Physics 100 Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Unit 1: Physics Basics

Practice Test

Metric Base units: Name the basic metric units for each of the following…

1. Volume (size) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Mass (amount of matter in something) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Weight (how heavy something is; a measure of gravitational attraction) : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4. Length : \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Metric Estimation: Provide the correct metric unit for each of the following.

Answer Choices: mm, cm, L, mL, kg, g, m, N

5. The width of a pinky fingernail = 1 \_\_\_\_\_\_\_

6. The length of a long step = 1 \_\_\_\_\_\_\_

7. The mass of a standard Nalgene bottle full of water = 1 \_\_\_\_\_\_\_

8. The mass of a paper clip = 1 \_\_\_\_\_\_\_

9. The volume of a chocolate chip = 1 \_\_\_\_\_\_\_

10. The volume of a standard Nalgene water bottle = 1 \_\_\_\_\_\_\_

11. The thickness of a dime = 1 \_\_\_\_\_\_\_

12. The weight of an uncooked burger patty = 1 \_\_\_\_\_\_\_

Metric Ratios: Enter numbers that give the correct ratios

13. \_\_\_\_\_\_\_ m = \_\_\_\_\_\_\_\_ cm

14. \_\_\_\_\_\_\_ m = \_\_\_\_\_\_\_\_ km

Measuring/metric conversion:

15. Measure the line on the right and record the length in cm and mm.

Length = \_\_\_\_\_ cm = \_\_\_\_\_\_\_mm

16. Measure the line below, and record the length in m and km.

Length = \_\_\_\_\_\_\_\_\_\_ cm = \_\_\_\_\_\_ mm

17. Measure the mass of object A and record it in kg. Mass of A = \_\_\_\_\_ g

Finding Speed From a Video:

25. Find the speed of the duct tape in the provided video. The video frame rate = 240 frames/second (fps = 240f/s), and the BB-gun is 92cm long.

a. How many seconds (t) does it take for the tape to pass the BB-gun?

b. What is the length of the BB-gun, in meters?

c. What is the speed (v) of the duct tape, in meters per second?

How Water Rockets Work:

26. Use Newton’s 3rd Law to explain how a water rocket flies.

27. Describe two different ways to make a rocket flight straight.

28. Explain why a water rocket won’t fly as high if you don’t add any extra mass to it.

29. Explain why a water rocket won’t fly as high if you add too much extra mass to it.

30. Give one reason why a water rocket won’t fly as high if you add too much water to it.

31. Give at least one reason why a water rocket won’t fly as high if you don’t add any water to it.

32. List three factors that affect the drag (wind resistance) that acts on a water rocket.