**0704499997@TEA**

USING MATERIALS

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| **APPLICATION** | **CATEGORY** | **SUITABILITY** | **ADVISE ON THE CHOICE** |
| **Construction**  **Of;**  **Dam**  **Swimming pool**  **Building**  **Bridge etc** | Synthetic materials which are man made such as iron bars,cement or natural materials which are God-made such as wood | Properties of Iron bars;  They are very strong  Have high tensile strength  Are malleable  Ductile  High melting point  Iron bars are used to re-inforce the concrete,to make window shutters | Iron bars are non-biodegradable hence pollute the environment ,mitigated by recycling |
| **Packaging** | Synthetic materials which are man made such as plastics or natural materials which are God-made such as papers | Properties of plastics;  They are flexible  Water proof  Are strong  Light  Low melting points  Plastics are used to make packaging materials | plastics are non-biodegradable hence pollute the environment ,mitigated by recycling |
| **Textile ie**  **Making of;**  **Sweaters**  **Tents**  **Ropes**  **Seat belts**  **Shirts**  **Fishing nets**  **Mosquito nets**  **Rain coats**  **Threads** | Synthetic materials which are man made such as nylon,polyster or natural materials which are God-made such as cotton,wool,silk | Properties of nylon;  They are flexible  Water proof  Very strong  Light  Resistant to heat  Can easily be dried  Fairly elastic  Nylon is used to make clothings like sweaters,shirts | Nylon is non-biodegradable hence pollute the environment ,mitigated by recycling |

PERIODIC TABLE

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| **BOA** | **2311X and 3919Y** | **35.517Cl** |
| **category** | Metal because it loses its outer most electrons to become positively charged for example sodium,potassium | Non-metal because it gains electrons to become positively charged |
| **suitability** | Soft  Reacts violently with water  Low melting point  Good conductor of electricity  Highly flammable  Use;  It is highly soluble in water hence can easily be absorbed by plants as a nutrient | Poor conductor of electricity  Green in colour  Tasteless  Bleaching agent  Use;  Used in water treatment by killing germs |
| **impact** | Excessive accumulation of this substance leads to soil depletion leading to soil infertility.mitigated by regulating the amount/proper disposal | Excessive accumulation of this substance leads to soil depletion leading to soil infertility.mitigated by regulating the amount/proper disposal |

CATEGORIZING COMPOUNDS

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| **BOA** | **IONIC COMPOUNDS such as**  **CaO,MgO,ZnO,CuO,NaCl,KCl,MgCl2,Na2O etc** | **COVALENT COMPOUNDS such as**  **CO2,H2O,NH3,SO2,SO3, etc** |
| **category** | Ionic compound with giant ionic structure because it is formed when a metal loses its outermost electrons to a non metal for example sodium chloride,potassium chloride | covalent compound with simple molecular structure because it is formed by sharing electrons between non metals for example water,carbondioxide,ammonia,etc |
| **suitability** | Conducts electricity in molten state  Solid at room temperature  High melting and boiling points  Soluble in water  Insoluble in organic solvents  Use;  It’s a food additive which improves food taste  It’s a preservative hence improves shelf life of food | Does not conducts electricity  Liquid/gas at room temperature  Low melting point  Soluble in organic solvents  Insoluble in water  Use;  It’s(carbondioxide) a preservative for soft drinks hence improves shelf life of soft drinks |
| **impact** | Poor disposal of this substance into water bodies pollutes the water hence death of aquatic animals.mitigated by proper disposal of this substance | High accumulation of carbondioxide in atmosphere leads to global warming .mitigated by planting trees to absorb carbondioxide |

FORMULAE,MOLE CONCEPT,STIOCHIOMETRY

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| **BOA** | **Products/substances eg ammonium nitrate,ammonium sulphate,ammonium carbonate,ammonium phosphate**  **C=12,P=31,H=1,O=16,N=14** |
| **Category** | Synthetic nitrogenous fertilizers for example ammonium nitrate,ammonium carbonate,ammonium sulphate, ammonium phosphate because they contain nitrogen which supports plant growth |
| **Suitability** | Molar mass of NH4NO3=132g  Percentage of nitrogen=28/132 x100=35%  Molar mass of (NH4)2SO4=132g  Percentage of nitrogen=28/132 x 100=21.2%  Molar mass of (NH4)2CO3=96g  Percentage of nitrogen=28/96 x 100=29.2%  Molar mass of (NH4)3PO4=149g  Percentage of nitrogen =42/149 x 100= 28.2%  Recommend farmers to use ammonium nitrate because it has the highest percentage of nitrogen which improves on soil fertility hence proper plant growth |
| **Impact** | Poor disposal of these substances into water bodies pollutes the water hence death of aquatic animals .mitigated use of organice manure |

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| **BOA** | **Solder(joining broken wires)** | **Duralumin(making parts of aeroplane,car)** | **steel ( making cutleries)** | **Bronze ( medals,ornament**  **Ts)** |
| **Category** | Alloy because it is a uniform mixture of two or more elements with atleast one component being a metal for example solder. | Alloy because it is a uniform mixture of two or more elements with atleast one component being a metal for example duralumin. | Alloy because it is a uniform mixture of two or more elements with atleast one component being a metal for example steel. | Alloy because it is a uniform mixture of two or more elements with atleast one component being a metal for example bronze. |
| **Suitability** | Low melting point  Good conductor of electricity  Good mechanical strength  Durable  Resistant to corrosion  Use;  Fixing broken wires | light  strong  durable  resistant to corrosion  use;  making parts of an aeroplane | Shiny  Strong  Durable  Resistant to corrosion  Use;  Making kitchen wares | Hard  Strong  Shiny  Doesnot corrode easily  Use;  Build statues,monaments,  Making medals |
| **Impact** | Non biodegradable hence pollute the environment .mitigated by recycling | | | |

REACTIVITY SERIES ie Alloys

SECTION B

Part i

Industrial processes

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| **Raw materials and process of production** | **Side effects and mitigations** | **Social benefits** |
| Manufacture of;  Oxygen  Ethanol  Detergents  Sulphuric acid  Nitric acid  Cement  Fertilizers  Chlorine  NaOH  Extraction of;  Aluminium  Copper  iron | Effluent discharge from the plant into water bodies contaminates the water hence affecting aquatic life and quality of water.Prevented by treated of the wastes before disposal/recycling of the wastes  **NB.this applies to all the industrial processes**  Emission of carbondioxide in the atmosphere which causes global warming.Prevented by recycling carbondioxide  **NB.This applies to extraction of iron and manufacture of cement**  Emission of sulphur dioxide gas in the atmosphere which causes air pollution resulting into acidic rain which affects plant growth.Mitigated by treating the gas  **NB.This applies to extraction of copper,manufacture of fertilizers**  Bursting of the vessel causing wounds and even death to workers.Mitigated by regular inspection and maintainance of the vessel  **NB.This applies to extraction of iron,aluminium,manufacture of oxygen,ethanol,cement,lime**, | Source of employment opportunities to the residents hence improved income.This allows them to afford basic needs like shelter,health and education which improves their standards of living  Increased government revenue through taxes hence improvement of infrastructures such as schools,roads,hospitals leading to development of the area |

Natural resources

Part ii

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| **Human activity** | **C+E+R+Cp**  **C;category**  **E;example**  **R;reason**  **Cp;composition** | **Impact of the human activity on the natural resource, how the impact occurs and mitigation** | **Importance/benefits of the Natural resource** |
| **Charcoal burning** | Air and vegetation are renewable natural resources because they can be replenished.Air is composed of oxygen,carbondioxide,  nitrogen where as vegetation is composed of carbon,hydrogen,  oxygen and magnesium | Charcoal burning involves cutting down of trees which results into increased accumulation of carbondioxide in the atmosphere leading to climate change like prolonged drought etc.This can be mitigated by planting trees to absorb carbondioxide from the atmosphere | Air facilitates respiration where food is broken down to release energy which facilitates food activities  Air facilitates photosynthesis where carbondioxide from the air combines with water in the presence of sunlight to make food |
| **Stone quarrying** | Rocks are non renewable natural resources because they can not be replenished.Rocks are composed of minerals like iron,copper,aluminium and calcium carbonate | Duringstone quarrying, quarry residues are washedaway by erosion to streams and rivers hence waterpollution and this can be mitigated by using strictlaws on proper disposal of the residues.  dust particles and toxicgases generated from the quarrying process pollutesthe air and may cause respiratory disorders. This can be mitigated by enforcing of strict laws and treating toxic gases before release.  During stone quarrying, water cycle is disrupted through lowering the water table hence drying up of wells. This can be mitigated by using strict laws | Rocks are used for construction,aggregates are mixed with cement ,water and sand to make concrete for construction |
| **Crop husbandry** | Water is a renewable natural resource because it can be replenished.Water is composed of oxygen and hydrogen | Crop husbandry involves the application of fertilizers in the garden,once these fertilizers are eroded into water bodies,they pollute the water hence making it unsafe for use.This can be prevented by application organic manure | Water bodies provide water for irrigation that cools crops and makes them to grow healthy and hence boost food production.  Water bodies provide water for drinking; this helps to cool our bodies and helps to dissolve the food we eat.  Generates hydroelectric power; fast moving water runs turbines that converts mechanical energy to electrical energy. |
| **Deforestation** | Air and trees are renewable natural resources because they can be replenished.Air is composed of oxygen,carbondioxide,  nitrogen where trees are composed of carbon,hydrogen,  oxygen and magnesium | when trees are cut down**,** water cycle is disruptedhencelittle rainfallreceived,this can be mitigated by planting trees to absorb carbondioxide from the tmosphere  when trees are cut down**,** carbondioxide accumulatesin the atmosphere which leads to global temperature rise hence reduced rainfallformation orswamps are drained.This can be mitigated by planting trees to absorb carbondioxide | Trees from forests are used as fuel since they are burn to release heat energy which can be used for cooking.  Trees provide us with oxygen for respiration; during photosynthesis, oxygen is released as a bi-product and can be used for respiration. |
| **Industrialization** | Air and water are renewable natural resources because they can be replenished.Air is composed of oxygen,carbondioxide,  nitrogen where as water is composed of hydrogen and oxygen | Disposal of untreated wastes into water bodies,pollutes the water hence death of aquatic life.mitigated by treating wastes before disposal. | Air facilitates respiration where food is broken down to release energy which facilitates food activities  Air facilitates photosynthesis where carbondioxide from the air combines with water in the presence of sunlight to make food |