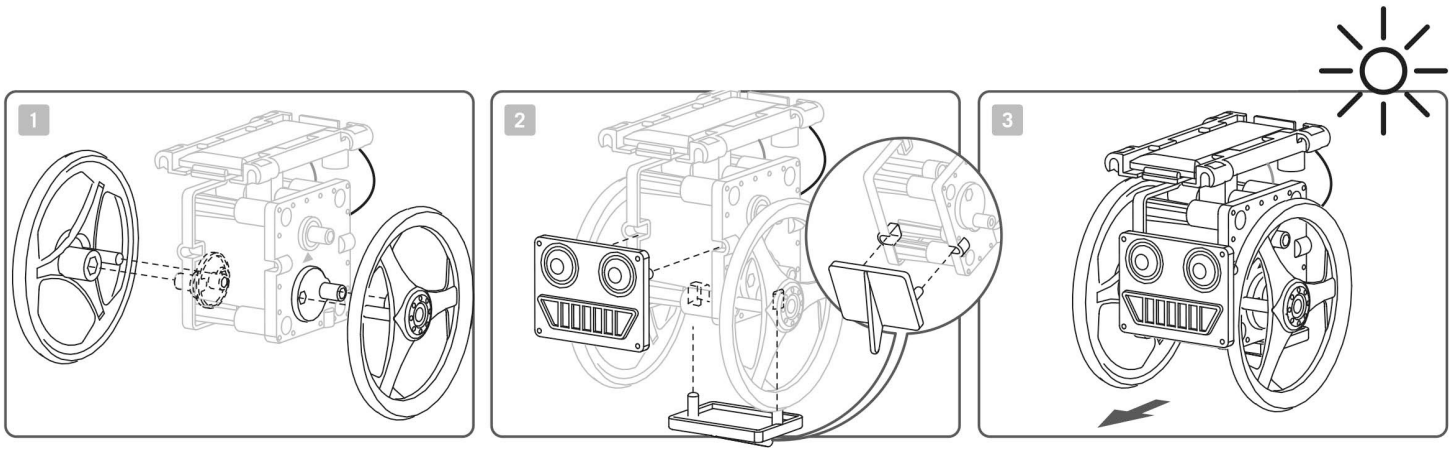
C. ASSEMBLING THE SOLAR GEARBOX:

1. Find the solar gearbox (part 12). Install the motor in the gearbox in the position shown, making sure that the gear on the motor shaft interlocks with the gear wheel inside the gearbox.

2. Push one of the pins on the solar panel support (part 6) into the slot at the top of the gearbox. The rounded pins under the support must be at the same end of the motor wires. Push the gearbox cover (part 2) into place, making sure the gear-wheel axles and the solar panel support slide into the slots in the cover. Secure the cover with four screws to complete the gearbox assembly.

3. Push the contacts on the ends of the wires from the motor into the slots at the end of the solar panel support. Make sure the wires are on the correct way side as shown. Slide the solar panel into the solar panel support. The electrical contacts must be face down, and towards the motor end of the gearbox. Secure the connection with two screws from the underside of the panel.

4. Push a cam wheel (part 8) onto the axle at each side of the gearbox, lining up the pin on each one with the marked guide. The axle and the hole on the cam wheels are in a hexagonal shape. Wiggle the cam wheels a bit to fit them in. Your solar gearbox is complete. You can use this shared mechanism in all three following sections.

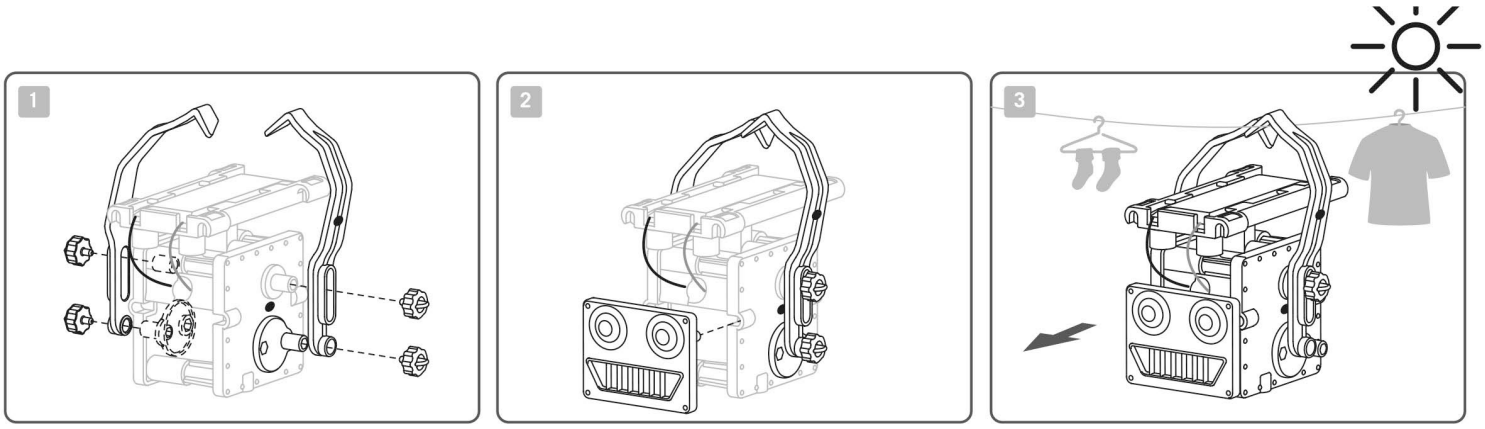


D. ASSEMBLING THE SOLAR VEHICLE:

1. Take the solar gearbox completed in Section C. Push a wheel (part 5) onto each cam, making sure the small pin on the wheel fits into the small hole on the cam.

2. Push the faceplate (part 3) into the slots on the front of the gearbox (the opposite end as the motor). Push the baseplate (part 4) into the slots on the underside of the gearbox, with the fin facing backwards.

3. Place the Solar Vehicle on a smooth, flat surface outdoors. Tilt the solar panel to point towards the Sun. The Vehicle should start to move along using energy from the Sun.

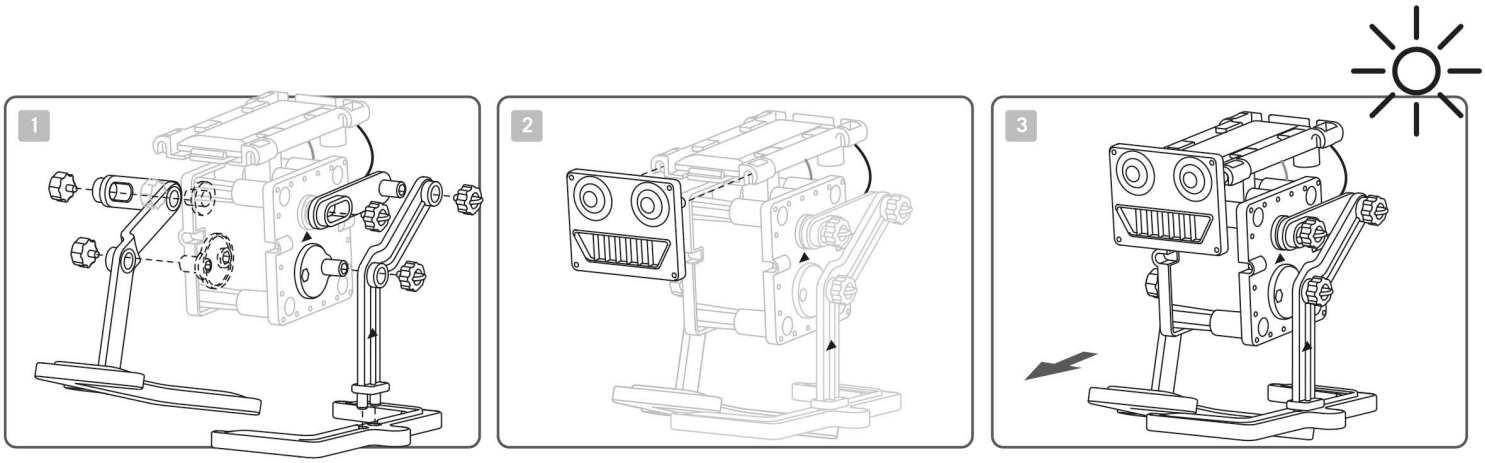


E. ASSEMBLING THE CLOTHESLINE CLIMBER:

1. Position the solar gearbox with the motor wires facing towards you. Push the end of the hooks (part 1) onto the pins on the cam wheels, making sure that the pins on the solar gearbox are in the slots on the hooks. Match the 'circle' and 'triangle' marks on the solar gearbox and the arms to make sure that you have the left and right arms on the correct sides. Push two connectors onto the pins on each side of the gearbox to keep the arms in place.

2. Push the faceplate into the slots on the front of the solar gearbox (the end with the wires).

3. Hang the Solar Clothesline Climber on a clothesline, or a string tied between to posts or trees. Tilt the solar panel to point towards the Sun. The Climber should start to move arm over arm along the line.



F. ASSEMBLING THE SOLAR ROBOT:

1. Push a foot (part 9) onto the end of each leg (part 10), observing the diagram to make sure that the feet point is in the correct direction. Put the link arms (part 7) onto the pins on the sides of the solar gearbox. Push each leg onto the pins on the cam wheel and the link arm. Match the 'circle' and 'triangle' marks on the gearbox and the legs to make sure that the left and right legs are on the correct sides. Push three connectors (part 11) onto the pins on each side of the gearbox to keep the legs and link arms in place.

2. Push the faceplate into the slots on the front of the solar gearbox (the end opposite the motor wires).

3. Place the Solar Robot on a smooth, flat surface outdoors. Tilt the solar panel to point towards the Sun. The Robot's legs should start to move along step by step.

G. TROUBLESHOOTING:

If there is no sunshine:

• Use a desk lamp with a 60-watt or higher incandescent light bulb (not a fluorescent energy-saving bulb) as an alternative light source.

If the Solar Robot does not move:

• The light may not be bright enough to produce enough electricity to work the motor. Bright sunlight needs to fall on the solar panel.

• The gears may be jamming a little. Put a very small amount of cooking oil on the gears.

If the Solar Vehicle, Clothesline Climber, or Robot moves backwards:

• Swap over the wires attached to the solar panel.

H. HOW IT WORKS:

The solar panel converts sunlight into electricity, which is fed to the motor. The motor turns the first wheel in the solar gearbox, and the gears reduce the speed of the movement so that the cam wheels turn slowly. On the Solar Clothesline Climber and the Solar Robot, the cams turn the rotation of the shaft into the backwards and forwards motion of the arms or legs.

I. FUN FACTS:

● Solar energy is energy that comes from the Sun in form of heat and light.
● A solar panel can convert light into electricity. The brighter the light, the more electricity you get.
● Some electric cars have solar panels on the roof that help to recharge the batteries that drive the engines.
● Robot engineers have built rope-climbing robots that pull themselves along a rope in the same way as the animal called a sloth!
● Space probes – a type of robot that flies through space and lands on other planets and their moons – normally get their power from solar cells.
● The World Solar Challenge is held each year. Competitors try to build a car that travels as far or as fast as possible on solar power alone.

QUESTIONS & COMMENTS:

We treasure you as a customer and your satisfaction with this product is important to us. In case you have any comments or questions, or you find any parts of this kit missing or defective, please do not hesitate to contact our distributor in your country, whose address is printed on the package. You are also welcome to contact our marketing support team at Email: infodesk@4M-IND.com, Fax (852) 25911566, Tel (852) 28936241, Web site: WWW.4M-IND.COM