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PARK PARADE, LONDON, NW10 4HT. MANUFACTURED BY HANGZHOU ZT MODEL COMPANY LIMITED. ADDRESS: NO 6
MINGDE RD., PUYAN, BINJIANG, HANGZHOU, CHINA.

PLAY • READ • INSPIRE



THE LEARNING BOOKLET

— FOR THE SPIRAL FACTORY —

Read to be inspired!

*Tons of designs
Awaiting your exploration
Full of creativity*



WARNING:
CHOKING HAZARD - Small parts,
Not for children under 3 years.

AGES **8+**





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WARNING MESSAGE

GENERAL WARNING

Before you begin, please read through the instructions together with your children. Make sure you understand the safety messages. Please keep the packaging and instructions, as they contain important information.

This kit is designed for children over 8 years of age.

CHOKING HAZARD - Small parts, not for children under 3 years.

Children should have parental supervision when assembling the product.

Water and rain will damage the electronic components.

Please clean the product with a clean cloth when necessary.

Make sure to remove the batteries from the battery compartment before cleaning.

OTHER WARNINGS

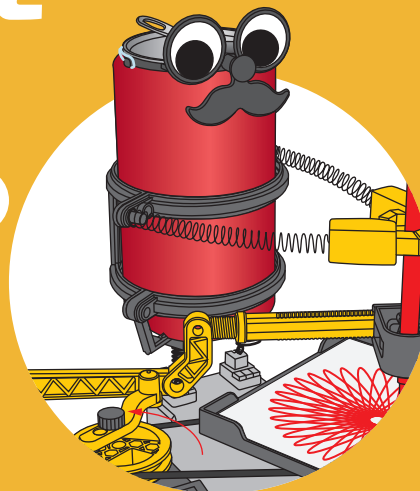
Using a screwdriver

*You must always be supervised by an adult when using a screwdriver.
The metal may have sharp edges that can cause injury.*

Using batteries

- Do not charge non-rechargeable batteries;
- Do not mix different types of batteries or new and used batteries;
- Insert batteries with correct polarities;
- Remove exhausted batteries from the toy;
- Do not short-circuit supply terminals;
- Remove rechargeable batteries from the toy before charging;
- Charge rechargeable batteries under adult supervision only.
- Do not use rechargeable batteries.

1 | WARNING MESSAGE

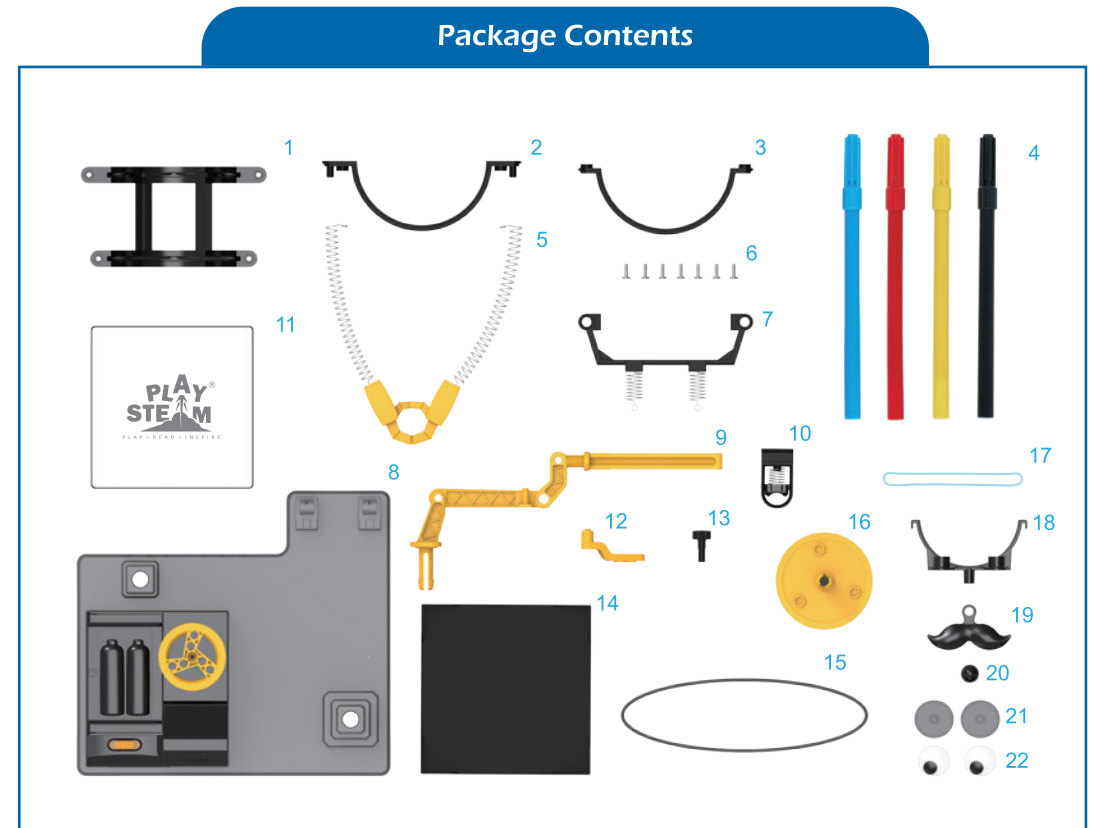
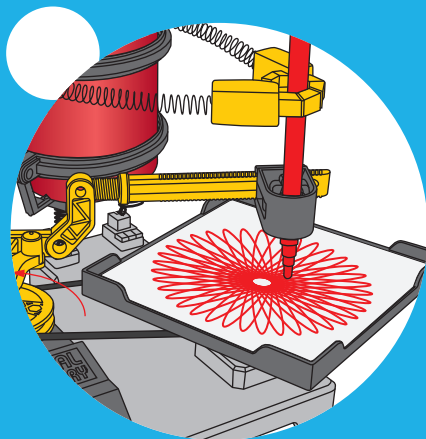




Read to be inspired!



2 | PACKAGE CONTENTS



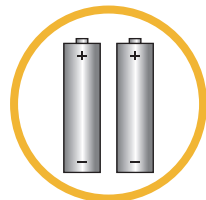
Conforms to ASTM D-4236

Serial	Name	Quantity	Serial	Name	Quantity
1	Robot (back)	1	12	Rocker arm snap	1
2	Robot (torso)	1	13	Adjustment knob	1
3	Robot (waist)	1	14	Tray	1
4	Marker	4	15	Conveyor belt	1
5	Robot (arms)	1	16	Conveyor dish	1
6	PB2.3*6 Screw	6 + 1(spare)	17	Rubber Band	1
7	Robot (legs)	1	18	Nose Frame	1
8	Power base	1	19	Mustache	1
9	Rocker arm	1	20	Plug	1
10	Pen buckle	1	21	Eye holders	2
11	Paper	30	22	Eyes	2

Necessary but not included



Can



Batteries
2 x AA (1.5V)

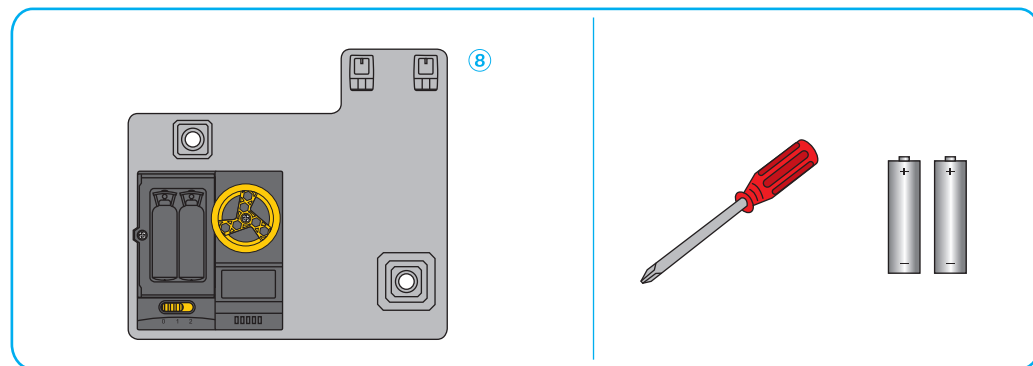


Cross-head screwdriver

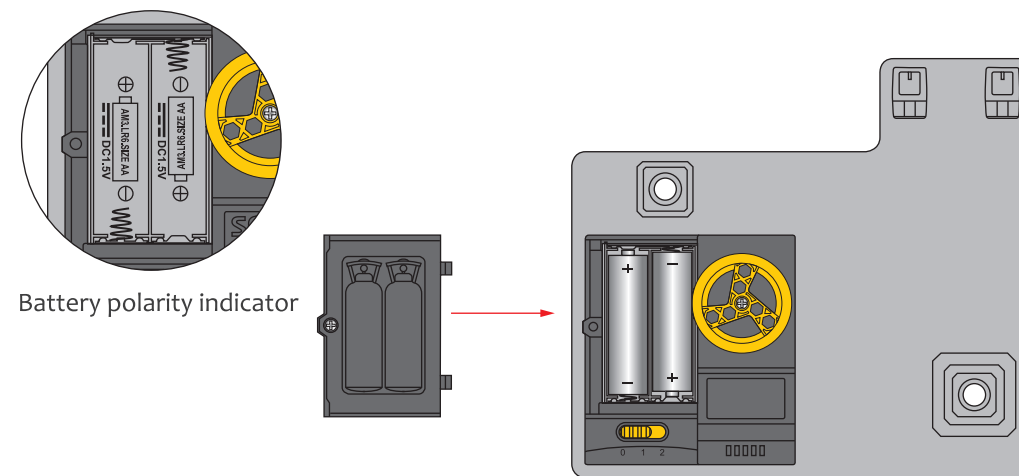
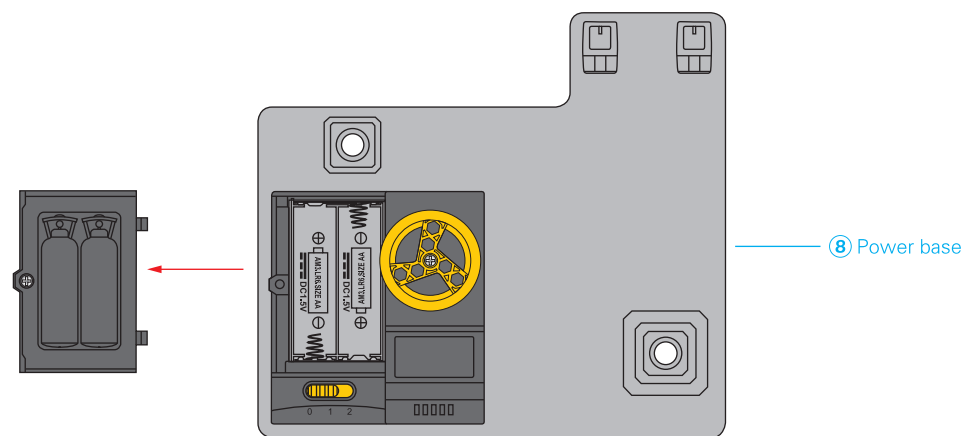


Assembly Steps

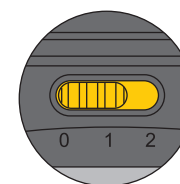
Battery Assembly



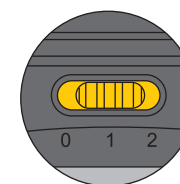
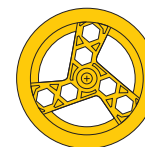
- 1 Open the battery compartment, then insert batteries according to the polarity signs.



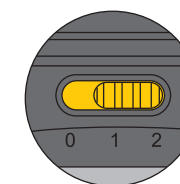
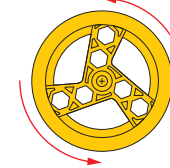
- 2 Turn the power switch to ON position (0 is OFF, 1 is normal speed, 2 is high speed), the conveyor dish should start rotating. After confirming the correct installation of batteries, put the compartment cover back and tighten with screws.



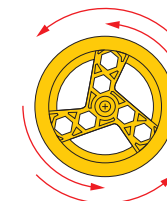
off



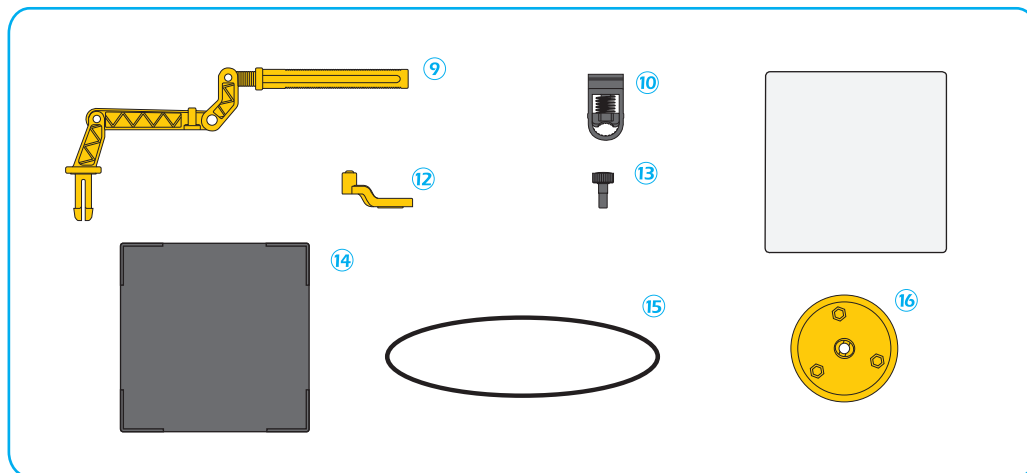
normal speed



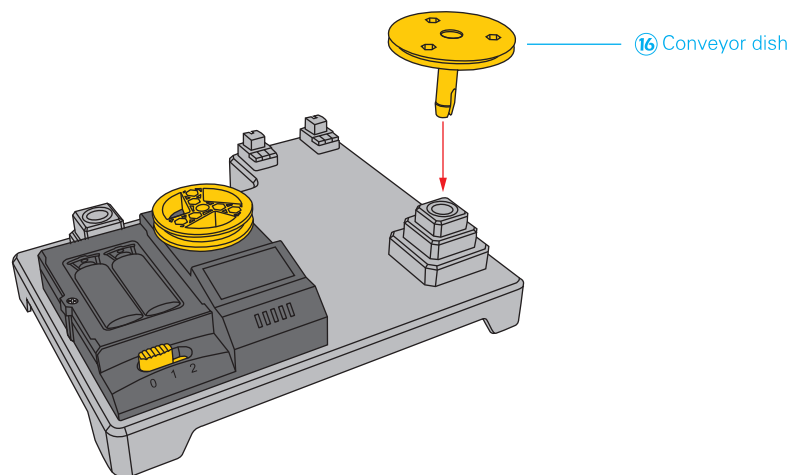
high speed



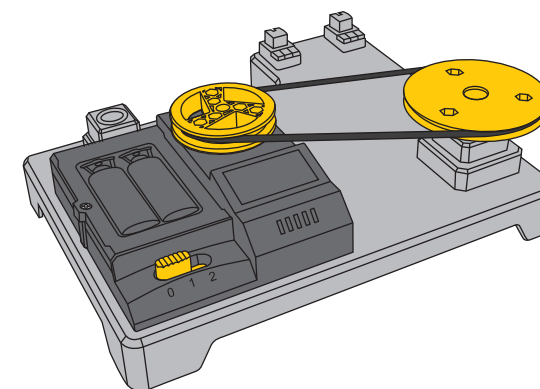
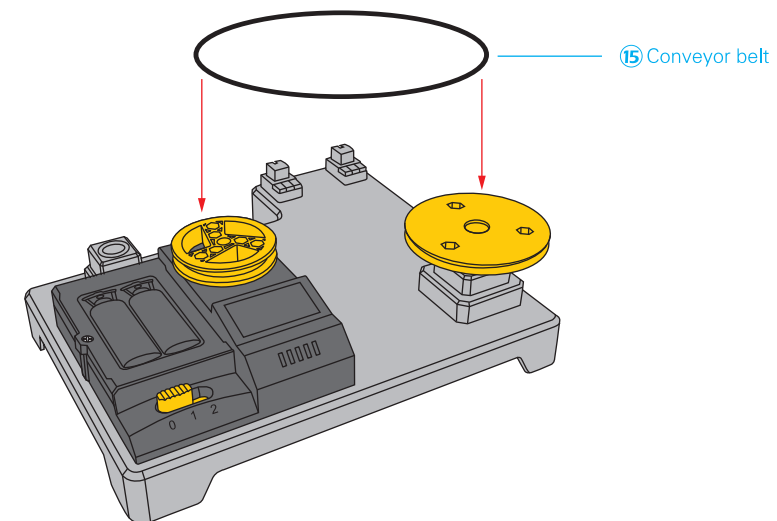
Base Assembly



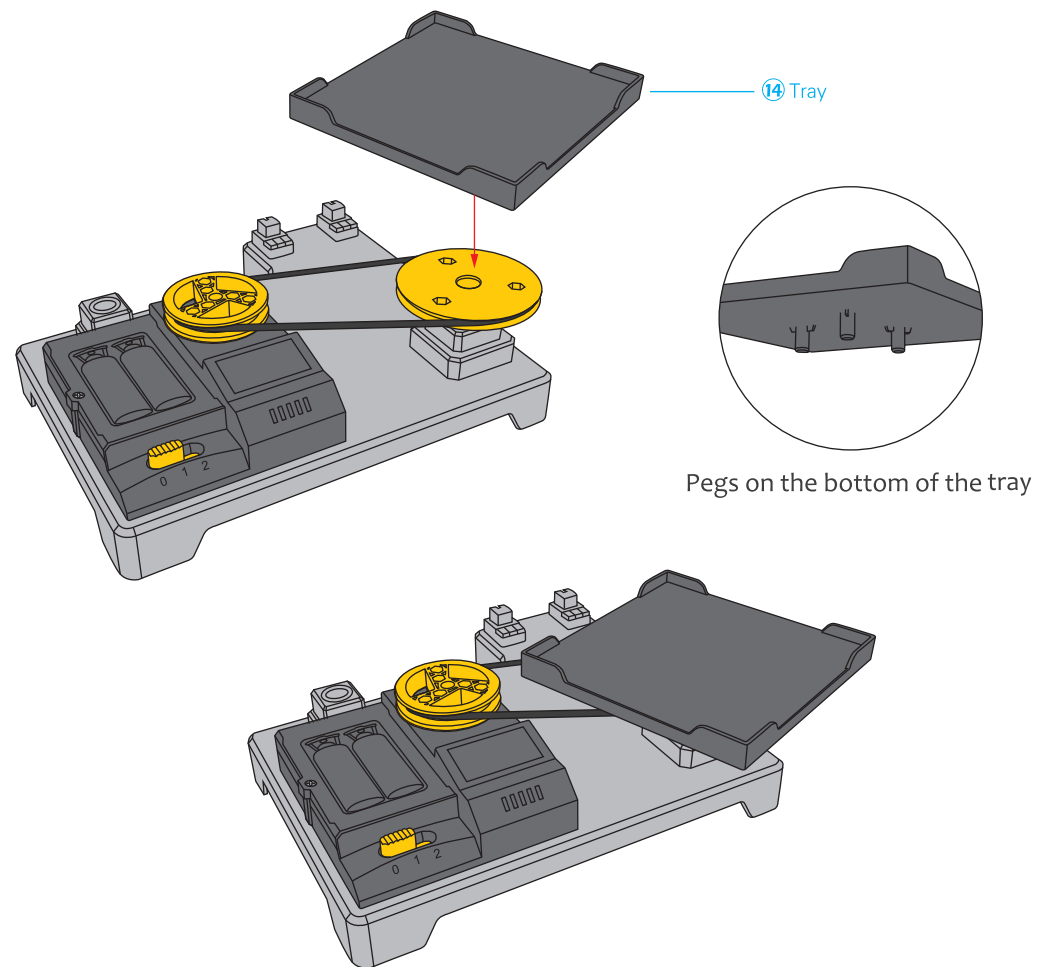
- 1 Insert the conveyor dish to base, as shown.



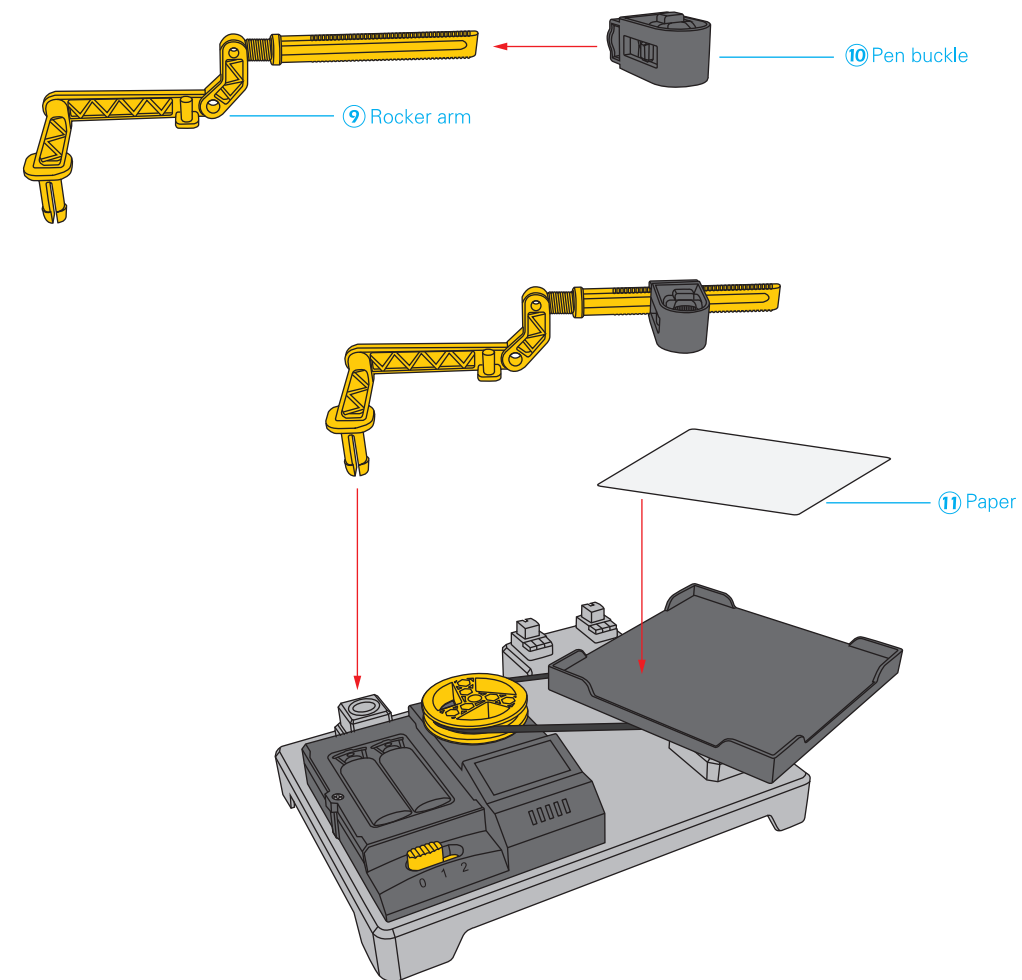
- 2 Insert the conveyor belt into the two conveyor dish slots, as shown.



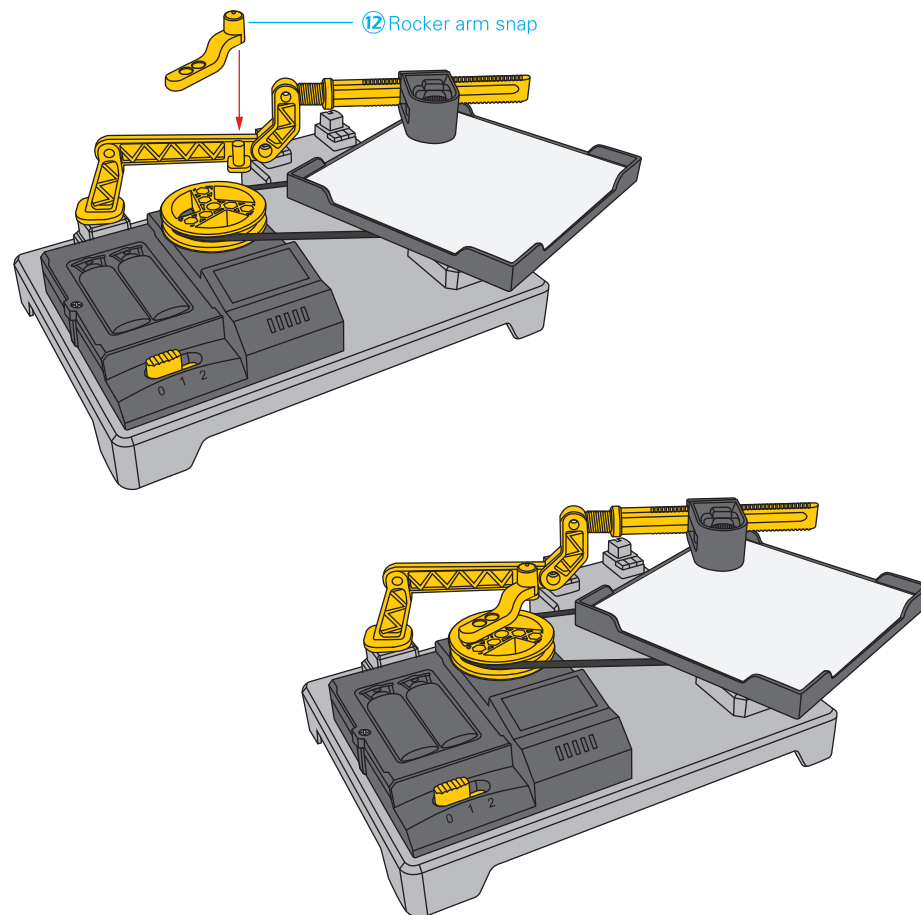
- 3 Stick the pegs on the bottom of the tray into conveyor dish holes, as shown.



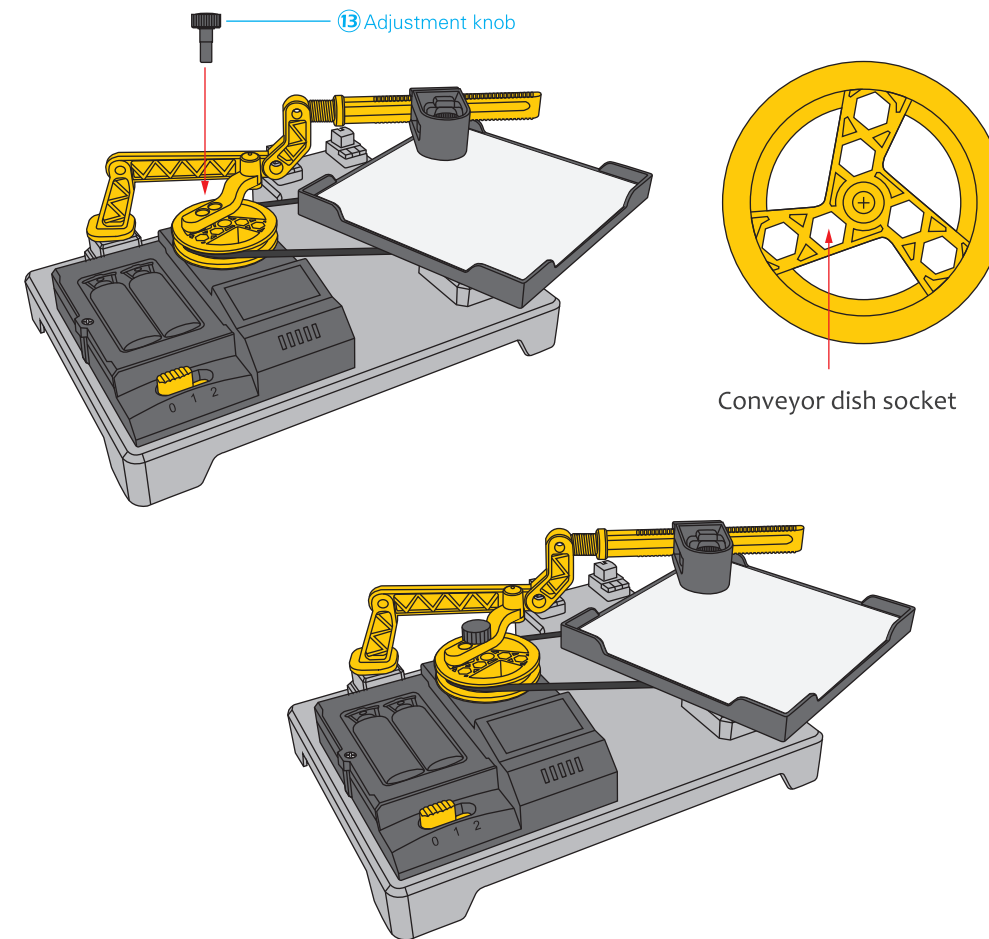
- 4 Insert the pen buckle into the rocker arm, then connect them to the power base.



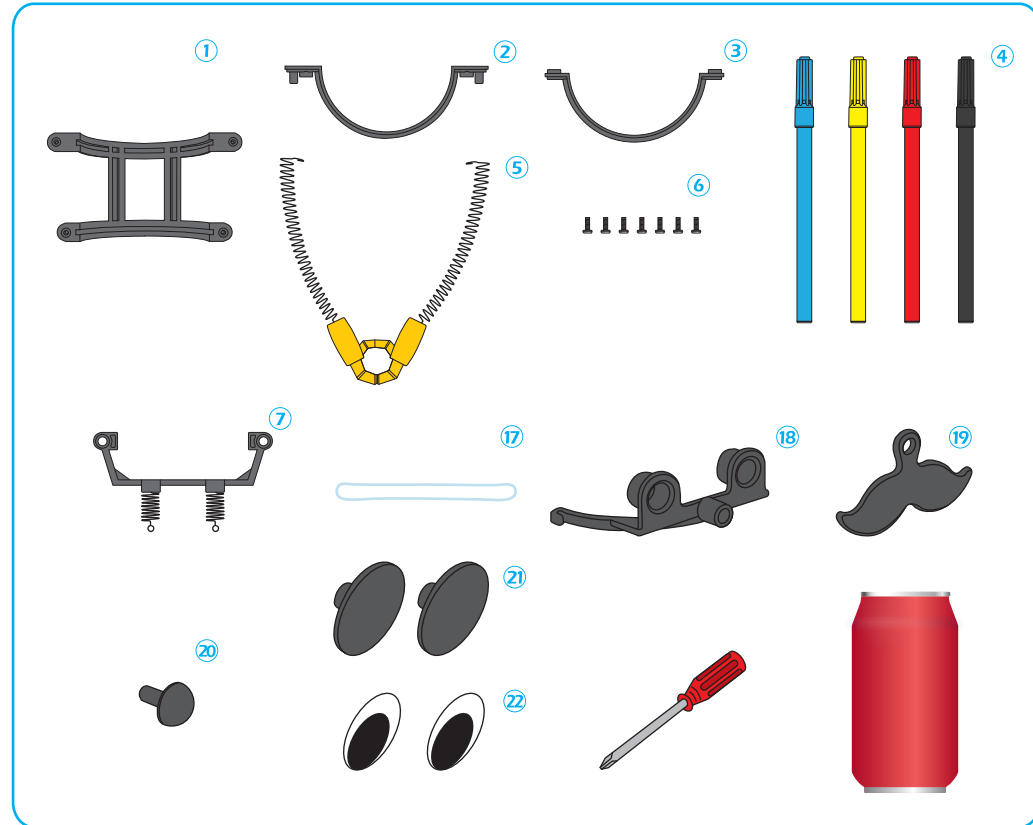
- 5 Insert rocker arm snap into rocker arm.



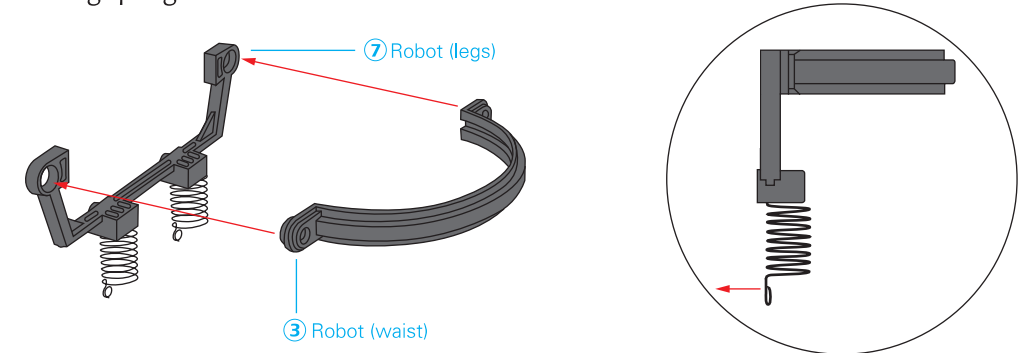
- 6 Choose a hole on rocker arm snap and a socket on conveyor dish , after aligning them , secure with adjustment knob.



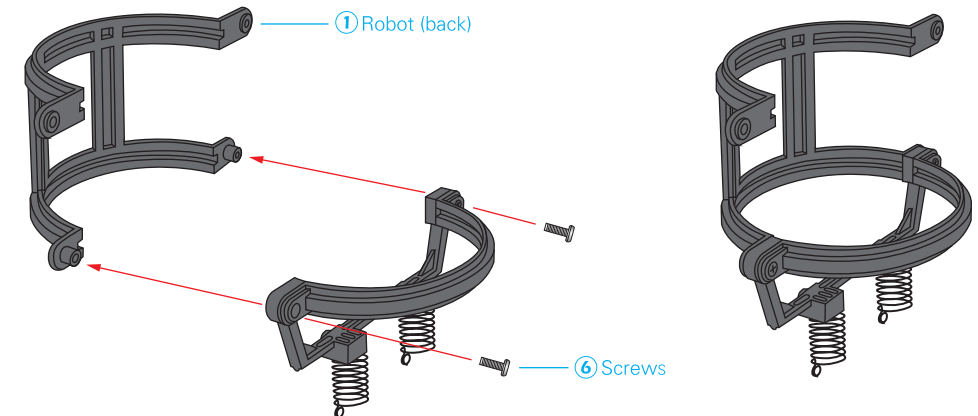
Robot Assembly



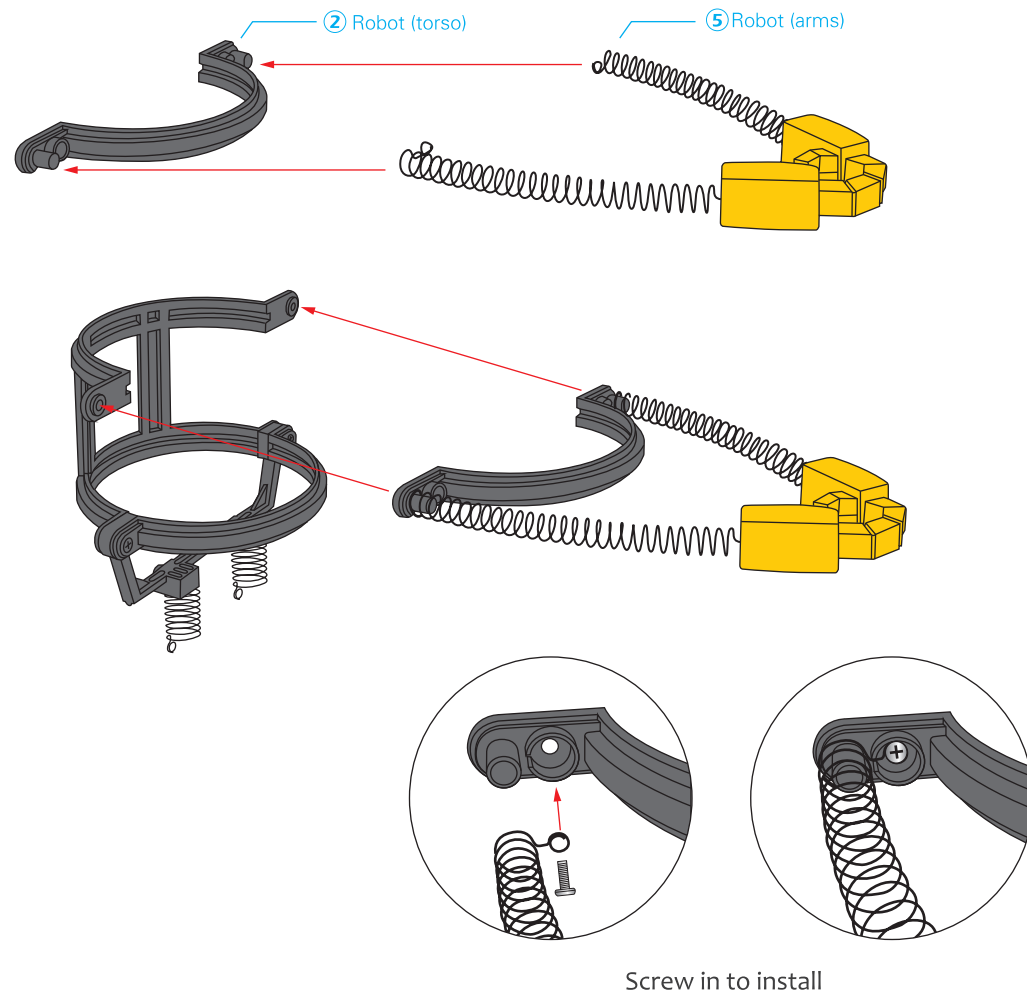
- 1 Connect the robot's waist to the legs, note the position of the robot leg spring hook.



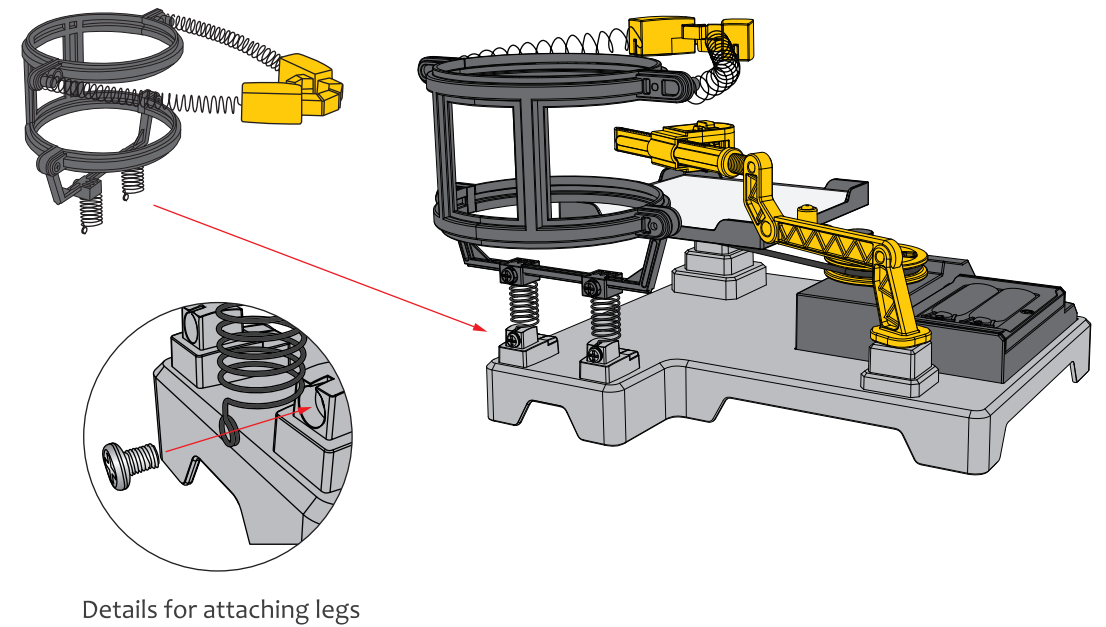
- 2 Fasten the assembled robot legs to the base of the robot back with screws.



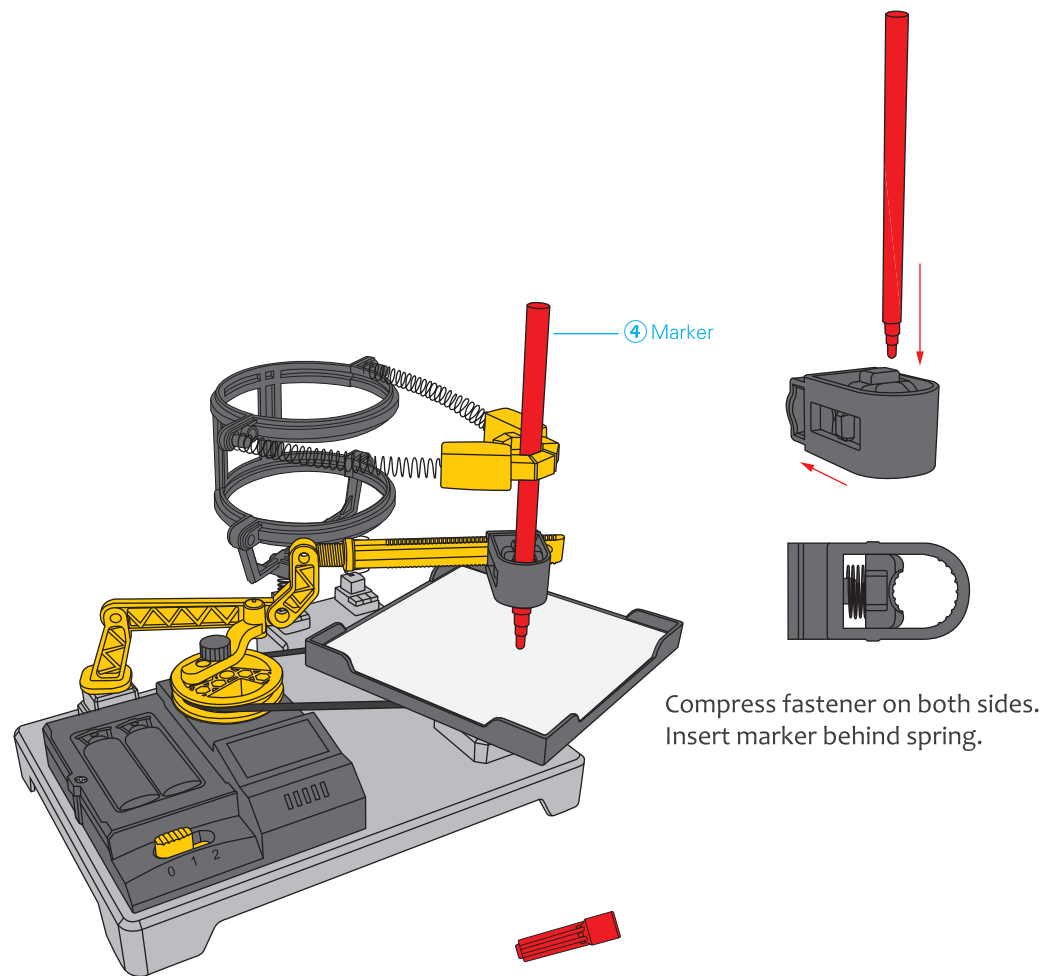
- 3 Position the robot arms' springs on the torso and fasten them tightly to the back with screws.



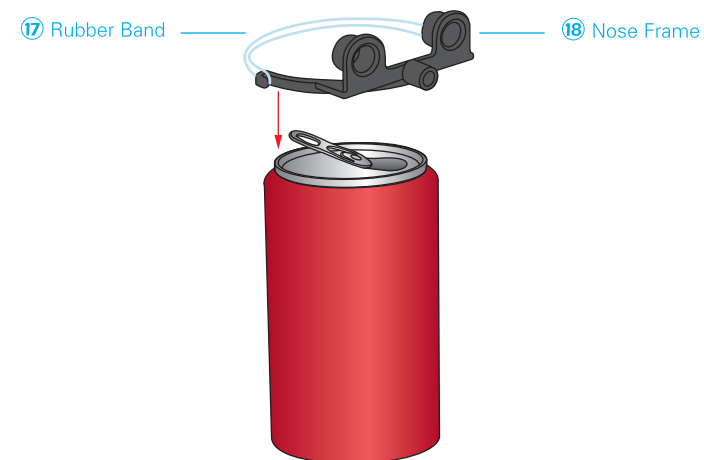
- 4 Attach the robot legs to the power base paying attention to their position.



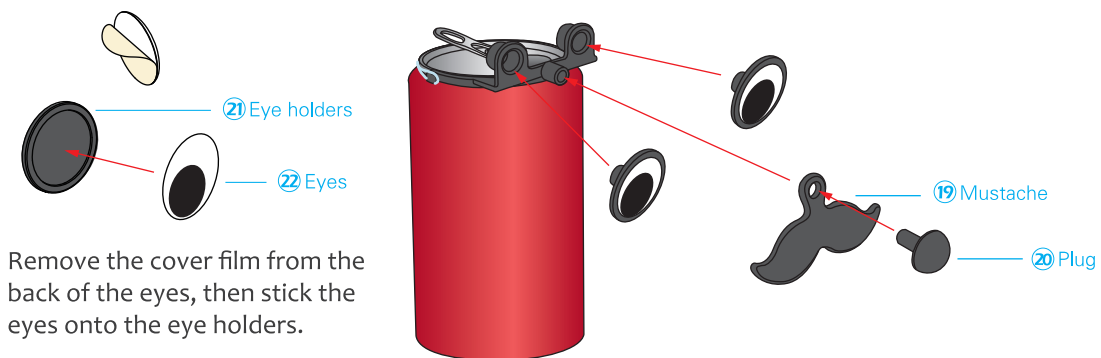
- 5 Remove the marker cap, and place the marker tip into the pen buckle and set it on the paper.



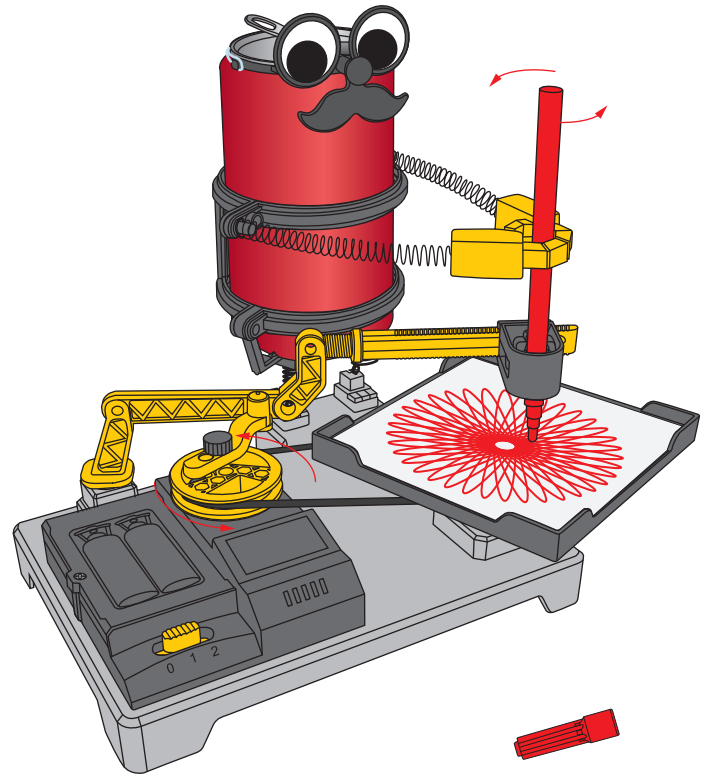
- 6 Hook the rubber band onto both sides of the Nose Frame, and loop it over the can's top edge.



- 7 Snap the Eyes into the Nose Frame, and insert the Plug into the slot on the Mustache, and then into the Nose Frame.



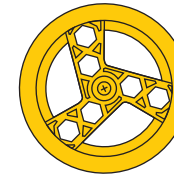
- 8 Insert the completed can. Assembly is complete!
Turn the power on and start scribbling!



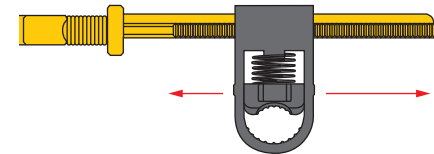
Adjustments



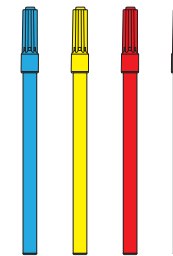
- 1 Selecting inner or outer rocker arm snap holes.



- 2 Selecting inner or outer conveyor dish sockets.

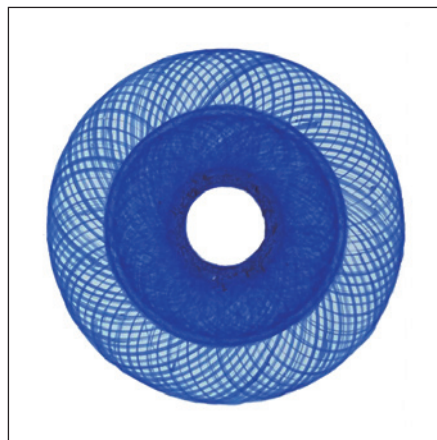
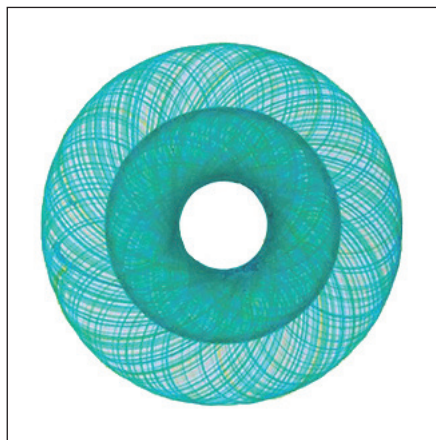
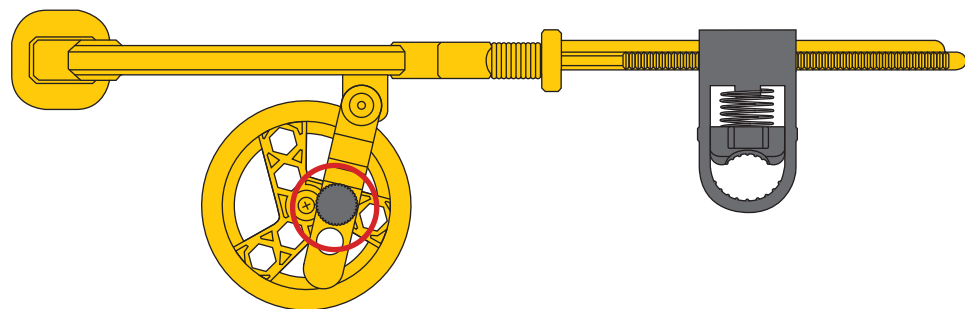


- 3 Sliding pen buckle to new position.

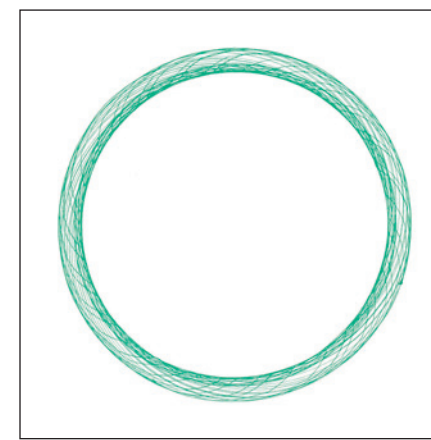
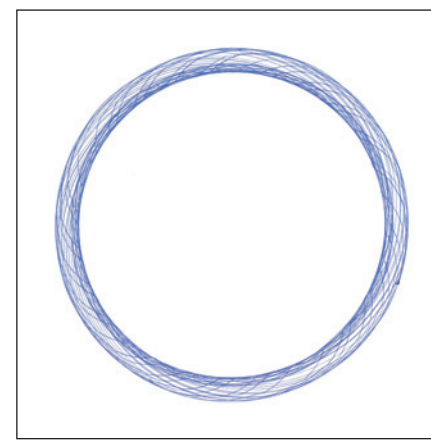
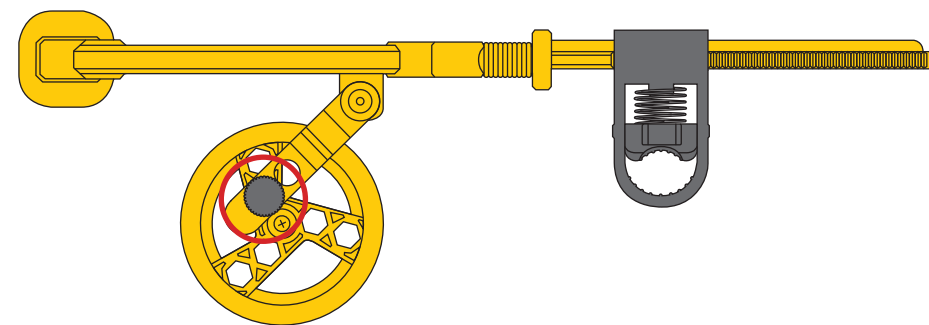


- 4 Using single or multi-colored markers.

Example one:



Example two:



4 | *ACTIVITIES*



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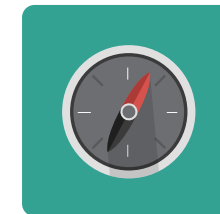
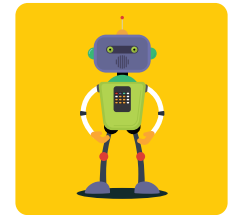
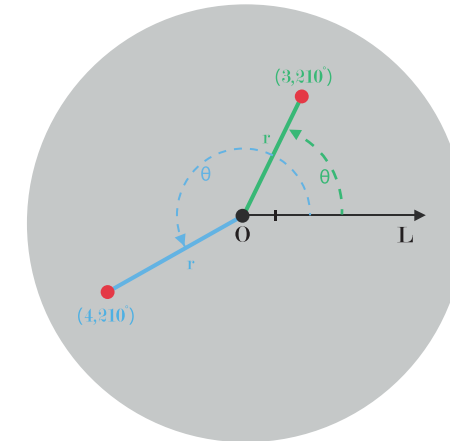
How does it work?

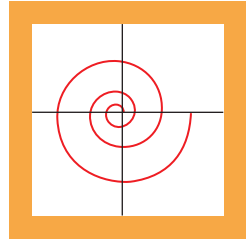
When we adjust the combinations of the hole and conveyor dish, and the distance of the pen buckle, the spiral patterns change.

It has unlimited creative possibilities.

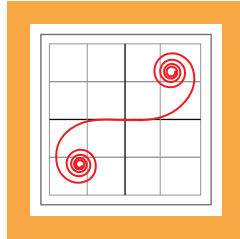
The line drawn on the card is determined by the distance from a reference point and the angle from the conveyor dish. In mathematics, it is called the Polar Coordinate System.

The Polar Coordinate System is widely used in Aviation, Engineering, Mathematics, Navigation, Physics, and Robotics.

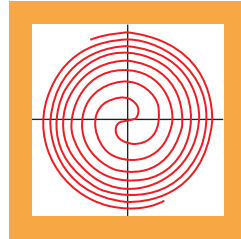




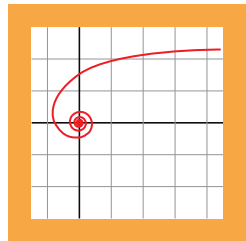
Archimedean spiral



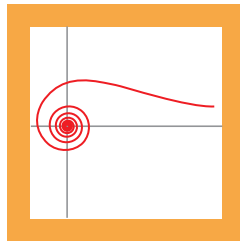
Cornu spiral



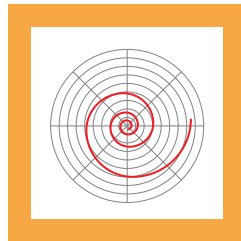
Fermat's spiral



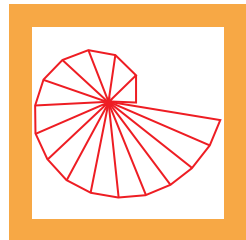
hyperbolic spiral



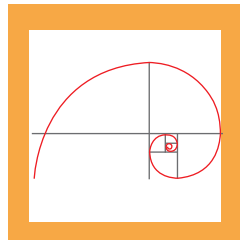
lituus



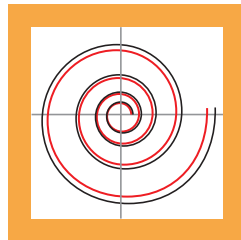
logarithmic spiral



spiral of Theodorus



Fibonacci Spiral
(golden spiral)



The involute of a circle
(black) is not identical
to the Archimedean
spiral (red)

Any Other Spirals?

There are many types of spirals. Some of them are two dimensional and some are even three dimensional.

Let's learn about the nine most common two-dimensional spirals here!



Read to be inspired!

Spirals are everywhere - Spirals are in the Galaxy



Read to be inspired!



Spirals are everywhere - Spirals are in
Ancient History. An Ancient Aztec spiral
ornament pattern.





Read to be inspired! 
Spirals are everywhere - Spirals are in
the Ocean. The Nautilus Shell's section.



Read to be inspired!



Spirals are everywhere - Spirals are in Nature





Read to be inspired!

Spirals are everywhere - [Spirals are in Architecture](#). Let's explore the Spirals all around you!



