**Read the following scenario and answer the questions**

1. Caroline loves music. She believes that she does her homework more efficiently when she listens to music. Her parents say that music is distracting when studying.

(a) What is the problem? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(b) Write a testable hypothesis in the “If . . . then . . .“ format.

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(c) What would the independent variable be in an experiment for this scenario?

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(d) What would the dependent variable be in an experiment for this scenario?

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**Answer the following questions.**

1. Differentiate between pure and applied science: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Differentiate between a law and a theory: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Differentiate between qualitative and quantitative data:

1. Ramon is comparing the growth rate of 2 tomato plants. He plans on watering one plant every day and watering the second plant every other day. He also plans on giving one plant full sun exposure, and the second plant partial sun exposure. Is this a controlled experiment? Why or why not?

1. Which type of microscopes can be used to view a living specimen?

1. You are viewing a specimen using a light microscope. What is the total magnification of the microscope if the objective lens being used is a 10X and the eyepiece is 10X? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Describe how to correctly carry a microscope:  
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1. What do electron microscopes use to illuminate a specimen?

1. Differentiate between a SEM and a TEM. Give at least 2 differences:

(a) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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(b) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**Calculate the following metric conversions:**

1) 2000 mg = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g 2) 104 km = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m

3) 480 cm = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_m 4) 5.6 kg = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ g

5) 8 mm = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm 6) 5 L = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mL

7) 198 g = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kg 8) 75 mL = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ L

9) 50 cm = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ m 10) 5.6 m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cm

11) 16 cm = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm 12) 2500 m = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ km

13) 65 g = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mg 14) 6.3 cm = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ mm

**Create a graph using the following data:**

|  |  |  |
| --- | --- | --- |
| **Time After Eating (hours)** | **Glucose Levels (mL/L) Patient A** | **Glucose Levels (mL/L) Patient B** |
| 0.5 | 170 | 180 |
| 1 | 155 | 195 |
| 1.5 | 140 | 230 |
| 2 | 135 | 245 |
| 2.5 | 140 | 235 |
| 3 | 135 | 225 |
| 3.5 | 130 | 200 |

Dr. Rosner monitored 2 patients with higher than normal blood sugar. She checked each patient’s blood sugar every 30 minutes over a 3.5 hour span of time. A blood glucose level above 140 for an extended period of time is considered abnormal.

**Draw and clearly label a graph in the space below:**