

PASCO[®]

MOTORIZED STRUCTURES

Motorized STEM Kits

Use Blockly coding to automate and control real-life models!



The image shows a blue PASCO Motorized Structure kit. It features a base with a motor and a control unit. The structure is built using blue beams and connectors. A white control unit is connected to the motor. The structure is shown in a dynamic pose, with the arms extended and the motor running.

Blockly

```
set stepper using units rev/s
for //control.Node :
  configure port A ✓
  rotate stepper through
    angle (rev) 0.9
    to max ±speed (rev/s) -0.33
    with acceleration (rev/s²) 0.02
  Wait for completion ✓
  sleep for 3000 ms
```

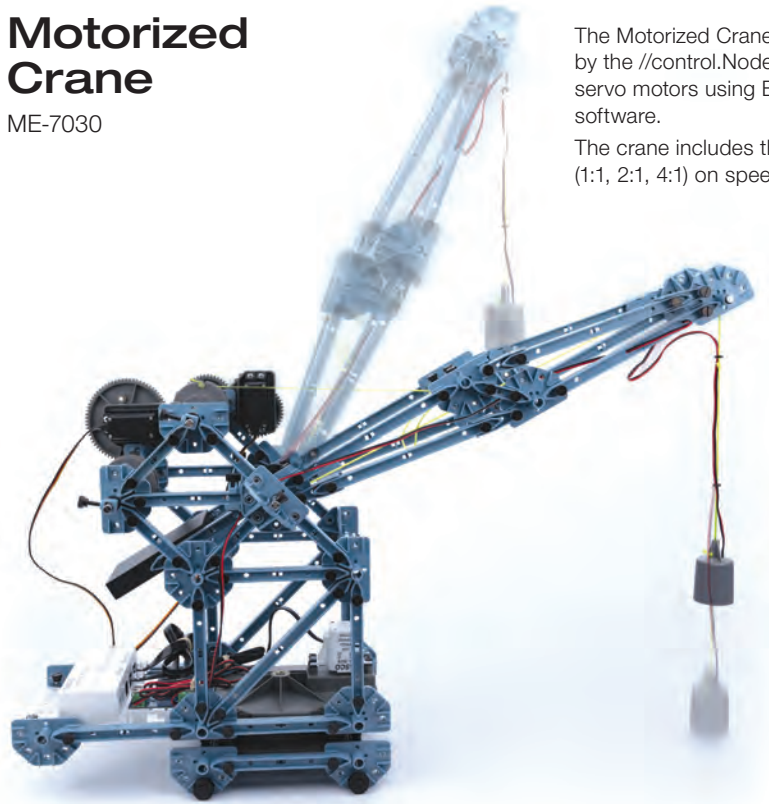
Students can:

- Build modular structures with realistic I-beams.
- Add gears, counterweights, electromagnets, and other accessories.
- Integrate live sensor data into their coding logic.

Motorized STEM Kits

Motorized Crane

ME-7030



The Motorized Crane is made using PASCO Structures and is controlled and powered by the //control.Node. Students program the controller to run the stepper motor and servo motors using Blockly coding embedded in PASCO Capstone or SPARKvue software.

The crane includes three sets of gears to explore the effect of gear ratios (1:1, 2:1, 4:1) on speed and lifting capability.

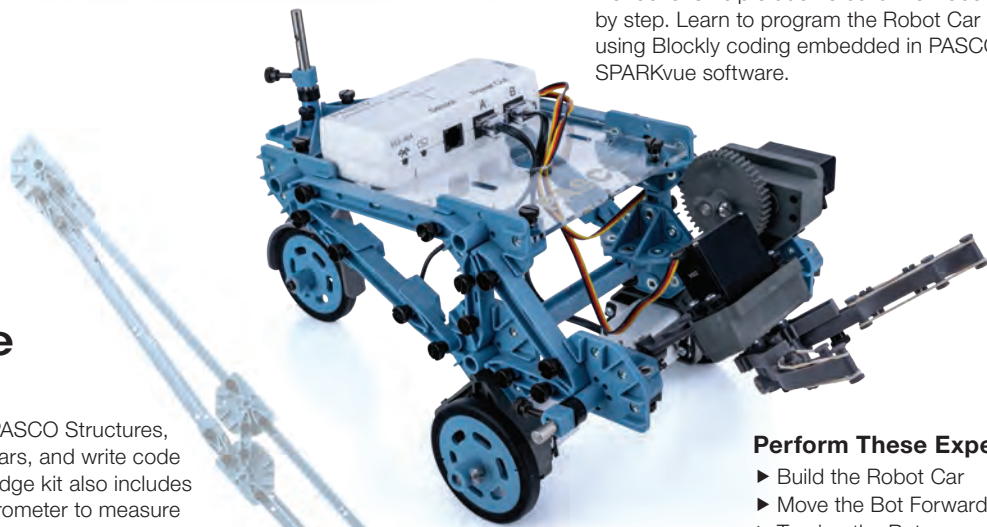
Activities:

- ▶ Build the Motorized Crane
- ▶ Introduction to Stepper and Servo Motors
- ▶ Position Boom Angle and Electromagnet height to reach a position
- ▶ Pick up a ball and drop it into a cup on a different level
- ▶ Effect of Gear Ratios on Speed
- ▶ Effect of Duty Cycle on the Load the Electromagnet Can Lift
- ▶ Effect of Spool Diameter

Robot Car

ME-7029

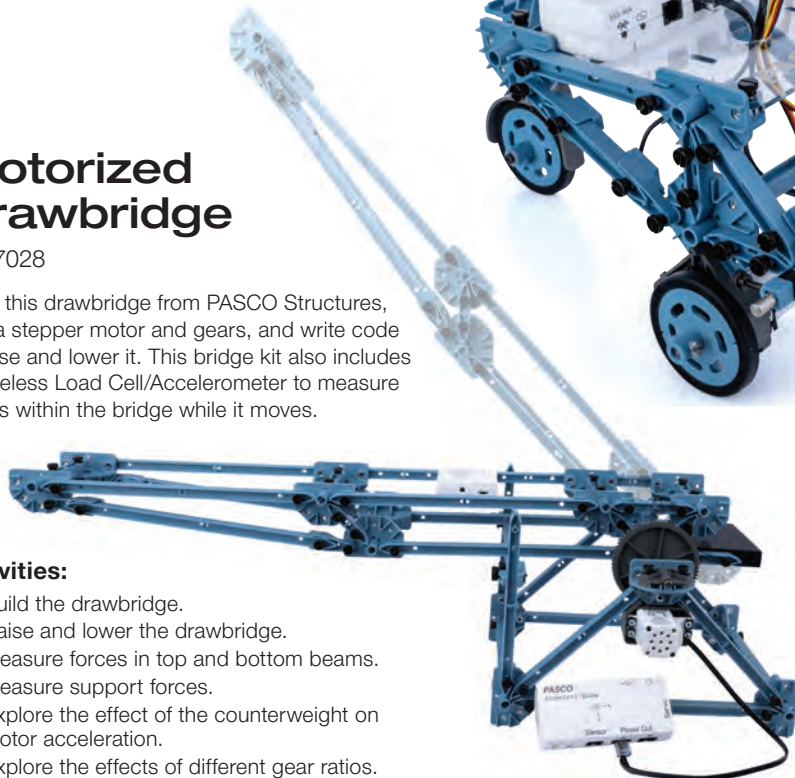
The Robot Car can navigate through a maze, turn in circles, and pick up objects with its gripper. The detailed instructions help students build the Robot Car step by step. Learn to program the Robot Car movement using Blockly coding embedded in PASCO Capstone or SPARKvue software.



Motorized Drawbridge

ME-7028

Build this drawbridge from PASCO Structures, add a stepper motor and gears, and write code to raise and lower it. This bridge kit also includes a Wireless Load Cell/Accelerometer to measure forces within the bridge while it moves.



Activities:

- ▶ Build the drawbridge.
- ▶ Raise and lower the drawbridge.
- ▶ Measure forces in top and bottom beams.
- ▶ Measure support forces.
- ▶ Explore the effect of the counterweight on motor acceleration.
- ▶ Explore the effects of different gear ratios.
- ▶ Use the load cell as a limit switch.
- ▶ Operate the drawbridge in response to a signal.

Perform These Experiments:

- ▶ Build the Robot Car
- ▶ Move the Bot Forward and Backward
- ▶ Turning the Bot
- ▶ Power Steering of Front Wheel
- ▶ Moving Objects with the Gripper
- ▶ Go to a Spot and Return
- ▶ Navigate a Maze
- ▶ Turn in a Circle
- ▶ Create a Function

For more information on the Motorized Structures, visit [pasco.com/structures](https://www.pasco.com/structures)

Accessories for PASCO Structures

Motor Mount (set of 2)

ME-7020

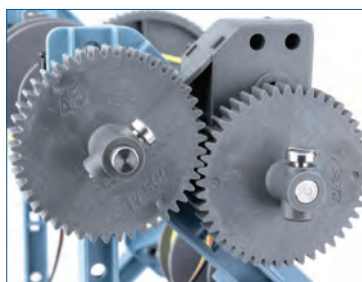
Attach PASCO Stepper Motors or regular size servo motors to PASCO Structures using this motor mount.



Gear Set

ME-7021

These three pairs of gears are driven by stepper motors or servo motors to make PASCO Structures move.



Spool and Bearings

ME-7022

This two-step spool is used to make a powered winch with PASCO Structures.



Caster Wheel

ME-7023

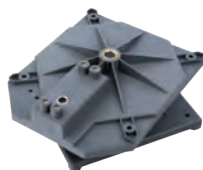
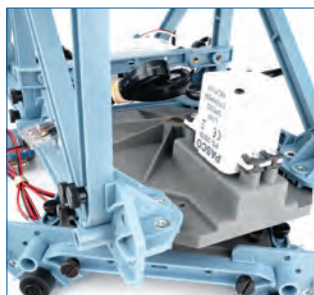
This caster wheel is part of the Motorized Robot Car, but it also can be purchased separately to add to your own PASCO Structures designs.



Turntable

ME-7024

This Turntable is designed to rotate cranes made from PASCO Structures.



Structures Gripper

ME-7025

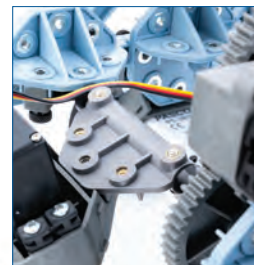
Add this Gripper to PASCO Structures to grab objects.



Structures Hinge

ME-7026

Use this hinge with the Structures to make movable joints. The hinge is designed to be used with the PASCO Structures axles.



Axle Bearings (set of 6)

ME-7043

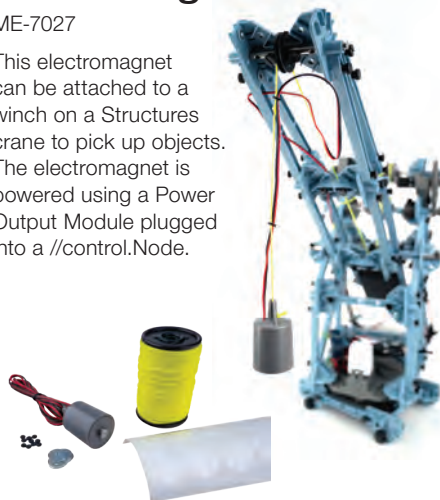
The Axle Bearings ensure smooth rotation of the axle and have features that match the Structures connectors so the axle can be screwed into the connector.



Electromagnet

ME-7027

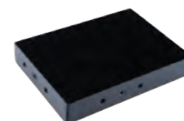
This electromagnet can be attached to a winch on a Structures crane to pick up objects. The electromagnet is powered using a Power Output Module plugged into a //control.Node.



Structures Counterweight

ME-7037

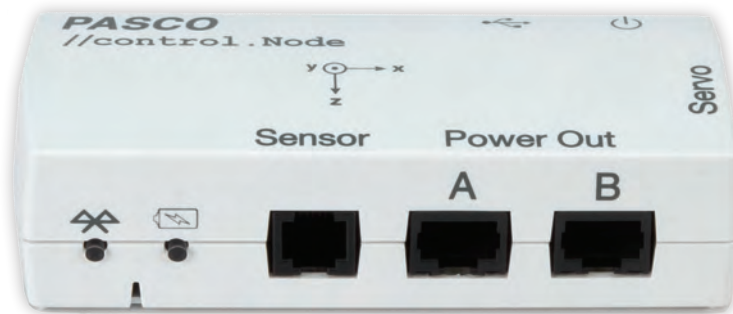
The Counterweight is used to offset the weight of drawbridges and cranes, making them more balanced and requiring less torque to move.



For the complete list of accessories or the Motorized Structures, visit pasco.com/structures

Control Servos and Stepper Motors with Coding

Combine the //control.Node with servos and stepper motors to control PASCO Structures, or even your own DIY projects!



//control.Node

PS-3232

High Speed Stepper Motor

PS-2976



Servo Motor

SE-2975



Low Speed Stepper Motor

PS-2978



//control.Node Platform

ME-7042

This platform secures the //control.Node to Motorized Structures such as the Motorized Crane and the Robot Car.



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