**html5 Gameshow Science 8**

**Matter**

**Question 1**

Matter can exist as - (choose ALL that apply)

Solid

Liquid

Gas

Plasma

This is correct

Matter can exist as solid, liquid, gas, or plasma

That is incorrect

Matter can exist as solid, liquid, gas, or plasma

**Question 2**

The higher the temperature of a substance, the –

(choose ALL that apply)

faster the speed of its particles

slower the speed of its particles

the greater the energy of its particles

the less the energy of its particles

--Right! Raising the temperature increases the energy and speed of atoms and molecules.

--Sorry Raising the temperature increases the energy and speed of atoms and molecules(need both correct answers).

**Question 3**

Pure water ( H<sub>2</sub>O) is -

a compound

a mixture

an element

--That's right The hydrogen and oxygen atoms are chemically combined.

--Sorry! H<sub>2</sub>O is a compound. The hydrogen and oxygen atoms are chemically combined in a fixed ratio - each molecule is 2 hydrogen + 1 oxygen

**Question 4**

The smallest particle of a compound is -

an atom

a molecule

--Right! A molecule of the compound is the same substance as the compound itself.

--Sorry The individual atoms of a compound will no longer be the same substance.

**Acids**

**Question 1**

Coffee has a pH of about 5. Therefore, coffee is -

extremely acidic

somewhat acidic

basic

neutral

--Correct! Coffee is somewhat acidic.

--Incorrect Zero is most acidic and 7 is neutral, so 5 is mildly acidic.

**Question 2**

On the 14 point pH scale, soaps and cleaning solutions are typically -

0-6(acidic)

7 (neutral)

8-14 (basic)

--Yes! For instance, bar soap typically has a pH of about 9.

--Sorry Bar soap has a pH of about 9. Strong household cleansers like ammonia might have a pH of 12.

**Question 3**

When acids dissolve in water, what is released into the resulting solution?

OH- (hydroxide) ions

H+ (hydrogen) ions

H+ and OH- ions equally

--Yes! An acid releases hydrogen ions (H+); a base releases hydroxide ions (OH-).

--That is incorrect An acid releases hydrogen ions (H+); a base releases hydroxide ions (OH-).

**Question 4**

The pH of lemon juice is 2; the pH of battery acid is 1. Compared to lemon juice, battery acid is -

10% more acidic

twice as acidic

10 times more acidic

--Right! For each point on the pH scale, acidity or basicity multiplies by 10.

--Not correct. Acidity or basicity multiplies by 10 for each point on the pH scale.

**Atomic Structure**

**Question 1**

Who, in his Atomic Theory of Matter, proposed that all matter is made of atoms and that atoms are indivisible and indestructible?

J.J. Thompson (approx. 1904)

Ernest Rutherford (approx. 1911)

John Dalton (approx. 1803)

Neils Bohr (approx. 1913)

--Right! Dalton didn't yet know about electrons, protons and neutrons.

--Sorry! John Dalton proposed the Atomic Theory of Matter in 1803. Dalton didn't yet know about electrons, protons and neutrons.

**Question 2**

Having discovered electrons, this scientist proposed the "plum pudding" atomic model.

<img src="questions/plumpudding.png" />

J.J. Thompson

Ernest Rutherford

John Dalton

Neils Bohr

--Right! Thompson believed that electrons resided within a sphere of uniform positive charge - the so-called "plum pudding".

--Sorry! It was Thompson who in 1904 proposed that electrons reside within a sphere of uniform positive charge - the so-called "plum pudding".

**Question 3**

Who, in 1911, demonstrated the existence of a positively charged nucleus that contains nearly all the mass of the atom?

Erwin Schrödinger

Ernest Rutherford

John Dalton

Neils Bohr

--Yes! Rutherford demonstrated that most of the atom is empty space.

--Sorry! It was Rutherford who demonstrated that most of the atom is empty space and nearly the entire mass of the atom is in the nucleus.

**Question 4** Which model of the atom best represents our current understanding?

Dalton's "Billiard Ball" model

Thompson's "Plum Pudding" model

the Bohr model

the "electron cloud" model

--Right! In the current "electron cloud" model, electrons occupy three-dimensional orbits around the nucleus.

--Sorry The current model is the "electron cloud" in which electrons occupy three-dimensional orbits around the nucleus.

**Periodic Table**

**Question 1**

How many elements are there? </b>

over 110

over 150

fewer than 80

--Correct! 118 elements have been either discovered or have been created in a laboratory.

--Sorry Over 110 (118) elements have been either discovered or have been created in a laboratory.

**Question 2**

The order of elements in the periodic table is based on the –

(choose ALL that apply)

number of protons in the nucleus

number of neutrons in the nucleus

atomic number

atomic mass

--Very good! The atomic number is the number of protons.

--Sorry! There are two correct choices; the atomic number IS the number of protons.

**Question 3**

The vertical columns in the table –

(choose ALL that apply)

are called periods

are called groups or families

include elements that contain the same number of electrons in their outer energy levels

include elements with similar properties such as boiling point

--Perfect! Columns are called groups or families. Their elements have the same number of electrons in their outer energy levels and similar properties.

--Sorry! You must choose all three correct answers. Elements in a column (group or family) have the same number of electrons in their outer energy levels and similar properties.

**Question 4 not in flash version**

These elements (blue squares) are -

<img src="questions/nonmetals.png" />

metalloids

metals

liquids

nonmetals

--Right! On the periodic table, nonmetals are on the right (except H on the left).

--Incorrect! The arrows point to nonmetals- all on the right except hydrogen.

**DRAGGER GAME 1**



Bond formed when atoms share electrons (usually two nonmetals)

--covalent bond

Bond formed when one atom (a metal) loses electrons and the other (a nonmetal) gains electrons

--ionic bond

Atom that has lost or gained an electron

-- ion

Atom that has gained or lost a neutron

--isotope

Atom that has gained or lost a proton

--a new element

4th state of matter; occurs under extreme heat

--plasma

**DRAGGER GAME 2**

Elements located on the stair-step line of the periodic table

--metalloids

Elements right of the stair-step line on the periodic table

--nonmetals

Elements left of the stair-step line on the periodic table

--metals

Horizontal rows of periodic table

--periods



Columns on periodic table

--groups or families

Number of protons in the nucleus

--atomic number

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atomic numbers of elements found naturally on Earth

--1-92

atomic numbers of elements artificially produced in laboratory

--over 92

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