Question 193: Why does a shadow decrease in size as a lamp distance to an object increases?

Reference Answer: (1) As the lamp distance from the backdrop increases, the angle at which the light rays/beams travel from the lamp to the object casting a shadow decreases, becomes more acute and shallow. (2) As the angle decreases/becomes more acute, the area of light becomes smaller and the area of light the object blocks becomes smaller, making the shadow also get smaller.

Question 248: What are some different types of energy?

Reference Answer: (2) sound, (2) light, (2) thermal, (2) kinetic, (2) potential, (2) nuclear, (2) chemical, (2) electrical

Question 262: What is a physical property?

Reference Answer: (2) Physical property does not change into a new substance , (1) it changes states or forms, but is still that subtance, (3) Like H2O is Ice, water and Vapor.

Question 277: Why do the number of electrons equal the number of protons in this atom?

Reference Answer: (2) it is not a charged atom so (1) protons equals the number of electrons.

Question 293: How would you explain VOLUME to a 10-year old kid? Include at least two examples that would be familiar to a child and that would clarify (make clear) your explanation.

Reference Answer: (1) Volume is the amount of space something takes up. For example, (2) think about when you get in the bathtub. The water goes up because your body is taking up space in the water. (3) Volume is measured in milliliters, liters, or centimeters

Question 292: How would you explain MASS to a 10-year old kid? Include at least two examples that would be familiar to a child and that would clarify (make clear) your explanation.

Reference Answer: (1) Mass is the amount of matter or stuff an object or substance contains (matter is anything with mass and volume, or anything that takes up space). (3) Think about how much stuff is in your closet. Your clothes and shoes have a certain about of matter. This measurement is the mass of your closet (or other valid example). Or, (3) think about putting sand in a bucket – the more sand you put in, the more mass the bucket will have (or other valid example). (2) Mass is measured in milligrams, grams or kilograms depending on how much matter you have. (3) Mass can be measured using a triple beam balance. Mass is related to weight, but they are not the same thing.

Question 302: After gathering data in class and graphing that data, explain why the graph curves to the right rather than increases in a straight line.

Reference Answer: (2) When we placed the car on a ramp, the force of gravity began acting on the car. (2) The steeper the angle of the ramp, the higher the force of gravity acting on the car would have been. This force caused the car to accelerate, making the car faster. (1) Stepper angles made the increase in speed even greater. Thus, the increase in speed would be larger for steeper angles. (3) On a flat surface, there would be no gravity in the direction of motion, and the speed would not increase. (3) In fact, friction would act against the car, and the speed would decrease (decelerate).

Question 322: What particles give a atom mass? Explain why.

Reference Answer: (1) The mass of an atom is almost completely due to the protons and neutrons in the nucleus. (1) The mass number of an atom can be found by adding the numbers of protons and neutrons. (3) Compared to these particles, electrons have practically no mass.

Question 372: What is an energy transfer or conversion? Explain.

Reference Answer: (1) When one type/form of energy is converted/changed into another type/form of energy. (2) Types/forms of energy include kinetic, (2) potential/stored, (2) mechanical, (2) thermal or (2) chemical energy. (3) Energy can also be transferred between objects without changing type/form, such as when a hot object touches a cold object, though this is not called a conversion.

Question 405: What would you expect to happen to your weight if you went to a planet with less gravity than Earth? What would happen to your mass?

Reference Answer: (1) My weight would decrease, because weight is the “pull of the planet” on my mass, and lower gravity means less of a pull. (1) My mass would stay the same because mass is not affected by gravity – the amount of matter in me doesn’t change by going to a different planet.

Question 417: Jake has a book, a ruler, and a balance. How can Jake find the density of the book with the tools he has?

Reference Answer: (2) find the mass with the balance, the volume with the ruler and then divide the mass by the volume... (1) m/v=density

Question 420: Explain how mass and weight are different.

Reference Answer: (1) Mass remains constant no matter the gravity, weight changes when gravity changes.

Question 467: Was is renewable energy? Give an example of a renewable energy resource.

Reference Answer: (1) Renewable energy is energy that can be used over and over again. (3) Solar power is a renewable energy resource.

Question 472: Is it possible for us to run out of energy?

Reference Answer: We can run out of energy resources, like coal, oil, and natural gas, but (1) we cannot run out of energy. (3) This is due to the law of conservation of energy.

Question 491: How does energy move in the cycle of rock formation?

Reference Answer: (1) It generally moves from Magma and Lava to Igneous to Sedimentary to Metamorphic then back to Magma and Lava or the Asthenoshpere.

Question 531: What does the Law of Conservation of Mass state?

Reference Answer: (1) created nor destroyed; rearranged

Question 560: when the viscosity is high what happens to the lava? And then when it low what happens to the lava being emitted out of the crater?

Reference Answer: (2) High Viscosity causes explosive reactions, (2) low viscosity causes slow flow of lava.

Question 578: What is the relationship between the density of a liquid and its position (location) in the graduated cylinder?

Reference Answer: (1) The liquids are layered or stacked based on their densities. (2) The less dense liquid is on top, the middle density is in the middle and the most dense liquid is on the bottom.

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Question 599: Tell me what you know about atomic structure.

Reference Answer: (2) In the nucleus are protons and neutrons. (2) Electrons circle around the outside of the nucleus. (2) Protons have a + charge. Neutrons have no charge. Electrons have a - charge. (3) Electrons have a mass of 0.0005 u amu or u stands for atomic mass units. (3) We use the Bohr Model in class to show Atomic Structure.

Question 600: What are forces?

Reference Answer: (1) Forces are a push or pull on an object. (1) Forces are vectors because they have magnitude and act in a certain direction. (3) Examples of forces are gravity, strong, weak, electromagnetic.

Question 605: So what makes objects move?

Reference Answer: (1) Forces make objects move. (1) Specifically, unbalanced forces make objects move. (3) If the forces on an object are balanced the object will not change its motion.

Question 624: How does knowing atomic structure and the number of valence electrons in an element connect to controlling a chemical reaction?

Reference Answer: (2) Energy is needed to break chemical bonds. (2) Valence electrons determine what the element may bond with to make a compound. (2) Many chemical reactions can be classified by what happens to the reactants and products. (2) Activation energy (like a spark) is the minimum amt. of energy added to start a chemical reaction. (2) To increase the rate of a chemical reaction, heat can be added and the surface area can be increased. (3) Law of conservation of energy is discussed.

Question 629: What are some properties of matter that you discovered in Inquiry 1.1-1.8.

Reference Answer: (1) Density, (1) solubility, (1) flammability, (1) color, (1) texture, (1) shape

Question 640: Describe the mass and volume of a very dense object

Reference Answer: (1) lots of mass in small amount of volume

Question 686: Predict what would happen to the particles if we added heat to a liquid.

Reference Answer: (1) The particles in the liquid would start to move faster and begin to move away from each other.

Question 690: What would you say is the best way to tell the different states of matter apart from each other?

Reference Answer: (1) arrangement of particles, (1) motion and energy of particles, (1) volume and shape of each state, (1) the properties of each state.

Question 692: Juan says that in a solid the particles donít move-that is why they are solid. Marissa disagrees and says the particles ARE moving. Who do YOU agree with and why?

Reference Answer: (1) Marissa is right because particles are always moving. (1) Particles in solids may simply vibrate and not move as freely as in liquids or gasses but they are still moving.

Question 711: How does the density of the large sample compare with the small sample assuming they are made of the same substance?

Reference Answer: (1) The densities are the same. (1) The larger sample will have more volume, more mass, more weight, but will have the same density because it is the same substance.

Question 715: Why doesn't an atom have a charge? Name the particles their charges and why the whole atom doesn't have a charge.

Reference Answer: (2) The protons have a positive charge and the electrons have a negative charge. (1) There are equal numbers of protons and neutrons so they cancel each other out. (3) Neutrons don’t have a charge.

Question 722: Is there a relationship between density and floating and sinking in water? if so, describe what this relationship is.

Reference Answer: (1) Yes, there is a relationship. (1) If the object is more dense than water it will sink. If the object is less dense than water it will float.

Question 731: What causes an atom to be an ion?

Reference Answer: (1) too many or too few electrons

Question 744: Take out your particle model of matter from your notebook. What do you think will happen if we add energy to a gas?

Reference Answer: (1) It will form a plasma. (3) A plasma is an ionized gas that has lots of energy.

Question 752: Explain what weathering is --> how it happens and the results of it: C, M

Reference Answer: (1) Weathering is the chemical changes in the surfaces of the earth by reactions in elemental bonds and the mechanical grinding and breaking of rocks and organic materials. (1) It causes the rocks from horizon 3 (bedrock) to become smaller particles and eventually shrink in size to pebbles, sand, dirt and dust.

Question 770: If you pop a balloon, what happens to the gas particles?

Reference Answer: (1) They spread out and move around

Question 779: Explain why 100 mL of cold water when heated, will expand to 102 mL of hot water.

Reference Answer: (1) When the water is heated, the molecules spread apart further from each other and this increases the volume of the water.

Question 787: What is temperature? How do we measure it?

Reference Answer: (1) A measurement of the average motion of particles in a substance. (1) Measured using a thermometer.

Question 830: What happens to the mass and the density when a substance is cooled.

Reference Answer: (1) Mass stays the same and density increases.

Question 837: Why do hot air balloons rise?

Reference Answer: (1) Hot air is less dense than cold air.

Question 898: Explain what erosion and deposition are? Give examples of each from the world we live in.

Reference Answer: (1) Erosion is the breaking down of rock and minerals by chemical and mechanical enrgy processes. (2) Examples are the roots of plants pulling chemicals out of the soil and pushing rocks apart. (1) Deposition is the carrying of dust, dirt and organisms by wind, water and glaciers to different parts of the earth. (3) Deflation of the dust deposited from the Great Dust Bowl showed how strong the wind, making it able to move the more dense soil. (2) The rock that makes the base of Long Island was deposited by glaciation millions of years ago (mya).

Question 935: Knowing what we do about how substances behave in a thermometer, explain why engineers leave gaps between cement blocks.

Reference Answer: (2) Substances can expand or contract when the temperature changes. (1) So engineers leave gaps between cement blocks so that the block has room to expand.

Question 997: Explain why the water came out of the potato with the salt on it. It is also the same reason the chloroplasts combined into a ball when the elodea was placed in salt water.

Reference Answer: (1) The salt caused the concentration of water molecules to be less outside the potato cell, in the little dip. (1) Osmosis caused the water molecules to go from the are of high water concentration to an area of low water concentration.

Question 1016: Bob has three different liquids. He wants to figure out which one is the densest. Write a short procedure describing the steps he could take to answer his question.

Reference Answer: (1) Measure mass and volume. Divide mass by volume.

Question 1025: Gas Laws - Applying Knowledge: Discuss a real life situation when Boyle's Law or Charles' Law makes an effect on a situation.

Reference Answer: (2) Scuba divers and lungs. (2) Hot air balloons (2) Tires on big rigs, cars, space shuttles, jets. (2) Footballs and other balls vacuum sealed bags as you rise in elevation (2) life rafts - don't over-inflate when it is going to be hotter (2) Ears popping as you rise in elevation

Question 1036: Describe a polar covalent bond

Reference Answer: (1) In a polar covalent bond, the electrons shared by the atoms spend a greater amount of time on average on one side, creating charges like a magnet.

Question 1050: Which has more energy? Molecules in motion, or molecules that are motionless?

Reference Answer: (1) molecules in motion

Question 1064: What are the three sub-atomic particles that we know make up an atom? What is the difference between these particles?

Reference Answer: (1) Proton, Neutron and Electron. (1) Protons are postively charged and are found in the nucleus. Neutrons are neutral and are found in the nucleus. Electrons are outside of the nucleus and they are negatively charged.

Question 1082: If a balloon is filled with room temperature air and then placed in a freezer, what would happen to the balloon? Explain.

Reference Answer: (1) It will get smaller (contract) because the particles would move less and get closer together.

Question 1111: What is the main difference between a chemical change and a physical change?

Reference Answer: (1) a chemical change produces a new substance a physical change does not change the substance.

Question 1137: give an example of a pure substance

Reference Answer: (1) elements or compounds

Question 1160: describe what a synthesis reaction is and give an example.

Reference Answer: A synthesis reaction is when two or more chemical reactants combine to form a more complex product. in the equation, the reactants will be on the left and the product on the right. An example is when hydrogen and oxygen combine to form water.