Science 10 – Physics Intro Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_

Conversions and Scientific Notation

**PART 1 – Distance**: how far an object has traveled

1. How many centimeters are in a meter? \_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm = 1 m
2. How many meters are in a kilometer? \_\_\_\_\_\_\_\_\_\_\_\_\_\_ m = 1 km
3. How many millimeters are in a centimeter? \_\_\_\_\_\_\_\_\_\_\_\_mm = 1 cm
4. How many millimeters are in a meter? \_\_\_\_\_\_\_\_\_\_\_\_\_\_mm = 1 m
5. Match the letter of the correct converted value to the following:

**PART 2 –** **Mass**: how heavy an object is

1. How many grams are in a kilogram? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g = 1 kg
2. How many milligrams are in a gram? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_mg = 1 g
3. How many centigrams are in a gram? \_\_\_\_\_\_\_\_\_\_\_\_\_ cg = 1 g
4. Match the letter of the correct converted value to the following:



**PART 3 – Time**: how long it takes

1. How many seconds are in a minute? \_\_\_\_\_\_\_\_\_\_\_ s = 1 min
2. How many minutes are in an hour? \_\_\_\_\_\_\_\_\_\_\_ min = 1 h
3. How many seconds are in an hour? \_\_\_\_\_\_\_\_\_\_\_ s = 1 h
4. How many hours are in a day? \_\_\_\_\_\_\_\_\_\_\_\_h = 1 day
5. Write the correct conversion for the following:
	1. 45 min = \_\_\_\_\_\_\_\_\_\_\_\_ s
	2. 240 s = \_\_\_\_\_\_\_\_\_\_\_\_\_ min
	3. 240 s = \_\_\_\_\_\_\_\_\_\_\_\_\_ h
	4. 5 h = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ min
	5. 7.8 hours = \_\_\_\_\_\_\_\_\_\_\_\_\_\_ s
	6. 0.054 hours = \_\_\_\_\_\_\_\_\_\_\_\_ min

**PART 4 – Speed:** how fast an object is travelling

Sometimes conversions need to be two parts. For example, **speed** is measured in meters per second (m/s) or kilometers per hour (km/h). This is because speed is a **rate**. It represents how much **distance** is covered in a certain amount of **time**.

****Here’s the easy way to convert speed: (just need to remember this…)

**km/h to m/s 🡪 mulitply by 1000 and divide by 3600**

**m/s to km/h 🡪 multiply by 3600 and divide by 1000**

This way is a bit tricky at first, but will really help you in future Science classes (chem/physics):

*Example: 412 m/s = \_\_\_\_\_\_\_\_\_\_\_\_\_\_km/h (to do this, multiply by “conversion factors”)*

Try these:

1. 50 km/h = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m/s
2. 805 km/h = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m/s
3. 1 m/s = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ km/h
4. 8 m/s = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ km/h

**PART 5 –** **Scientific Notation**

Scientific Notation is used to represent very **large** or very **small** numbers.

* For example, instead of writing 52000, we can convert to scientific notation: 5.2 x 104
* For example, instead of writing 0.00063, we can convert to scientific notation: 6.3 x 10-4

Rules: 🡪 there can only be one digit before decimal point

🡪 the exponent indicates movement of decimal place:

Positive exponent 🡪5.21 × 10 4 = 52 100 (moves to the right)

Negative exponent 🡪 5.21 x 10-4­­ = 0.000521 (moves to the left)

Write the following numbers correctly in scientific notation:

1) 45000 - \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 2) 3450 - \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 3) 0.00000314 - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

4) 530000 - \_\_\_\_\_\_\_\_\_\_\_\_\_ 5) 0.0052 - \_\_\_\_\_\_\_\_\_\_\_\_\_\_ 6) 0.00068 - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_