



2024-2025 Regional Finals Study Guide – Gamma Question Set

Instructions: This study guide should be your first resource in preparing for the National Science Bee Regional Regional Tournaments on the Gamma Question Set. Many of the facts below are found at some point in the 120 questions that compose the Gamma Question Set. Thus we have selected these facts for this study guide to help make your preparation easier and more efficient. Other facts in the study guide will be contained within the White and Blue Question Sets later in the year, so this can also serve as a good introduction to those questions. Remember that the questions are all short paragraphs on a particular topic, so if a topic is referenced below, then it is a good idea to learn a bit more about it on your own than what is listed here (since additional facts about a topic will also be referenced in the question). It is also helpful to read the introduction of a Wikipedia page on a topic to gain additional context about why it is significant. Please also use our past question sets (especially International Science Bee Regional Finals questions from past years) which are found [here](#). Many of the topics that are found in past years' questions will again be found in the questions at this year's Regional Tournaments, and at the Asian Championships too. Good luck!

Biology & Anatomy

1. [Chromosomes](#) are composed of proteins and a single molecule of DNA.
2. A [food chain](#) depicts the order of sequence of organisms who feed on one another.
3. [Neurons](#) are nerve cells which receive sensory input and send motor signals to the muscles.
4. A [joint](#) is a part of the body where two or more bones connect.
5. The [Tyrannosaurus Rex](#) was a species of carnivorous dinosaur that lived during the late [Cretaceous](#) period.
6. [Viruses](#) multiply by infecting host cells with genetic material.
7. The [heart](#) is an organ of the circulatory system that is responsible for pumping blood throughout the body.

Astronomy

1. [Alpha Centauri](#) is a triple star system that is the closest star system to the Sun.
2. An [eclipse](#) occurs when a celestial body, such as the Moon, blocks the Sun's light from reaching Earth.
3. [Neptune](#) became the farthest planet from the Sun following [Pluto](#)'s demotion to a dwarf planet.
4. A [black hole](#) is an incredibly dense region in space where gravity is so strong, light cannot escape.
5. [Global Position System](#), or GPS, is a U.S.-based satellite network used for navigation.
6. When a star runs out of fuel and collapses in on itself, it explodes in a [supernova](#).
7. An [exoplanet](#) is located outside of the Solar System, and thus, does not orbit our Sun.
8. The [asteroid belt](#) is located between Mars and Jupiter. It is home to [Ceres](#), the largest asteroid, which is considered a dwarf planet.
9. The [Kuiper Belt](#) lies beyond Neptune and includes the dwarf planet Pluto and its moon Charon.

Chemistry

1. [Sublimation](#) is the process of a solid substance turning into a gas.
2. The goal of [alchemy](#), a historical pseudoscience, was to transform base metals into silver or gold.
3. [Neon](#), the fifth most abundant element in the universe, is used in fluorescent lamps and signs.
4. The first element of the periodic table is [hydrogen](#), which is also the most abundant element in the universe.
5. [Pasteurization](#) is a method of heat treatment that is used to destroy microorganisms on food products. It is named for the French chemist Louis Pasteur who developed it.
6. Substances, such as water and honey, are described as [liquids](#) since they possess a definite volume but not a fixed shape.
7. [pH](#) is a metric used to measure the acidity or basicity of a substance. It is commonly said to range from 0 to 14. Values close to 0 are more acidic; values close to 14 are more basic.
8. [Organic chemistry](#) is a subdiscipline concerned with compounds containing Carbon, an element with atomic number 6. Carbon and organic compounds form the basis of all known life.

Computer Science

1. A [central processing unit](#) is a component which interprets and executes instructions on a computer.
2. [HTML](#) is the standard language used to create webpages on the World Wide Web.
3. [Spamming](#) is the practice of mass-sending unwanted messages via email or text.

Earth Science

1. The [crust](#) is the outermost layer of Earth. Beneath the crust lies the [mantle](#). The border between the crust and the mantle is known as the [Moho](#).
2. [Corals](#) are invertebrates which make up the reefs that serve as an ecosystem for many marine animals.
3. The [Last Glacial Period](#), also known as the Last Ice Age, peaked approximately 22,000 years ago and ended about 11,700 years ago.
4. [Lava](#) is molten rock that is expelled during a volcano eruption.
5. [Fracking](#) is the process of extracting natural gas and oil from shale rock.

Math

1. The three legs of a right [triangle](#) are associated with the Pythagorean theorem, which states that the sum of the squares of the side lengths of the triangle equals the square of the length of the hypotenuse (the side of the triangle opposite the right angle).
2. A [complex number](#) consists of a real part and an imaginary part.
3. [Exponentiation](#) is an operation involving repeated multiplication of a number based on its superscript.

Physics

1. [Isaac Newton](#) (1642-1727) developed the law of gravity legendarily after an apple fell on his head.
2. [Elasticity](#) is an object's ability to return to its original shape after being flatten or stretched.
3. [Boiling point](#) is the temperature it takes to transform a substance, typically a liquid, into a vapor.
4. [Combustion](#) is a reaction between a fuel and an oxidant, giving off heat and light.
5. [Gamma rays](#) are the strongest form of electromagnetic radiation.
6. [Fission](#) occurs when a neutron bombards into an atomic nucleus, resulting in the atom to split into two smaller nuclei.
7. The [speed of sound](#) measures how fast vibrations travel. If an object exceeds it, a sonic boom occurs.