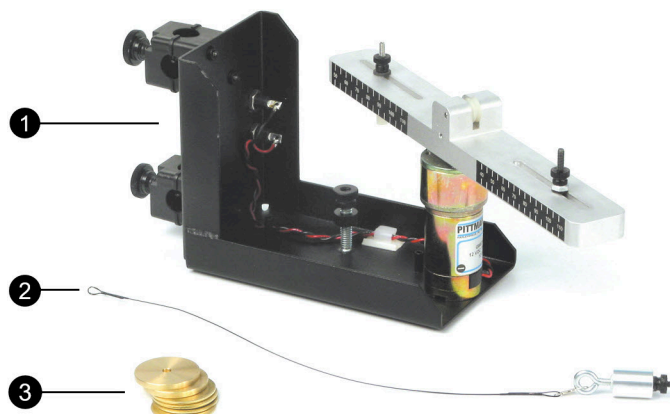


Centripetal Force Apparatus

ME-8088



What's included

- 1 Frame with electric motor
- 2 Ball bearing swivel with cable
- 3 Mass
 - 2× 5-g Mass
 - 2× 10-g Mass
 - 2× 20-g Mass

Introduction

The Centripetal Force Apparatus allows students to investigate the relationships between centripetal force, radius, mass, and velocity for an object undergoing uniform circular motion. Traditional experiments in this area involve the swinging of masses above the head. The traditional approach is difficult to execute and data is rarely sufficient for understanding the relationships. The Centripetal Force Apparatus removes these difficulties by using sensors to measure the force and velocity of the mass as it rotates.

Velocity is varied by changing the voltage supplied to the included electric motor. Drilled masses are included to facilitate a range of mass trials. The radius is changed by sliding the captured masses along the grooves in the rotating arm. A convenient measuring scale is included on both sides of the arm.

The sturdy base includes rod clamps for connection to a standard rod stand. The unit can also be clamped to a table using a C-clamp.

Equipment setup

Required equipment

- PASPORT High Resolution Force Sensor (PS-2189)
- Photogate Head (ME-9498A)
- Large Rod Base (ME-8735)
- 45 cm Stainless Steel Rod (ME-8736)
- 90 cm Stainless Steel Rod (ME-8738)
- Multi-Clamp (ME-9507)
- Banana Plug Cords (SE-9750)
- Power Supply, 12 VDC, 0.5 A
- PASCO Capstone or SPARKvue software

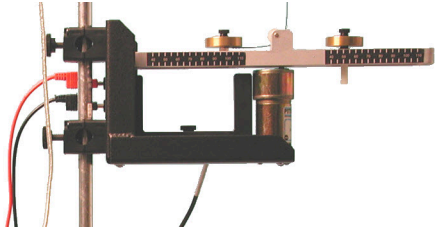
Procedure

⚠ WARNING

Do not stand next to the motor or rotating arm or look at the rotating arm at eye level. To avoid possible injury from the rotating arm hitting the body, keep at least a one-foot distance from the motor and rotating arm when running the motor.

1. Mount the 90 cm stainless steel rod into a base support stand.

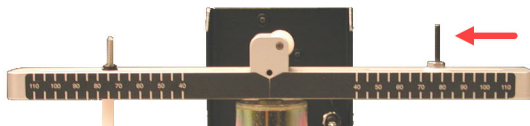
- Insert the rod through the rod clamps on the Centripetal Force Accessory to attach it to the rod. Tighten the thumbscrews on the rod clamps.



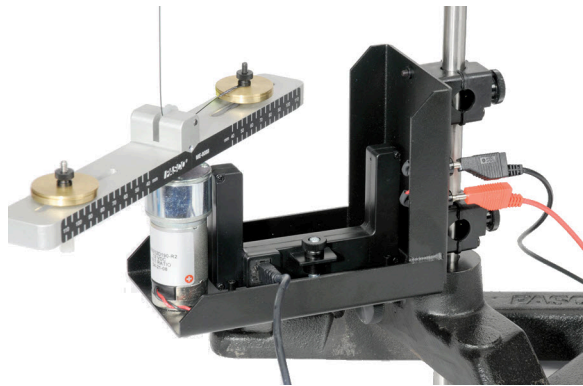
- Remove the free mass holder and measure its mass. To remove the free mass holder, loosen the screw below the rotating arm.

✓ NOTE

The free mass holder includes the screw, two plastic washers, a nut, and two thumbscrews.



- Use a thumbscrew to mount the Photogate Head to the bottom base of the Centripetal Force Accessory.

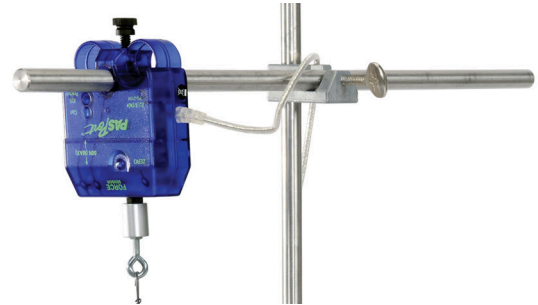


- Attach the Multi-Clamp to the upper end of the stainless steel rod.
- Insert the 45 cm stainless steel rod horizontally into the Multi-Clamp.

- Slide the Force Sensor through the stainless steel rod and adjust the top screw to anchor it to the rod.

✓ NOTE

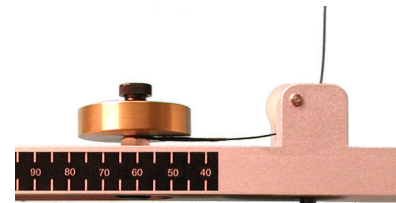
Be sure to keep the cords from the sensor out of the path of the rotating arm.



- Attach the ball bearing swivel to the bottom of the Force Sensor.
- Thread the cable from the swivel hook through the pulley and over the free mass holder.

✓ NOTE

Always lay down the cable before adding the mass.



- Add a mass to the free mass holder then screw on the thumbscrew to hold the mass in place.
- Add a mass to the fixed mass holder and use a thumbscrew to hold the mass in place.
- Plug the Force Sensor into a PASPORT interface.
- Use banana plugs to connect the Centripetal Force Accessory to a power supply.
- To turn on the motor to the Centripetal Force Accessory, turn on the Power Supply.

⚠ CAUTION

To avoid damaging the equipment, keep all cords away from the motor and rotating arm.

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include editable student handouts and teacher notes. Visit [pasco.com/freelabs/ME-8088](https://www.pasco.com/freelabs/ME-8088).

Software help

The SPARKvue and PASCO Capstone Help provide additional information on how to use this product with the software. You can access the help within the software or online.

SPARKvue

Software Main Menu  > Help

Online [pasco.com/help/sparkvue](https://www.pasco.com/help/sparkvue)

PASCO Capstone

Software Help > PASCO Capstone Help


Online [pasco.com/help/capstone](https://www.pasco.com/help/capstone)


Specifications and accessories

Visit the product page at [pasco.com/product/ME-8088](https://www.pasco.com/product/ME-8088) to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

Technical Support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

 Chat [pasco.com](https://www.pasco.com)

 Phone 1-800-772-8700 x1004 (USA)
+1 916 462 8384 (outside USA)

 Email support@pasco.com

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Limited warranty

For a description of the product warranty, see the Warranty and Returns page at [pasco.com/legal](https://www.pasco.com/legal).

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