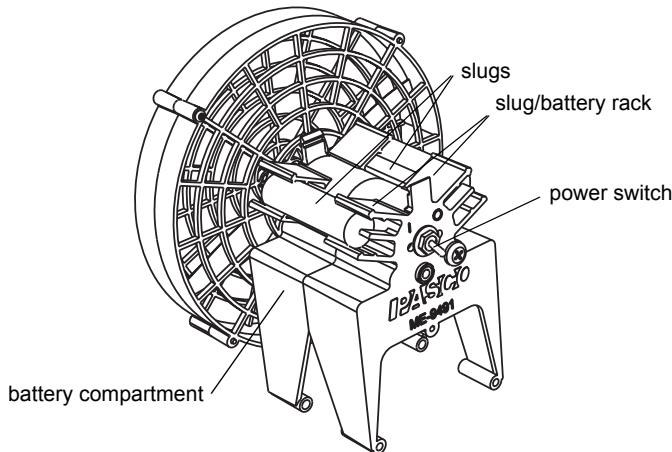


Fan Accessory

ME-9491



| Included Equipment | Part Number |
|--|---------------------|
| Fan Accessory | ME-9491 |
| aluminum slugs (2) | |
| rubber bands | |
| Required Equipment | Part Number |
| 4 AA batteries | |
| Dynamics Cart or | ME-9430 or ME-9454 |
| PAScar or GOcar | ME-6950 or ME-6951 |
| Suggested Equipment | Part Number |
| Dynamics Track | ME-9429A or ME-9452 |
| Tape Timer or | ME-9283 |
| Motion Sensor and a Science Workshop™ computer interface or | CI-6529 |
| Motion Sensor and a 750 interface or | CI-6742 and CI-7500 |
| PASport Motion Sensor and USB Link with a USB enabled computer | PS-2103 and PS-2100 |
| Smart Pulley and computer interface | ME-9387 |
| Friction Cart Accessory | ME-9457 |

Introduction

The PASCO ME-9491 Fan Accessory mounts on any PASCO Cart for use with a Dynamics Track (ME-9429A or ME-9452) to demonstrate principles of motion. The self-propelled Fan Accessory facilitates students' understanding of Newton's Second Law of Motion because the fan produces the applied force, and all the mass of the system is in one place. The mass and force can be adjusted for a variety of force experiments.

Specifications

| | |
|--|----------------------------|
| Mass of Fan Accessory (with 4 AA Energizer™ batteries and mass slugs)¹ | approximately 310 g |
| Mass of aluminum slug | approximately 20 g |

¹Note: The masses of batteries of different brands vary slightly.

Assembly

assembly on the Dynamics Cart

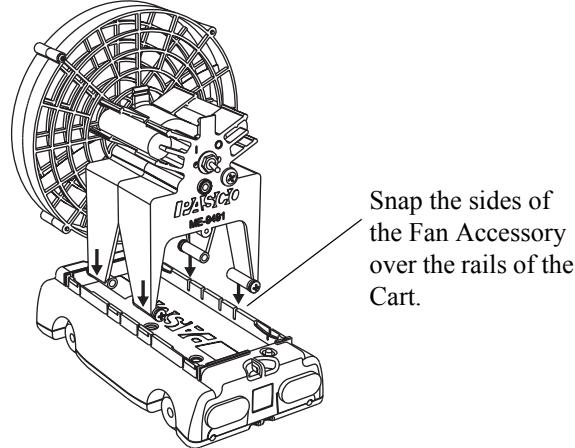


Figure 1. Attaching the Fan Accessory to the Cart

Operation

1. Change the speed of the Fan Accessory by using two, three, or four batteries. When using less than four batteries, insert the slugs as necessary to complete the circuit (Figure 2).

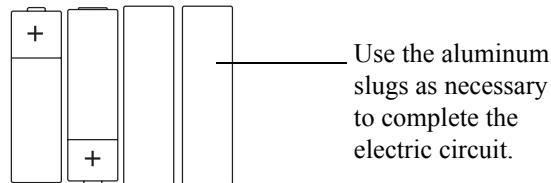


Figure 2. Supplying three different voltages by installing two, three or four batteries.

2. Store unused batteries or slugs in the storage rack on the top of the Fan Accessory.

3. Vary the mass of the Fan Accessory by placing or removing the slugs or batteries in the storage rack.

Suggested Experiments¹

Experiment #1: Measure the acceleration of the cart using the Motion Sensor, Smart Pulley or Tape Timer. Vary the mass of the Fan Accessory or the speed of the propeller and repeat (Figure 3)

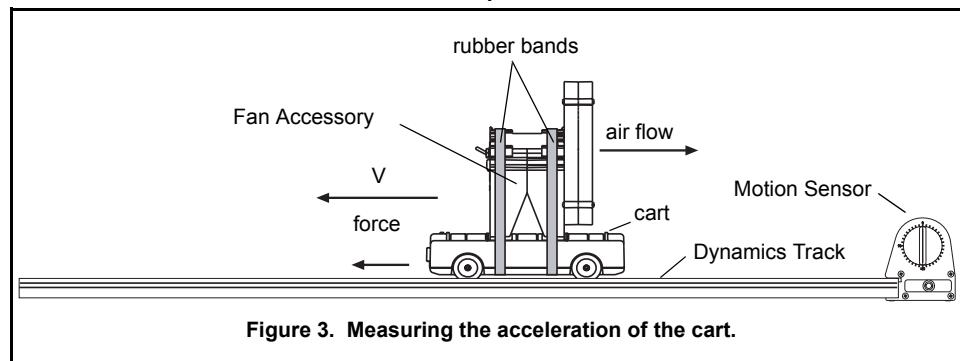


Figure 3. Measuring the acceleration of the cart.

Experiment #2: Determine the force of the fan by connecting the cart to a mass that hangs over a pulley. Adjust the hanging mass until the cart doesn't move. Vary the fan speed and repeat (Figure 4)

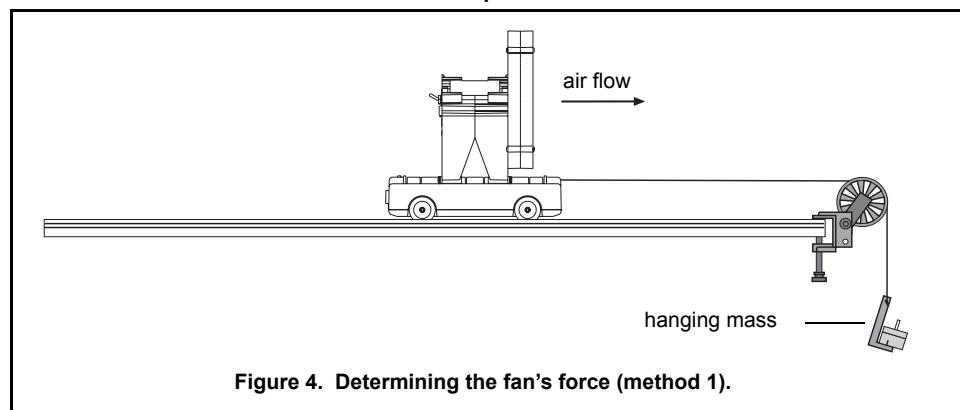


Figure 4. Determining the fan's force (method 1).

Alternative method: Use a spring scale to determine the fan's force at three different propeller speeds (Figure 5)

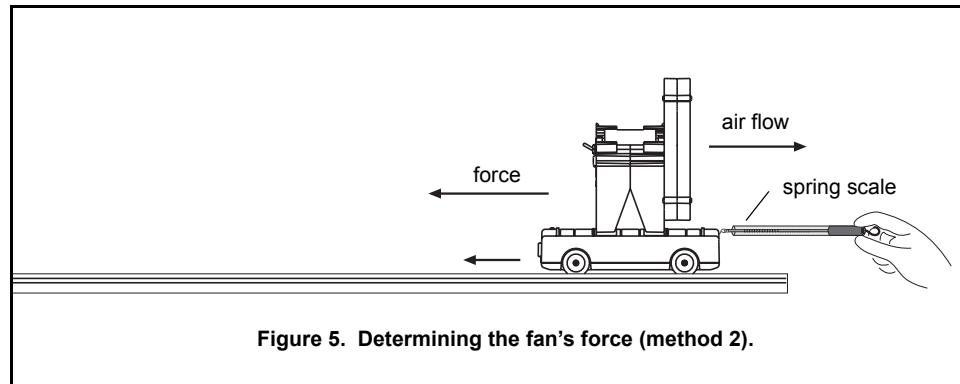


Figure 5. Determining the fan's force (method 2).

¹ For a discussion of fan cart experiments, refer to Robert A. Morse, "Constant Acceleration Experiments with a Fan-Driven Dynamics Cart," *The Physics Teacher*, October, 1993, pp. 436-438.

Experiment #3: Counteract the fan's force with the force of gravity by inclining the track until the cart cannot climb it. Vary the fan speed and repeat (Figure 6)

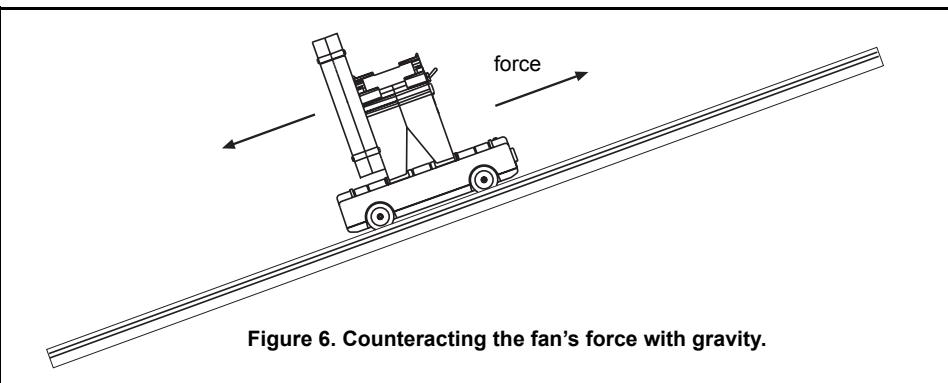


Figure 6. Counteracting the fan's force with gravity.

Experiment #4: Counteract the acceleration due to the fan's force with friction by attaching a Friction Cart Accessory to the Dynamics Cart and adjusting the friction until the cart moves at constant speed. Vary the fan speed and repeat (Figure 7).

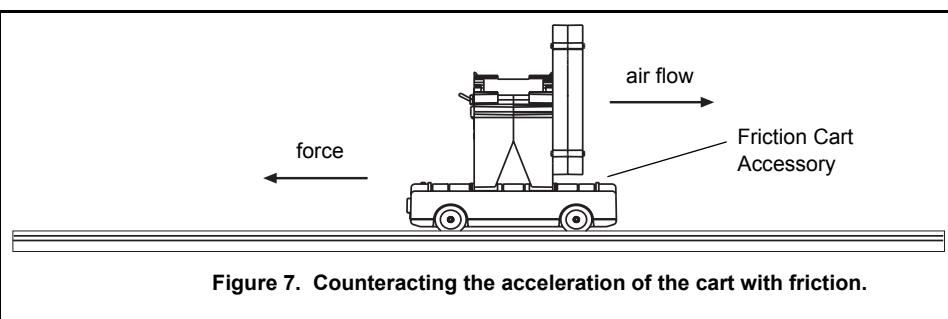


Figure 7. Counteracting the acceleration of the cart with friction.

Technical Support

For assistance with any PASCO product, contact PASCO at:

Address: PASCO scientific
10101 Foothills Blvd.
Roseville, CA 95747-7100

Phone: 916-786-3800 (worldwide)
800-772-8700 (U.S.)

Fax: (916) 786-7565

Web: www.pasco.com

Email: support@pasco.com

Limited Warranty

For a description of the product warranty, see the PASCO catalog.

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