Name _____ Date _____ Class _____

SECTION 1 Reinforcement

Forces Chapter 3.1 Review

Directions: *Answer the following questions on the lines provided.*

1. What is a force?

2. How can you know when an object has an unbalanced force on it?

3. Is it possible for an object at rest to have forces acting upon it? Explain.

4. What are the three types of friction and when does each apply?

Directions: *Solve the following problems. Show your calculations in the spaces provided.*

5. A baseball has a mass of 0.145 kilograms. If the acceleration due to gravity is 9.8 m/s^2, what is the weight of the baseball in newtons?

6. A suitcase with a mass of 2 kg has a weight of 18 N on a particular planet. What is the acceleration due to gravity on that planet?

7. A grapefruit has a weight on Earth of 4.9 newtons. What is the grapefruit's mass?

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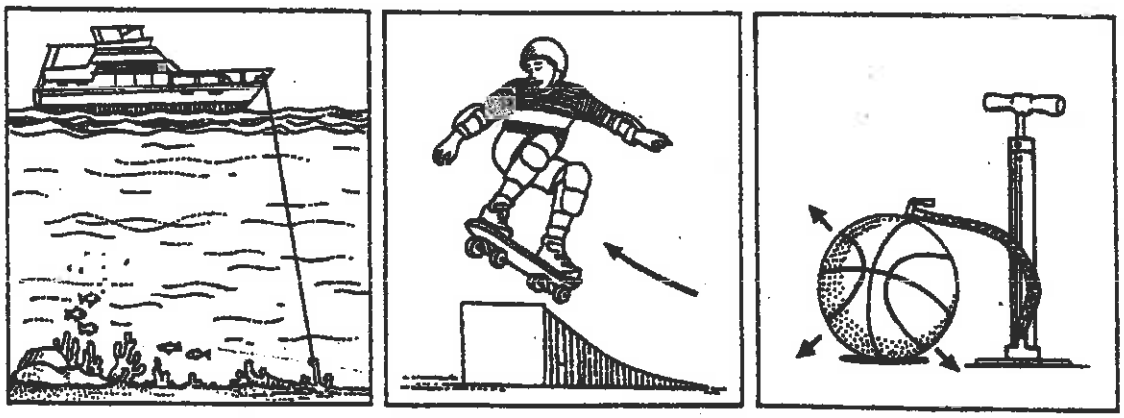
Worksheet

LESSON 4.1 ■ LEVEL 1

Forces

1. Throwing, lifting, pushing, and pulling are kinds of _____.
2. A force does not always make something move. An example of a force that keeps an object from moving is _____.
   a. a hook holding a picture in place on a wall
   b. the tracks holding a roller coaster car in a loop
   c. a bicycle rider pushing on the pedals
3. A force that acts on every object on Earth all of the time is _____.
4. The amount of force it takes to move a one-kilogram mass with an acceleration of one meter per second squared is called one _____.
5. Look at the drawings of forces at work in the diagram. Notice what each force is doing.



A. Force of an anchor B. Force of a ramp C. Force of air in a basketball

   a. A force changes direction of motion in the box marked _____.
   b. A force prevents motion in the box marked _____.
   c. A force changes an object's shape in the box marked _____.

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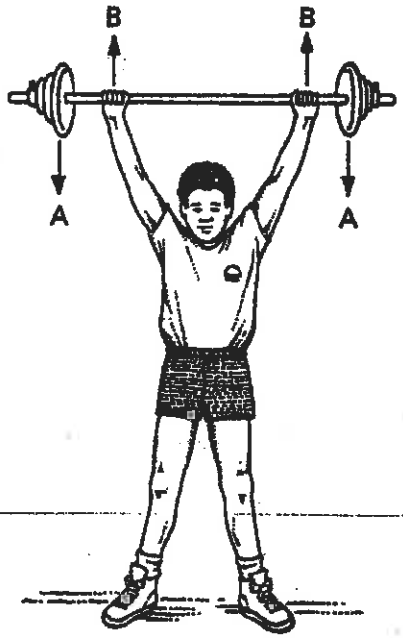
Balanced Forces

In the drawing at the right, the arrows indicate forces.



1. **a.** The force exerted by the athlete on the barbell and the force of the barbell acting on the athlete are _____.

1. balanced
2. not balanced
3. acting in the same direction

b. In the drawing the arrows that show the force of gravity are labeled _____.

2. **a.** Newton's first law of motion explains that as long as the forces on an object _____ each other, the object's _____ will not change.

b. Another way to say this is that a resting object will begin to move only if the forces on it become _____.

3. **a.** The force called _____ occurs when surfaces rub together.

b. The direction of this force is _____.

1. opposite to the direction of a moving object
2. the same direction as the direction of a moving object

c. An example of this force is _____.

Gravity and Other Forces

Worksheet

LESSON 4.5 ■ LEVEL 1

1. The force of attraction that exists between any two pieces of matter is _____.

2. The universal law of gravitation states that the amount of gravitational force between two objects depends on two things:

   1) the _____ of the two objects and

   2) the _____ between the two objects.

3. The force of gravity on you is greatest if you are _____.

   a. on your bike
   b. in an airplane flying at 35 000 feet
   c. on the space shuttle orbiting Earth

4. The force of gravity will be greater on you than on someone whose mass is _____ yours.

   a. greater than
   b. less than

5. You would weigh less on the moon than you do on Earth because _____.

   a. Your mass is less on the moon.
   b. The mass of the moon is less than Earth's mass.
   c. The universal law of gravitation only applies on Earth.

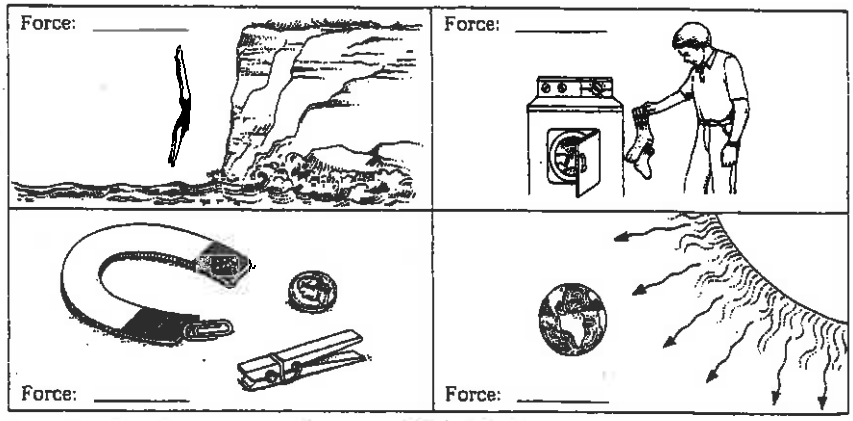
6. Mass is a measure of the amount of _____ in an object, while _____ is a measure of the pull of gravity on an object.

7. electric force _____

8. magnetic force

9. gravitational force

10. nuclear force



DIFFERENCES IN GRAVITY

Figure A shows eleven objects in the sky. Study them. Then answer the questions.

1. Which of these:

   a) is the largest? _____

   b) is the smallest? _____

   c) has the most mass? _____

   d) has the least mass? _____

   e) has the strongest gravity? _____ Why? _____

   _____

   f) has the weakest gravity? _____ Why? _____

   _____

COMPLETING SENTENCES

Complete the sentences with the choices below. Two of these may be used twice.

earth	less	how much matter
small	large	moon
how much gravity	weight	gravity
more		

1. Mass tells us _____ an object has.
2. Weight tells us _____ pulls on an object.
3. Usually, _____ objects have stronger gravity than _____ objects.
4. The stronger the gravity, the _____ something weighs; the weaker the gravity, the _____ the weight.
5. As you move away from an object, its gravity pulls _____.
6. As you move closer to an object, its gravity pulls _____.
7. _____ does not change mass.
8. But gravity can change _____.
9. The _____ is larger than the moon.
10. The earth has greater gravity than the _____.

Name Date Class

Directed Reading for Content Mastery

Overview
Forces and Newton's Laws

Directions: *Complete the concept map using the terms listed below.*

pushes and pulls **Newton's Laws** **mass**
inertia **acceleration** **pairs**
unbalanced **gravity**