

FROSHMORE SCIENCE 23-24

Round One

Read only for Round One

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: Hydrogen peroxide becoming water and oxygen, for example.*** This type of chemical reaction involves a single compound breaking down into two or more simpler substances, often with the help of heat. What is this reaction that is the opposite of a synthesis reaction?

ANSWER: **Decomposition** (reaction)

BONUS BONUS: This type of reaction involves a free element replacing another element in a compound, leaving the element replaced as a free element. What is this reaction?

ANSWER: **Single Displacement** [accept "**Single Replacement**" also]

- _____ 2. **SOCIAL STUDIES: This organization added the Tuscarora as its sixth and final member in 1722. This organization's ruling doctrine is the Great Law of * Peace** which was established by the Great Peacemaker. Hiawatha was a leader of what Native American alliance?

ANSWER: **Iroquois** (Confederacy) [also accept Haudenosaunee]

BONUS BONUS: What founding father was inspired by the Great Law of Peace in the creation of his Albany Plan?

ANSWER: (Benjamin) **Franklin**

- _____ 3. **SCIENCE: This marine mammal, the largest pinniped, is found only in the arctic regions.*** It is the largest of the seals, their only predators are orcas and polar bears. What is this animal that is easily recognizable by their tusks and whiskers?

ANSWER: **Walrus**

BONUS BONUS: Almost all of this material used by the Anglo-saxons and the Norse was harvested from walruses. Trade in this material is severely restricted in most countries. What is this material most commonly associated with elephant tusks?

ANSWER: **Ivory**

- _____ 4. **FINE ARTS: This artist failed to establish an art colony alongside Paul Gauguin. This artist of *Wheatfield with Crows* and *Cafe Terrace at Night* depicted a group of peasants in * *The Potato Eaters*.** What Dutch artist painted *The Starry Night*?

ANSWER: (Vincent) **Van Gogh**

BONUS BONUS: Van Gogh's works were inspirational for what pointilist artist of *A Sunday Afternoon on the Island of La Grande Jatte*?

ANSWER: (Georges) **Seurat**

- _____ 5. SCIENCE: **This can be defined as momentum over time.*** It is more commonly defined as the product of an object's mass and acceleration. What is this quantity associated with Newton's Second Law?

ANSWER: **Force**

BONUS BONUS: This is a rotational equivalent to force. It is the product of a linear force and the length of the lever arm, or distance from the rotating body. What is this quantity measured in Newton meters?

ANSWER: **Torque**

- _____ 6. MATH COMPUTATION: There are six starting players on a volleyball team. How many different ways can they be introduced at a pep rally?

ANSWER: **720 (prompt on six factorial)** [6x5x4x3x2x1=720]

BONUS BONUS COMPUTATION: There are 12 total players on the volleyball team. If they want to select three players to represent them at a social function, how many different ways can these three players be selected if order is NOT important?

ANSWER: **220** [(12x11x10)/(3x2x1) = 220]

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. CURRENT EVENTS/POP CULTURE: **It's their first album of original music since 2005 and the first since the death of drummer Charlie Watts.*** The new album is entitled *Hackney Diamonds*. Name the band led by Mick Jagger.

ANSWER: **Rolling Stones**

BONUS BONUS: In which city was the Rolling Stones formed?

ANSWER: **London**

- _____ 8. SCIENCE: **A July 2023 paper described how this larva of the genus Megalopyge uses a toxin which tears holes in cellular membranes.*** Native to the southern US, the southern flannel species is covered in hairs and can be found in Oklahoma. What is the term for this worm-like larvae?

ANSWER: **Caterpillar**

BONUS BONUS: The ancestors of the Southern Flannel Moth gained the aerolysin [air-ro-lie-sin] toxins from bacteria through this process. What is the three-word term for the movement of genes from one species to another?

ANSWER: **Horizontal Gene Transfer**

9. SOCIAL STUDIES: **One title taken by this man was “King of Scotland,” while another of his official titles was “Conqueror of the British in Africa in general and * Uganda in particular.”** Who is this African dictator, who ruled Uganda from 1971-1979.

ANSWER: (Idi) Amin

BONUS: One year after Amin was deposed, this man took power in Zimbabwe. Who is this dictator of Zimbabwe who ruled from 1980-2017?

ANSWER: (Robert) Mugabe

10. SCIENCE: **This principle first saw print in 1738 as part of the book Hydrodynamical.*** This principle is used to explain the lift force on an airplane wing where differential flow velocity results in higher pressure below the wing and a resulting lift force. What is this principle that also explains the Venturi effect in a carburetor?

ANSWER: Bernoulli's (Principle)

BONUS: BONUS: Bernoulli's equation makes the assumption that this property of a fluid is equal to zero. It is a function of the intermolecular forces between particles of the fluid and is described as resistance to flow.

ANSWER: Viscosity

11. LITERATURE: **This book features Matt Miller, a high school senior, coping with his mother's death.*** Matt's dad suffers from alcoholism. Name this novel where Matt's neighbor Willie Ray offers him a job helping out at Ray's Funeral Home.

ANSWER: *The Boy in the Black Suit*

BONUS: BONUS: Who is the author of *The Boy in the Black Suit*?

ANSWER: Jason Reynolds

12. MATH: Given this equation: $3x^2 + 42x + 5y^2 - 40y + 12 = 0$
Which conic section is formed by this equation when graphed?

ANSWER: Ellipse

BONUS: BONUS COMPUTATION: Given this equation: $(x - 3)(y + 1) = 12$
[READ The quantity x minus three times the quantity y plus one equals twelve.]
Which conic section is formed by this equation when graphed?

ANSWER: Hyperbola

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. **SCIENCE: These tiny hairs are given a Latin name meaning “eyelash” and in eukaryotic cells they are structurally identical, except for length, to flagella.*** They also sit on the surface of some cells and beat in coordinated waves to move fluids or particles across the cell's surface. What are these tiny hairs used by paramecium for movement?

ANSWER: Cilia

BONUS BONUS: In which respiratory structure can you find cilia that help move mucus and trapped particles out of the lungs?

ANSWER: Bronchi [accept Bronchial tubes]

14. **HUMANITIES: Gagaku is a traditional style of court music from this country, which included the vocal Saibara genre. The biwa and * shamisen** are traditional instruments from this country, whose traditional theater styles include Noh and Kabuki. What is this Asian country which saw an artistic boom during the Heian period?

ANSWER: Japan

BONUS BONUS: The Japanese music genre Shomyo is a traditional style of chanting specific to what religion?

ANSWER: Buddhism [accept specific forms of Buddhism like Zen Buddhism or Pure Land Buddhism]

15. **SCIENCE: The two parts of this large molecule found in the nucleus of eukaryotic cells are held together by hydrogen bonds.*** It consists of a sugar-phosphate backbone with attached nitrogenous bases and encodes genetic information. What is this molecule that forms a double helix?

ANSWER: Deoxyribonucleic Acid [accept DNA]

BONUS BONUS: What are the four nitrogenous bases that make up DNA?

ANSWER: Adenine, Cytosine, Guanine, and Thymine [any order]

16. **SOCIAL STUDIES: A demonstration led by this organization was violently disrupted in the Battle of the Overpass. This organization assists in organization efforts for grad student workers in the * University of California system.** What is this labor union composed primarily of employees of companies like Ford and General Motors?

ANSWER: United Auto Workers [also accept UAW]

BONUS BONUS: The Battle of the Overpass was fought near what Ford plant in Dearborn, Michigan?

ANSWER: (Ford) River Rouge (Complex)

- _____ 17. SCIENCE: This structure is formed of fibrin to provide support and protection during healing.* The fibrin hold the wound closed and locks out bacteria while new tissue growth occurs underneath this structure. What is the common term for the hard covering over an injury?

ANSWER: Scab

- BONUS BONUS: Scabs are part of the wound healing process. During this process, these cells engulf invaders and dead cells to clean the wound site. What is the term for these cells that protect against invaders and increase in number during an infection?

ANSWER: White Blood Cells [also accept Leukocytes]

- _____ 18. MATH: Which trigonometric function is defined as the opposite leg of a right triangle over the adjacent leg of the same triangle?

ANSWER: **Tangent**

- BONUS BONUS: What is the reciprocal function for the trigonometric function cosine?

ANSWER: **Secant**

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: **In photosynthesis they are 6, 6, 1, and 6.*** They can represent both molecules and moles. In a chemical equation, the number in front of a chemical formula that indicates the ratio of reactants and products is called what?

ANSWER: Coefficient

- BONUS BONUS: Given the unbalanced equation $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$ balance the equation and give the coefficients in order.

ANSWER: 1, 3, 2 [$\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$]

- _____ 20. CURRENT EVENTS/POP CULTURE: **The biggest earthquake in 120 years hit this country*** in fall 2023. More than 2000 people died in the quake. Name the country where the earthquake struck near the city of Marrakech.

ANSWER: Morocco

- BONUS BONUS: The famous Koutoubia building suffered damage. What type of building is this that is used daily for prayers, weddings, and funerals?

ANSWER: mosque

21. FINE ARTS: **The magazine *Notebook on Cinema* was central to this country's New Wave movement. *The 400 Blows* and *Breathless* are films from this country, whose early silent era included the films of Georges Milies. Francois Truffaut and Jean-luc Goddard are directors from what country?**

ANSWER: (Republic of) **France**

BONUS BONUS: French New Wave film critic Jacques Rivette particularly hated the work of what Japanese director of *Seven Samurai* and *Yojimbo*?

ANSWER: (Akira) **Kurosawa** [accept names in either order, but Kurosawa is required]

22. SCIENCE: **This plant is a member of the nightshade family and is native to the Andes Mountains.*** It is the world's fourth largest food crop and while the stems and leaves contain toxic compounds, the tubers are generally low enough in concentration to be edible. Name this staple of Europe, especially Ireland.

ANSWER: **Potato**

BONUS BONUS: This edible berry is, like the potato, also a member of the nightshade family. What plant's fruit was once known as the "love apple"?

ANSWER: **Tomato**

23. MATH COMPUTATION: The hypotenuse of a right triangle is 25 centimeters long; one leg is 7 centimeters long.

What is the area of this triangle in square centimeters?

ANSWER: **84** (square units)

BONUS BONUS COMPUTATION: The area of a triangle is 72 square feet. Its height is 16 feet. What is its base in yards?

ANSWER: **3** (yd)

24. SOCIAL STUDIES: **These laws were first introduced to Oklahoma with the passage of Senate Bill 1. These laws were ruled unconstitutional in a Supreme Court case centered around * Topeka's Board of Education. Brown v. Board overturned what racial segregation laws, which get their common name from a character from racist minstrel shows?**

ANSWER: **Jim Crow** (Laws) [prompt on Segregation before it is read]

BONUS BONUS: What supreme court decision established the "Separate but Equal" doctrine that was overturned by the decision in Brown v. Board?

ANSWER: **Plessy v. Ferguson** [fully Homer A Plessy v. John H. Ferguson; accept names in either order]

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: Coming from the Greek equivalent of Aves,* this is the systematic study of birds. What is the term for this branch of biology?

ANSWER: **Ornithology**

SCIENCE: Helium has two stable ones. It also the name used for Springfield's baseball team in The Simpsons and Albuquerque New Mexico's real life team. What is this term for variations in atoms of the same element?

ANSWER: **Isotope**

SCIENCE: The pineal, pituitary, and thyroid are among the parts of this system.* What is the name of this system of glands that secrete chemicals into the bloodstream to regulate other organs?

ANSWER: **Endocrine** (system)

SCIENCE: The fern gametophyte that develops from the spores is tiny and requires this substance to allow the sperm to reach the egg and fertilize it. It is this dependence that limits ferns to environments with enough of this.

ANSWER: **Water**

SCIENCE: These biologic macromolecules are chains of amino acids.* The genetic code specifies a series of amino acids for building these as needed and they are then broken down and recycled. Many of these are enzymes that catalyze reactions in the cell. What are these molecules that form one of the three major food types?

ANSWER: **Proteins**

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