

FROSHMORE SCIENCE 23-24

Round Three

Read only for Round Three

Officials Checklist and reminders:

- 1.) Review this checklist and reminders document and the rules flow chart. _____
- 2.) Pencils and fresh scratch paper for each participant _____
- 3.) Timer instructions _____
- 4.) Identify the head coach for each team. _____
- 5.) Identify the team captain. _____
- 6.) Review the pumpnickel rule _____

Accept only the answer to the bonus question that comes from the captain.

The captain may defer to another team member to give the answer to the bonus question.

If you want them to indicate a deferral in a specific way – tell them at the beginning of the match. “If you are going to defer on a bonus question, please do so by”

Coaches may use an ipad or table to keep score (I've sent out an excel score sheet) They may not use their ipad, phone or other technology to look up answers, send or received text messages or emails or to make calls during competition.

Before you begin, remind students that on a toss-up question they must buzz-in and be recognized before giving the answer and that they may NOT confer on a toss-up. You may only confer on a bonus question.”

When you read a toss-up question – identify the subject, then read the question.

If the team member buzzes-in before the question is completed and the answer is incorrect, say ‘incorrect, I will finish the question’ then finish reading the question.

If you have finished reading the question when the first team buzzes-in and gives an incorrect response say ‘incorrect,’ look at the second team call them by team name and say ‘_____ I have finished the question’

If the time has expired, their response should be to immediately buzz-in to be recognized. If there is still time (5 seconds for a regular question 15 on a math computation) they have the remaining time to buzz.

If the toss-up question is not answered correctly by either team, give the correct answer. Do NOT read the bonus question, go on to the next toss-up. **If you need a replacement question for this subject,**

you may use the unused bonus.

The first time you read a bonus question for each team say ‘Here is your bonus question, you do not need to buzz-in. Remember you may confer on this question, and I will take the answer from the team captain.’

There is NOT a penalty for buzzing during a bonus question.

When the time for conferring has expired (10 seconds – 15 on math or science computation) **call for the answer.** Say, ‘Captain?’ or ‘answer please’ (or something similar). If they do not give you an immediate answer say ‘time’ and give the correct answer.

There is no limit to the number of team members a team substitutes.

On a toss-up question, do not give the correct response until you have given both teams an opportunity to answer the question.

Leading articles such as “the,” “an,” and “a” are not required (e.g., Tale of Two Cities is an acceptable answer for The Tale of Two Cities). However, if an article is given, it must be the correct one.

Plural/Singular answers are acceptable unless otherwise delineated.

Last names are acceptable, except where there is more than one common person in the same field.

Prompt for more information by saying – ‘more’ or ‘more specific’.

Questions requiring additional computation time (15 seconds) have computation in the subject line - MATH COMPUTATION: or SCIENCE COMPUTATION: or BONUS COMPUTATION: (If it needs it and we forgot it, add it!)

Math or Science questions that do not require computation and receive regular question time (5 for toss-up and 10 for bonus) do not have computation in the subject line - MATH: or SCIENCE: or BONUS

Explain the addition of the word Computation to the timer and the team at the beginning of the tournament. After the first question containing COMPUTATION: You may choose to say only Computation if you wish.

Give your stall count before the game starts. A stall count is the amount of time allowed for the student to begin their answer once you've called on them. "My stall count is _ _ _." Fill in the blanks with your count. Do you count 1, 2, stall? 1, 2, 3, stall? Do you say stall on the upbeat of the 3rd second or the downbeat? My preference is you count 1(1001), 2(1002), 3(1003) with stall being called on the downbeat of 3. (Down beat being the end of the 1003 with 100stall. You do not have to say the 1000 or the second 1, 2 or 3 out loud. You do need to make some type of physical indication - head nod, hand count (like a basketball referee counting the backcourt) even a foot tap. But do something so the student can see the seconds slipping away. This also helps with consistency. Neither team can say the other team received more time before a stall was called. When an immediate answer is expected 1 second is adequate time to allow before a stall is called.

"Welcome to Round One of the tournament. I am _____, your moderator. (if you have a judge, timer and scorekeeper, introduce them as well) Our two teams are _____ and _____. Head coaches, will you please stand. A protest may be lodged only by the head coach." (run a buzzer check) "Students, remember, you may not give an answer until you are recognized. If you do so, it will be ruled as an incorrect response, even if your answer is correct. Explain the timing for Math or Science Computation: (see instructions) Good sportsmanship is expected from **all** players, substitutes, coaches, spectators and parents. Except for using the excel spreadsheet to keep score, you may not use computers, smart phones, iPad, etc. during the competition. Turn off all and put away all electronics at this time. (pause) Are there any questions? Let's begin."

- _____ 1. **SCIENCE: This class of animals are often used as indicator species of ecological hazards because of their permeable skin.*** They generally start life as a larvae living in water and must metamorphose into air-breathing adults. What is this class that is generally found in moist environments and often live both on land and in water?

ANSWER: Amphibian

BONUS BONUS: This order of amphibians includes the frogs and toads. What is this order that is named for its members' lack of a tail?

ANSWER: Anura

- _____ 2. **MATH COMPUTATION: Simplify and evaluate: $5^3 \bullet 5^7 \bullet 5^{-6}$**
[READ: Five cubed times five to the seventh power times five to the negative sixth power]

ANSWER: **625** [Do NOT accept 5^4 ; instructions were to simplify AND evaluate]

BONUS BONUS COMPUTATION: Simplify and evaluate: $6^4 \bullet 2^{-5} \bullet 3^{-5} \bullet 6$
[READ: Six to the fourth times two to the negative fifth times three to the negative fifth times six]

ANSWER: **1** [$6^4 \bullet 6 = 6^5$; $2^{-5} \bullet 3^{-5} = 6^{-5}$; $6^5 \bullet 6^{-5} = 6^0 = 1$]

- _____ 3. **SCIENCE: To find the speed of wave, this value is multiplied times the wavelength.*** It is used to carry information in the most common type of radio waves by being changed. What is this property of waves defined as the number of waves that pass a point in a given time period?

ANSWER: Frequency

BONUS BONUS: The effect is seen in any type of wave, such as sound or light, where the wavelength changes relative to the motion of the source and observer. What is this phenomenon illustrated by a passing siren?

ANSWER: Doppler Effect

- _____ 4. **SOCIAL STUDIES: An Ottoman admiral with this nickname won the Battle of Preveza over the Holy League under the orders of Suleiman the Magnificent. A king with this nickname * drowned while on the Third Crusade. What is this nickname, Italian for "red beard," which was used as an Operational name for the Nazi invasion of the Soviet Union?**

ANSWER: Barbarossa

BONUS BONUS: Frederick Barbarossa held what position at the time of his death? The first holder of this position was Charlemagne, and it was chosen by a group of electors.

ANSWER: Holy Roman Emperor

- _____ 5. CURRENT EVENTS/POP CULTURE: **India stopped issuing visas to citizens from*** this country. Indian diplomats say they have been threatened in the country. Name the North American country that India has also asked to reduce its diplomatic presence.

ANSWER: Canada

BONUS BONUS: Canada's Prime Minister accused India's government agents of playing a role in killing a Sikh separatist leader. Who is the Prime Minister?

ANSWER: **Justin Trudeau**

- _____ 6. SCIENCE: **This condition can often result in stroke, heart attack, or the development or rupturing of an aneurysm.*** This condition can result from a lack of sleep, What is this condition also called "Hypertension"?

ANSWER: High Blood Pressure

BONUS BONUS: Researchers at Penn State found that "catching up" on missed sleep over the weekend does not lower this aspect of daytime blood pressure. What is the term for blood pressure when heart contracts?

ANSWER: Systolic (blood pressure)

END OF FIRST QUARTER

The score at the end of the first quarter is
Team one _____ Team two _____

Are there any questions?

(pause and look at the coaches if there are no protests proceed)

"Coaches... you may substitute if you wish."

- _____ 7. HUMANITIES: **This character notices the German word for "rage" scratched into the floor in one story. In another story, this character is presumed dead alongside his rival Professor * Moriarty.** *A Study in Scarlet* and *The Final Problem* are stories featuring what detective?

ANSWER: Sherlock Holmes [accept either name]

BONUS BONUS: What author wrote the Sherlock Holmes stories?

ANSWER: (Arthur Conan) Doyle

- _____ 8. SCIENCE: **The value of this for polar ice is about 0.60*** while ocean water is about 0.06 and concrete is 0.55. Surfaces with higher values will absorb less light and therefore less heat. What is the term for the reflectivity of a surface or planet?

ANSWER: Albedo

BONUS BONUS: The decreased albedo of Polar Regions causes this type of effect, where the increased heat absorption causes greater ice melting, which causes a decrease in albedo and thus more heat absorption. What is this effect that also occurs when a microphone is brought near its speaker?

ANSWER: Feedback (loop)

- _____ 9. **SOCIAL STUDIES: The Battle of Saragarhi was the last stand of a Sikh regiment in this country. This country was the center of a conflict between Russia and Great Britain known as the * Great Game.** What is this middle-eastern country currently ruled by the Taliban?

ANSWER: (Islamic Republic of) **Afghanistan**

BONUS BONUS: What country's invasion of Afghanistan led to a boycott of the 1980 Summer Olympics?

ANSWER: **Soviet Union** [also accept USSR or Union of Soviet Socialist Republics; do NOT accept or prompt on Russia]

- _____ 10. **SCIENCE: This cycle has a major impact on climate cycles such as ice ages.*** The element at the heart of this cycle exists as an oxide while in plants, it is found in sugars and starches. What is this cycle that plays a role in the greenhouse effect?

ANSWER: **Carbon Cycle**

BONUS BONUS: These are the organisms that release nutrients like carbon back into the ecosystem from organisms that are not eaten, such as top predators and dead vegetation. What are these organisms that break down organic matter?

ANSWER: **Decomposers**

- _____ 11. **MATH COMPUTATION: Find 625 to the $\frac{3}{4}$ power.** [sixty hundred twenty-five to the three-fourths power]

ANSWER: **125**

BONUS BONUS COMPUTATION: Find negative three hundred forty-three to the negative one-third power.

ANSWER: **-1/7**

- _____ 12. **SCIENCE: This simple machine converts rotational motion to linear motion and can be seen in car jacks and soda bottles?*** It consists of an inclined plane wrapped around a central axis. What is this simple machine that is often used as a fastener?

ANSWER: **Screw**

BONUS BONUS: There are three classes of levers based on the positioning of the fulcrum, effort, and force. A nutcracker, with the fulcrum on one end and the force on the other end is an example of which type of lever?

ANSWER: **Second-class** (lever)

END OF FIRST HALF

The score at the end of the first half is

Team one _____ Team two _____

Are there any questions?

(pause and look at the coaches if there are no protests proceed)

"Coaches... you may substitute if you wish."

- _____ 13. FINE ARTS: **This artist painted a cat with a human face in *Paris through the Window*. This artist painted *Yellow* and *White* variations of the * Crucifixion of Jesus. Who is this Belarusian-Jewish painter of *I and the Village*?**

ANSWER: (Marc) Chagall

- BONUS BONUS: What Italian-Jewish artist painted surrealist elongated figures in *The Jewish Woman* and *Women with Red Hair*?

ANSWER: (Amadeo) Modigliani

- _____ 14. SCIENCE: **This is a eukaryotic kingdom that uses chitin (ky-ten) in their cell walls. *** Some of them can be parasitic and cause fatal infections in humans, but it is also thanks to them that we have light, airy bread and beer. What is this kingdom that includes yeast, mold, and mushrooms?

ANSWER: Fungi

- BONUS BONUS: This group of fungi is species specific and causes infected individuals, such as ants, to engage in behavior that will help spread the fungus. What is the zombie fungus that is the inspiration for the game and streaming series "The Last of Us?"

ANSWER: Cordyceps [CORE-de-seps]

- _____ 15. LITERATURE: **It is typically passed down by word of mouth.*** It has no author, rather it emerges from the culture and is carried forward by constant retelling. What is the umbrella term for folk stories, fairy tales, tall tales, and urban legends?

ANSWER: folklore

- BONUS BONUS: This popular Anglo-Saxon folk tale is considered folk lore. Name the monster story with no author.

ANSWER: Beowulf

- _____ 16. SOCIAL STUDIES: **While campaigning for the Senate, this woman said, "People are people" when asked if she could represent white people. This woman took part in the March on Washington after leading a * sit-in at the Katz Drug Store. Who is this civil rights leader from Oklahoma?**

ANSWER: (Clara) Luper

- BONUS BONUS: Luper was a member of the Youth Council of what civil rights organization founded by W.E.B. du Bois?

ANSWER: NAACP [National Association for the Advancement of Colored People]

17. SCIENCE: **This material, when produced by glacier activity, is called rock flour or stone dust.*** It is made from quartz and feldspar and is composed of grains larger than clay but smaller than sand. What is this material often found as a suspended load in water and as a depositional material at the bottom of bodies of water?

ANSWER: Silt

BONUS BONUS: This metamorphic rock is derived from shale and shale-like sedimentary rocks. It is more fine-grained than silt and has been used for tile and for a writing surface because of the ease of forming flat sheets. Name this type of rock.

ANSWER: Slate

18. MATH COMPUTATION: What is the sixth term of the geometric sequence whose first term is 240 and whose common ratio is $\frac{1}{2}$?

ANSWER: **15/2 OR 7.5 OR $7\frac{1}{2}$**

BONUS BONUS COMPUTATION: In the infinite geometric sequence starting with 240 and having a common ratio of $\frac{1}{2}$, what is its sum?

ANSWER: **480**

END OF THIRD QUARTER

The score at the end of the third quarter is
Team one _____ Team two _____

Are there any questions?

(pause and look at the coaches if there are no protests proceed)

"Coaches... you may substitute if you wish

19. SCIENCE: ***Streptococcus*, [strep-to-caw-cus], Influenza virus, and *Candida albicans* are all examples of this,*** something that can produce a disease. This term, as well as the term for the study of the effects of diseases, are both derived from the Greek for "suffering." What is this term for an agent that can cause a disease?

ANSWER: Pathogen

BONUS BONUS: This disease is caused by a bacteria named after it. If the spores are inhaled, it is characterized by chest pain, fever, and shortness of breath. It is commonly spread through contact with animals. What is this pathogen that has been weaponized by some countries?

ANSWER: Anthrax

20. CURRENT EVENTS/POP CULTURE: **He called on Elon Musk to roll back antisemitism*** on X. He visited Musk in California before traveling to meet with world leaders at the United Nations General Assembly. Name the man who is the Israeli Prime Minister.

ANSWER: Benjamin Netanyahu

BONUS BONUS: In which city does the United Nations meet?

ANSWER: New York City

- _____ 21. SOCIAL STUDIES: **Else Young is the first recorded death in these events in Connecticut. A defendant in one of these events refused to enter a plea, was killed by being crushed under stones and was * Giles Corey.** What are these events in which people suspected of supernatural powers were put on trial, most famously in Salem?

ANSWER: Witch Trials

BONUS BONUS: What Massachusetts clergyman defended his involvement in the Salem Witch Trials with the book *Wonders of the Invisible World*?

ANSWER: (Cotton) Mather

- _____ 22. SCIENCE: **This condition is responsible for 60 to 80% of all cases of age-related cognitive impairment.*** This condition is characterized by difficulty remembering the most recent events and the highest risk factor is genetic. What is this specific type of dementia named for the German psychiatrist who first documented it?

ANSWER: Alzheimer's (Disease)

BONUS BONUS: A 2023 research paper found that normal participants exposed to this sensory input which was used 2 hours a night during sleep over a six month period, showed significant improvement on cognitive tests. What type of stimulus was this?

ANSWER: Smells [accept Olfactory (stimuli)]=

- _____ 23. MATH COMPUTATION: If $x = 4$ and $y = -3$, evaluate $x^2 - y^2 - 5xy$

ANSWER: **67**

BONUS BONUS COMPUTATION: If $x = 36$, $y = 4$, and $z = -2$, evaluate $3z^2 + 3yz + \sqrt{xy}$.
[READ: three Z squared plus three Y Z plus the square root of X Y]

ANSWER: **0**

- _____ 24. HUMANITIES: **This author's use of dashes may have been intended as a pause between a comma and a period. This author of "Hope is the thing with feathers" described a figure * "kindly" stopping for the speaker of one poem. "Because I could not stop for death" is a poem by what American poet of "I heard a fly buzz- when I died?"**

ANSWER: (Emily) Dickinson

BONUS BONUS: "Are you Nobody too?" is the second line of what poem by Emily Dickinson?

ANSWER: "I'm Nobody, Who are You?"

END OF GAME

The score at the end of the game is

Team one _____

Team two _____

If there is a tie allow for substitution before you ask the tie-breaker questions.

Tie Breakers

SCIENCE: Adopted in 1960 to replace the CGS system* by the General Conference on Weights and Measures, it was designed to make measurement easier across the SCIENCES. What is this current measurement system that uses metric measurements?

ANSWER: **International System** (of Units) [accept **System International** or **SI**]

SCIENCE: This branch of chemistry is concerned with compounds containing carbon atoms.* Its name comes from the fact that many of the compounds used and studied came from living things before they were synthesized in the lab.

ANSWER: **Organic** (Chemistry)

SCIENCE: This device uses induction to increase or decrease the voltage of an electric current.* These can often be seen mounted on power poles, separating the transmission current from the home current. What is this device that is used to reduce losses in electric transmission lines?

ANSWER: **Transformer**

SCIENCE: Wood, Cotton, Beef, and wind power are all considered this, a raw material that can be replenished within a reasonable time. Counter examples include fossil fuels and mineral resources.

ANSWER: **Renewable Resource**

SCIENCE: These structures are the primary organ in multicellular land animals for gas exchange with the atmosphere. What are these structures?

ANSWER: **Lungs**

Are there any questions? (pause and look at the coaches if there are no protests proceed)
This ends the game. "