

Round 1 Elementary

Round 1 Tossups

(1) This scientist names inhibitory cells within the brain which are classified as Type One or Two based on their axon length. This man names a "stain" which was used to discover that brain tissue consists of individual neurons. An organelle named for this scientist passes vesicles [[VEH-sih-kuls]] through folds called cisternae [[sis-TER-nay]]. For the point, name this Italian biologist whose namesake "apparatus" packages proteins within the cell.

ANSWER: Camillo **Golgi** [[GOHL-jee]] (accept **Golgi** apparatus; accept **Golgi** complex; accept **Golgi** body; accept **Golgi** stain)

(2) This structure's cortex is home to namesake granule [[GRAN-yool]] cells, the most common type of neuron in the brain. This structure contains a set of GABAergic [[gah-bah-EHR-jik]] inhibitory neurons called the Purkinje [[per-KIN-jee]] cells. This structure, which sits behind the pons, regulates motor control and balance. For the point, name this region of the lower brain, the name of which comes from the Latin for "little brain."

ANSWER: **Cerebellum** (prompt on "hindbrain"; prompt on "little brain" or "brain" before mentioned; do not accept or prompt on "cerebrum")

(3) When this substance is extruded underwater, it can form its "pillow" variety. This substance can be classified as either 'a'ā [[AH-AH]] or pahoehoe [[pah-HOY-HOY]] based on its texture and makeup. Pumice [[PUM-iss]] and obsidian are examples of igneous rocks formed by the cooling of this substance. For the point, name this form of molten rock created when magma reaches the Earth's surface.

ANSWER: **Lava** (do not accept or prompt on "magma")

(4) At the Kamioka Observatory, these particles were discovered to have mass by Takaaki Kajita [[tah-kah-AH-kee kah-JEE-tah]]. Beta-plus decay releases a positron, a neutron, and one of these one-half spin particles. These particles come in three flavors corresponding to electrons, muons [[MYOO-ons]], and tauons, between which they oscillate. For the point, name these neutrally charged leptons, which are nearly massless.

ANSWER: **Neutrinos** (accept Tau **neutrinos**; accept Muon **neutrinos**; accept Electron **neutrinos**; prompt on "fermions"; do not accept or prompt on "neutrons")

(5) First described by Thomas Addison, an autoimmune disease impacting this organ is the most common cause of pernicious anemia. Infections with *H. pylori* bacteria and misuse of NSAID [[EN-sed]] painkillers are the most common causes of ulcers in this organ. This organ releases chyme [[KIME]] into the duodenum [[doo-AH-deh-num]] of the small intestine. For the point, name this organ that digests food with its namesake acid.

ANSWER: **Stomach** (accept **Stomach** acid)

(6) A high-pressure solvent is forced through a bed of tightly packed adsorbing material in this technique's high-performance variety. This technique uses a mobile and stationary phase and can be demonstrated with a coffee filter and marker. For the point, name this lab technique used to separate mixtures using namesake paper, which forms colorful bands.

ANSWER: **Chromatography** (accept High-performance or High pressure liquid **chromatography**; Accept Paper **chromatography**)

(7) The planetary variety of these structures occur when a red giant expels its outer layers. The Pillars of Creation are a formation within one of these structures named Eagle. In the early 20th century, the Andromeda Galaxy was thought to be this galactic entity. The Crab is a well-known example of, for the point, what large star-forming clouds of dust and gas?

ANSWER: **Nebulae** (or **Nebulae**; accept Reflection **nebula**; accept Emission **nebula**; accept Planetary **nebula**; accept Eagle **nebula**; accept Crab [a]nebula)

(8) This force is independent of surface area in Amontons's [[ah-mohn-TOHNS]] Law. This force is described by a namesake coefficient, represented with the letter *mu* [[MYOO]], and comes in dynamic and kinetic varieties. Causing your hands to warm up when you rub them together, for the point, what is this force which resists an object's motion?

ANSWER: **Friction** (accept Dynamic **friction** or Sliding **friction**; accept Kinetic **friction**; accept Coefficient of **friction**)

(9) This substance naturally sorts into distinguishable layers known as "horizon," and its "O" type contains the highest amount of organic material. Loam [[LOW]-um] is a type of this substance particularly valuable for agriculture, and this substance can be enriched with humus [[HYOO-muss]]. This substance is composed of organic matter, sand, silt, and clay. For the point, identify this substance in which seeds are planted.

ANSWER: **Soil** (accept **Dirt**; accept **Earth**)

(10) One variety of these organisms can leave behind hardened scars known as their namesake "boot." Carmine dyes are made from a type of beetle that lives on these organisms, one species of which, Peyote [[peh-YOH-teh]], contains the hallucinogen mescaline [[MEH-skah-lin]]. The pin cushion and Saguaro are examples of, for the point, what desert plant which is covered in spines?

ANSWER: **Cactus** (or **Cacti**; or **Cactuses**; accept **Cactaceae**; accept Saguaro **cactus**; accept Pincushion **cactus**; accept Peyote **cactus**)

(11) One of these devices allows for reverse flow below the breakdown voltage. A triangle whose point leads into a line is the standard circuit notation for these devices. The simplest kind of these devices is a single p-n junction. For the point, name these devices that only allow current flow in a single direction, which include a notable "light-emitting" variety.

ANSWER: **Diode** (accept Light-Emitting **Diode**; accept Zener **diode**; accept P-N **diode**; prompt on "LED")

(12) With Mascheroni [[mah-skeh-ROH-nee]], this man names a constant symbolized with a lowercase gamma. This man's namesake number is defined as the limit of "one plus one over n all to the nth power" as n approaches infinity, roughly equal to 2.718. For the point, name this Swiss mathematician whose namesake number is the base of the natural logarithm.

ANSWER: Leonhard **Euler** [[OY-lehr]] (accept **Euler**-Mascheroni constant or **Euler's** constant; accept **Euler's** number; prompt on "e")

(13) This compound can trigger a runaway feedback loop according to the "gun hypothesis." This greenhouse gas is commonly trapped inside ice clathrates [[KLATH-"rates"]] at the bottom of the ocean. This compound is the primary fuel found in natural gas. For the point, name this simplest hydrocarbon, a tetrahedral compound with chemical formula CH₄.

ANSWER: **Methane** (accept **CH₄** before mentioned)

(14) Proposed by Andrei Sakharov, these particles are theorized to decay into a neutral pion [{"PIE"}-on]] and a positron. These particles can capture an electron through inverse beta decay. These particles make up the nucleus of the protium isotope of hydrogen. For the point, name this positively charged baryon [{"BAY"}-ree-on]], which forms the nucleus with neutrons.

ANSWER: **Proton**

(15) Some varieties of these animals from the *Anthophila* [[an-thoh-FEE-lah]] clade [[KLADE]] are able to communicate distance information through a "waggle dance." Neonicotinoid [[nee-oh-nih-KAH-tih-noyd]] pesticides are considered the most common cause of colony collapse disorder among these animals. The "Africanized" hybrid type of these animals are often known as the "killer" variety. For the point, name these insects that live in colonies and produce wax and honey.

ANSWER: **Bees** (accept **Honeybees**; accept Africanized honey**bees**; accept Killer **bees**; accept Wallace's giant **bee**; do not accept or prompt on "wasps")

(16) This element names a type of photoluminescence often contrasted with fluorescence. This element's allotropes include a tetrahedral white variety and an amorphous red variety. The primary ingredient in match heads, for the point, what is this element which is located below nitrogen on the periodic table, with atomic number 15 and symbol "P"?

ANSWER: **Phosphorus** (accept **P** before mentioned; accept White **phosphorus** or Tetra**phosphorus**; accept Red **phosphorus**)

(17) The formation of this material lends its name to the Carboniferous [[kar-boh-NIH-fer-us]] period, during which it was deposited in namesake seams and beds. This material is made from the deposition and compression of ancient plant matter, which eventually solidifies to become peat and this material. Varieties of this material include lignite, anthracite, and the bituminous variety. For the point, name this solid fossil fuel.

ANSWER: **Coal** (accept Black **coal**; accept Bituminous **coal** before mentioned; accept **Lignite** or **Anthracite** before mentioned)

(18) This field's structure is equivalent to the non-empty set A. This field takes its name from the Arabic for the "reunion of broken parts" or "bone-setting." According to the fundamental theorem of this field, at least one complex root can be found for every non-constant single-variable polynomial with complex coefficients. For the point, name this field of mathematics used to solve for unknown variables.

ANSWER: **Algebra** (or **al-Jabr**; accept Fundamental Theorem of **Algebra**)

(19) A child with this condition is chronicled in *The Spirit Catches You and You Fall Down*. This condition can be treated with phenytoin [[feh-neh-TOH-in]] or phenobarbital [[fee-noh-BAR-bih-tahl]]. Severe, hemisphere-isolated types of this condition can be treated with a split-brain procedure. Episodes of this condition can be induced by slashing strobe lights. For the point, name this neurological disorder, the most common cause of seizures.

ANSWER: **Epilepsy** (accept **Epileptic** seizure(s); prompt on "seizures" before mentioned)

(20) This compound is oxidized by heating it with oxygen to form nitric oxide in the first step of the Ostwald process. Mixing this compound with bleach-containing substances produces toxic chloramine [[KLOH-rah-meen]] vapors. Fritz Haber [[HAH-buh]] discovered a process for, for the point, what simplest amine [[AM-een]] compound with formula NH₃?

ANSWER: **Ammonia** (accept **NH₃** before mentioned; do not accept or prompt on "Ammonium")

(21) With Maurice Koechlin [[KEH-klin]], this engineer built the Garabit [[gah-rah-BEE]] Viaduct, and he built the interior pylons for the Statue of Liberty. One of this engineer's projects, which at the time was the world's tallest manmade structure, relied on an exponential shape and latticework to withstand high wind speeds. For the point, name this French civil engineer, who names a triangular tower in Paris.

ANSWER: Gustave **Eiffel** (or Alexandre Gustave **Eiffel**; or Bönickhausen dit **Eiffel**; accept **Eiffel** Tower or Tour **Eiffel**)

(22) BlueMaxima's Flashpoint is a project dedicated to saving these programs made on Adobe Flash. One of the most popular frameworks for making 3D types of these programs is the Unreal Engine owned by Epic, used to make popular examples such as *Rocket League* and *Fortnite*. For the point, name these computer entertainment programs, early examples of which include *Pong* and *Pac-Man*.

ANSWER: **Video Games** (accept **Computer Games**; prompt on "Game(s)")

(23) This organ is made up of several hexagonal lobules [[LOB-yools]], which consist of this organ's namesake cells arranged around a central vein. In the Cori cycle, lactose is moved into this organ where it is converted into glucose. Long-term alcohol abuse leads to Cirrhosis [[sih-ROH-siss]], which leads to deterioration of, for the point, what large abdominal organ which removes toxin from the blood and produces bile.

ANSWER: **Liver** (accept **Liver** cells)

(24) This is the largest body to have its existence predicted by the now-discredited Titius-Bode [[TIH-tee-uss-BOHD]] Law. The moons of this planet are named for Alexander Pope and William Shakespeare characters, including Titania and Miranda. This planet's axis of rotation sits at a 90-degree angle relative to its orbit. For the point, name this seventh planet from the Sun.

ANSWER: **Uranus**

(25) President Warren G. Harding presented this scientist with one gram of an element she discovered while on a visit to the White House. This woman died of aplastic [[AY-"plastic"]] anemia as a result of prolonged exposure to her work with radiation. For the point, name this woman, the first person to win two Nobel Prizes in two different scientific fields: Chemistry and Physics.

ANSWER: Marie **Curie** (or Marie Salomea Skłodowska **Curie**; or Maria Salomea **Skłodowska**; accept Madame **Curie**)

Extra Question

(1) The olm is a salamander species that is the only European vertebrate to exclusively live in these habitats. Unlike many insects living in these habitats, *Leptodirus* [[lep-toh-"DIE"-russ]] beetles retain their bright colors. Species that live in these habitats are referred to as troglobites. For the point, name these habitats inhabited by many depigmented and blind species, which are also a popular roosting spot for bats.

ANSWER: **Cave** (or **Caverns**)