

# Car & Ramp

## Assembly Instructions

The Car & Ramp is an excellent tool for teaching and learning about forces and motion. Students are able to perform accurate and repeatable experiments that explore the concepts of speed and acceleration, Newton's Laws, simple machines and friction.

The ramp is 48" long and has a pulley mounted at one end for added versatility. The car has all-metal ball bearing wheels, eyelets for attaching strings or force scales, and a threaded center post for securing weights. A detailed Curriculum Resource Guide is available to make the Car & Ramp a more effective learning tool.

### Parts Checklist

The following items are provided with the Car & Ramp:

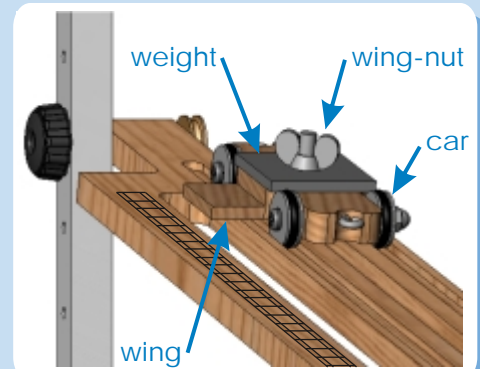
- ramp
- car with wing nut
- foot for the ramp
- black knob
- protractor (this is an option for some configurations)

In addition, you will need these items:

- Physics Stand, assembled
- timer console with power transformer
- photogates with wires (2)
- weight set (optional)
- spring scales (optional)
- string (optional)

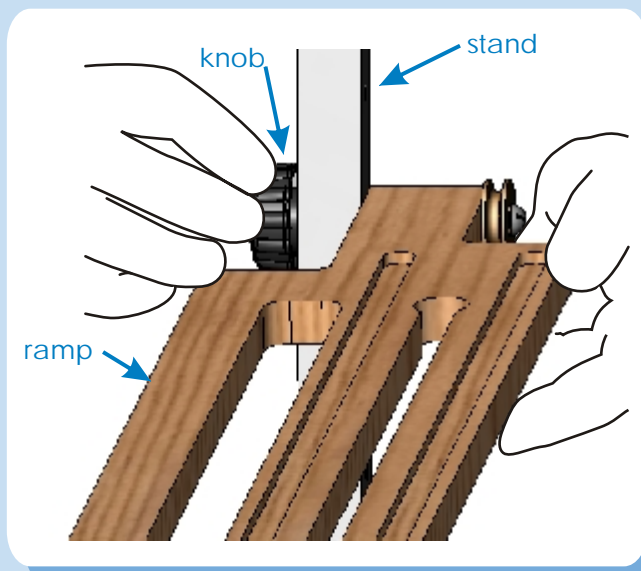
### Placing the Car on the Ramp

Place the car on the ramp by fitting the wide head of the screw through the keyhole at the top of the ramp. The wing on the car should be on the side of the ramp with the scale printed on it. Weights can now be added to the car to change its mass. Secure the steel weights using the wing-nut.



### Attaching the Physics Stand

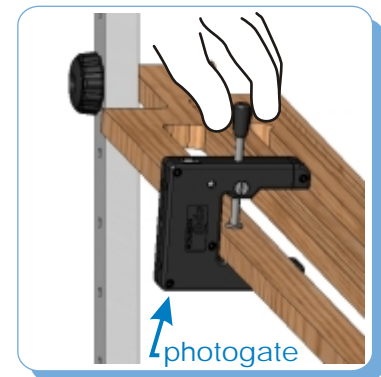
Attach the ramp to the Physics Stand by inserting the threaded rod that is attached to the ramp through one of the holes in the pole. Secure by tightening the black knob. The foot fits into the hole at the bottom of the ramp.



### Using the CPO Timer

Place the photogates at the desired position on the scale, ensuring that the photogates fit flush against the edge of the ramp. Tighten the knobs to lock into position.

Connect the photogates to the A and B slots of the timer console using the supplied wires. The car should pass through photogate A and then through photogate B. The timer should be set to interval mode, and both A and B lights should be lit. If set-up properly, the wing on the car will trigger the photogates. Note: The wing is 5 cm long.



Note: For detailed instructions on using the CPO Timer, please refer to the manual that is supplied with the CPO Timer.

For technical assistance, please call 866.588.6951.