Grade 7 Science Review

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Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Class \_\_\_\_\_\_\_\_\_

**Grade 7 Science Review**

**Ecology and Micro-organisms**

**Vocabulary: You should know the meaning of all these words.**

**Ecology Biosphere**

**Biotic Abiotic**

**Photosynthesis Cellular Respiration**

**Producer Consumers (Primary, Secondary, Tertiary)**

**Decomposers Scavengers**

**Food Chain Food Web**

**Ecosystem Habitat**

**Niche Community**

**Population Micro-organisms**

**Short and Long Answer Questions**

**COMPLETE QUESTIONS ON A SEPARATE PIECE OF PAPER WHERE NECESSSARY!**

**1. Complete the vocabulary crossword.**

**2.** **Explain the process of photosynthesis and include a diagram. Be sure to include the following words: sun, carbon dioxide, water, sugar, oxygen, roots, chlorophyll and leaf.**

3. Explain the process of cellular respiration and include a diagram. Be sure to include the following words: sun, carbon dioxide, water, sugar, oxygen, roots, chlorophyll and leaf.

4. Why are plants important for the survival of all living things?

5. Draw a food web containing: 2 producers, 4 primary consumers, 2 secondary consumers and 1 tertiary consumer.

6. a) List all the abiotic factors in the diagram below.

 b) List all the biotic factors in the diagram below.

7. Define the following and provide an example of each of the following.

1. Producer
2. consumer: ( primary consumer (1°), secondary consumer (2°), tertiary consumer (3°)
3. herbivore:
4. carnivore:
5. decomposer:
6. scavenger:

8. Answer the following questions using the diagram on the next page.

1. What is the energy source of the ecosystem?
2. List all of the producer organisms.
3. List all of the consumer organisms and specify their consumer level:

Primary consumer:

Secondary consumer:

Tertiary consumer:

1. List any decomposers in the ecosystem.
2. List the abiotic factors in the diagram necessary for life.
3. Predict the effect of removing all producers from the ecosystem.
4. Predict the effect of removing all of the decomposers from a community.



9. Explain how bacteria can be both helpful and harmful to humans. Give 2 examples to support your response.

10. What 4 main factors are needed for the survival of a species? Choose 2 other limiting factors and explain how they can affect a population.

11. Use the principal of bioaccumulation to explain the effect of increasing pesticide levels in food chain.

**Ecology and Micro-organisms Crossword Puzzle**

**Across**

8. Unicellular organisms that cause animal waste to decay.

10. The layers of the Earth in which all living things exist.

11. Non-living things that can reproduce inside living cells.

14. All organisms of the same kind in an ecosystem.

18. Organisms interacting with each other and the abiotic components of their environment.

19. Ways that an organism interacts with the biotic and abiotic components of its habitat.

20. Living components of the biosphere.

**Down**

1. A chemical change where light energy is changed to food.

2. All living things in an ecosystem.

3. Living things that cannot make their own food.

4. A model showing how energy is passed from one organism to another.

5. The environmental space in which an organism lives.

6. Living thing that makes its own food.

7. An organism that breaks down the bodies of dead things and of waste products.

9. A consumer of dead organisms.

12. Mushrooms

15. Non-living components of the biosphere

16. A chemical change that releases energy inside living cells

17. Study of how things interact with each other and their environment.

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CHEMISTRY

**Vocabulary – you should know the meaning of these words.**

**Matter**

**2 Ways to Classify Properties of Matter**

**Qualitative Property**

**Quantitative Property**

**2 Classifications of Matter**

**Pure Substances**

**Mixtures -Heterogeneous Mixture**

**-Homogeneous Mixtures (Solutions)**

**Changes of State**

**Vaporization 2 Parts of a Solution**

**Evaporation Solute**

**Condensation Solvent**

**Sublimation**

**Fusion**

**Solidification**

**Concentration of Solutions**

**Solubility Saturated**

**Concentrated Unsaturated**

 **Dilute Supersaturated**

**Energy**

**Insulator**

**Conductor**

**Heat**

**Temperature**

**3 Methods of Heat Transfer**

**Conduction**

**Convection**

**Radiation**

**Long and Short Answer Questions: Answer on a separate piece of paper where necessary!**

1. **Write the definitions and give an example of any 15 words from the vocabulary list above.**
2. **a) State the 5 points of the Particle Theory.**

**b) Draw a diagram of a solid, liquid and a gas to show the speed and spacing of particles in each state of matter.**

1. **Fill in the following chart using “fixed/definite” (stays the same)**

**Or “not fixed/variable” (changes).**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Solid** | **Liquid** | **Gas** |
| **Mass** |  |  |  |
| **Volume** |  |  |  |
| **Shape** |  |  |  |

**4. *Draw* and *label* the “Change of State Triangle”. Show whether each change of state is gaining or losing energy.**

1. **Use these terms to show which are examples of the following changes of state:**

**Evaporation, Condensation, Fusion, Sublimation, Vaporization**

1. **On a warm spring day, snow melts \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
2. **On the hottest day of summer, water is sprayed on your roof \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
3. **On a cold day in winter, frost develops on your car windshield \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
4. **A summer storm causes rain to fall \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
5. ***State* and *explain* 3 factors that affect the rate of dissolving.**

**Classifying Mixtures**

1. **Classify each mixture as either homogeneous or heterogeneous.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Mixture** | **Homogeneous or Heterogeneous** | **Solute(only if homogeneous)** | **Solvent (only if homogeneous)** |
| **Salad Dressing** |  |  |  |
| **Iced Tea** |  |  |  |
| **Sand** |  |  |  |
| **Pizza** |  |  |  |
| **Salt Water** |  |  |  |
| **Black coffee** |  |  |  |
| **Sprite** |  |  |  |
| **Soil** |  |  |  |

**Concentration of Solutions**

1. **Read the following statements. Rewrite those that are incorrect so that they become correct.**
	1. **If a solution is saturated at 20° C, then it will be saturated at 25°C.**
	2. **Oil is soluble in water**
	3. **When some solvent evaporates, a solution becomes more saturated.**
	4. **When a saturated solution is cooled, some particles become to appear in the solution. The solution is now unsaturated.**
	5. **A solute is always solid.**

**Heat, Temperature & Thermometers**

1. **Compare and contrast heat and temperature.**
2. **Explain the advantages and disadvantages of using an alcohol vs. a mercury thermometer.**
3. **State which object has more heat energy and give a reason why:**
	1. **a snowball or a snowman**
	2. **A 375 ml can of Pepsi that has been sitting in the refrigerator, or a 375 ml can of Pepsi that been sitting in your locker.**

**Application Questions**

1. **What materials would you use to make a frying pan? What would you avoid using? Explain using words like insulator and conductor.**
2. **If you wanted to design a space-suit that absorbed energy well, what combination of colour and texture would you use?**
3. **Explain how soup on the stove is heated using both conduction and convection.**

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**Forces and Structures**

**Vocabulary: You should know the meaning of all of these words.**

**Load**

**2 Characteristics of Force**

 **Direction**

 **Magnitude**

**3 Classifications for Structures**

**Frame structure**

**Mass structure**

**Shell structure**

**2 Ways to Apply a Force**

**Point of Application**

**Plane of Application**

**Stability Strength**

**Centre of gravity Corrugation**

 **Base of Support Lamination**

 **Balance Strut (brace)**

 **Tie**

 **Arch (Curve)**

**Cantilever**

**Gusset**

**3 Internal Forces 2 External (dynamic) Forces**

**Torsion Live load**

**Tension Dead load**

**Compression**

**Shear**

**Stress**

**Structural fatigue**

**Structural Failure**

**Efficiency**

**Long and short answer questions: Answer on a separate piece of paper .**

**1. Draw a concept map that shows how the terms and concepts in the vocabulary list are related to each other.**

**2. Match the descriptions in column A with an item in column B. Items in column B may be used more than once, or not at all.**

**A. Types of Structures**

**\_\_\_\_i. This structure can be so heavy that the earth beneath it is pressed down unevenly.**

**\_\_\_\_ii. A potter knows how to create this type of structure.**

**\_\_\_\_iii. A thin layer of curved material provides strength and rigidity to this structure.**

**\_\_\_\_iv. A Ferris wheel designer works with these types of structures.**

**\_\_\_\_v. Ancient monuments were often this type of structure.**

**B. a) mass**

 **b) shell**

 **c) frame**

**A. Types of Forces:**

**\_\_\_i. Crushes material by squeezing it together**

**\_\_\_ii. Stretched material by pulling its ends apart.**

**\_\_\_iii. Bicycle spokes experience this type of force.**

**\_\_\_iv. Bends or tears material by pushing it in opposite directions at the same time.**

**\_\_\_v. Doorknobs are designed to withstand this kind of force.**

**B. a) tension**

 **b) compression**

 **c) shear**

 **d ) torsion**

**3. Explain why the material used in shell structures does not have to be especially strong.**

**4. Mass structures are technologically simple structures. Today, humans often build more complicated structures such as shell structures, or a combination of shell and frame structures. Suggest two reasons for this change.**

**5. Name the forces acting on a teeter- totter. Use the letters from the diagram to identify where each forces occurs.**

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**6. Sketch each of the following methods for strengthening a structure. Show the forces involved.**

1. **tie**
2. **gusset**
3. **brace**
4. **cantilever**
5. **arch**

**7. A group of students has been given a task of building a model bridge using spaghetti held together with big globs of glue.**

**a) Why would this not be the preferred strategy?**

**b) How could the students make their bridge more structurally efficient?**

**8. You continuously exert forces on structures around in your daily life. For each type of internal and external force, identify an example from your daily life that illustrates that particular force.**

|  |  |  |
| --- | --- | --- |
| **Force** | **Internal or External?** | **Example** |
| **Tension** |  |  |
| **Dead load** |  |  |
| **Compression** |  |  |
| **Torsion** |  |  |
| **Live load** |  |  |
| **Shear** |  |  |

**9. Explain what strategy you would use to help keep you stable during a tug of war.**

**10. Explain how a tower’s center of gravity not being over its base will cause it to fail.**

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**11. Freestanding lamps are easily pushed or pulled over by toddlers. What are two ways that a lamp could be more stable? Use centre of gravity in your answer.**

**12. Describe three differences between the two structures shown here that make A more stable than B.**

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**13. When major structures fail, many lives can be lost, and property damage can be very expensive. Should engineers and designers be held responsible if their structures fail because of poor design? Support your opinion with at least two reasons.**

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**Earth’s Crust**

**Vocabulary: You should know the meaning of these words.**

**Elements Igneous Rock**

**Compounds Magma**

**Minerals Lava**

**Rocks Intrusive Igneous Rock**

**Lustre Extrusive Igneous Rock**

**Colour Course grained rocks**

**Streak Fine grained rocks**

**Hardness Porous rock**

**Cleavage Sedimentary Rock**

**Fracture Sediments**

**Magnetism Deposition**

**Metamorphic rock Transportation**

**Foliated rock Compression**

**Non-foliated rock Cementation**

**Ore**

**Short Answer and Long Answer Questions:**

1. **Select any 10 of the words from the word list above and use them in a paragraph.**

**2 a) Describe the structure of the Earth.**

**b) Even though the inner layer of the Earth is extremely hot, the inner core is solid. What is the reason for this?**

**3. Explain the difference between a rock and a mineral.**

1. **Give examples of 3 minerals and their uses.**
2. **Name 7 tests that are used to tell minerals apart. Choose the test for the hardness, as well as 2 other tests and describe how they would be used in the identification of a mineral.**
3. **a) Explain how water erodes rocks.**
4. **Explain and describe 2 other types of erosion.**
5. **Explain how sedimentary rocks are formed. Be sure to use the words *compaction, erosion, cementation, and deposition* in your explanation.**
6. **Why are fossils only found in sedimentary rocks?**
7. **Explain the difference between intrusive and extrusive igneous rock.**
8. **Give a detailed description of how igneous rocks are formed.**
9. **Explain how the conditions deep inside the Earth play an important role in the formation of metamorphic rocks.**
10. **Draw and sketch the rock cycle. Using your diagram, list at least 2 different paths that an igneous rock might follow to become a different form of igneous rock.**
11. **Give 2 examples and their uses for each of the three rock types.**

**DESIGN SKILLS**

**Gathering Data**

1. Label the parts of a laboratory thermometer.



a) bulb

b) bore

c) scale

d) stem

e) coloured alcohol

1. Investigation into the heating of a substance.

**A B**

\_\_\_\_ i. Time intervals between temperature measurements. a) dependant variable

\_\_\_\_ ii. Temperature of the sample. b) independent variable

\_\_\_\_ iii. Indentifies a change of state taking place. c) warming curve

\_\_\_\_ iv. As time increases, the temperature increases. d) cooling curve

\_\_\_\_ v. As time increases, the temperature decreases. e) horizontal or plateau

**Graphing and Interpreting Data**

**In a recent lab, students were asked to measure the height of a bean plant at the end of each week. There were two groups of plants in the experiment:**

 **Group A plants were given 4 hours of sunlight a day.**

 **Group B plants were given 8 hours of sunlight a day.**

**The results of the experiment over a 9 week period are in the tables below.**

**Table 1: Bean Plant Growth with 4 hours of Sunlight per day**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| **Plant Height(cm)** | **2.0** | **4.5** | **7.7** | **11.2** | **16.6** | **21.8** | **26.4** | **29.0** | **33.9** |

**Table 2: Bean Plant Growth with 8 hours of Sunlight per day**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Week** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| **Plant Height (cm)** | **2.9** | **5.6** | **8.7** | **12.7** | **17.9** | **23.4** | **28.3** | **31.2** | **35.8** |

**1. Create 2 separate graphs on the graph paper attached. Remember to label all the necessary information on your graphs.**

**2. Answer the following questions:**

1. **Which group of plants A or B would you expect to grow taller? Why?**
2. **Based on your results which group of plants grew taller? Why do you think that occurred?**
3. **If I was a gardener and wanted to make use of this information what should I do to make sure my plants are growing as much as possible?**
4. **As a budding scientist, you become fascinated with plants after this experiment and decide to perform another one during summer holidays. This time you want to test how often to water a plant. Design an experiment that you could perform to determine this. Be sure to include what materials you will use, how much sunlight the plant will get, what types of plants you would use, the time period of the experiment, etc.**

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***Practice Test Questions with Answer Key***

***ECOLOGY***

1. Biological organization.

 A B

 i. One organism. a) community

 ii. A group of individuals of the same species. b) individual

 iii. All of the individuals that exist in the same area. c) ecosystem

 iv. The interactions between abiotic features of an area d) biome

 and the biotic community. e) population

 v. A large area with characteristics climate, soil, plants,

 and animals

1. Types of biomes.

 A B

 i. A biome that is cold, dry, and treeless. a) temperate forest

 ii. A biome that is dominated by evergreen trees. b) grassland

 iii. A biome that is dominated by deciduous trees. c) tundra

 iv. A biome that is dominated by grasses. d) boreal forest

 v. A biome that is very dry. e) desert

1. Parts of an ecosystem.

 A B

 i. water a) abiotic

 ii. tree b) biotic

 iii. soil

 iv. ant

 v. Sun

1. Terms related to ecosystems.

 A B

 i. The living parts of an ecosystem. a) habitat

 ii. A group of organisms that can successfully b) biotic

 reproduce among themselves. c) abiotic

 iii. The non-living parts of an ecosystem. d) adaption

 iv. The place where a particular organism lives. e) species

 v. An inherited characteristic that helps an organism

 survive.

1. Jesse takes a walk through a meadow on a spring day. She inhales the crisp, fresh air and notices some birds perched in a tree. Her boots become wet since the ground was dampened by last night’s rain. She walks on hoping to catch a glimpse of a field mouse.

 a) List two abiotic factors described in this story.

 b) List two biotic factors described in this story.

1. List the six levels of biological organization and give and example of each.
2. Explain how a human being depends on sunlight, air, water, and soil.
3. Is it easier to accurately predict weather or climate? Which information is more useful? Explain your answer.
4. Describe the hydrosphere, lithosphere, and atmosphere.
5. Fill in the blanks below to show the levels of biological organization, from individual organisms to the biosphere, on the stair chart provided.

 a)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ b)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ d)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



1. Roles of organisms.

 **A B**

 \_\_\_\_ i. Organisms that can make their own food. a) producers

 \_\_\_\_ ii. Organisms that eat the food made by other organisms. b) omnivores

 \_\_\_\_ iii. Organisms that only eat plants. c) consumers

 \_\_\_\_ iv. Organisms that eat only meat d) carnivores

 \_\_\_\_ v. Organisms that eat both plants and animals. e) herbivores

 f) users

1. Species living together.

 **A B**

 i. Relationships based on associations between species. a) host

 ii. One partner in relationship benefits and other is b) ecosystem

 harmed. c) commensalism

 iii. The harmed organism in a relationship. e) symbiosis

 iv. Relationship in which both partners benefit. f) parasitism

 v. One partner in relationship benefits and other is g) mutualism

 not harmed.

1. Describing ecosystems: match the figure in **A** with the appropriate term in **B**..



B

a) pyramid of numbers

b) producers

c) food web

d) herbivores

e) carnivores

f ) examples of biomass

1. The role of organisms in food chains.

**A B**

\_\_\_\_ i. Process by which new species gradually a) prey

 replace old species in an ecosystem. b) scavengers

\_\_\_\_ ii. Organisms that eat dead or decaying plant c) succession

 or animal matter. e) decomposers

\_\_\_\_ iii. Organism that is caught and eaten by f) habitat

 another organism of a different species g) niche

\_\_\_\_ iv. The role that is undertaken by an organism

 in an ecosystem.

\_\_\_\_ v. Organisms that break down and absorb

 dead or waste materials.

1. If you found cats, mice, and corn in the same ecosystem, what role would each be playing in the food chain?
2. What role do predators play in a complex ecosystem? Explain your answer using a specific example of a predator and its prey.
3. What factors do you need to examine in order to understand an organism’s niche?
4. The three forms of symbiosis are parasitism, mutualism, and commensalism. Make a chart, and define each of these forms. Provide an example of each type of relationship.
5. The water cycle.

A



B

a) condensation

b) sublimation

c) evaporation

d) run-off

e) precipitation

f) transpiration

1. The carbon dioxide and oxygen cycle.

**A B**

 \_\_\_\_ i. Gas used to make oxygen. a) respiration

 \_\_\_\_ ii.The oxygen-using process. b) oxygen

 \_\_\_\_ iii.Another name for burning. c) combustion

 \_\_\_\_ iv. Process plants use to make their own food. d)water

 \_\_\_\_ v. Product of respiration. e) carbon dioxide

 f) photosynthesis

1. Examples of different limiting factors.

**A B**

\_\_\_\_ i. The lynx-hare relationship. a) forest fires

\_\_\_\_ ii. The brook trout, perch, and sunfish b) predator-prey populations

 relationship. c) disease and parasites

\_\_\_\_ iii. White pine rust or corn smut. d) competition for resources

\_\_\_\_ iv. Caribou can’t find food due to e) climate changes

 unusually high snowfall. f) commensalism

\_\_\_\_ v. May cause secondary succession.

1. Technology and nature’s regulators.

**A B**

\_\_\_\_ i The care, management, and using of forests. a) forestry

\_\_\_\_ ii. The growing of foods. b) insulin

\_\_\_\_ iii. Product that kills unwanted animals. c) micro-organisms

\_\_\_\_ iv. Prescribed by a doctor to kill bacteria. d) medicine

\_\_\_\_ v. Tiny organism such as bacteria. e) pesticide

 f) agriculture

1. States of matter.

**A**

\_\_\_\_ i. The particles are widely spaced.

\_\_\_\_ ii. Has a fixed shape.

\_\_\_\_ iii. The particles are relatively close together.

\_\_\_\_ iv. Takes the shape of its container.

\_\_\_\_ v. The particles are held closest together.



1. Classifying matter.

**A B**

\_\_\_\_ i. pure air a) pure substance

\_\_\_\_ ii. piece of granite rock b) homogeneous mixture

\_\_\_\_ iii. gold c) heterogeneous mixture

\_\_\_\_ iv. alcohol and water mixture

\_\_\_\_ v. brass

1. Terms related to matter.

**A B**

\_\_\_\_ i. blood a) pure substance

\_\_\_\_ ii. colour, mass, state, melting point b) heterogeneous

\_\_\_\_ iii. nickel c) homogeneous

\_\_\_\_ iv. Windshield washer fluid d) properties

\_\_\_\_ v. dry soup mix e) mechanical mixture

1. Terms related to the particle theory of matter.

**A B**

\_\_\_\_ i. A combination of two or more substances a) particles

 that do not dissolve together. b) solution

\_\_\_\_ ii. When one substance dissolves or c) mechanical mixture

disappears in another substance, and their d) pure substance

properties are blended.. e) theory

 \_\_\_\_ iii. Tiny bits that make up matter.

 \_\_\_\_ iv. An explanation based on gathered information.

 \_\_\_\_ v. Material containing only one kind of particle

 throughout.

1. A substance that has only one type of particle is referred to as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. The acronym for Workplace Hazardous Materials Information System is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. The characteristics that are used to describe a material are known as its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
4. The particle theory states that all matter is made up of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Explain the difference between a pure substance and a mixture, and give two examples of each.
6. Give one example *each* of a homogeneous mixture in a solid, liquid, and gas state.
7. What two properties does all matter have?
8. Explain why gases change their shape and fill a container.
9. Physical and chemical changes.

**A B**

\_\_\_\_ i. souring of milk a) physical

\_\_\_\_ ii. dissolving alcohol in water b) chemical

\_\_\_\_ iii. the formation of clouds

\_\_\_\_ iv. burning a candle

\_\_\_\_ v. bananas ripening

1. Solutions and state of matter.

**A B**

\_\_\_\_ i. nitrogen and oxygen a) two gases

\_\_\_\_ ii. perfume and air b) two solids

\_\_\_\_ iii. water and Epsom salt c) a liquid and a solid

\_\_\_\_ iv. copper and tin d) a gas and a liquid

\_\_\_\_ v. air in ice e) a gas and a solid

 f) two fluids

1. Terms related to solutions.

**A B**

\_\_\_\_ i. A solution that has more solvent than solute. a) solvent

\_\_\_\_ ii. Substance that dissolves a material in a solution. b) solute

\_\_\_\_ iii. Substance dissolved in a solvent. c) dilute

\_\_\_\_ iv. Able to dissolve in a solvent. d) insoluble

\_\_\_\_ v. A solution that has more solute than solvent. e) soluble

 f ) concentrated

1. In a solution of carbon dioxide and water, the water is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the carbon dioxide is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. When gases are cooled, they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
3. Desalination and distillation use different \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sources.
4. Dissolved \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ give water its taste.
5. Types of solutions.

**A B**

\_\_\_\_ i. The solution contains more solute than it can a) saturated

 normally hold at a certain temperature. b) unsaturated

\_\_\_\_ ii. A crystal added to the solution dissolves. c) supersaturated

\_\_\_\_ iii. The solution has dissolved as much solute as it can

 at a certain temperature.

\_\_\_\_ iv. A crystal added to the solution will not dissolve.

\_\_\_\_ v. If a crystal is added to the solution, the extra solute

 immediately crystallizes.

1. Separating mixtures.

**A B**

\_\_\_\_ i. A process that uses evaporation and condensation a) magnetism

 to separate the solute from the solvent. b) floatation

\_\_\_\_ ii. Used to remove magnetic materials. c) sifting

\_\_\_\_ iii. Uses filter paper to separate large particles. d) filtration

\_\_\_\_ iv. Used to separate materials that are less dense than e) distillation

 the solvent. f) settling

\_\_\_\_ v. Uses a sieve or strainer to separate larger particles.

1. Terms related to solutions.

**A B**

\_\_\_\_ i. Substance in which a solute dissolves. a) agitation

\_\_\_\_ ii. How much solute is dissolved in a solution b) solvent

\_\_\_\_ iii. What comes out of a supersaturated solution c) excess solute

 when a crystal is added. d) saturated

\_\_\_\_ iv. The mass of a substance that will dissolve in e) concentration

 100 g of water at a certain temperature. f) solubility

\_\_\_\_ v. Shaking or mixing.

1. Well-known temperatures.

**A B**

\_\_\_\_ i. Temperature of boiling water at sea level. a) 0ºC

\_\_\_\_ ii. Comfortable room temperature. b)20-25ºC

\_\_\_\_ iii. Absolute zero. c)37ºC

\_\_\_\_ iv. Temperatures of an ice-water bath. d) 100ºC

\_\_\_\_ v. Normal human body tempera tures. e) 0 K

1. Specialized thermometers.

 **A B**

 \_\_\_\_ i. Makes permanent recording of a) bimetallic strip

 temperature on graph paper. b) infrared thermogram

 \_\_\_\_ ii. Made of two different metal strips c) recording thermometer

 fused together. d) thermocouple

 \_\_\_\_ iii. Special photograph in which colours e) strip thermometer

 show temperature of an object.

 \_\_\_\_ iv. Contains crystals that turn colour to

 indicate temperature.

 \_\_\_\_ v. Made of two different metal wires twisted

 together.

1. Terms related to the study of thermal energy and heat technology.

 **A B**

 \_\_\_\_ i. Waste products of industrial processes a)energy

 warming the environment. b) temperature

 \_\_\_\_ ii. Energy released or transferred by a c) kinetic energy

 moving object. d) thermal energy

 \_\_\_\_ iii. Ability to do work or to cause change. e)thermal pollution

 \_\_\_\_ iv. Total kinetic energy of all the particles

 in a substance.

 \_\_\_\_ v. Average kinetic energy of the particles

 in a substance.

1. What is temperature? What are two common ways of estimating temperature?
2. Define energy. How is it different from matter? What SI unit is used to measure

 energy?

1. a) What is kinetic energy?

 b) What two types of objects have high kinetic energy?

 c) Provide two examples of objects with low kinetic energy.

1. a) What is thermal pollution?

 b) Identify three sources of thermal pollution.

 c) Why is thermal pollution an environment concern? Give one example of a potential problem.

1. States of matter.

 **A B**

 \_\_\_\_ i. Particles are separated by large spaces. a) solids

 \_\_\_\_ ii. Very strong forces of attraction between particles. b) liquids

 \_\_\_\_ iii. Cannot be compressed. c) gases

 \_\_\_\_ iv. Particles move freely but volume remains d) solids and liquids

 constant. e) liquids and gases

 \_\_\_\_ v. No definite shape. f) solids and gases

1. Changes of state.

 **A B**

 \_\_\_\_ i. Frost appearing on windows. a) melting

 \_\_\_\_ ii. Ice cream running down a cone on a hot sunny b) freezing

 day. c) phases

 \_\_\_\_ iii. Steam rising from a cup of hot tea. d) condensation

 \_\_\_\_ iv. A pond becoming hard enough to skate on. e) sublimation

 \_\_\_\_ v. Moisture forming on the side of a glass of cold f) evaporation

 water.

1. Changes in energy.

 **A B**

 \_\_\_\_ i. Temperature remains constant as potential a) expansion

 energy changes. b) contraction

 \_\_\_\_ ii. Fast-moving particles escape into the air; slower c) no change

 ones stay behind. d) evaporative cooling

 \_\_\_\_ iii. Particles spread farther apart, and material e) hidden heat

 becomes larger. f) change of state.

1. Properties of matter.

 **A B**

 \_\_\_\_ i. Temperature at which rapid evaporation occurs. a) melting point

 \_\_\_\_ ii. Temperature at which solidification occurs. b) boiling point

 \_\_\_\_ iii. Temperature at which fusion occurs. c) freezing point

 \_\_\_\_ iv. Energy required to warm 1 g of a substance d) Celsius

 by 1ْC. e) specific heat capacity

 \_\_\_\_ v. Energy required to increase the temperature

of an f heat capacity object by 1ْC.

1. Some systems and the type of energy sources they rely on.

**A B**

\_\_\_\_ i. toaster a) mechanical

\_\_\_\_ ii. bus b) chemical

\_\_\_\_ iii. wind-up toy c) nuclear

\_\_\_\_ iv. star d) electrical

\_\_\_\_ v. dog

1. Investigation into the heating of a substance.

**A B**

\_\_\_\_ i. Time intervals between temperature measurements. a) dependant variable

\_\_\_\_ ii. Temperature of the sample. b) independent variable

\_\_\_\_ iii. Indentifies a change of state taking place. c) warming curve

\_\_\_\_ iv. As time increases, the temperature increases. d) cooling curve

\_\_\_\_ v. As time increases, the temperature decreases. e) horizontal or plateau

1. A substance will \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as its temperature increases.
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is a change of state in which the particles become more organized.
3. The particles in a solid move by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ while remaining in a fixed position in a regular arrangement.
4. Solids, liquids, and gases are the three states, or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, of matter.
5. The graph shows a warming curve for an unknown substance. Identify the section(s) in which the potential energy is increasing.



1. at B only
2. at C only
3. at A and at C
4. at B and at D
5. What is the relationship between heat capacity and how quickly a substance will warm or cool?
6. Explain how the same temperature of 0ºC can simultaneously be the melting point and freezing point of water.

GEOLOGY

1. Clues to mineral identification.

**A B**

\_\_\_\_ i. A substance’s “scratch ability.” a) streak

\_\_\_\_ ii. How a mineral breaks apart. b) colour

\_\_\_\_ iii. Depends on how light is reflected from the surface. c) cleavage

\_\_\_\_ iv. Left on a piece of unglazed tile when a mineral is d) hardness

 rubbed on it. e) lustre

\_\_\_\_ v. Can vary depending on presence of impurities.

1. Rock families.

**A B**

\_\_\_\_ i. Has changed form. a) igneous

\_\_\_\_ ii. Made from settled matter. b) sedimentary

\_\_\_\_ iii. Fire-formed. c) metamorphic

\_\_\_\_ iv. Contains fossils.

\_\_\_\_ v. Intrusive or extrusive.

FORCES & STRUCTURES

1. What is the difference between mass and weight?
2. Classifying structures.

**A B**

\_\_\_\_ i. This structure can be so heavy that the earth a) mass

 beneath it is pressed down unevenly. b) frame

\_\_\_\_ ii. A potter knows how to create this kind of structure. c) shell

\_\_\_\_ iii. A thin layer of carefully shaped material provides

 strength and rigidity to this structure.

\_\_\_\_ iv. a Ferris wheel designer works with these kinds of

 structure.

\_\_\_\_ v. A tiny flaw can cause this structure to fail.

1. Design features.

**A B**

\_\_\_\_ i. window screen a) layered

\_\_\_\_ ii. wool socks b) woven

\_\_\_\_ iii. polyester-cotton thread c) knit

\_\_\_\_ iv. corrugated cardboard box d) composite

\_\_\_\_ v. plywood

1. Methods of joining materials.

**A B**

\_\_\_\_ i. Carefully shaped parts that hold themselves together. a welding

\_\_\_\_ ii. Thread, string, or rope, inserted in holes in materials b brazing & soldering

 to fasten them together. c interlocking shapes

\_\_\_\_ iii. Metal pieces that are melted and fused together. d ties

\_\_\_\_ iv. Sticky substances that flow into tiny cracks on the e adhesives

 surface of materials to bind the surfaces together.

\_\_\_\_ v. Process of joining two shapes by using a melted

 substance that binds the shapes as the substance cools.

1. Elements of design.

**A B**

\_\_\_\_ i. The weight carried or supported by a structure. a) load

\_\_\_\_ ii. The purpose for which a structure is designed. b) shell structure

\_\_\_\_ iii. The study of beauty and art in nature. c) function

\_\_\_\_ iv. Layers of material glued together. d) aesthetics

\_\_\_\_ v. Constructed with a thin, carefully shaped covering. e) lamination

1. Winnipeg is often threatened in the spring by the flooding of the Red River. In order to protect property, authorities have built large dams made up of thousands of sandbags. Sometimes the sandbags are not effective in controlling the water. List two ways that sandbag dams could fail.
2. Why do an egg-sized lump of lead and an egg-sized piece of foam have different masses?
3. Give two situations in which high structural efficiency would be important and two situations where it would not be important.
4. Stresses put to good use.

**A B**

\_\_\_\_ i. Strands of thread are spun together to increase their a) buckle

 strength. b) shear

\_\_\_\_ ii. The pin on a boat propeller breaks when it becomes c) twist

 tangled in weeds.

\_\_\_\_ iii. The bumper of a car collapses during a collision.

\_\_\_\_ iv. Pop cans are crushed for transportation to a recycling

 plant.

\_\_\_\_ v. The tab of a pop can breaks off easily.

1. Explain why a football player practises throwing a football in a spiral motion.
2. Explain why it is possible to “steer” with no hands on a fast moving bicycle.
3. Explain how counterweights and guy wires are used to stabilize structures.
4. What type of foundation would be most appropriate for each of the following structures?

**Answer Key**

1. i. b; ii. e; iii. a; iv. c; v. d
2. i. c; ii. d; iii. a; iv. b; v. e
3. i. e; ii. a; iii. b; iv. d; v. c
4. i. a; ii. b; iii. a; iv. b; v. a
5. i. b; ii. e; iii. c; iv. a; v. d
6. a) Any two (2) of: air, water, soil.

b) Any two (2) of: Jesse, birds, tree, field mouse.

1. 1 mark for each level and 1 mark for each example. Examples will vary, but may include:

 individual – any single organism (e.g., a cat)

 population – herd, gaggle, school, etc.

 community – population of frogs and aquatic plants living in one area

 ecosystem – marsh

 biome – one (1) of: tundra, boreal forest, temperate forest, grassland, desert, tropical rain forest

 biosphere – whole planet

1. Answers will vary but should include one example from each element of the environment. For example:

 Sunlight – provides energy that gives warmth; provides energy for plants; which are main sources of food.

 Air – oxygen to breathe; air currents circulate wastes/oxygen.

 Water – used in life processes such as breathing, and digesting food; lubricates internal organs; responsible for purifying air and the soil; makes huge percentage of human body.

 Soil – used for building materials; provides minerals and nutrients for plants (an important source of food).

1. Answers should include: 1. It is more difficult to predict weather accurately since it can change daily or even hourly. 2. The usefulness of the information depends on the purpose. For someone planning an outing for the next day, information about the weather is more useful. If a farmer wanted to plant a specific crop in a new area, information about climate is more useful.
2. hydrosphere – all the water on Earth

 lithosphere – solid mineral material that covers Earth

 atmosphere – blanket of air surrounding both the hydrosphere and lithosphere

11 a) population; b) community; c) ecosystem; d)biome.

12. i.a; ii.c; iii.e; iv.d; v.b

13. i.d; ii.e; iii.a; iv.f; v.c

14. i.d; ii.e; iii.a; iv.f; v.d

15. i.c; ii.b; iii.a; iv.f; v.d

16.cats- carnivores; mice-herbivores; corn-producer.

17. 1. A predator hunts its prey 2. For example, a lynx hunts a snowshoe hare 3. So the lynx would be the predator and the snowshoe hare would be the prey.

18. 1. What it eats, 2. Where it lives, and 3. How is interacts with other organisms in its ecosystem.

19. 1 mark for all the headings, 1 mark per definition, 1 mark per appropriate example.

|  |  |  |
| --- | --- | --- |
| Form of Symbiosis | Definition | Example |
| Parasitism  | One partner benefits, other suffers | Tapeworm living inside human |
| Mutualism | Both organisms benefit. | Protozoa living in termites digest wood particles, producing food for termite. |
| Commensalism | One partner benefits, Other not affected.  | Clownfish living with sea anemones. |

20. i.c; ii.a; iii.e; iv.d; v.f

21. i.e; ii.a; iii.c; iv.f; v.d

22. i.b; ii.d; iii.c; iv.e; v.a

23. i.a; ii.f; iii.e; iv.d; v.c

24. i.c; ii.a; iii.b; iv.b; v.a

25. i.b; ii.c; iii.a; iv.b; v.b

26. i.b; ii.d; iii.a; iv.c; v.e

27. i.c; ii.b; iii.a; iv.e; v.d

28. pure

29. WHMIS

30. properties

31. particles

32. Pure substance- 1. only one kind of particles throughout 2.e.g., distilled water, sugar).

33. One(1) appropriate example in each category. Foe example:

Solid- steelm bronze, brass

Liquid- tea, vinegar, honey

Gas- air, water vapour

34. All matter 1. Occupies space and 2. has mass

35. 1. Gases have fewer particles per volume than liquids or solids

36. i.b; ii. A; iii.a; iv.b; v.b

37. i.a; ii.d; iii.c; iv.b; v.e

38. i.c; ii.a; iii.b; iv.e; v.f

39. solvent, solute

40. condense

41. energy

42. minerals

43.i.c; ii.b; iii.a; iv.a; v.c

44. i.e; ii.a; iii.d; iv.b; v.c

45. i.b; ii.e; iii.c; iv.a; v.c

46. i.c; ii.d; iii.b; iv.e; v.a

47. i.d; ii.b; iii.e; iv.a; v.c

48. i.c; ii.a; iii.b; iv.e; v.d

49. i.e; ii.c; iii.a; iv.d; v.b

50. 1. How warm or cool something is. 2. By touch and 3. by sight

51. 1. An object’s ability to cause changes or to make something else move. 2. Matter has mass and 3. takes up space; energy does not have either of these properties. 4. The joule.

52. a) 1. The energy of moving objects.

b) 2. Fast- moving small objects and 3. slow-moving massive objects. C) Any two (4. and 5.) examples, but objects must be either slow- moving(e.g. snail, molasses) or have little mass( e.g. mosquito, feather).

53.a) 1. Accidental warming of the environment, caused by thermal energy produced by industrial processes. Or warming of the environment that results from human activities.

b) 2. Vehicles and machinery that burn fuel; 3. heating and air conditioning systems in a building; and 4. power stations and other large industries.

c) 5. Can affect local ecosystems by increasing air and water temperatures. 6. E.g., fish my suffocate since warm water contains less dissolved oxygen.

54. i.c; ii.a; iii.d; iv.b; v.e

55. i.e, ii.a; iii.f; iv.b; v.d

56. i.f; ii.d; iii.a; iv.b; v.e

57. i.b; ii.c; iii.a; iv.e; v.f

58. i.b; ii.a; iii.e; iv.c; v.d

59. expand or increase its length

60. Any one of: solidification, condensation, or sublimation( gas to solid).

61. vibrating

62. phases

63. D

64. 1. A large heat capacity means a large amount of energy must be added or subtracted to increase or decrease the temperature even a little. 2. So, the larger the heat capacity of a substance, the slower it will warm or cool.

65. 1. When ice is warmed, it changes state from a solid to a liquid at 0°C. This is the melting point of ice. 2. When liquid water is cooled, it will solidify at 0°C. Therefore, this temperature can also be called the freezing point of water.

66. i.d; ii.c; iii.e; iv.a; v.b

67. i.c; ii.b; iii.a iv.b; v.a

68. i.a; ii.c; iii.c; iv.b; v.c

69. i.b; ii.c; iii.d; iv.a; v.a

70. i.c; ii.d; iii.a; iv.e; v.b

71. i.a; ii.c; iii.d; iv.e; v.b

72. i.d; ii.c; iii.b; iv.c; v.b

73. 1. They make a hole in the materials being joined, which can weaken the materials, 2. especially if the type of fastener( egg. Nails or thread) is forced into the materials.

74. Any two of:

- The wall may not be heavy enough to stay in place.

-The wall may be so heavy that the earth beneath it is pressed down unevenly.

-The wall may not be thick enough or fastened tightly together so parts of it are pushed out of place.

75. a) Ties such as thread or string.

 b) Adhesives

 c) Interlocking shapes

 d) Melting( e.g. welding, braising, or soldering) or interlocking shapes

76. i.b; ii. A; iii.a; iv. c; v.d

77. 1. The particles that make up the lead are packed tightly together (high density), whereas

 2. The particles that make up the foam have large spaces between them (low density)

78. 1. The mass of an object is the measure of the amount of material in it. 2. Weight is the gravitational force between objects and Earth.

79. Answers will vary, but may include:

-Important- two of: bridge, skyscraper, airplane, paper bag;

- Not important- two of: dam, pyramid, space stations, satellites.

80. i.c; ii.b; iii.a; iv.a; v.b

81. 1.Spin stabilization keeps the ball travelling in 2. a stable, predictable path.

82. 1. By crouching low, you keep your centre of gravity low. 2. The wider the stance, the larger the area supporting your weight. 3. Both of these positions increase your stability, making it harder for the other team to pull you over.

83. 1. Since the wheels are spinning fast, they resist change in direction. 2. The principle of spin stabilization will allow the bicycle to go straight.

84.1. They create a balance by pulling in the opposite direction to a 2. potentially destructive force acting on the structure.

85. Allow any reasonable answer, such as:

 a) A foundation dug deep into the ground and spread over a large area.

 b) A foundation set into the ground below the frost line.

 c) A large hole filled with concrete.

 d) Pilings driven down through the water to a solid base.

86. i.d; ii.b; iii.a; iv.c; v.b