

1. **The level of this ion in the blood is controlled by FGF23. Upon receiving a signal, epidermal growth factor receptor adds this to itself, starting an intercellular signaling cascade. Three of these ions are found in hydroxylapatite, which is a calcium containing compound that makes up bone. This ionic group is attached to proteins by kinases. It is found on the five (\*) prime end of DNA. Three of them are attached to adenosine in ATP. For 10 points, name this ion composed of four oxygens and one phosphorus.**

ANSWER: **phosphate** ion [prompt on **PO<sub>4</sub><sup>3-</sup>**]

001-11-29-05102

2. **This force was first spotted by its enemies at Lizard Point. The Battle of Gravelines resulted in the defeat of this force. This force was led by the Duke of Medina-Sidonia after the death of its originally planned leader, the Marquis of Santa Cruz. The defeat of this force was attributed by some to the so-called Protestant Wind. Only sixty (\*) of the ships from this fleet were able to return to their country of origin. For 10 points, name this fleet of ships that Philip II sent in an attempt to take England in 1588.**

ANSWER: Spanish **Armada** [or Invincible **Armada**; or **Armada** Espanola; or **Armada** Invencible]

023-11-29-05103

3. **Though not the namesake of any free energies, this man introduced thermodynamics into the chemistry curriculum in the textbook *Thermodynamics and the Free Energy of Chemical Substances*, co-authored with Merle Randall. Along with Irving Langmuir, he theorized that atoms either donated, accepted, or "shared" electrons to get to a valence of eight. He also defined an acid as an (\*) electron pair acceptor and a base as an electron pair donor. For 10 points, name this chemist who is also the namesake of electron dot structures used to represent covalently bonded compounds.**

ANSWER: Gilbert Newton **Lewis**

003-11-29-05104

4. **In one of his plays, Harry and Edna are frightened into leaving home and stay at Agnes and Tobias' house. He also wrote a play in which Jerry kills himself with a knife held by Peter. This author of *A Delicate Balance* and *The Zoo Story* also wrote a play in which the "mousy" (\*) Honey and her husband Nick visit the house of the bickering couple George and Martha. For 10 points, name this dramatist of *Who's Afraid of Virginia Woolf*?**

ANSWER: Edward Franklin **Albee** III

024-11-29-05105

5. **This was the name of the first vehicle planned for the canceled *Constellation* program of missions to the Moon and Mars, and is the name of the first nebula to be photographed. The constellation of this name contains a red giant 950 times as large as the Sun, as well as the gamma star Bellatrix. The two primary stars of this constellation have names meaning "the left leg of the giant" and "the giant's shoulder." (\*) For 10 points, Rigel and Betelgeuse (BAY-tell-"juice") are found in what constellation with both a "sword" and a "belt"?**

ANSWER: **Orion**

019-11-29-05106

6. **One character in this opera sings the aria “Avant de quitter ces lieux,” in which he reveals he will be safe at war because of his sacred medallion but worries about his sister. The antagonist rouses Siebel and Wagner with the “Song of the Golden Calf.” The lead soprano of this opera is Marguerite, who sings about the finery of her necklaces and earrings in the “Jewel Song.” The antagonist of this opera uses an image of (\*) Marguerite at her spinning wheel to convince the title character to sell his soul. For 10 points, name this Charles Gounod opera about Mephistopheles and a German scholar.**

ANSWER: *Faust*

015-11-29-05107

7. **One Senator and congressman from this state, Claude Pepper, was nicknamed "Red" for his left-wing positions and was the architect of a law that abolished most mandatory retirement ages. The Battle of Olustee was the main Civil War battle fought in this state. Henry Flagler was instrumental in establishing railways in this state and making it a (\*) tourist destination. For 10 point, name this state that was the home of Osceola, a leader of the Seminoles, and was at the center of the disputed 2000 U.S. Presidential election.**

ANSWER: Florida

030-11-29-05108

8. **This artist painted a woman kneeling next to the bed of a tubercular girl in his *The Sick Child*. That work, along with such paintings as *Death in the Sickroom* and *Vampire*, is a part of this artist's *Frieze of Life* series. That same series also includes a painting that depicts two men in the left background under a (\*) blood-red sky while the central figure opens his mouth and clutches his head between his hands. For 10 points, name this Expressionist painter, a Norwegian who created *The Scream*.**

ANSWER: Edvard Munch (moonk)

023-11-29-05109

9. **One argument put forward by this man considers a man looking at every possible shade of a certain color and seeing a blank at one point. That idea of the “missing shade of blue” can be found in this man’s “Of the Origins of Ideas.” Another work by this man features Demea, Philo, and Cleanthes debating the existence of God. Immanuel (\*) Kant credited this author of *Dialogues Concerning Natural Religion* for awakening him from a “dogmatic slumber.” For 10 points name this Scottish philosopher and writer of *An Enquiry Concerning Human Understanding*.**

ANSWER: David Hume

002-11-29-05110

10. **At the end of this novel, the protagonist's daughter, Berthe, must support herself by working in a cotton factory. In this novel, a man named Hippolite has his leg amputated after a botched operation. The protagonist of this novel drinks arsenic in order to avoid the shame of her husband discovering her (\*) affairs with Leon and Rodolphe. This novel focuses on a woman bored with her marriage to a country doctor named Charles. For 10 points, name this novel about the adulteress Emma, written by Gustave Flaubert.**

ANSWER: *Madame Bovary*

080-11-29-05111

11. **Identical busts of this man can be found in cities in West Virginia, Missouri, and Louisiana, all of which share this man's name. This man issued a proclamation granting liberty to murder any civilians supporting a certain European country in his "Decree of War to the Death." This man's victory at the Battle of Carabobo led to the independence from (\*) Spain of Venezuela, which was one nation that formed the short-lived republic of which this man served as president. For 10 points, name this leader of Gran Colombia known in South America as the Liberator.**

ANSWER: Simón Bolívar

081-11-29-05112

12. **This man's papers were collected in *The Farther Reaches of Human Nature*. He described moments of profound happiness that he called "peak experiences," which many of his subjects repeatedly experienced. He proposed that humans must attain (\*) physical needs such as water and food, then safety needs, and once a person achieved those they could potentially reach self-actualization. For 10 points, name this humanist psychologist who created the concept of the Hierarchy of Needs.**

ANSWER: Abraham Harold Maslow

027-11-29-05113

13. **In one story, this god is the first to be tried for murder after killing Halirrhothius to protect his daughter Alcippe (al-KIP-ee). This god was trapped in a giant bronze bar by giants called the Aloadae (ah-LOW-uh-dye). Through Rhea Silvia, this god is sometimes credited with fathering Romulus and Remus. He angers (\*) Hephaestus by sleeping with Aphrodite and is accompanied by personifications of terror and fear named Phobos and Deimos. For 10 points, name this Greco-Roman god of war.**

ANSWER: Ares [or Mars]

015-11-29-05114

14. **This play ends with a performance of the song "Hey, ho, the wind and the rain" by a jester. A subplot in this play involves a plot between Andrew Aguecheek, Sir Toby Belch, and the aforementioned jester Feste to humiliate the uptight steward Malvolio, who wants to marry his lady Olivia. However, Olivia actually falls in love with a character who disguises herself as the (\*) man Cesario after a shipwreck off the Illyrian coast. For 10 points, name this William Shakespeare comedy which contains the marriage of Viola and Duke Orsino.**

ANSWER: Twelfth Night, or *What You Will*

082-11-29-05115

15. **For an RLC circuit, the frequency associated with this effect is where impedance is at a minimum. Substances can be analyzed through a technique that uses the nuclear magnetic form of this effect. That technique's commonly used medical variant is called (\*) MRI. This effect causes the amplitude of a system to hit a maximum. For a vibrating string, the frequencies of this are multiples of the fundamental. For 10 points, name this effect where the frequency of the input force equals the natural frequency of the system.**

ANSWER: resonance

001-11-29-05116

16. **This geological feature has a Vishnu Group that consists of the Vishnu, Brahma, and Rama Schists. A trail that can be followed in this site travels along the Bright Angel Fault. The Kaibab Plateau borders one part of this geological feature known as the North Rim. In 2007, a glass (\*) skywalk was opened at this site for public use. For 10 points, name this geological feature of northern Arizona that was created by the Colorado River.**

ANSWER: Grand Canyon

023-11-29-05117

17. As Duane Jackson, this actor attends Sam the Lion's cinema in *The Last Picture Show*. He dates Maggie Gyllenhaal in his Oscar-winning turn as fading country star "Bad" Blake in *Crazy Heart*. A girl named Mattie Ross hires his character, "Rooster" Cogburn, to track her father's killer in the Coen brothers' (\*) *True Grit*. In another film, he plays a bowler named "The Dude" who must deliver a million dollar ransom. For 10 points, name this star of *Tron* and *The Big Lebowski*.

ANSWER: Jeff Bridges

079-11-29-05118

18. In this novel, Count Mippipopolous espouses the philosophy of getting your money's worth and knowing when you have. The prostitute Georgette Leblanc tries to hide her rotting teeth in this novel, and the hotel owner Montoya provides support for those who show promise as "the real thing" in this novel. The wounded World War I veteran (\*) Jake Barnes is the protagonist of this work in which the matador Romero slays a bull in Pamplona. For 10 points, name this book about members of the Lost Generation living in Spain in the 1920s, a novel by Ernest Hemingway.

ANSWER: *The Sun Also Rises*

030-11-29-05119

19. This composer was given the task of improvising on a "Royal Theme" provided to him by a monarch, which eventually resulted in his piece *The Musical Offering*. The fifth part of another work by this composer contains a solo for virtuoso harpsichord. That work was written for the (\*) margrave of a certain city. For 10 points, name this German composer whose works include the organ piece *Toccatina and Fugue in D minor*, *The Well-Tempered Clavier*, and the *Brandenburg Concertos*.

ANSWER: Johann Sebastian Bach

023-11-29-05120

20. This ruler put down the rebellion of Lucius Antonius in the Perusine War. He signed with Lucius' brother the Treaties of Tarentum and of Brundisium. This man supposedly asked Quintilius Varus for his legions back after the Roman defeat at the Battle of Teutoburg Forest. This man formed part of a group along with (\*) Lepidus and a man whom this ruler defeated at the Battle of Actium. For 10 points, name this member of the Second Triumvirate who defeated Mark Antony and became the first emperor of the Roman Empire.

ANSWER: Gaius Julius Caesar Augustus [or Gaius Julius Caesar Octavianus]

023-11-29-05121

21. This artist's depiction of the god Iris is missing both an arm and a head and was incorporated into *The Apotheosis of Victor Hugo*. Romantically involved with the sculptor Camille Claudel, he also created a monument to the martyrs of a French city besieged during the Hundred Years' War, *The Burghers of Calais* (kuh-LAY). This sculptor's (\*) *The Gates of Hell* includes miniature versions of *The Kiss* and a sculpture of Dante resting his chin on a clenched fist. For 10 points, name this French sculptor of *The Thinker*.

ANSWER: François-Auguste-René Rodin (roh-DAN)

083-11-29-05122

22. One short story by this author tells of how the Devil helped Pahom (pah-HOME) acquire lots of real estate, while another story tells of Trukhashevsky's (TROO-kah-SHEV-skee's) affair with Pozdnishev's ("PAUSED"-nee-shev's) wife. Those stories are "How Much Land Does a Man Need?" and "The Kreutzer (KROYT-zer) Sonata." This author recounted the (\*) last days of a dying judge in *The Death of Ivan Ilyich* (ILL-ee-itch). For 10 points, name this author of *Anna Karenina* (kah-REN-inn-uh) and *War and Peace*.

ANSWER: Leo Nikolayevich Tolstoy

001-11-29-05123

23. This product often undergoes an alkali wash treatment to increase available niacin, known as nixtamalization. This product's "field" version has been bred to maximize starch production at the expense of taste and received 56 billion dollars worth of subsidies between 1995 and 2006. It is processed into a fuel additive found in (\*) E10, and a sweetener found to increase obesity at a faster rate than sucrose. For 10 points, name this staple crop native to the New World which is used to create ethanol and a namesake high fructose syrup, also known as maize.

ANSWER: corn [or maize before mention]

082-11-29-05124

1. One member of this duo, Jacob, illustrated the connection between Germanic and the Indo-European languages with his namesake law. For 10 points each:

[10] Name this pair of German linguists who also collected stories such as "Hansel and Gretel" and "Rumpelstiltskin" in their namesake fairy tales.

ANSWER: Brothers **Grimm**

[10] The brothers Grimm's linguistics work dealt with this discipline, the study of the history of a word's origins and derivation.

ANSWER: **etymology**

[10] In linguistics, this term refers to the change in the English language from the fifteenth to eighteenth centuries in which the namesake types of letters diphthonzed.

ANSWER: **Great Vowel Shift**

030-11-29-05201

2. The primary antagonist of this novel is a large, hairless man usually referred to only as The Judge. For 10 points each:

[10] Name this violent novel about The Kid's exploits as part of the Glanton gang along the U.S.-Mexico border.

ANSWER: ***Blood Meridian*** or *the Evening Redness in the West*

[10] *Blood Meridian* was written by this American author of *The Road*.

ANSWER: Cormac **McCarthy**

[10] This McCarthy novel, which takes its title from the poem "Sailing to Byzantium," is about a drug deal gone bad.

ANSWER: ***No Country for Old Men***

024-11-29-05202

3. Answer some questions about a certain Greek hero, for 10 points each.

[10] This man married Andromeda after rescuing her from a sea monster, and also chopped off the head of Medusa.

ANSWER: **Perseus**

[10] Perseus was the son of this woman, whose father Acrisius locked her up to prevent her from conceiving a child, although Zeus still managed to impregnate her.

ANSWER: **Danae**

[10] When Perseus chopped off Medusa's head, Chrysaor and this brother of his were born from Medusa's body. This creature's father was Poseidon.

ANSWER: **Pegasus**

024-11-29-05203

4. This quantity is 1.33 for water. For 10 points each:

[10] Name this measure of the speed of light in a medium, relative to that in a vacuum.

ANSWER: **index** of **refraction** [or **refractive index**; prompt on **n**]

[10] This law relates the sines of the angles of incidence and refraction to the indices of refraction in the media being entered and exited.

ANSWER: **Snellius's Law**

[10] Snell's Law can be used to find this angle at which total internal reflection occurs.

ANSWER: **critical** angle

003-11-29-05204

5. Routes for climbing this peak include going by the West Buttress or along the Muldrow Glacier route.  
For 10 points each:

[10] Name this mountain that is the highest in North America.

ANSWER: Mount **McKinley** [or **Denali**]

[10] Mount McKinley is a part of this range, named for the U.S. state in which Mount McKinley is located.

ANSWER: **Alaska**

[10] This nearby peak is also part of the Alaska Range, and it is the second highest peak fully within the United States.

ANSWER: Mount **Foraker**

023-11-29-05205

6. During this election, the Republicans gained immense popularity by releasing the "Contract With America." For 10 points each:

[10] Name this midterm election in which Newt Gingrich became the Speaker of the House for the 104th Congress on the force of public dissatisfaction with liberal policies, such as a universal health care plan.

ANSWER: **1994** Midterm Election

[10] The 1994 election signaled the country's unhappiness with the policies of this Democratic president. He also signed NAFTA and was impeached for lying about an affair with Monica Lewinsky.

ANSWER: Bill **Clinton** [or William Jefferson **Clinton**; or William Jefferson **Blythe** III]

[10] During his first term, Clinton also weathered this scandal, centering on a failed real-estate investment. David Hale alleged that Clinton had forced him to loan \$300,000 for the namesake venture.

ANSWER: **Whitewater** Scandal

080-11-29-05206

7. Name some Chicago buildings or their architects for 10 points each:

[10] This building lost the world's tallest building title to the Petronas Twin Towers and was renamed the Willis Tower.

ANSWER: **Sears** Tower

[10] This "father of the skyscraper" helped give Chicago a distinct style through some of his collaborations with Dankmar Adler, such as the Chicago Stock Exchange and the Wainwright Building in St. Louis.

ANSWER: Louis **Sullivan**

[10] This cantilevered house in Hyde Park is often considered the best example of Frank Lloyd Wright's Prairie Style.

ANSWER: **Robie** House

015-11-29-05207

8. After being threatened with a beating by his son for a change, the protagonist of this play has a change of heart and sets fire to the Thinkery. For 10 points each:

[10] Identify this play in which Strepsiades attempts to confuse his creditors by applying the twisted logic of the Sophists.

ANSWER: *The* **Clouds**

[10] *The Clouds* was written by this comic playwright, who described an attempt to get all Athenian women to stop having sex with their husbands until peace is declared in *Lysistrata*.

ANSWER: **Aristophanes**

[10] In another Aristophanes play, these animals laugh at the groans of pain uttered by Bacchus and represent both the fans and critics of Aristophanes's plays.

ANSWER: **frogs**

020-11-29-05208

9. Hippolyte Fizeau was among the first to describe this effect. For 10 points each:

[10] Name this effect similar to the Doppler Effect in which light emitted from an object moving away from an observer will be shifted towards the lower energy end of the visible spectrum.

ANSWER: **red shift**

[10] Red shift is described in this equation named for an American astronomer that relates the observed velocity of an object to its distance times a certain constant.

ANSWER: **Hubble's law**

[10] The inverse of the constant in Hubble's law is often used as an estimate for this quantity, believed to be roughly 13.5 billion years.

ANSWER: **age of the universe** (accept equivalents)

064-11-29-05209

10. Based on the video game of the same name, this film followed Agent 47's work for The Organization.

For 10 points each:

[10] Name this 2007 action movie whose plot hinges on the assassinated president of Russia actually being a body double.

ANSWER: ***Hitman***

[10] This star of *Hitman* can now be seen on *Justified* and is perhaps best known as Seth Bullock on *Deadwood*.

ANSWER: Timothy **Olyphant**

[10] Olyphant played the terrorist mastermind in this 2007 Bruce Willis film, the fourth appearance of Willis as John McClane and the only hit movie named after the state motto of New Hampshire.

ANSWER: ***Live Free or Die Hard***

019-11-29-05210

11. This country's painters have included Ilya Repin and members of the Constructivist movement. For 10 points each:

[10] Name this country, another citizen of which founded the Blue Rider movement with Franz Marc and painted several *Compositions*.

ANSWER: **Russia** [prompt on **Soviet Union**; prompt on **USSR**]

[10] This aforementioned Russian painter founded the Blue Rider, which was named after a painting by him.

ANSWER: Wassily Wassiliyevich **Kandinsky**

[10] This Russian painter was affiliated with the Jack of Diamonds movement before painting geometrically perfect squares in works like *Black Square* and *White on White* as the foremost exponent of Suprematism.

ANSWER: Kasimir Severinovich **Malevich**

026-11-29-05211

12. The first known example of this action was in 387 BCE, when the Gauls did it after winning the Battle of the Allia. For 10 points each:

[10] Identify this act of plunder, which also took place in 410 by Visigoths under Alaric.

ANSWER: a **sack of Rome** [or obvious equivalents; prompt on partial answer]

[10] In 455, Rome was again sacked by Geiseric, the leader of this people. In 430, their siege of Hippo had caused the death of St. Augustine.

ANSWER: **Vandals**

[10] Repeated sieges were among the reasons that Roman control of Italy fell and was replaced by leaders such as this Ostrogoth, who ruled from Ravenna for a long period around the turn of the sixth century.

ANSWER: **Theodoric** the Great

019-11-29-05212

13. Muller's Ratchet describes how mutations can occur in organisms undergoing this process. For 10 points each:

[10] Name this general form of reproduction which as its name suggests involves only a single parent.

ANSWER: **asexual** reproduction

[10] Many single celled organisms undergo this form of asexual reproduction in which the parent divides into two daughter cells.

ANSWER: **binary fission**

[10] Some reptiles undergo this form of asexual reproduction in which an unfertilized egg develops into an offspring.

ANSWER: **parthenogenesis**

064-11-29-05213

14. This empire used the "quipu," a system of knotted cords, to keep records. For 10 points each:

[10] Identify this empire which ruled from Cuzco in modern-day Peru before its conquest by Pizarro.

ANSWER: **Incan** empire

[10] Pizarro forced this Incan emperor to fill a room with gold, then strangled him to death anyway.

ANSWER: **Atahualpa**

[10] Just before Pizarro's arrival, Atahualpa had secured his claim on the Incan throne by defeating this half-brother at the Battle of Quipaipan (kee-pie-PON).

ANSWER: **Huascar**

019-11-29-05214

15. This man used the metaphor of a tangled bank in one of his works. For 10 points each.

[10] Name this author of *On the Origin of Species* and proponent of natural selection.

ANSWER: Charles Robert **Darwin**

[10] This coiner of the word "invertebrate" proposed a a form of evolution using acquired characteristics. A common illustration involves a giraffe's neck getting longer because it stretches to get leaves.

ANSWER: Jean-Baptiste **Lamarck**

[10] This author of *Le Règne Animal* was one of the first to propose that animals have gone extinct. He had a notable debate with Geoffroy St. Hilaire.

ANSWER: Georges **Cuvier**

001-11-29-05215

16. Characters in this novel include Pirate Prentice and Bianca Erdman. For 10 points each:

[10] Name this 1973 novel about Tyrone Slothrop, Pavlovian conditioning, and V-2 rockets.

ANSWER: **Gravity's Rainbow**

[10] *Gravity's Rainbow* is by this postmodern novelist who also wrote *The Crying of Lot 49*.

ANSWER: Thomas Ruggles **Pynchon**

[10] This Pynchon novel, named after a pair of surveyors, is narrated by Wicks Cherrycoke.

ANSWER: **Mason & Dixon**

024-11-29-05216

17. This god weighed the heart of the dead on a scale against the feather of Ma'at. For 10 points each:

[10] Name this jackal headed god of Egyptian myth.

ANSWER: **Anubis** [or **Anpu**; or **Inpu**]

[10] According to some stories, Osiris is the son of this god of the underworld who was chopped to pieces by his brother Set.

ANSWER: **Osiris** [or **Aseri**]

[10] Osiris's three siblings included Set, Isis, and this woman who married her brother Set.

ANSWER: **Nephthys**

064-11-29-05217

18. He wrote plays such as *Love's Last Shift* and *The Careless Husband*. For 10 points each:

[10] Name this Poet Laureate who was parodied in *The Dunciad*.

ANSWER: Colley **Cibber**

[10] This author of *The Dunciad* wrote some other parodic works, including the mock-epic *The Rape of the Lock*.

ANSWER: Alexander **Pope**

[10] Pope also wrote one of these works "on Criticism" and one of them "on Man." This term was coined by Michel de Montaigne.

ANSWER: **essays**

024-11-29-05218

19. This country gained economic ascendancy in the 1600's, partially through the Baltic "Mother Trade" that was facilitated by the *fluyt*. For 10 points each:

[10] Name this country that gained independence from Spain in the 80 Years' War, and whose modern capital is Amsterdam.

ANSWER: Kingdom of the **Netherlands** [or Koninkrijk der **Nederlanden**]

[10] During the seventeenth century, Dutch nobles maniacally purchased and hoarded these objects, some of which did not even exist. The *Semper augustus* was particularly sought after.

ANSWER: **tulips**

[10] Some historians theorize that Dutch "tulipmania" was a response to Swedish defeats in the Thirty Years' War. This Swedish king won a significant victory at Breitenfeld but was killed at Lutzen.

ANSWER: **Gustavus Adolphus** [or **Gustav II** Adolf]

080-11-29-05219

20. This composer added cannons to the score of one patriotic piece that includes a riff on "Le Marseillaise." For 10 points each:

[10] Name this Russian composer who wrote the *1812 Overture* and the ballet *The Nutcracker*.

ANSWER: Peter Ilyich **Tchaikovsky** [or Pyotr Ilich **Tchaikovsky**]

[10] Tchaikovsky also wrote this ballet in which von Rothbart turns Odette into the title creature.

ANSWER: **Swan Lake** [or **Lebedinoye ozero**]

[10] Tchaikovsky's first piece in this genre led to a long debate with Nikolai Rubinstein. It opens with a descending chromatic F, D flat, C, B-flat sequence in the brass reminiscent of the *Marche Slav*.

ANSWER: **Piano Concerto** [prompt on partial answer]

026-11-29-05220

21. At standard pressure, this value is one hundred degrees Celsius for water. For 10 points each:

[10] Name this temperature at which a substance's liquid and gas forms are in equilibrium.

ANSWER: **boiling point**

[10] Boiling point elevation is one of these types of properties that depend only on the amount of solute in solution and not on the type of solute.

ANSWER: **colligative** properties

[10] For a liquid-vapor boundary, this equation states that the natural log of the ratios of two pressures is proportional to the difference of the reciprocals of the temperatures.

ANSWER: **Clausius-Clapeyron** equation (CLOW-see-us klah-PAY-ron)

020-11-29-05221