

Robot Arm

Name(s): _____

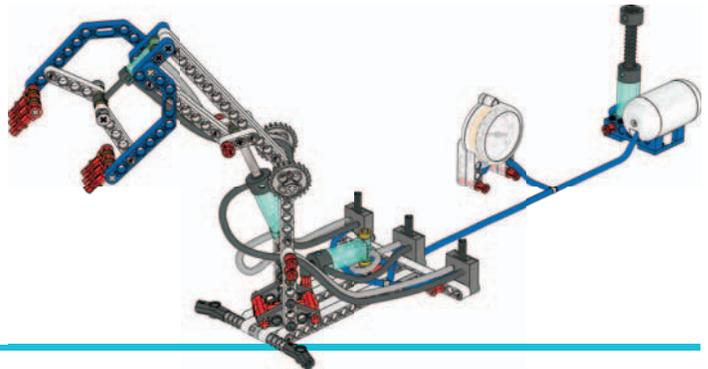


Build the Robot Arm and investigate how to make the most energy efficient sequence of strokes.

Build the Robot Arm.

(All of book 4A and book 4B to page 19, step 19)

- Pump air into the system and use the manometer to detect whether there is an air leak.
- Try all valve settings and check all moving parts to ensure that they move freely.
- Turn the arm to its resting position: turned to the far right, arm up, and grippers open. Then, empty the air tank.



What is the most energy efficient sequence?

Find out which sequence is the most energy efficient for picking and placing objects.

First, predict which sequence of strokes is the most energy efficient at picking and placing a piece of paper. Your sequence must start in the resting position, use all six movements at least once, and then return to the resting position.

Then, test your sequence of strokes and note the loss of pressure after each stroke. Start with about 36 PSI (or 2.5 bars of pressure).

Test several times to make sure your results are consistent. *Record your findings on graph paper.* Change the sequence of strokes. Test your new sequence to determine if it is more or less efficient.

| Stroke | My sequence |
|--------|-------------|
| A | |
| B | |
| C | |
| D | |
| E | |
| F | |
| G | |
| H | |

Explain your findings:

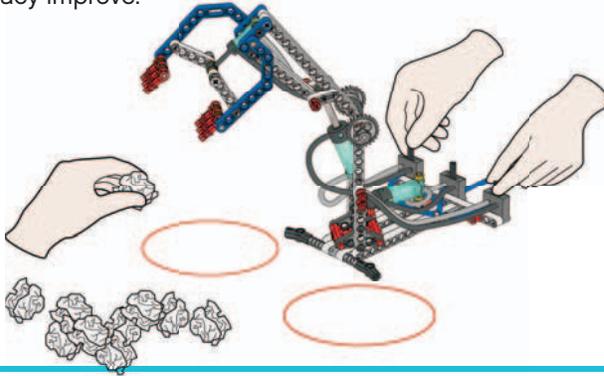
How good are you at operating the robot?

Find out how quickly and accurately you can pick and place pieces of paper from one circle to another circle.

First, predict how many pieces of paper you can accurately place inside the circle within 30 seconds.

Then, test how many pieces of paper you can accurately place inside the circle within 30 seconds.

Repeat the test three times to see if your speed and accuracy improve.



| | My prediction | My findings |
|--------|---------------|-------------|
| Test 1 | | |
| Test 2 | | |
| Test 3 | | |

Optional: My Amazing Pneumatic _____ !

Invent a new and useful machine that uses the same mechanisms as the Robot Arm but does a different job. Sketch it and explain the three most important features.

Optional: Further Research

Describe some of the industries and jobs for which the Robot Arm can be used and what some of its limitations may be.