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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Conference Tournament 2015****Round 3****First Period, Fifteen Tossups** |

1. At this location, Stephen Mather ordered the cutting of a drive-through tunnel in the Wawona Tree to boost tourism. This location contains a grove named after the Tuolumne River that is home to many examples of sequoia trees. The naturalist John Muir opposed the building of a dam in this location's northern area, the Hetch Hetchy Valley. This park is home to the Sentinel Dome and Half Dome, locations heavily photographed by Ansel Adams. For 10 points, name this California national park where El Capitan is found.
ANSWER: **Yosemite** National Park

2. In a book, this man analyzed social cues called "tacts" and "mands" using his three-term contingency model. This author of *Verbal Behavior* introduced "fixed" and "variable" reward intervals called schedules of reinforcement. A variation on this psychologist's main invention features an electrified floor used to demonstrate avoidance learning. That contraption of his includes a tray of food pellets attached to a lever that rats learned to operate. For 10 points, name this psychologist who used namesake boxes to study operant conditioning.
ANSWER: B.F. **Skinner** [Burrhus Frederic **Skinner** ]

3. This player hit for the cycle in a September 2011 game against the Colorado Rockies. This player hit a three run triple off of Justin Verlander to open the scoring in the 2012 All-Star Game. This player was named MVP of the 2012 World Series after hitting three home runs in Game One, two of which were also surrendered by Verlander. For 10 points, name this third baseman nicknamed "Kung Fu Panda," who signed with the Boston Red Sox in the 2014 offseason after winning three World Series titles with the Giants.
ANSWER: Pablo **Sandoval** Â [Pablo Emilio Juan Pedro **Sandoval** Jr.]

4. A Roman-era ditch in this modern day country is known as the Fossa Regia. This country's largest island, which may have inspired the Homeric island of the Lotus-Eaters, is Djerba Island. This country was the site of an early American defeat during World War II at Kasserine Pass. In late 2010, a street vendor set himself on fire in this country, inspiring protests that ousted Zine El Abidine Ben Ali and marked the beginning of the Arab Spring. For 10 points, name this northernmost African country, the modern-day site of Carthage.
ANSWER: **Tunisia** [or **Tunisia**n Republic; or al-Jumhuriyya at-**Tunisiyyah**]

5. In a parable by Jesus, this number of servants are given various sums of money, but one of the servants buries the money in the ground. This many disciples are present during the Transfiguration of Jesus. After fasting for forty days, Jesus is tempted by Satan this number of times. It is both the number of times that Peter denies Jesus and the number of wise men that visit the infant Jesus. For 10 points, give the number of aspects of God present in the Trinity.
ANSWER: **3**

6. This deity is rudely insulted by a ferryman that refuses to let him cross a river. This deity wrestles with a woman representing old age and tries to drink water from a horn connected to the ocean when he and Loki travel to Utgard. This deity's wife is the golden-haired harvest goddess Sif. At Ragnarok, this deity dies from the poison of the Midgard Serpent shortly after slaying it with his weapon Mjolnir. For 10 points, name this hammer-wielding Norse god of thunder.
ANSWER: **Thor**

7. Munitions intended for this war were destroyed by secret agents in the Black Tom explosion. The Green Corn rebellion was led by farmers opposed to this war, which was promoted by the Creel Committee. Despite using the slogan "He kept us out of war," a president entered this war after the discovery of the Zimmerman telegram and the sinking of the Lusitania. For 10 points, name this war ended by the Treaty of Versailles, which the US entered under Woodrow Wilson.
ANSWER: **World War I** [or **WWI** ; the **Great War** ]

8. This artist's most valuable painting was from his *Death and Disasters* series and featured images of a car mangled around a tree, contrasted with a silver field. This man was shot in 1968 by Valerie Solanas, the radical feminist author of the *S.C.U.M. Manifesto.*This artist operated out of a studio called "The Factory" and is credited with the observation that in the future, everyone would be famous for fifteen minutes. For 10 points, name this Pop Art painter, noted for his depictions of things like Campbell's Soup cans.
ANSWER: Andy **Warhol** [or Andrej **Varhola** Jr.]

9. Crosses that this ruler constructed in remembrance of his wife still exist at Geddington and Waltham Cross. The Frescobaldi of Florence became this king's money lenders after he expelled all of England's Jews in 1290. This king's forces killed Llywelyn the Last and annexed Wales. During his reign, an army led by the Earl of Surrey and Hugh de Cressingham lost to William Wallace at Stirling Bridge. For 10 points, name this English king who was nicknamed "Longshanks."
ANSWER: **Edward I** [or Edward **Longshanks** before it is read; prompt on **Edward** or the **Hammer of the Scots**]

10. This poem's author discussed the principles underlying its creation in the essay "The Philosophy of Composition." The speaker of this poem makes repeated reference to a "pallid bust of Pallas" in his room. This poem is set "once upon a midnight dreary," when the speaker is visited by the title creature. For 10 points, name this poem by Edgar Allan Poe about a bird who croaks, "Nevermore."
ANSWER: "The **Raven** "

11. Parts of this structure are connected by the ligamenta flava. The "bamboo" form of this structure can indicate the disease ankylosing spondylitis. The nucleus pulposus squeezes through the fibrous ring when part of this structure herniates, which can cause sciatica. The axis and atlas are the first two parts of its cervical region, and in humans its 12 thoracic bones attach to the ribs. The last section of this structure is called the tailbone. For 10 points, name this skeletal structure that encloses a namesake "cord" and is comprised of 33 vertebrae.
ANSWER: **spine** [or **vertebral column** ; or **backbone** ; or **spinal column** ; prompt on **vertebrae** and intervertebral **discs** ; accept **axis** before "flava", prompt after it is read; accept **cervical spine** until it is read]

12. The IUCN has two categories for this phenomenon, one qualified by "in the wild". This phenomenon occurred on Stephens Island due in part to the cat Tibbles. Species thought to have experienced this phenomenon that later reappear, such as the coelacanth (SEE-luh-kanth), are called "Lazarus species". The Alvarez hypothesis supposed that the K-T boundary was indicative of a "mass" example of this phenomenon. It occurred on Mauritius to the dodos, and endangered species are at risk of it. For 10 points, name this evolutionary mechanism in which all individuals in a species die off.
ANSWER: **extinction** [or **dying out** ; or word forms; accept **extermination** or **eradication** before "JLB", prompt on those answers after]

13. Leonhard Euler showed the infinite sum of "one over n squared" was this number squared over six. It is impossible to construct a square with the same area as a given circle using only a compass and straightedge because this number is transcendental. The square root of two times this number appears in the denominator of the normal distribution function. Archimedes approximated it by constructing polygons around and within a circle. This number in radians is equivalent to 180 degrees. For 10 points, name this ratio of a circle's circumference and diameter.
ANSWER: **pi**

14. This man wrote popular narrative poems such as *The Lay of the Last Minstrel* and *Marmion.* Now he is better remembered for novels such as *Waverley,* the first in a series including one about a legendary Scottish outlaw and another about a disinherited knight named Cedric of Rotherwood. For 10 points, name this Scottish novelist of *Rob Roy* and *Ivanhoe.*
ANSWER: Walter **Scott**

15. A quantity represented by this letter is multiplied by 1.22 over the diameter of an aperture, according to the Rayleigh criterion. This letter names the cosmological constant and the point at which helium can transition between fluid and superfluid states. The half-life of a material equals the natural log of 2 divided by a quantity represented by this letter. Another quantity represented by this letter equals the velocity of a wave divided by its frequency. For 10 points, name this Greek letter that represents the wavelength.
ANSWER: **lambda** [or **lambda** point]

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 3****Directed Round** |

1A. What non-orientable surface is constructed by giving a strip of paper a half-twist and gluing the ends of the strip together?
ANSWER: **Moebius** strip [or **Moebius** band]

1B. What man, who cast David Bowie as the protagonist of his movie *Labyrinth* , created Kermit the Frog and *Sesame Street?*
ANSWER: Jim **Henson** [or James Maury **Henson** ]

2A. What dimensionless quantity, the ratio between inertial and viscous forces, determines whether a fluid's flow is turbulent or laminar?
ANSWER: **Reynolds** number [or **Re** ]

2B. Which Italian scientist names a method of silver staining used for visualizing nervous tissue and is also known for his discovery of a namesake organelle involved in protein packaging?
ANSWER: Camillo **Golgi**

3A. This is a 20-second calculation question. A function is defined as f of x equals e to the quantity x minus 2. What is the inverse of this function?
ANSWER: f inverse of x equals **2 plus ln x** [or **2 plus** natural **log** arithm of **x** ; or **ln x plus 2** ; or natural **log** arithm of **x, plus 2** ; do not accept answers including "quantity x plus 2"]

3B. This is a 20-second calculation question. A 95% confidence interval for the proportion of voters who will vote for the incumbent in the upcoming election is given as 0.48 to 0.56. What proportion of voters sampled said they would vote for the incumbent?
ANSWER: **0.52** [or **52%** ; or **52/100** ; or **13/25** ]

4A. What Kurt Vonnegut novel follows Billy Pilgrim, who becomes "unstuck in time"?
ANSWER: ***Slaughterhouse-Five***

4B. The St. Francois (francis) Mountains can be found in which high plateau region covering parts of Missouri and Arkansas?
ANSWER: **Ozark** s [or **Ozark** Mountains; or **Ozark** Plateau]

5A. What ancient maritime power, with capital at Tyre and cities across the Mediterranean, developed a script which is the ancestor of almost all modern alphabets?
ANSWER: **Phoenecia**

5B. Give the English translation of the Latin term "annus mirabilis," which John Dryden used as the title of a 1667 poem about London, England.
ANSWER: **wonderful year** [or **year of wonders** ; or **year of miracles** ]

6A. What jazz bassist and bandleader composed and performed the bebop albums *Pithecanthropus Erectus* and *The Black Saint and the Sinner Lady?*
ANSWER: Charles **Mingus** Jr.

6B. What Platonic dialogue includes a drinking party where Socrates and other prominent Athenians discuss the nature of love?
ANSWER: ***Symposium***

7A. What anti-foreigner revolt was suppressed by the Eight-Nation Alliance and led by the Society of Righteous and Harmonious Fists?
ANSWER: **Boxer** Rebellion

7B. What satirical essay by Jonathan Swift recommends the consumption of poor Irish children as a way to combat famine?
ANSWER: "A **Modest Proposal** "

8A. This is a 30-second calculation question. A volume of water that completely fills a right cylindrical vase of radius 2 inches and height 12 inches is being poured into a whole number of glass balls. If the balls each have a radius of 2 inches, how many of them are needed to completely empty the vase?
ANSWER: **5** balls [do not accept "4.5 balls"]

8B. This is a 30-second calculation question. A triangle has side lengths of 6, 9, and 12 units. What is the sine of the angle opposite the side of length 12 units?
ANSWER: square **root** of **15** all **over 4** [or **rad** ical **15** all **over 4** ; or square **root** of **quantity 15 over 16** ]

9A. Which literary term usually refers to a third-person narrator presented as all-knowing?
ANSWER: **omniscience** [or **omniscient** ]

9B. What Chilean poet wrote, "In you everything sank!" in his "Song of Despair" and also wrote *Canto General?*
ANSWER: Pablo **Neruda**

10A. In 2014, French ISIL member Mehdi Nemmouche allegedly killed four people in a shooting at which European city's Jewish Museum?
ANSWER: **Brussels**

10B. What conservative activist and founder of the Eagle Forum successfully led the fight against adoption of the Equal Rights Amendment?
ANSWER: Phyllis **Schlafly**

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 3****Third Period, Fifteen Tossups** |

1. A composer from this country opened an opera with an orchestral sneeze, and collaborated with the composer of *Music for Strings, Percussion and Celesta* on a project to collect this nation's folk songs using phonograph cylinders. This country lends its name to a series of virtuoso gypsy music-infused piano pieces which are divided into a slow *lassan* and fast *friska* section. The second of those "rhapsodies" from this country is often used in cartoons. For 10 points, name this Eastern European country, home to the composers Bela Bartok and Franz Liszt.
ANSWER: **Hungary** [or **Magyarorszag** ]

2. This author created a teenage lover of Queen Elizabeth I who changes sex at around the age of thirty. One of her novels ends when amateur painter Lily Briscoe completes a portrait of Mrs. Ramsay as other members of the Ramsay family sail to the title structure. This author of *Orlando* wrote the feminist essay "A Room of One's Own." Characters in another novel of hers learn of Septimus Smith's suicide and attend a party held by Clarissa. For 10 points, name this modernist British author of *To the Lighthouse* and *Mrs. Dalloway*.
ANSWER: Virginia **Woolf** [or Adeline Virginia **Stephen**]

3. The Quadruple Alliance was formed to oppose this king, whose troops encroached onto the Spanish Netherlands in the War of the Devolution. In a coronation portrait by Hyacinthe Rigaud, this man wears red heels and a white pantyhose. This king's mother Anne of Austria served as a regent early in his reign, and he began his personal rule after the death of his minister Cardinal Richelieu. This king pressured nobles into spending part of the year in his chateau of Versailles. For 10 points, name this "Sun King," an absolutist monarch of France.
ANSWER: **Louis XIV** [or Louis the **Sun King** until it is said; or Louis le **Roi-Soleil** ; or **Louis the Great** ; or **Louis le Grand** ; prompt on **Louis** ]

4. In this country's first major sound film, a woman sings "Falling in Love Again" as a teacher who becomes a cabaret clown watches. In a film from this country, a sailor chops open a coffin to discover a swarm of rats inside, and a shadowy figure with long fingers creeps up a staircase. *The Blue Angel* is a film from this country, home to a female director who depicted mass rallies in *The Triumph of the Will,* Leni Riefenstahl, as well as the director of *Nosferatu,* F.W. Murnau. For 10 points, name this country where many directors made propaganda films for the Nazis.
ANSWER: **Germany** [or Federal Republic of **Germany** ; or Bundesrepublik **Deutschland** ]

5. This man was rewarded by a god for his kind treatment of the satyr Silenus. This ruler was advised to wash himself in the Pactolus River. His barber discovered that this man had the ears of a donkey, a punishment inflicted by Apollo after this man claimed Pan played better music than the god. This ruler found he was unable to eat after Dionysus gave him a soon detested supernatural power. For 10 points, name this mythical Greek king who was given the power to turn everything he touched to gold.
ANSWER: **Midas**

6. Ozone cleaves alkenes because it catalyzes this type of reaction. Glutathione and vitamin E react with agents that catalyze these reactions to prevent cellular stress. CO2 is the endpoint of a biological series of these reactions that catabolically release energy. The conversion of cuprous sulfate to cupric sulfate is an example of this kind of reaction. This type of reaction occurs at the anode in galvanic cells. In these reactions, the charge on a single atom increases because it loses electrons. For 10 points, name these electrochemical reactions contrasted with reductions.
ANSWER: **oxidation**s [prompt on **redox** reactions; prompt on **oxidation-reduction**s]

7. A holder of this office proposed a seven-point plan for ending World War I in August 1917. A failed assassination attempt against a person with this title occurred in Manila in 1970. 1978 was the most recent year in which three people held this title. Eugenio Pacelli negotiated the 1933 Reichskonkordat with Nazi Germany before ascending to this position. The 1929 Lateran Treaty officially established the state over which holders of this title rule. For 10 points, name this title, held by men like Pius XII and Francis I, which signifies their leadership of the Catholic Church.
ANSWER: **Pope** [or **Bishop of Rome** ]

8. This group's enemies included stupid EPA administrator Walter Peck. In their second appearance, they battled a Carpathian tyrant named Vigo who lived in the form of a painting. In their first appearance, this group battled the Sumerian god Gozer, who took on the form of the Stay Puft Marshmallow Man. This team has also encountered a green being called Slimer. This team's theme song asks "Who you gonna call?" For 10 points, name this crew of paranormal investigators from a namesake 1984 film starring Dan Aykroyd and Bill Murray.
ANSWER: **Ghostbusters**

9. This scientist's observations of supernova SN 1604 led to it being named after him. This scientist used a convex lens for the eyepiece in his refracting telescope that improved on Galileo's design. This scientist inherited most of Tyco Brahe's observational data at the latter's death. He developed a law stating that the square of a planet's orbital period is proportional to the cube of the semi-major axis of the planet's orbit. For 10 points, name this astronomer who developed three laws of planetary motion.
ANSWER: Johannes **Kepler**

10. A character in this novel crosses five passes and kills six generals along the way. It begins with an aphorism about how empires "long divided, must unite; long united, must divide." In this novel, characters pledge support to their ruler in the Oath of the Peach Garden. It features the Battle of Red Cliffs, which is where Cao Cao is ultimately defeated. This novel explains the formation of Cao Wei, Shu Han, and Eastern Wu. For 10 points, name this classical Chinese novel by Luo Guanzhong about the feudal states that emerge at the end of the Han dynasty.
ANSWER: ***Romance of the Three Kingdoms*** *[*or ***San Guo Yan Yi*** ]

11. A mixed forest region on the southern shore of this body of water is named for the ancient region of Hyrcania. The Absheron Peninsula, which extends into this body of water, is a major oil-producing region centered on Baku. This body of water is a habitat for the Beluga sturgeon, the source of the most expensive caviar. The Volga River flows into this body of water. For 10 points, name this largest lake on Earth, which borders Iran, Azerbaijan, and Russia, and is typically called a "sea" instead of a "lake."
ANSWER: **Caspian** Sea

12. This man was the subject of an online trend created by Jon Stewart in which people set a video celebrating his Congressional service to inappropriate music. During a 2014 debate, this man said that hospitals in his home state were being "rimracked" by the Affordable Care Act. During the 2013 government shutdown, Rand Paul was overheard telling this man "we're gonna win this," prior to this man co-sponsoring the shutdown-ending bill with Harry Reid. For 10 points, name this senator from Kentucky, who became the Senate Majority Leader in 2015.
ANSWER: Mitch **McConnell** [or Addison Mitchell **McConnell** ]

13. Telomeres arrange in a flower petal design in the "bouquet" substage of this process. Bivalents form in another of its phases after the zipper-like synapsis occurs. This process is divided into reductional and equational parts. Oocytes (OH-uh-sites) are suspended in a stage of this process in which chiasmata move to separate non-sister chromatids. Genetic material is swapped in this process when homologous chromosomes cross over during prophase I. For 10 points, name this process that yields four haploid gametes from a single diploid cell.
ANSWER: **meiosis** [or **meiosis I**; prompt on **prophase** I; do not accept "mitosis"]

14. In a story by this man, the protagonist says, "You were right, old hoss," to a hallucinated friend from Sulphur Creek before dying in a place that is "seventy-five below zero." The title character in one of his novels is the son of Kiche and is named by Grey Beaver. In a novel by this author of "To Build a Fire," the protagonist is eventually owned by the kind John Thornton after being stolen for use in the Klondike Gold Rush. For 10 points, name this author of *White Fang* and *The Call of the Wild.*
ANSWER: Jack **London** [or John Griffith **London** ; or John Griffith **Chaney**]

15. With the United States, this country agreed to a border in the San Juan Channel after the bloodless Pig War. The Treaty of Washington was negotiated with this country by Hamilton Fish to settle the Alabama Claims. Ships called Laird Rams were constructed in this country, which was the destination of a ship intercepted by Charles Wilkes with James Mason and John Slidell on board, the *Trent.* For 10 points, name this country which maintained neutrality during the American Civil War, and had earlier lost the American colonies in the Revolution.
ANSWER: **U**nited **K**ingdom [or Great **Britain** ; or **England**]

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| High School Academic Pyramid Questions | **VHSL Scholastic Bowl****Regular Season 2014****Round 3****Tiebreaker/replacement questions** |

1. This property's magnetic moment can be calculated by multiplying it with the gyromagnetic ratio. Particles with an integer value for this property are exempt from the Pauli exclusion principle. The Stern-Gerlach experiment deflected a beam of silver atoms to determine that this property is quantized. Bosons have an integer value for this property, while fermions, including electrons, have half-integer values for it. For 10 points, name this property, a particle's intrinsic angular momentum.
ANSWER: **spin** [prompt on **angular momentum** until it is read]

2. The sorites paradox and the Gettier problem are unresolved issues in this discipline. Michel de Montaigne claimed that to study this discipline was "to learn to die." In the 20th century, this discipline bifurcated into analytical and contintental traditions. Bertrand Russell wrote an influential history of this discipline. This discipline is divided into fields such as aesthetics, metaphysics, and ethics. Its earliest practitioners, such as Heraclitus, are called "Presocratic." For 10 points, name this intellectual discipline that asks questions about the nature of things.
ANSWER: **philosophy** [accept word forms; accept **metaphysics** before "Michel" is read; accept **epistemology** before "Michel" is read]

3. This author wrote about the affair between Eben Cabot and his mother-in-law Abbie Putnam in his play *Desire Under the Elms.* He wrote about the frequenters of Harry Hope's saloon in another play. This author's posthumously published masterpiece describes the tubercular Edmund and the morphine addict Mary, both of whom are members of the Tyrone family. For 10 points, name this American playwright of *The Iceman Cometh* and *Long Day's Journey into Night.*
ANSWER: Eugene **O'Neill**

4. The production of these objects was authorized after the Hampton Court Conference. A "Wicked" one of these objects, co-produced by Robert Barker, was nicknamed for accidentally leaving out the word "not." William Tyndale produced these texts during the Reformation. The invention of the movable type helped Johannes Gutenberg produce these texts. For 10 points, name these texts whose translations include the Vulgate and the King James Version.
ANSWER: **bible**s [or **King James** Version or **Authorized** Version before "Tyndale" is read]

5. A traditional dance form from this country involves jumping over sliding bamboo sticks and is called "tinikling." This country's Zamboanga Peninsula is a hub for operations by the terrorist organization Abu-Sayyaf. Its oldest city is found on the island of Cebu, where Magellan was killed. The Visayas separate this country's largest island from its southern region, Mindanao. For 10 points, name this Southeast Asian island nation, whose largest island of Luzon holds the city of Manila.
ANSWER: **Philippines** [Republic of the **Philippines** ] [or Republika ng **Pilipinas** ]

What protagonist of *A Streetcar Named Desire* states, "I have always depended on the kindness of strangers," before her admittance to a mental hospital?
ANSWER: **Blanche** DuBois [or Blanche **DuBois** ]

This is a calculation question. What is the range of the function f of x equals negative x squared plus 2 x plus 3?
ANSWER: f of x is **less than or equal to 4**