Newton’s 2nd Law

Station 1

Place the cart at the START line. Turn on the fan to its highest setting. Start timing when the cart is released. Stop timing when the cart crosses the FINISH line. Record the time. The mass of the cart is **720 g**. Measure the distance between the START line and the FINISH line.

Each tile is 30 cm long.

Calculate: (a) the acceleration of the cart

(b) the force of the fan on the cart

Station 2

Start collecting data on the LabQuest. Trigger the cart. Use the acceleration graph to average the acceleration of the cart from when the cart breaks contact with the barrier to when the cart stops. The mass of the cart is **665 g**.

Calculate: (a) the weight of the cart

(b) the size of the friction on the cart

Station 3

Start the cart at the 50 cm mark of the track ruler. **The mass of the cart is 650 g**.Start collecting data on the LabQuest. Release the cart. Use the force graph to average the force readings on the cart while the cart is moving and record the average force.

Calculate: (a) the acceleration of the cart

(b) the mass of the hanging object

Station 4

Record the tension in rope A from the spring scale.

Measure the angle labeled **α** in the drawing left.

Calculate: (a) the tension in rope B

(b) the tension in rope C

(c) the weight of the hanging object

(d) the mass of the hanging object

rope

C

rope B

rope

A

**α**

Station 5

Hold the system motionless. Record the tension in the string.

Calculate the mass of object ***A***. Object ***A*** is the force sensor.

Start collecting data on the LabQuest. Release the system.

Use the force graph to average the tension in the string while the system was moving.

Calculate: (a) the NET force on object ***A*** while moving

(b) the acceleration of object ***A*** while moving

(c) the acceleration of object ***B*** while moving

(d) the mass of object ***B***

(e) the NET force on object ***B*** while moving

***A***

***B***