Name _____

Hour _____

Physics - Chapter 4 Task List

Task	In Class? (Yes/No)	Date Due	Grade
Activity – Dishes & Table Cloth	Yes		/5
** Vodcast #1 – Newton's 1st Law*			/9
** Vodcast #2 – Weight vs. Mass*			/9
Worksheet – Ch.4 #1-6			/5
Quiz 4.1 Newton's 1st Law, Weight, Mass	Yes		*/15
** Vodcast #3 – Net Force & Free Body Diagrams*			/15
Worksheet – Ch.4 #7-12			/5
• Lab 4.1 - Virtual Free Body Diagrams	Computers Available on		*/15
Quiz 4.2 Net Force & Free Body Diagrams	Yes		*/15
** Vodcast #4 – Tensions*			/9
Worksheet – Ch.4 #13-15			/5
Chap 4 Concept Review			/10
Concept Development 4-1	Extra Credit		
Test Chapter 4	**Yes**		*/100
Packet Total	**MUST Turn in before taking the Ch 4 Exam**		**/64**

Chapter 4 Objectives

Vodcast #1

1. State Newton's 1st Law.

2. Why do the dishes stay on top of the table in the BMW motorcycle video?

3. Define inertia and describe how objects behave because of inertia.

Vodcast #2

4. Distinguish between mass and weight and state its metric units.

5. Example #1: Calculate the weight of an object of known mass of 4 kg.

6. Example #2: Calculate the mass of an object that weighs 28 N.

Vodcast #3

7. Define force and state its metric unit.

8. List 3 examples of different types of forces.

9. Example #1: Create a free body diagram to show the forces on a rocket being launched.

10. Calculate the net force acting on an object if:
    - No force pushes/pulls on it.
    - 1 force of 5N pushes on it.
    - Forces of 10N and 5N pull on it in the same direction.
    - Forces of 10N and 5N push on it in opposite directions.

11. Identify the conditions necessary for a body to be in equilibrium and describe all of the forces acting on the body.

Vodcast #4

12. What is tension?

13. Example #1: Calculate the tension in a rope supporting a 50 kg mass.

14. Example #2: Calculate the tension in each rope if 4 ropes are equally supporting a 12 kg mass.

Chapter 4 Problems

1. What is required in order for a car that is at rest to start moving?

2. What is required for a cart that is moving on an air track to keep moving on the air track?

3. What does inertia measure?

4. Mass is measured in _____. Weight is measured in _____.

5. A car with a mass of 1200 kg has a weight of _____?

6. A man weighs 1645 N, what is his mass _____?

(Questions #7 – 12) Draw a free body diagram for each situation below. Identify the type of force acting in each direction on the object. Represent the relative magnitude of each force by using an appropriate length for each vector arrow. Consider air resistance and friction in all appropriate situations.

7. A Physics textbook sits motionless on a table. Diagram the forces acting on the book.

8. A hockey stick is used to give a hockey puck a push to the left across the ice. Neglecting friction, diagram the forces on the hockey puck as it is pushed.

9. Two Physics students push with equal force on a cart. Student #1 pushes from the left, while Student #2 pushes from the right, causing the cart to remain motionless. Diagram the forces acting on the cart.

10. A truck is moving to the right with a constant velocity. Diagram the forces acting on the truck, including air resistance.

11. A skydiver is descending back to earth at a constant velocity. Diagram the forces acting on the skydiver, including air resistance.

12. A Physics textbook is moved with an acceleration to the left by a force applied from the rightward direction. Diagram the forces acting on the textbook.

13. Monty, the monkey at the Sunshine Zoo, hangs in his pen from two long vines. Monty weighs 128 N. The tension in one of the vines is 48.0 N

    a) Draw a free body diagram for the forces acting on the monkey.

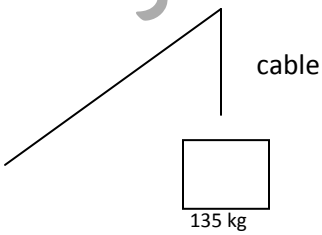
    b) What is the tension in the second vine?

14. Eleanor, the trapeze artist at the Smiley Circus, weighs 135.0 lbs. Her trapeze swing is supported by two cables, each supporting equal weight.

    a) Draw a free body diagram for the forces acting on the swing.

    b) What is the tension in each cable?

15. A crane supports a 135 kg mass at the end of its cable. What is the tension in the cable?



Concept Review: Newton's 1st Law - Ch. 4 Name _____

Period _____

1. What is the effect of friction on a moving object?

2. Does the law of inertia pertain to moving objects, objects at rest, or both?

3. The law of inertia states that no force is required to maintain motion. Why, then, do you have to keep pedaling your bicycle to maintain motion?

4. If you were in a spaceship and launched a cannonball into frictionless space, how much force would have to be exerted on the ball to keep it going?

5. Does a 2-kilogram rock have twice the mass of a 1-kilogram rock? Twice the inertia? Twice the weight (when weighed in the same location)?

6. Does a liter of molten lead have the same volume as a liter of apple juice? Does it have the same mass?

7. What is the weight of 2-kilograms of yogurt?

8. Susie Small finds she weighs 300 N. Calculate her mass.

9. Suppose you place a ball in the middle of a wagon that is at rest and then abruptly pull the wagon forward. Describe the motion of the ball relative to (a) the ground and (b) the wagon.

10. When a junked car is crushed into compact cube, does its mass change? Its volume? Its weight?

11. When you compress a sponge, which quantity changes: mass, inertia, volume, or weight?

12. What is the net force or, equivalently, the resultant force acting on an object in equilibrium (at rest)?

13. Forces of 10 N and 15 N act in same directions on an object, what is the net force?

14. If forces of 10 N and 15 N act in opposite directions on an object, what is the net force?

15. How does the tension in your arms compare when you let yourself dangle motionless by both arms and by one arm?

16. In the cabin of a jetliner that cruises at 600 km/h, a pillow drops from an overhead rack into your lab below. Since the jetliner is moving so fast, why doesn't the pillow slam into the rear of the compartment when it drops?