



**13 American Literature**  
**2 World Literature**  
**1 British Literature**  
**3 European Literature**  
**1 Mixed Literature**

**Literature**  
(OP distribution, not going to lie!)

**3 Biology**  
**2 Biochemistry**  
**2 Organic Chemistry**  
**3 Other Chemistry**  
**4 Physics**  
**1 Lab Techniques/Equipment/Stuff**  
**1 Math**  
**4 Other Science**  
**(ESS/Astronomy/Astrophysics/Psychology/Mixed/Multi-Field Scientist)**

**Science**

**Moderator, read:** This packet is sponsored by the #AddJoeEmojisToHSQB movement.

(1) A law named after a scientist with this last name may be visualized in reciprocal space by constructing a Ewald [ee-vald] sphere. An effect discovered by one man with this last name is intensified by repeated reflection between the h, k, and l planes. Scientists with this last name built upon Max von Laue's [laow] work on lattice diffraction to create their eponymous law, stated as (\*) " $2d \sin \theta = n \lambda$ ". For 10 points, name this last name shared by a father and son duo who formulated their law that describes X-ray scattering in crystals.

ANSWER: Sir William Lawrence **Bragg** or William Henry **Bragg** <Physics - Tegulla>

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(2) In the play in which he appears, this character pledges to guard another character from one hundred men after that character earlier offended a powerful nobleman with his latest satire. This character ends a duel he has by saying, "When I end the refrain, thrust home!, which results in the death of (\*) Valvert. This character later dies due to wounds sustained after a log hit him, not before revealing he was the author of Christian's letters. For ten points, name this lover of Roxanne with a comically large nose, the namesake of an Edmond Rostand play.

ANSWER: **Cyrano de Bergerac** (from the play *Cyrano de Bergerac* based on the author *Cyrano de Bergerac*) <European Literature - de Guzman>

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(3) One type of these substances that has two distinct melting points is cholesteryl benzoate. The lyotropic type of these substances is made by dissolving a mesogenic substance in a solvent. Disclinations in these materials are present during their nematic phase. Despite their name, these substances possess no solid lattice and only maintain (\*) short-range order. These substances are often placed between two layers of polarizing material in certain TVs. For 10 points, name these substances often used in electronic displays, such as LCDs.

ANSWER: **liquid crystals** (prompt on LCD until mention) <Physics - Tegulla>

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(4) In one part of this work, a woman with inconsistent life stories is thrown out of her building after a newly installed sink is stolen. Another story in this book has Twinkle enchanted a large statue of Jesus in her attic. A different story from this book depicts two lovers confessing to each other during repeated (\*) blackouts, and another, has Dev whisper the title word in Miranda's ear. The title story of this work ends with Mr. Kapasi saving Bobby from a group of monkeys. For ten points, name this collection of short stories by Jhumpa Lahiri [JUM-pa LA-he-ree].

ANSWER: *The Interpreter of Maladies* (first story is "A Real Durwan", second is "The Blessed House", third is "A Temporary Matter", fourth is "Sexy"; anti-prompt on any of the stories) <World Literature - de Guzman>

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(5) It's not sodium, but a salt of this element is necessary to synthesize graphene or graphite oxides in Hummer's method. That same salt of this element is also used in a technique in which it causes a solution to change color from purple to brown in the presence of double or triple-bonded substances, called the Baeyer [Bay-urr] saturation test; that salt is this element's (\*) permanganate. This element's nitrate is the main component of gunpowder, and various salts of this element are referred to as "potash". For 10 points, name this alkali metal symbolized K.

ANSWER: **potassium** (accept K until "K"; accept potassium permanganate until "Gun powder") <Oth. Chem - Tegulla>

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( 6 ) *Description acceptable.* **At the end of one play, an instance of this action occurs after a character tells another that they will drink tomorrow “beneath the willow trees”, and hearing this action causes Larry to hide his face in his hands. Another instance of this action happens after its participant cries (\*) “I’ll give it you!”; that person, who is married to Rezia, does this action because he cannot talk to Evans. For ten points, name this type of suicide committed by Parritt at the end of *The Iceman Cometh* and by the shell-shocked Septimus Smith.**

ANSWER: **death** by **falling** (accept answers that describe dying after falling or jumping off a building or out of a window; prompt on suicide until FTP by asking “By what means did they commit suicide?”) <Mixed Literature - de Guzman>

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( 7 ) **During a self-imposed experiment in which this thinker directly confronted his thoughts, he recorded his experiences in a series of seven manuscripts called the “Black Books”. This thinker observed that seemingly unrelated events have unusually significant connections, a phenomenon which he termed (\*) “synchronicity [sin-chru-ni-city] .” This thinker studied the unconscious masculine side of women and feminine side of men, which he called the anima and animus. For 10 points, name this Swiss psychologist who popularized the idea of archetypes and posited the existence of a “collective unconscious.”**

ANSWER: Carl Gustav **Jung** <Psychology - Tegulla>

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( 8 ) **A poem by this author ends by describing “old bones” that “live to learn her wanton ways”, and how the speaker measures “time by how a body sways”. Another poem by this author recalls a time when “The whisky on” its subject’s breath “could make a small boy dizzy”. The most famous (\*) villanelle by this poet includes variations of “I learn by going where I have to go” and “I wake to sleep and take” the title action “slow.” For ten points, name this author of “I Knew a Woman”, “My Papa’s Waltz” and “The Waking”.**

ANSWER: Theodore **Roethke** <American Literature - de Guzman>

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( 9 ) **The ideal type of a device that performs this process has an infinite input impedance; that type of this process’ namesake device is its operational, or op, type. An ultrashort LASER pulse may undergo the “chirped” form of this process, and the namesake electrical device that performs this process (\*) increases the amplitude of an input signal. The letter “A” in the acronym LASER stands for, for 10 points, what term which generally refers to a process that results in an increase of the magnitude of a stimulus, such as increasing the loudness of sound.**

ANSWER: **amplification** (accept chirped **amplification** and **op-amp**; accept word forms and phrases that indicate a signal is being **amplified**) <Physics - Tegulla>

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( 10 ) **A woodpecker tells this character to shoot the top of a man with a magical shirt’s head. This character’s mother fails to adhere to the advice of his grandmother and subsequently is impregnated by Mudjekeewis [mugee-kee-wis] or “The West Wind”. This character ends his story by adopting the (\*) Christianity of “the Pale-Face”, which all takes place “by the Gitchee Gumee [gich-ee goom-ee]”. For ten points, name this character, lover of Minnehaha, and namesake of a “Song” about them, written by Henry Wadsworth Longfellow.**

ANSWER: **Hiawatha** <American Literature - de Guzman>

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( 11 ) Avery, McLeod, and McCarty proved that this substance induces bacterial transformation. In one experiment, this substance becomes observably less dense after being moved from a nitrogen-15 to a nitrogen-14 solution. When this substance becomes supercoiled, it can be (\*) unwound by topoisomerase [topoh-eye-SOM-err-rays]. Cas9 cleaves this substance in the CRISPR [crisp-er] gene editing technique. Chromosomes are made up of histones and, for 10 points, what nucleic acid known for its double-helical structure?

ANSWER: DNA or deoxyribonucleic acid <Biology – Tegulla>

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( 12 ) One author from this country described “What remains of the village... must rouse itself” in the essay “Our America”. That same writer from this country described a “cruel person who tears out/ the heart with which I live” in “I Cultivate a White Rose”. The most famous poem from this country begins with the line (\*) “I am a truthful man” and was written by an anti-revolutionary who died in the Battle of Dos Rios. For ten points, name this home country of Jose Marti, author of “Guantanamera” [gwan-ta-na-me-ra].

ANSWER: Cuba <World Literature - de Guzman>

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( 13 ) A cyclic ketone may be converted to a type of these compounds in the Baeyer-Villiger [Bay-urr Vil-la-gurr] oxidation. The Claisen condensation involves two of these compounds reacting with each other to form an alcohol and a (\*) beta-keto type of them. Arthur Speier [speer] and Emil Fischer discovered a reaction which produces these compounds by refluxing an alcohol with a carboxylic acid. For 10 points, name these compounds that are hydrolyzed in saponification and are known for their fruity aromas.

ANSWER: ester (accept beta-keto ester) <Orgo Chem- Tegulla>

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( 14 ) The final two lines of this work state: “May that man that hath the Muses scorned alive, nor dead, be ever of a Muse adorned”. Characters in this work are challenged by St. Elmo’s Fire and the giant Adamastor. The last section of this work has the central character’s lover explain to him the Ptolemaic view of the universe at the (\*) Isle of Love; her name is Thethys [te-thiss]. In this work, the gods Bacchus and Venus quarrel over the fates of the crew of Vasco da Gama. For ten points, name this poem by Luis Vas de Camoes, the national epic of Portugal.

ANSWER: *The Lusiads* (accept Os Lusiadas) <European Literature - de Guzman>

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( 15 ) Actions across a Stern layer utilize a variant of this equation that includes the Frumkin correction. The immunity of an element in a solution can found by applying this equation over varying pH and constructing the resulting Pourbaix [pohr-bay] diagram. In the denominator of one term in this equation, the quantity of (\*) transferred electrons, z, is multiplied by Faraday’s constant, F. For 10 points, name this equation that calculates the reduction potential of an electrochemical cell.

ANSWER: Nernst equation (accept Butler-Volmer equation before the second line) <Other Chemistry - Tegulla>

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( 16 ) A chapter of this work describes an “animal life” living illiterate man named Alec Therien. Another part of this work lists several reasons for why one should be vegetarian, titled “Higher Laws”. A different chapter of this work describes the noise of church bells and the nostrils of an “iron horse” in (\*) “Sounds”. This work’s first chapter, “Economy”, describes a 2 year, 2 month, 2 day stay in a cabin by a pond. For ten points, name this work quintessential to

transcendentalism, subtitled *Or, Life In the Woods*, written by Henry David Thoreau [thurr-oh].

ANSWER: Walden <American Literature - de Guzman>

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Note to moderator: read the answerline carefully before starting the question.

(17) A namesake *in vitro* process for creating these entities often utilizes fetal bovine serum. These entities are typically transferred using an inoculation loop. Robert Koch [pronounced like "Coke"] pioneered the streaking method, which causes these entities to become diluted, thus isolating pure strains. A common laboratory growth medium called (\*) agar facilitates the growth of these entities. For 10 points, name these clumps of microorganisms that are grown on a Petri dish.

ANSWER: microbial cultures (or bacterial cultures or microorganism cultures; accept bacterial or microbial colony; leniently accept a general description describing a group of microorganisms; prompt on bacteria or microorganisms) <Lab Technique - Tegulla>

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(18) One character with this physical condition and a philosophy PhD is assaulted by a man who states that he had "been believing in nothing ever since" he "was born!". That character with this condition, nicknamed Joy, is abandoned in the loft of a (\*) barn. Another character with this impairment nails a doubloon to the mast of his ship and dies while killing Moby-Dick. For ten points, name this physical impairment shared by Hulga Hopewell from "Good Country People" and Captain Ahab, in which a person is missing one limb that is used for walking.

ANSWER: being one-legged or having one leg (accept similar answers that indicate only having use in one leg or have artificial legs) <American Literature - de Guzman>

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(19) An equation modelling these objects is derived from a simplification of the Bose-Einstein distribution as a result of massless particles having zero chemical potential. A displacement constant symbolized  $b$  is divided by the these objects' absolute temperature to give their peaks of (\*) radiance, according to Wein's [veen's] displacement law. The "ultraviolet catastrophe" resulted from the incorrect prediction that these objects emitted radiation of all frequencies by the Rayleigh-Jeans law. For 10 points, name these theoretical objects that absorb all incident radiation.

ANSWER: blackbody (accept perfect blackbody) <Astrophysics - Tegulla>

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(20) A couple in this work often visits a grave and tends it with flowers that seem to say "life which has no end". One character in this novel exchanges a Pushkin novel for one called *Stoff und Kraft*. A different character in this novel once gave a lover a ring engraved with a (\*) sphinx and is shot in the leg by a character who loved Anna Odintsova and dies due to a typhus infection he contracted during an autopsy. For ten points, name this novel about Arkady and the "nihilist" Bazarov, written by Ivan Turgenev.

ANSWER: Fathers and Sons <European Literature - de Guzman>

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(21) This quantity is said to be rotationally symmetrical if a physical system behaves independently of orientation, according to Noether's [noh-turr's] theorem. Hamilton's principle states that taking the time integral of this quantity yields action. The Legendre [lehg-gin-dray] transform of the Hamiltonian yields this quantity. The namesake of this quantity also names a set of (\*) points at which the centrifugal and gravitational forces of two orbiting bodies balance each other. For 10 points, name this quantity, given by kinetic energy minus potential energy.

ANSWER: Lagrangian (accept L) <Physics - Tegulla>

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( 22 ) When this character is asked if there is any heart disease in his family, he responds “nothing chronic except malaria and accidents”. In the short story in which he appears, this character has to explain why there is nothing in holes, how a road can run both ways, what makes grass green, and is forced to eat (\*) oats. This character must do those things because he plays the “hoss” in the game “Black Scout”. For ten points, name this character, who, along with Sam, kidnaps the son of Ebenezer Dorset in O’Henry’s “The Ransom of Red Chief”.

ANSWER: Bill Driscoll (accept either underlined portion) <American Literature - de Guzman>

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( 23 ) Mutations in the COL1A1 or ADAMTS2 genes cause the ill-function of this protein in Ehlers-Danlos [eh-lurs dahn-lohs] syndrome. Certain residues on this protein are converted to aldehydes by an enzyme called lysyl oxidase. This protein, which contains many (\*) hydroxyproline-glycine-proline motifs in its triple-helical structure, is synthesized in the presence of Vitamin C as a cofactor. For 10 points, name this common protein found in connective tissue and the extracellular matrix of mammals.

ANSWER: collagen (accept elastin before the second line) <Biochem - Tegulla>

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( 24 ) The first play in this collection ends as one character cries “She’s guilty - not medicine!” after being tricked to drink poison. In this collection, the son of Madame Brantome is murdered on board his clipper ship by a man who later commits suicide after telling his sister that she can no longer see Peter Niles. In this collection, Christine and Captain Brant murder Civil War General (\*) Ezra Mannon. For ten points, name this trilogy, consisting of *Homecoming*, *The Hunted*, and *The Haunted*, a retelling of Aeschylus’ *Oresteia*, by Eugene O’Neill.

ANSWER: Mourning Becomes Electra <American Literature - de Guzman>

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( 25 ) When types of these specific entities which contain a z component separate from their non-z counterparts, a type of Jahn-Teller distortion called an elongation occurs. These specific entities may split into  $t_{2g}$  [T-sub-2-G] and  $e_g$  [E-sub-G] components according to crystal field theory, which also describes the bright colors present in certain (\*) coordination complexes. These entities may be preferentially filled with electrons from a 4s orbital in elements like copper. Transition metals are the first to fill, for 10 points, which atomic orbitals that come between p and f orbitals?

ANSWER: d orbitals <Other Chemistry - Tegulla>

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( 26 ) In one work, this poet describes a crowd whose “thick tongues blort” and whose “eyes squeeze grief”. This poet of “Faith Healing” describes the waning influence of the Church in another poem in which the speaker says “Here endeth” too loudly. A more infamous poem by this man says to “get out as early as you can,/ And don’t have any (\*) kids yourself.”, which opens “They’ll [mess]/f--- you up, your mom and dad”. For ten points, name this author of “Church Going” and “This be the Verse”.

ANSWER: Philip Larkin <American Literature - de Guzman>

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( 27 ) The Gal4 [G-A-L-4] transcription factor found in these organisms allows them to undergo a two-hybrid assay that screens for protein-protein interactions. Two of these organisms may form either mating type a or alpha. One species of these organisms which has 16 chromosomes, called (\*) *Cerevisiae* [cerr-eh-vees-ee-ay], was the first eukaryote whose genome was fully sequenced. The culinary applications of these eukaryotes are a result of their ability to release lots of carbon dioxide and ethanol via fermentation. For 10 points, name these unicellular fungi which are often used for baking bread.

ANSWER: yeasts (accept Saccharomyces; accept *Saccharomyces cerevisiae* until "cerevisiae" is read) <Biology – Tegulla>

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( 28 ) In one play of this collection, a woman refuses to sing without a Coca-Cola. Another play in this collection opens with two men driving a truck full of watermelons to the land of a man killed by the Ghosts of Yellow Dog. A different play from this collection sees (\*) Cory unable to play football because of his garbage collecting father, Troy Maxon. For ten points, name this collection of ten plays, including *Ma Rainey's Black Bottom*, *The Piano Lesson*, and *Fences*, written by August Wilson, most of which are set in the title Pennsylvania city.

ANSWER: Pittsburgh Cycle <American Literature - de Guzman>

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( 29 ) The accuracy with which a result described by this adjective is predicted is called the specificity, or true [*this adjective*] rate, of the test. During transmission electron microscopy, compounds like uranyl acetate are used to create a stain described by this adjective that colors the background instead of the specimen. Crystal violet is not able to properly stain (\*) bacteria described as Gram-[this adjective], due to a lack of peptidoglycan in their cell walls. The test result that indicates *not* having a disease is described with, for 10 points, what adjective that, in mathematics, refers to numbers less than zero.

ANSWER: negative (accept true negative rate or negative stain or Gram-negative bacteria) <Biology - Tegulla>

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( 30 ) One character with this name ends the play she titles by crying "Mamma! Mamma! I want Mamma!" That same character with this first name has a fiancée who inherits a business because his parents' marriage is only legal in Australia, making him a foundling by the name of Adolphus (\*) Cusins [coo-sins]. A person with this name declares "Shoot if you must this old gray head,/ But spare your country's flag". For 10 points, give the first name of the title character in a Whittier poem and of a Salvation Army Major in a George Bernard Shaw play.

ANSWER: Barbara (Accept Major Barbara or "Barbara Frietchie") <American Literature - de Guzman>

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( 31 ) The Bergius process performs this type of reaction on bitumen [bai-too-min]-containing coal to produce synthetic fuel. Sir Geoffrey Wilkinson popularized a method for performing this type of reaction which uses his namesake homogenous catalyst that contains a rhodium-centered coordination complex. Another catalyst that carries out this type of reaction is synthesized from a (\*) nickel-aluminum alloy and is called Raney nickel. Unsaturated fats become saturated through, for 10 points, what type of reaction which adds the namesake element that is symbolized H?

ANSWER: hydrogenation <Orgo Chem - Tegulla>

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Note to moderator: pause briefly at comma before powermark.

( 32 ) A nun in this play dies after eating poisoned rice given to her by the title character's slave. Two men in this play kill each other after being duped by the title character to love his daughter, (\*) Abigail. Those two men, Mathias and Lodowick, are found by Ferneze, who prevents the Turkish Calymath from being killed by the play's title character, who

dies after falling into the cauldron he prepared for Calymath. For ten points, name this Christopher Marlowe play about the merchant Barabas.

ANSWER: *The Jew of Malta* <British Literature - de Guzman>

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**( 33 ) Even-numbered spheres cannot contain continuous fields of these entities, according to the hairy ball theorem. A pseudo-type of these entities behaves irregularly under transformations in three-dimensions, such as inversion. Three of these entities give the volume of a (\*) parallelepiped by taking their triple product. If a pair of these entities are perpendicular to each other, their dot product equals 0. For 10 points, name these mathematical entities that have magnitude and direction.**

ANSWER: **vector** (accept **vector field**; prompt on **force field** before second line is read) <Math - Tegulla>

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**( 34 ) One character in a play by this author tells a story about how a soldier gave him a pair of dry socks. That play opens with a discussion about a fallen tree in the central family's backyard. Another play by this man sees one character cry "I have given you my soul; leave my name!" before being (\*) hanged since his wife Elizabeth did not confirm that he slept with Abigail Williams. For ten points, name this man who wrote of Joe Keller in *All My Sons* and John Proctor in *The Crucible*.**

ANSWER: Arthur **Miller** <American Literature - de Guzman>

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**( 35 ) The metabolism of this compound releases carbon dioxide, which is detected by a breath test that may indicate the presence of stomach-residing bacteria, such as *H. pylori*. Ammonium cyanate is converted to this compound through a synthesis reaction discovered by Friedrich (\*) Wohler [free-drik voo-lur]. The namesake cycle of this compound occurs in the liver, where it is formed by combining two molecules of ammonia with a molecule of carbon dioxide. For 10 points, name this nitrogenous compound found in urine.**

ANSWER: **urea** (do not accept or prompt on **piss...**) <Bio Chem - Tegulla>

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**( 36 ) Description Acceptable. After seeing the results of one instance of this action, Ruthie throws away the "sof' eggs" in her hand. After another instance of this action, an ex-convict puts a turtle into his coat. Another occurrence of this action happens after a mechanic and his (\*) wife argue, causing the wife to run out to try and speak to who she thinks she had an affair with. For ten points, name this action that happens to both the Joad family dog and the turtle from the beginning of *The Grapes of Wrath*, as well as what causes the death of Myrtle Wilson.**

ANSWER: Getting **run over** (accept answers that describe something being hit by a car) <American Literature - de Guzman>

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**( 37 ) The rule of parsimony is the last of this man's five rules that predict the crystalline structures of ionic compounds. This man invented a widely used scale that runs from 0.79 to 3.98, called his namesake electronegativity. Along with identifying the structure of (\*) alpha helices and beta sheets and classifying them as secondary protein structures, this man was the first to explain the concept of orbital hybridization. For 10 points, name this scientist who advocated for mega doses of Vitamin C.**

ANSWER: Linus **Pauling** <Mixed Field Scientist - Tegulla>

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( 38 ) The protagonist of this novel, born in Tennessee during a meteor shower, first meets the antagonist while he is accusing a preacher of raping children and goats. The protagonist joins Captain White whose crew gets massacred, is arrested, and then is set free at Chihuahua. Later, the Yuma (\*) tribe shoot the protagonist in the leg with an arrow, and the antagonist shoots Tobin, a member of Glanton's gang in the neck. For ten points, name this novel about "the kid" and Judge Holden, two Native American scalpers, written by Cormac McCarthy.

ANSWER: Blood Meridian <American Literature - de Guzman>

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( 39 ) This phenomenon can arise during conditions of a lack of upwelling in the Walker circulation. The atmospheric effects of this phenomenon are observed by noting the difference in pressures between Tahiti and Darwin, Australia; that pressure difference for this phenomenon is measured by the (\*) Southern Oscillation Index. This phenomenon and its counterpart (emphasize) La Niña [la nee-niya] occur alternatingly. For 10 points, name this periodic phenomenon characterized by unusually high surface water temperatures in the Pacific Ocean.

ANSWER: El Niño-Southern Oscillation (accept Southern Oscillation before mentioned) <ESS - Tegulla>

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( 40 ) Note to moderator: Before reading, read aloud this script: "When writing this packet, Antonio always ran into a problem which was that his tossups were too long. This is Tiny Tossups after all, and not ACF Nats tossups. Shiva, being the strict and sexy packet editor, said no. But he figured out the errors in his ways. So, Shiva the benevolent and sexy leader allowed Antonio to create this 14-line, 284 word long tossup that is Superpower, Super Duper Power, Super Duper Mega Power, Super Duper Mega Ultra Power, and zero marked. To clarify, if you answer the question after the zero-mark, you get no points, because why are you waiting all the way until the end for the 14-line tossup. Like seriously."

In his screenwriting debut, this person wrote the script for a 1981 neo-noir (~) erotic thriller starring (!) Jack Nicholson that was based off of a 1934 novel by James M. (-) McCain. In 2008 this man wrote an essay which detailed his falling out with political correctness and adoption of conservatism called "Why I Am No Longer A Brain-Dead Liberal". In another work, he claimed that the subject "of all drama is (+) The Lie" in his *Three Uses of the Knife*. In one play by this man, a person asked to name a contraption used for spreading the legs of dead pigs says "Things are what they are". In that play by this man, a character gets beat up by a gang of Mexicans for confusing the names of (\*) Masonic and Columbus Hospital. Another play by this author ends with one character angrily holding a chair above his head after snapping at another character for telling him not to refer to his wife as "baby". Another play by him opens with an epigram by William Makepeace Thackeray and details the conflict between two men who try to get a movie made with a successful actor but are distracted by a seductive secretary who wants to greenlight a movie based on a book by Bobby Gould instead. Known for terse and vulgar dialogue, his most famous play opens with people named Patel being made fun of in a Chinese restaurant and follows Levene, Roma, Moss, and Aaronow in a competition for a Cadillac by seeing who can make the most sales. For ten points, name this contemporary conservative Jewish-American playwright behind works like *American Buffalo*, *Oleanna*, *Speed-the-Plow*, and (0) ~~Glengarry Glen Ross~~.

ANSWER: David Mamet <good tossups and question length; American Literature - de Guzman>

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