Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ JMJ Date \_\_\_\_\_\_\_\_\_\_

Period \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Miss Pisciotta

Chapter 4 HW Sheet

 **HW #1**

1. What is a fluid?

2. What is atmospheric pressure?

3. Compare and contrast the properties of liquids and gases.

4. Explain how pressure is measured and the name of measurement used to describe pressure.

5. In which direction does a fluid apply pressure on an object?

6. Suppose you pour water from a small bottle into a large bowl. What affect does this have on the water’s volume and shape?

7. What is the formula for density.

**HW #2**

1. A diver is on a research expedition, studying fish at a variety of sea levels. How does the pressure on the diver change as she swims deeper? Use the terms air column, water column, and water pressure in your response.

2. What is the relationship between different elevations and atmospheric pressure?

3. What is the relationship between underwater pressure and depth?

4. Underwater pressure depends on what two factors?

5. Would the pressure be different on a scuba diver swimming at 2.4 m below the surface than an scuba diver swimming at 4.6m below the surface? Why or why not?

6. Why do you feel more pressure underwater than atmospheric pressure?

**HW #3**

1. What is the density of water? Of air? How do the two affect pressure?

2. What two factors determine density?

3. Write out the equation to calculate density.

4. Explain why the density of water is greater than the density of air given the same volume of each.

5. Why do different fluids have different densities?

6. What is the unit of measurement for density?

**HW #4**

1. What is a buoyant force?

2. What does a buoyant force act on?

3. From which direction does a fluid apply pressure?

4. Why is a buoyant force always an upward force?

5. When do you float? When do you sink?

6. Why does the buoyant force on an object not change with depth?

**HW #5**

1. What does Archimedes’ principle state?

2. A billiard ball sinks to the bottom of a fish tank filled with water. Explain.

3. When a rubber duck is placed in a fish tank filled with water, it floats. Explain.

4. Two metal boats equal weight are placed in water. One boat is filled with air. The other is filled with water. Which boat will float? Why?

5. A balloon filled with helium air floats. Explain why the buoyant force pushes the balloon upward.

6. A young child blows up a balloon hoping it will float, but instead it falls to the ground. Explain.

**HW #6**

1. Why does using fluid forces in a closed container change forces but not work?

2. Explain Pascal’s principle.

3. Describe the hydraulic lift.

4. What is the formula related to Pascal’s principle?

5. Why is the output force greater than input force?

6.Does the output piston do more work than the input piston?

**HW #7**

1. What happens to speed when pressure on a fluid increases? When it decreases?

2. What is true about the pressure exerted in a water hose as water rushes out of it?

3. What happens to the pressure on the sides of the hose when the speed of the water increases?

4. How does Bernoulli’s principle apply when a soccer ball is kicked in a way that makes the ball spin?

5. In which direction does the soccer ball in the diagram curve when it is kicked with the spin shown? Explain.

**HW #8**

1. As the speed of an object traveling through fluid increases, the drag force on the object also \_\_\_\_\_.

2. As the size of an object traveling through a fluid increases, the \_\_\_\_\_ on the object also increases.

3. As the surface area of an object traveling through a fluid increases, the drag force on the object also \_\_\_\_\_.

4. As the \_\_\_\_\_ of a fluid increases, the drag force also increases.

5. Jon and Charles, a set of identical twins, are at the beach. Jon is wading in shallow water. Charles is walking out of th water. Which twin experiences the greatest drag force? Explain.

6. Two cars are traveling in the same direction at the same speed. The red car is larger and is shaped like a box. The blue car is much smaller and has a rounded shape. Which has the greatest drag? Explain.

7. Two trucks that are exactly alike are carrying exactly the same loads. Truck A is traveling at 88.5 km/hr. Truck B is traveling at 56.3 km/hr. Which truck experiences the greatest drag?

8. Explain why many runners work out by running water or with a small parachute attached to them. Describe how this affects their muscles.

9. Why does using fluid forces in a closed container change forces but not work?