

## Round 4

Brad Fischer • Charlotte Maher • Adam Silverman • Kristin Strey

### Tossups

(1) **This is the heaviest element that contains no  $d$  electrons. The ion of this element is a second messenger in cells and is stored in the sarcoplasmic reticulum. This metal is found in minerals like gypsum and fluorite, and its (\*) carbonate is found in limestone. The shells of mollusks are reinforced by the alkaline earth metal, just like the bones of humans. For ten points, name this element that is found next to potassium on the periodic table and has symbol Ca [C-A].**

ANSWER: calcium (accept Ca until it is read)

(2) **This short story concludes by describing “two foolish children in a flat,” one of whom sets aside two of the title objects because “they’re too nice to use just at present.” In this short story, a set of jeweled (\*) combs are given to Della, who sells her hair to purchase a gold watch-chain for Jim, who sells his watch. For ten points, name this Christmas-time short story by O. Henry in which a young couple sell their prized possessions to buy things for each other.**

ANSWER: The Gift of the Magi

(3) **This country celebrates Obon, a summertime festival of remembrance. During wedding ceremonies in this country, couples may perform the San-san-kudo ceremony by drinking alcohol together. This country’s practice of (\*) kotsuage [koh-tsoo-ah-gay] involves collecting the bones of a cremated person with chopsticks, and is partially derived from Shinto beliefs. For ten points, name this East Asian country where red torii [toh-ree] gates line the way to the Fushimi Inari shrine in Kyoto.**

ANSWER: Japan (accept Nihon-koku; accept Nippon-koku)

(4) **This parameter is zero for a standard normal distribution. For populations and samples respectively, this quantity is symbolized by “ $\mu$ ” [mew] and “ $\bar{x}$ .” Outliers have a large effect on this quantity, so in a right-skewed set like income, this value is greater than the (\*) median. The mode and range are typically learned at the same time as, for ten points, what statistical measurement whose formula is commonly described as “add up everything and divide by the number of values?”**

ANSWER: mean (accept arithmetic mean; accept average)

(5) **This singer declares “I’m on an island / even when you’re close” in a 2021 song, and admits “I thought it, but I kept it hid” in a collaboration with Elton John produced by PNAU [pah-NOW]. This singer of “We’re Good” and the album (\*) *Future Nostalgia* sings “I might just give you a bite” in a 2022 song with Megan Thee Stallion. For ten points, name this English singer who performed “Cold Heart,” “Don’t Start Now,” and “Sweetest Pie.”**

ANSWER: Dua Lipa

(6) **The 2022 Nobel Prize in Physics was awarded for experiments showing the entanglement of these particles. The double-slit experiment was first performed using these particles, whose energy is (\*) quantized by Planck’s constant. Wave-particle duality was first explained using these particles, which move at 300 million meters per second and carry the electromagnetic force. For ten points, name these elementary particles of light.**

ANSWER: photons

(7) **John Carver and other passengers of this ship were buried on Cole’s Hill, where human remains often washed down the hill in later years. The failure of the *Speedwell* caused overcrowding on this ship. Mourt’s Relation preserves the text of a governing (\*) compact signed by forty-five people aboard this ship for what became Plymouth Colony. In 1621, the first Thanksgiving was celebrated by the surviving passengers of, for ten points, what ship that brought the Pilgrims to America?**

ANSWER: Mayflower

(8) **In this novel, a group who live at Castle Rock chant “Cut his throat. Spill his blood” during a celebration that ends with the death of Simon. In this novel, a pair of broken (\*) glasses is used by Sam-n-Eric for lighting a signal-fire, and Ralph insists on using a conch shell to hold votes until Piggy is killed. For ten points, name this novel by William Golding in which a group of young boys become stranded on a deserted island.**

ANSWER: Lord of the Flies

(9) **For a musician on this instrument, Hanus Wihan, composer Antonín Dvorak [d-VOR-jak] wrote his final *Concerto in B minor*. Jacqueline Du Pré popularized the only concerto for this instrument by (\*) Edward Elgar, and its modern performers include Yo-Yo Ma. For ten points, name this tall string instrument that is lower-pitched than the viola and higher than the double bass, and that is often stabilized between a musician’s knees.**

ANSWER: cello (accept violoncello)

(10) **At a conference held in this country, Portugal presented the “Pink Map,” which was approved by all attendees except Britain, to handle claims in southern Africa. This empire, which was unified by a statesman who claimed “Politics is the art of the possible” in describing his philosophy of (\*) *Realpolitik*, included states like Schleswig, Holstein, and Prussia. Otto von Bismarck helped unify, for ten points, what European country where Kaisers Wilhelm I [first] and II [second] led from Berlin?**

ANSWER: Germany (accept German Empire; accept Deutsches Kaiserreich or Deutsches Reich; do not accept or prompt on “Prussia”)

(11) **In the *Gylfaginning* [GILL-fah-gih-ning], this god is challenged to drink the sea and lift a gray cat that is actually a monster in disguise. At Ragnarök, this god is destined to kill his long-time rival, the serpent (\*) Jörmungandr [YOHR-mun-gahn-dur]. This god’s chariot is pulled by a pair of goats named “Tooth-Grinder” and “Tooth-Gnasher,” and uses iron gloves to handle his signature weapon. For ten points, name this Norse thunder god who wields the hammer Mjölhnir [mee-YOLL-neer].**

ANSWER: Thor (accept Donar)

(12) **Description acceptable. This event was described as “legitimate political discourse” in a resolution that censured Adam Kinzinger and Liz Cheney. Bennie Thompson chairs a committee that formed in July 2021 to investigate this event, in which (\*) Ashli Babbitt was fatally shot while trying to cross a barricade. Police officer Eugene Goodman directed armed rioters away from the Senate floor during, for ten points, what failed American coup d’etat [koo day-TAH] in early 2021?**

ANSWER: **January 6th** (attempted) coup d’etat (accept descriptions of a mob attack, riot, etc. on the **Capitol** on January 6th, 2021; accept descriptions of a mob attack, riot, etc. to **keep** Donald **Trump in office**; accept descriptions of a mob attack, riot, etc. to **prevent** Joe **Biden from taking office**; prompt on other descriptions of the day that don’t explicitly say any of those 4 things)

(13) **This literary character may have been inspired by Basile’s [BAH-zee-lay’s] character “Petrosinella,” who summons animals who defeat an ogress. In a German story about this character, she is named after a salad plant and given to Dame (\*) Gothel, who imprisons her in a room with no door. For ten points, name this character from Grimm’s fairy tales who is asked to help a prince reach the top of a tower by letting down her long hair.**

ANSWER: **Rapunzel**

(14) **Callimachus’ lost work *Pinakes* [PIN-ah-keez] listed the contents of one of these locations. Legend says that, after Hulagu Khan’s 1258 siege of Baghdad, the Tigris River turned black because of the destruction of one of these places, the House of (\*) Wisdom. Alexandria contained a “Great” one of, for ten points, what educational facilities that stored tablets, papyrus scrolls, or other scholarly writings?**

ANSWER: **library** (prompt on “archive(s)”)

(15) **The ends of these objects are colloquially called toes or snouts. These objects lose mass through ablation, which is divided into processes like calving. Drumlins, tarns, and mountains of sediment called (\*) till are created by erosion by these objects, in which they “pluck” out the bedrock of valleys. Climate change is leading to a dramatic retreat of these objects in the Arctic. For ten points, name these huge masses of ice.**

ANSWER: **glaciers** (do not accept or prompt on “iceberg(s)”)

(16) **Charles Stephens was the first to die at this location while trying to replicate Annie Edson Taylor’s 1901 stunt. In 2012, Nik Wallenda presented his passport after crossing this feature on a tightrope. The (\*) *Maid of the Mist* tours this location, which includes three features called Bridal Veil, American, and International. It’s illegal and dangerous to try to “ride” a barrel down, for ten points, what waterfall system on the US-Canada border?**

ANSWER: **Niagara Falls** (accept **Niagara** River; accept **International Falls** before “International” is read)

(17) **In a painting, this deity is blown toward an orange grove by the god Zephyr, where this deity is received by the Hora of Spring. This deity stands in an arch underneath her son, a child aiming a (\*) bow and arrow, in the painting *Primavera*. This goddess uses her long, blonde hair to cover her naked body as she floats to shore on a seashell in a Botticelli painting titled *The Birth of* this goddess. For ten points, name this Greco-Roman goddess of love.**

ANSWER: **Venus** (accept **Aphrodite**; accept The Birth of **Venus**; accept Nascita di **Venere**. In *Primavera*, Venus stands under Cupid.)

(18) **The Minnesota Glacier cuts this region's tallest mountain range, the Ellsworth Mountains, in half. Congressman Carl Vinson, who promoted exploration of this region, is the namesake of its tallest peak and the massif in which it is found. Queen** (\*) Maud Land is a Norwegian territory in this region, and other sectors are claimed by New Zealand and Chile. Lake Vostok lies entirely underneath a glacier at the Pole of Cold in, for ten points, what southernmost continent on Earth?

ANSWER: Antarctica

(19) **Chargaff's rules were used to determine the structure of this molecule, the subject of an X-ray diffraction image called Photo 51. This molecule's major and minor grooves are composed of hydrogen-bonded antiparallel strands of a phosphate-sugar backbone.** (\*) Maurice Wilkins gave two Cambridge researchers Rosalind Franklin's photos of this molecule without her permission. For ten points, Watson and Crick correctly figured out that what molecule forms a double helix?

ANSWER: DNA (accept deoxyribonucleic acid)

(20) **This literary character fails to read a note from Artemidorus, who tells him to "mark well Metellus Cimber." This character is told "when beggars die, there are no comets seen" while ignoring a warning from his wife,** (\*) Calpurnia. This title character ignores another warning to "beware the Ides of March," and groans "Et tu, Brute?" as he is stabbed by Cassius and Brutus. For ten points, name this title character who, in a play by Shakespeare, rules Rome until his assassination.

ANSWER: Julius Caesar (accept Julius Caesar; accept The Tragedy of Julius Caesar)

## Bonuses

(1) When Charles Darwin observed one of these plants with a particularly long neck, he ascertained that there must be a moth with a nose long enough to fertilize it; the moth was eventually discovered 20 years after he died. For ten points each,

Name these plants, examples of which include orchids and daisies.

ANSWER: **flowers** (accept **blossoms**; prompt on, but do not reveal otherwise, “angiosperms”)

Using flowers and fruits to spread pollen, rather than using cones or spores, was a key evolutionary advantage that this superphylum gained over its rival gymnosperms.

ANSWER: **angiosperms**

Flowers really only evolved as a way of convincing birds and bees to transport pollen from the stamen to this female sex organ of a plant, which is composed of a stigma, an ovary, and a style.

ANSWER: **pistils**

(2) After this god was murdered by his brother, Set, his body was dismembered and scattered across Egypt. For ten points each,

Name this green-skinned Egyptian ruler of the underworld.

ANSWER: **Osiris** (accept **Usiris**; accept **Aser**; accept **Usire**)

This sister-wife of Osiris collected his body parts and put him back together after Set’s attack. After temporarily reviving Osiris, this goddess gives birth to Horus.

ANSWER: **Isis** (accept **Aset**; accept **Iset**; accept **Ase**)

In some tellings of the myth, the body parts of Osiris had symbolic meaning; this part is associated with the djed column or pillar, which symbolizes stability. Egyptian mummies often had *djed* amulets kept near this body part.

ANSWER: **spine** (accept **backbone**)

(3) A poem addressed “To His Excellency, [this general]” commands him to “Proceed, great chief, with virtue on thy side” during the American Revolution. For ten points each,

Name this Revolutionary War general who, in the poem, is told to lead “Columbia” to victory for “freedom’s cause.”

ANSWER: George **Washington** (accept **To His Excellency, General Washington**; accept **His Excellency, General Washington**)

“To His Excellency, General Washington” is by this early American poet, who was emancipated from slavery after the publication of her collection *Poems on Various Subjects, Religious and Moral*.

ANSWER: Phillis **Wheatley** (accept Phillis Wheatley **Peters**)

One of Wheatley’s short poems reflects “On Being Brought from” this continent “to America.” Wheatley was trafficked from this continent as a child as part of the slave trade.

ANSWER: **Africa** (accept **On Being Brought from Africa to America**)

(4) Give the following about conservation areas in Africa, for ten points each.

An annual migration of hundreds of thousands of zebras and wildebeests takes place in this region of East Africa. The world's largest wild lion population lives within the national park of the same name.

ANSWER: Serengeti (accept Serengeti National Park)

Just east of the Serengeti National Park is a UNESCO World Heritage Site protecting one of these geographic landforms called Ngorongoro [en-GORO-en-goro], which formed from the collapse of a volcano.

ANSWER: crater (accept volcanic caldera)

The Serengeti and Ngorongoro national parks are found in this east African country. Its capital is now Dodoma, having moved last century from its largest city, Dar es Salaam.

ANSWER: United Republic of Tanzania

(5) A Jean-Jacques Rousseau quote about brioche may be the source of a saying commonly attributed to this woman. For ten points each,

Name this queen who very likely never proclaimed “Let them eat cake”, contrary to the popular myth.

ANSWER: Marie Antoinette (accept Marie Antoinette Josèphe Jeanne; accept Maria Antonia Josepha Johanna; prompt on partial answers)

Marie Antoinette and her husband, Louis XVI [16th], were executed in the wake of this revolution, which began in 1789 at the Bastille prison complex.

ANSWER: French Revolution

Marie Antoinette married Louis while he held this position, the heir apparent of pre-Revolutionary France. This term is the French name of an animal that appears on the coat of arms used by its holder.

ANSWER: dauphin (accept dolphin)

(6) Give the following about rotational physics, for ten points each.

An object's rotational motion can be changed by this quantity, the rotational analog of a force. Because a lever can cause an object to move around an axis, it applies this kind of twisting force.

ANSWER: torque

A moving object has this quantity, which is computed by multiplying its mass and its velocity. If the object is rotating, it has the angular type of this quantity, which is calculated similarly: moment of inertia times angular velocity.

ANSWER: momentum (accept linear and/or angular momentum)

While spinning at over 1,000 RPM, this piece of lab equipment can separate plasma from the rest of the blood. You can answer with either the name of the device or the similarly named fictitious force on which it relies.

ANSWER: centrifuge (accept word forms like centrifugation; accept centrifugal force; do not accept or prompt on “centripetal (force)”) )

(7) This novel's frame story is a letter written from Arctic ship captain Robert Walton to his sister, telling her about an encounter with two strange men. For ten points each,

Name this novel by Mary Shelley in which the title scientist describes being terrified by a humanoid "monster" he creates in his lab.

ANSWER: **Frankenstein** (accept, but do not otherwise reveal, **Frankenstein** or The Modern Prometheus)

*Frankenstein* is subtitled for the "Modern" version of this mythical Greek figure, since Doctor Frankenstein introducing a dangerous scientific advancement to humanity is similar to this Titan giving humans fire.

ANSWER: **Prometheus**

Victor Frankenstein's meddling with forces he doesn't fully understand causes him to abandon his creation, who becomes bitter and murders this woman, Frankenstein's wife.

ANSWER: **Elizabeth** Lavenza (accept Elizabeth **Lavenza**; prompt on "Mrs. Frankenstein")

(8) Give the following about colleges whose athletic conference memberships make absolutely no sense, for ten points each.

The Big Ten is traditionally a midwestern conference, so the definition of "Midwest" officially expanded to include California in 2022 when two schools pledged to join the Big Ten. Name either school, each of which has "California" in its name.

ANSWER: University of **Southern California** (accept **USC**; prompt on "Bruins"; do not prompt on any partial answers) or University of **California, Los Angeles** (accept **UCLA**; prompt on "Bruins"; do not prompt on any partial answers)

Most of the full member schools of the Atlantic Coast Conference are at least close-ish to the coast of the Atlantic Ocean, but not all. The biggest offenders are the Cardinals of this university in north-central Kentucky.

ANSWER: University of **Louisville**

The Atlantic 10 Conference - which actually has 15 member schools - doesn't know where the ocean is, either. The conference includes the University of Dayton in this non-Atlantic state, as well as two schools farther west - Loyola University Chicago and Saint Louis University.

ANSWER: **Ohio**

(9) Answer the following about American sculptor Edmonia Lewis, who depicted an old man teaching a young child in the sculpture *Old Arrow Maker*, for ten points each.

Sculptures like *Old Arrow Maker* and *Minehaha* were inspired by Edmonia Lewis's one-quarter heritage from this American ethnicity.

ANSWER: **Native American** (accept **indigenous** Americans; accept American **Indian**; accept **Mississauga**; accept Mississauga-**Ojibwe**)

Edmonia Lewis stunned the attendees of the Centennial Exposition in 1876 with her sculpture *The Death of this Egyptian queen*, who killed herself with an asp after the death of Mark Antony.

ANSWER: **Cleopatra** (accept **Cleopatra** VII Philopator)

In another sculpture, Lewis depicted this biblical woman folding her hands in prayer as an empty water jug sits at her feet after she was sent into the desert with her son Ishmael.

ANSWER: **Hagar** (accept **Hajar**)

(10) The last words of this man, "I [...] am now quite certain that the crimes of this guilty land will never be purged away but with blood.", were printed as a rallying cry in numerous abolitionist newspapers. For ten points each,

Name this man who was hanged for treason after carrying out a raid on a federal arsenal at Harpers' Ferry.

ANSWER: John **Brown**

The Pottawatomie Massacre took place in this state, which was said to be "Bleeding" from the sheer quantity of slavery-related rioting that took place before the Civil War.

ANSWER: Bleeding **Kansas**

The Pottawatomie Massacre took place three nights after pro-slavery forces sacked this Kansas town, destroying the printing capabilities of two anti-slavery newspapers and accidentally killing one man. William Quantrill later raided this town during the Civil War.

ANSWER: **Lawrence**, Kansas

(11) This unfortunate literary orphan is apprenticed to an undertaker and falls in with a gang of pickpockets in a novel named for him. For ten points each,

Name this Victorian boy who asks for gruel by saying, "please sir, I want some more" while living in a poor house.

ANSWER: **Oliver** Twist (accept Oliver **Twist**)

*Oliver Twist* is by this English author, who also wrote about poor children in *Great Expectations*.

ANSWER: Charles **Dickens** (accept Charles John Huffam **Dickens**)

Oliver goes to work with Fagin's gang of young pickpockets when he is recruited by this boy, whose real name is Jack Dawkins.

ANSWER: The Artful **Dodger** (accept **Jack** or **Dawkins** before "Jack" is read)



(12) Many old molecular biology labs are equipped with these devices to sterilize a workspace before doing cell culture. For ten points each,

Name these devices that provide an open flame in a laboratory. They were invented by and named for a German chemist.

ANSWER: Bunsen burners (prompt on “burners”)

Bunsen burners are fed by this fossil fuel, which is mainly composed of methane but is tainted with small amounts of sulfides so that it can be smelled.

ANSWER: natural gas (accept fossil gas)

The safe way to heat a metal under a Bunsen burner is to place it in one of these round porcelain containers, which are extremely heat-resistant. A common lab demo involves measuring the weight of one after burning a magnesium ribbon.

ANSWER: crucibles

(13) One member of this group, Wang Hongwen, killed two of the guards attempting to arrest him; otherwise, the downfall of this group was proclaimed as bloodless. For ten points each,

Name this group of Chinese Communist Party officials whose influence peaked during the Cultural Revolution.

ANSWER: Gang of Four (accept Si rén bang)

One of the Gang of Four, Jiang Qing [jaang ching], was the widow of this Chairman of the Chinese Communist Party. The Gang of Four were arrested in October 1976, a month after this man’s death.

ANSWER: Mao Zedong (accept Mao Tse-tung)

During the Cultural Revolution, students wearing this color of armband formed a paramilitary group that was embraced by Mao, then shunned as they became too left-wing. A collection of sayings by Mao was published in a “Little” book of this color.

ANSWER: red (accept Red Guard; accept Little Red Book)

(14) In the Quran, this religious figure is shocked to see the wise man al-Khidr cut a hole in a boat, kill a young man, and rebuild a wall. For ten points each,

Name this man who learns about the will of Allah from al-Khidr and who, in the book of Leviticus, receives numerous holy laws from Yahweh.

ANSWER: Moses (accept Moshe; accept Musa)

Before receiving the laws outlined in Leviticus, Moses receives this short set of rules from Yahweh while atop Mount Sinai. These rules include the directions not to kill and not to commit adultery.

ANSWER: Ten Commandments (accept Decalogue; accept Aseret ha’Dibrot; prompt on “Commandments” or “Dibrot” alone)

Earlier in his life, Moses follows Yahweh’s instructions to part and then close this waterway while he leads the Israelites out of Egypt.

ANSWER: Red Sea (accept Yam Suf; accept hayyam ha’adom; accept al-Bahr al-Ahmar)

(15) Give the following about the 2022 winners of the Fields Medal, the highest honor in mathematics, for ten points each.

Hugo Duminil-Copin is a French mathematician who specializes in applying this field of math to physics. Statisticians often apply the results of this branch of math, in which the likelihood of an event is studied and given a value between 0 and 1.

ANSWER: **probability**

Ukraine's Maryna Viazovska, the second woman to win a Fields Medal, solved the optimization problem of packing these shapes in eight-dimensional space and in 24-dimensional space. In 3D, the volume of these shapes equals four-thirds times pi times their radius cubed.

ANSWER: **spheres** (accept **hyperspheres**)

English number theorist James Maynard built on Yitang Zhang's study of twin primes, which are pairs of prime numbers that differ by this value.

ANSWER: **two**

(16) The United States claimed victory in the Space Race because we got to the Moon, so all of these other Soviet firsts don't really count. For ten points each,

This first artificial satellite to orbit Earth was launched in October 1957. It broadcast a beeping radio signal for three weeks.

ANSWER: **Sputnik 1**

In 1957, this dog was picked up off the streets of Moscow and became the first creature to orbit the Earth, flying aboard Sputnik 2.

ANSWER: **Laika**

In 1961, Yuri Gagarin became the first human in space, flying aboard this spacecraft.

ANSWER: **Vostok 1** (prompt on "Vostok")

(17) A novel set in this modern country follows Saleem Sinai, who is born at the end of the British Raj. For ten points each,

Name this modern country whose 1947 independence from Britain was fictionalized in the novel *Midnight's Children*, which is partially set in Mumbai.

ANSWER: **India** (accept Republic of **India**; accept **Bharat** Ganrajya)

This Indian-born author wrote *Midnight's Children*, and was nearly-fatally stabbed in a 2022 attack.

ANSWER: Salman **Rushdie** (accept Sir Ahmed Salman **Rushdie**)

Salman Rushdie's attack came after decades of careful living. His death was called for in 1989 because he wrote this novel, in which Gibreel Farishta and Saladin Chamcha survive the explosion of an airplane.

ANSWER: The **Satanic Verses**

(18) This man closed down a newspaper called the *Independent* after being sued for publishing libelous editorials that blamed Jews for violence committed against them. For ten points each,

Name this incredibly anti-semitic American industrialist. This man's use of the assembly line greatly boosted his factories' output of Model T cars.

ANSWER: Henry **Ford**

The *Independent* was named for this Michigan town, which was Ford's birthplace and is still the site of the River Rouge factory and Ford headquarters. Today, this city is home to America's largest Muslim population.

ANSWER: **Dearborn**

Ford's business schemes included building Fordlandia, a company town and plantation in Brazil that produced this key material for car production. The plantation failed in less than a decade, but the town has since been reclaimed by a few thousand Brazilians.

ANSWER: **rubber** (prompt on "latex;" prompt on "tire(s)")

(19) The final movement of this work, "Neptune, the Mystic", was premiered with a choir of students from St. Paul's Girls' School. For ten points each,

Name this astrologically-inspired orchestral suite that opens with "Mars, the Bringer of War".

ANSWER: The **Planets**, Opus 32

This English composer, who taught at St. Paul's and was thus able to arrange the choir on very short notice, composed *The Planets*.

ANSWER: Gustav **Holst**

Holst's suite includes seven movements. He omitted Earth for astrological reasons, and he omitted this dwarf planet because Clyde Tombaugh was still over a decade away from discovering it.

ANSWER: **Pluto**

(20) Some varieties of French have up to seventeen of these sounds, including the schwa [shwah]. For ten points each,

Give the linguistic term for a sound of speech made with an open vocal tract. These sounds are contrasted with consonants, in which the tract is constricted or closed at some point.

ANSWER: **vowels**

Some vowel sounds, like the "oy" in "toy," are made up of two gliding vowel sounds; the combined sound is known by this term, from the Greek for "two sounds."

ANSWER: **diphthongs**

Diphthongs are written using two symbols in this standardized alphabet, whose basic set of 107 letters and 52 diacritic symbols is used to help standardize pronunciation.

ANSWER: **International Phonetic** Alphabet (accept **IPA**)