Classify each image as an element, compound, or mixture.

1. 
2. 
3. 

1. __________
2. __________
3. __________

Question #: 2

Fill in each blank with the word physical or chemical.
The melting point of water is a ___1___ property.
The rate of corrosion of steel is a ___2___ property.
The color of a copper chloride solution is a ___3___ property.

1. __________
2. __________
3. __________
**Question #**: 3

You are given a container filled with an unknown liquid. Which property is **most** useful for identifying the substance?

A. The density of the liquid is found to be 1.40 g/mL.
B. The volume of liquid is 125 mL.
C. The liquid is clear and colorless.
D. The mass of the liquid is 175 g.

**Question #**: 4

Select the **true** equality.

A. 1 ms = 1000 μs
B. 1 ns = 10^9 s
C. 1 s = 10^3 ks
D. 10^{-12} ps = 1 s

**Question #**: 5

Write 0.000297 in scientific notation.

1 Report your answer with **three** significant figures. Use the format 2.22E2 or 2.22E-2 for scientific notation.

1. __________

**Question #**: 6

A student discovers a gold nugget that weighs 909 kg and decides to share it evenly with his chemistry student peers. If there are 2.41×10^3 chemistry students, how many kg of gold does each student receive?

1 Report your answer with **three** significant figures using the format 2.2e2 or 2.2e-2 for scientific notation. Do NOT include units in your answer.

1. __________
Question #: 7
An antique spoon is found to have a mass of 0.055 lbs and a volume of 2.38 cm$^3$ using Archimedes' principle. Of what material is the spoon likely made given the densities below?

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<thead>
<tr>
<th>Material</th>
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</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>nickel</td>
<td>8.91</td>
</tr>
<tr>
<td>silver</td>
<td>10.5</td>
</tr>
<tr>
<td>stainless steel</td>
<td>7.82</td>
</tr>
</tbody>
</table>

A. silver  
B. brass  
C. stainless steel  
D. nickel

Question #: 8
How many zeros are significant in 0.001030 g? Report your answer as a whole number. Do NOT include units in your answer.

1. __________

Question #: 9
What is the result of the calculation? Report your answer with the correct number of significant figures.

$3.14159 + 9.2 =$

1. __________
Question #: 10

What is the result of the calculation with the correct number of significant figures? 

\[(987.65 \times 4.321) + 1234.5678 = ?\]

A. 5502  
B. 5502.2  
C. 5.50 \times 10^3  
D. 5.5 \times 10^3  
E. 5.5022035 \times 10^3

Question #: 11

The iPad Air has a height of 9.4 in. What is the height in cm?

A. 24 cm  
B. 3.7 cm  
C. 61 cm  
D. 2.3 \times 10^2 \text{ cm}

Question #: 12

A newborn baby eats 8 times a day. If the baby eats 90. mL of formula per feeding, how many days will 850. ounces of formula last? (When mixed with water, 1 ounce = 29.6 mL.)

A. 35 days  
B. 28 days  
C. 45 days  
D. 62 days
Question #: 13

The average home lawn is 10871 square feet (ft$^2$). What is the size in square meters (m$^2$)?

A. 3212.5 m$^2$
B. 1009.9 m$^2$
C. 8283.7 m$^2$
D. 12,871 m$^2$

Question #: 14

When John Dalton proposed his atomic theory in 1805, he postulated that all matter is made of atoms that are indivisible, and that atoms of the same element have exactly the same mass. Which two statements suggest that this is not exactly correct?

A. We now know that bonds between atoms may be broken in chemical reactions.
B. We now know that mass is always conserved in a chemical reaction.
C. We now know that isotopes exist.
D. We now know that atoms are made of protons, neutrons, and electrons.

Question #: 15

The information from which two choices combined to give the mass of the electron?

A. Thomson’s cathode ray experiments
B. Geiger, Marsden, and Rutherford’s gold foil experiments
C. Millikan’s oil drop experiments
D. Dalton’s atomic theory
Question #: 16

For the glucose molecule below, the molecular formula is ___ and empirical formula is ___.

A. C₆H₁₂O₆, CH₂O  
B. C₆H₁₂O₆, C₆H₁₂O₆  
C. C₆H₁₂O₆, C₃H₆O₃  
D. C₆H₁₂O₆, C₂HO₂

Question #: 17

Fill in the blanks to create the isotopic symbol for a nucleus with 24 protons and 29 neutrons.

1. __________
2. __________
3. __________
Question #: 18

A neutral atom of chlorine-35, contains ___1___ protons, ___2___ neutrons, and ___3___ electrons.

1. _________
2. _________
3. _________

Question #: 19

Europium (Eu) has two stable isotopes, the heavier of which has a natural abundance of 52.19% and an isotopic mass of 152.92 amu.
What is the mass number of the lighter isotope?

A. 151  
B. 154  
C. 149  
D. 152

Question #: 20

Complete the table for each ion. Use **whole numbers** for numeric answers. Do **NOT** include units in your answers.

<table>
<thead>
<tr>
<th>Ion</th>
<th>Number of protons</th>
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<th>Choose one: cation or anion</th>
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<tbody>
<tr>
<td>Al$^{3+}$</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Se$^{2-}$</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

1. _________
2. _________
3. _________
4. _________
5. _________
6. _________
Question #: 21

Which two of the pure substances below are molecular elements?

A. argon  
B. bromine  
C. carbon dioxide  
D. oxygen  
E. lithium

Question #: 22

Provide either the missing symbol or the missing element name for each.

<table>
<thead>
<tr>
<th>Element Name</th>
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<tr>
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1. _________
2. _________
3. _________
Question #: 23

Suppose a nonmetal main-group element readily forms an ion with a 1− charge. Using the figure below, where on the periodic table is that element located?

A. A  
B. B  
C. C  
D. D  
E. E

Question #: 24

Which two correctly pair the element with its most common ionic charge?

A. Ca, 2+  
B. F, 1+  
C. Al, 2+  
D. P, 3−
**Question #**: 25

Which ion is permanganate?

A. ClO$_4^-$  
B. MgO$_4^-$  
C. MgO$_4^{2-}$  
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**Question #**: 26

What is the formula of the ionic compound formed between the most common ions of silver and sulfur?

A. AgS  
B. Ag$_2$S$_3$  
C. Ag$_3$S  
D. AgS$_2$

**Question #**: 27

What is the name of Fe$_2$S$_3$?

A. iron(III) sulfide  
B. iron sulfate  
C. iron sulfide  
D. diiron trisulfide
Question #: 28
What is the name of N₂O₅?

A. nitrogen oxide  
B. nitrogen(II) oxide  
C. nitrogen pentoxide  
D. dinitrogen pentoxide

Question #: 29
What is the chemical formula for phosphorus pentabromide?

A. PB₅  
B. PBr₅  
C. P₂Br₁₀  
D. BP₅  
E. PtBr₅

Question #: 30
Name the acid HF(aq).

1. ____________
Question #: 1

Classify each image as an **element**, **compound**, or **mixture**.

1) [Image 1]
2) [Image 2]
3) [Image 3]
1. Mixture
2. Compound
3. Element

Question #: 2

Fill in each blank with the word **physical** or **chemical**.
The melting point of water is a **1** property.
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The color of a copper chloride solution is a **3** property.

1. physical
2. chemical
3. physical

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1. 3.77e-1 | 3.77E-1 | 0.377 | .377 |

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1.

1. 2

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\[ \text{\color{#d62728}{C. C}_6\text{H}_{12}\text{O}_6, \text{C}_3\text{H}_6\text{O}_3} \]
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2. 10
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6. anion

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Name the acid HF(aq).

1. hydrofluoric acid