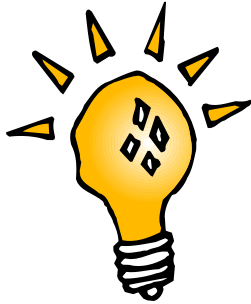


Grade 8 Natural Science Worksheet

Matter

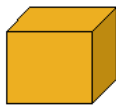
Part One: Define matter



1. Use this picture of a burning light bulb to define what we mean by “matter” and to distinguish between the concepts of “matter” and “energy”.

[8]

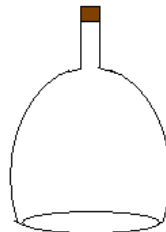
- 2.



**a block of gold
(solid)**



**a glass of water
(liquid)**



**a flask of air
(gas)**

Use this picture to define what we mean when we say that matter exists in different “phases”. Also show how you can prove that these phases have mass and volume.

[10]

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Part Two: Complete the table

Complete the following table by making a tick in the appropriate column.

	Solid	Liquid	Gas	Energy – not matter
Water				
Aluminium foil				
Heat				
Steam				
Rubber ball				
Rust				
Mercury				
X-rays				
Blood				
Light				

[10]

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Part Three: Fill in the missing words

Read the notes and fill in the missing words by choosing terms from the box below:

Long ago, in ancient (a) , a scientist named Democritus stated that matter is made of invisible, indivisible (b) . Democritus named these indivisible particles of matter “atoms”. Back then they thought of an atom as a solid particle.

Today, thanks to the advances in science by great scientists like Dalton, (c) , (d) and others, we have a more accurate idea of what atoms look like.

An atom consists of (e) charged protons and neutral (no charge) (f) concentrated in an area called the core. Negatively charged (g) orbit the core. You could imagine it as a miniature solar system; the core is like the sun in the middle and the electrons orbit the core similar to the way planets orbit the sun. The electrons don't float away because they are attracted to the core by the (h) . The numbers of (i) in different atoms vary. For example, a (j) atom has 1 proton, an atom has 8 (k) and a (l) atom has 20.

Atoms join together to form (m) . Molecules can be made up of only 2 atoms or many atoms – depending on the type of molecule. A table salt molecule is made up of (n) atoms, a water molecule of (o) , and a sugar molecule is made up of (p) atoms. If a substance is made up of atoms that are all the same then we call the substance an (q)

.
 If a substance is made up of different atoms, we call the substance a (r) . One of the compounds vital to our existence is water. It is made up of two (s) atoms and one (t) atom.

compound	Rutherford	24	molecules	hydrogen	oxygen	element
Greece	protons	2	calcium	electrons	positively	oxygen
particles	3	protons	Bohr	neutrons		hydrogen

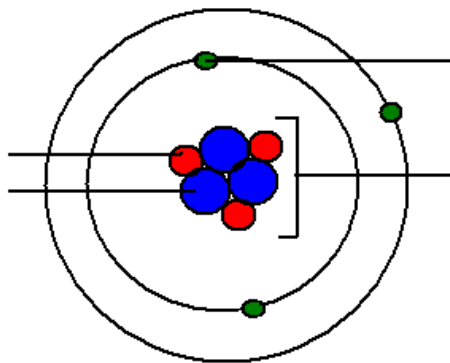
[20]

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Part Four: Label the parts of a model of an atom

1. Below is a diagram of a model of an atom.
Label the parts of the atom.

[4]



2. Match the term in column B with the description in column A.

[13]

Column A	Column B
1. How much there is of a substance (measured in grams or kilograms).	Atom
2. The smallest bit of matter.	Electron
3. Matter that can be poured and takes the shape of the containers.	Compound
4. Matter made of two or more different atoms.	Melting
5. Anything that has mass and takes up space.	Mass
6. Matter made up of only one kind of atom.	Molecule
7. Matter that has a certain size and shape.	Volume
8. Matter is often transparent and fills available space.	Gas
9. A solid changes to a liquid.	Element

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10. A liquid changes to solid.	Matter
11. What is formed when two atoms bond.	Solid
12. The space taken up by matter.	Liquid
13. Part of the atom that orbits the core.	Freezing

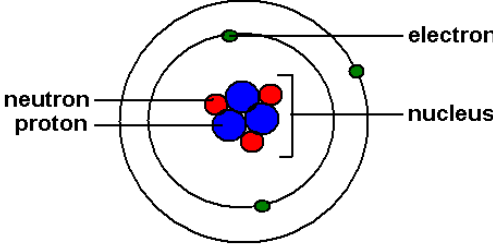
[Total marks: 65]

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Suggested Solutions

Question number	Possible marks	Solution																																			
1.1	8	The stuff that makes up all things is called matter. ✓ It is a word used to describe anything physically real ✓ – anything that we can see, touch taste or smell. ✓ Matter is defined as anything that has mass ✓ and takes up space. ✓ A light bulb is made of matter, ✓ but the light coming from the bulb is not matter but a type of energy. ✓ Energy is not something that has a mass or takes up space. ✓																																			
1.2	10	<p>Matter is made up of particles. ✓</p> <p>Matter can be in the form of a solid – all the particles are tightly organised in a fixed structure, the particles vibrate only. ✓</p> <p>Matter can be in the form of a liquid – all the particles can flow fairly freely. ✓</p> <p>Matter can be in the form of a gas – all the particles float completely freely. ✓</p> <p>It is easy to find the mass of a block of gold (a solid) – simply weigh it on a scale. ✓ If you drop the gold into a container, filled to the brim with water, some of the water will slosh over the side. ✓ This shows that the golden block takes up space.</p> <p>A liquid, like water, also has a mass and a volume. You can measure the volume of the water easily using a measuring cylinder. ✓ To measure the mass of the water, you have to weigh the water in the measuring cylinder and then subtract the mass of the empty container. ✓</p> <p>To show that a gas, like air, takes up space, fill a balloon with air and watch it get bigger and bigger as more air comes into the balloon. ✓</p> <p>To show that air has mass, is a bit tricky. Once again, the mass of the air in the balloon can be calculated, by weighing the balloon full of air and then subtracting the mass of the empty balloon. ✓</p> <p>Obviously a very sensitive scale, calibrated in milligrams, is needed for this task.</p>																																			
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