Name _____
Chapter 4: Regents Physics Weight lab

**Goal:** To experimentally determine the mass of (10) small objects in the physics classroom.

**Materials**

- 5N and 2.5 N Spring Scale
- Scale

**Procedure**

Use the hints below to find the (10) objects in the physics classroom that will be used in this experiment.

- Once you find the object, find the weight of the object using a Newton spring scale.
- Place the object on a scale and determine it's mass
- Finish the postlab when all objects are found

**Hint #1**: I'm a low friction rolling machine..give me a track and I'm off!

**Hint #2:** Don't try to stop me; I can cap a tube like no one else

**Hint #3**: I am circular (like a ring) and made of iron

**Hint #4**: Why run numbers in your head? I'm the wiz!

**Hint #5**: Squeeze me and I'll shoot dihydrogen monoxide at you!

**Hint #6**: Stack, stack, stack..you put a block on my top!

**Hint #7**: 100 = 1; but what am I?

**Hint #8**: I'm too sick to go to school..look, this proves it!

**Hint #9**: No hot hands with me!! I am great at protecting your phalanges.

**Hint #10**: I've finally been returned! I spent too long in the can.

Record your data and calculations in the table below

| Hint # | Object's Name | Weight (N) from spring scale | Mass using scale (Kg) | Weight (lbs) using formula | Mass (Kg) using formula |
|---|---|---|---|---|---|
| #1 | | | | | |
| #2 | | | | | |
| #3 | | | | | |
| #4 | | | | | |
| #5 | | | | | |
| #6 | | | | | |
| #7 | | | | | |
| #8 | | | | | |
| #9 | | | | | |
| #10 | | | | | |

**Calculations**

1. Calculate the weight of each object in pounds using the conversion 1kg = 2.205 lbs. Show work for each trial below. Place you answers in the table.

Trial #1

Trial #2

Trial #3

Trial #4

Trial #5

Trial #6

Trial #7

Trial #8

Trial #9

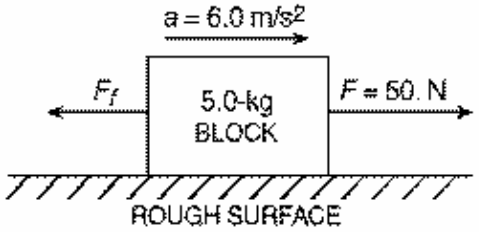
Trial #10

Name: _____

1) A 10.-kilogram rubber block is pulled horizontally at constant velocity across a sheet of ice. Calculate the magnitude of the force of friction acting on the block. [*Show all work, including the equation and substitution with units.*]

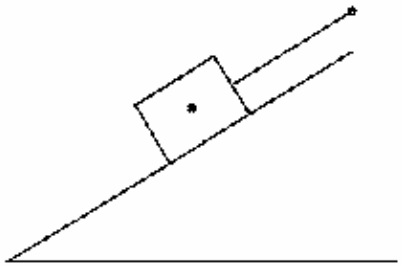
2) A skier on waxed skis is pulled at constant speed across level snow by a horizontal force of 39 newtons. Calculate the normal force exerted on the skier. [*Show all work, including the equation and substitution with units.*]

3) The diagram below shows a 5.0-kilogram block accelerating at 6.0 meters per second$^2$ along a rough horizontal surface by the application of a horizontal force, $F$, of 50. newtons.



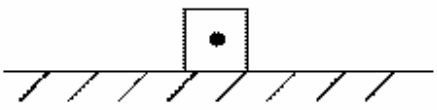

What is the magnitude in newtons of the force of friction, $F_f$, acting on the block?

4) A box of mass $m$ is held motionless on a frictionless inclined plane by a rope that is parallel to the surface of the plane. On the diagram below, draw and label *all* of the force vectors acting on the box.



Questions 5 and 6 refer to the following:

A force of 10. newtons toward the right is exerted on a wooden crate initially moving to the right on a horizontal wooden floor. The crate weighs 25 newtons.



5) (a) Calculate the magnitude of the force of friction between the crate and the floor in the given diagram. [*Show all work, including the equation and substitution with units.*]

(b) What is the magnitude of the net force acting on the crate?

(c) Is the crate accelerating? [*Explain your answer.*]

6) (a) On the diagram provided, draw and label *all* vertical forces acting on the crate.

(b) On the same diagram, draw and label *all* horizontal forces acting on the crate.

7) When a child squeezes the nozzle of a garden hose, water shoots out of the hose toward the east. What is the compass direction of the force being exerted on the child by the nozzle?