



NATIONAL Science Bee

2022-2023 Regional Finals Study Guide – White Question Set

Instructions: This study guide should be your first resource in preparing for the National Science Bee Regional Finals on the White Question Set. Most of the facts below are found at some point in the 120 questions that compose the White Question Set. Thus we have selected these facts for this study guide to help make your preparation easier and more efficient. 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 historical context about why it is significant. Please also use our past question sets (especially National 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 Finals, and at the National Championships too. Good luck!

Astronomy

1. [Carl Sagan](#) was an astronomer who co-wrote and hosted the show *Cosmos: A Personal Voyage*.
2. The [Big Bang](#) Theory suggests that our universe expanded 13.8 billion years ago from a single point.
3. [Saturn](#) is the sixth planet from the Sun and is the only planet less dense than water.
4. [Orion](#) is a constellation on the celestial equator. It is named after a hunter in Greek mythology.
5. A [black hole](#) is an incredibly dense region in space where the gravity is so strong, light cannot escape.
6. [Comets](#) are balls of frozen gases and rocks that orbit the Sun.
7. [Ceres](#) is a dwarf planet and the largest object in the asteroid belt.
8. A [rover](#) is a vehicle used to explore and take photographs, typically of the terrain of another planet.
9. Objects in the constellation [Andromeda](#) include the spiral galaxy of the same name.
10. [Mae Jemison](#) was the first Black woman in space and has worked on the 100 Year Starship project.

Biology

1. [Proteins](#) are macromolecules composed of long, folded chains of amino acids.
2. The [muscle](#) is a soft tissue responsible for the movement of the body.
3. The [bladder](#) is a hollow organ located in the lower abdomen. It is responsible for storing urine from the kidneys.
4. [Bipedalism](#) refers to a form of mobility using an animal's two rear feet.
5. Sir [Alexander Fleming](#) discovered the antibiotic penicillin in 1928.
6. [Hemoglobin](#) is a protein in red blood cells that transports oxygen from respiratory organs throughout the body.
7. The [diaphragm](#) is a respiratory organ that is situated below the lungs and heart. It acts as a barrier between the chest and the abdomen.
8. The [Tyrannosaurus Rex](#) is a species of carnivorous dinosaur that lived during the late Cretaceous period.
9. The method of killing microbes in food or liquid by heat, Pasteurization, is named after its discoverer, French chemist [Louis Pasteur](#).
10. [Viruses](#) multiply by infecting host cells with genetic material.
11. [Antibiotics](#) are medicinal drugs used to fight bacterial infections.
12. The [thyroid](#) is a gland in the neck that releases hormones that control metabolism.
13. A [chromosome](#) is made from tightly-packed DNA. It is found within the nucleus of a cell.
14. [Pollen](#) is a yellow powder produced by the stamen of a plant. It may be transported by insects and birds to the stigma of flowers in a process called pollination.

Chemistry

1. A [catalyst](#) is a substance that speeds up a chemical reaction without being used or changed in the reaction.
2. [Diffusion](#) is the net movement of molecules from a region of higher concentration to one of lower concentration.
3. [Potassium](#) is an alkali metal with the symbol K. Fruits and vegetables that are rich sources of potassium include bananas, carrots, and potatoes.
4. [Antoine Lavoisier](#), a French nobleman, discovered the role oxygen plays in combustion.
5. A [cation](#) is a positively charged ion.
6. [Temperature](#) is the measure of hotness or coldness of an object or environment, measured in degrees Celcius, Fahrenheit, or Kelvin.
7. [Uranium](#) is a metallic chemical element whose atomic number is 92. Its isotope, Uranium-235, is used to fuel nuclear power plants and nuclear weapons.
8. [Oxygen](#) is a nonmetallic element with the atomic number 8. Humans and animals breathe in oxygen and release carbon dioxide.

Computer Science

1. A [URL](#) (also called Uniform Resource Locator, or simple a web address) is a naming convention for different websites on the Internet.

Earth Science

1. The [inner core](#) is the innermost layer of the Earth. Unlike the outer core, it is a solid ball made primarily of iron.
2. [Corals](#) are marine invertebrates that consist of tiny polyps.
3. [Metamorphic rocks](#) are formed after a rock undergoes a change after being exposed to intense heat or pressure. Slate, soapstone, and marble are all examples of metamorphic rocks.
4. The upwelling of magma during [seafloor spreading](#) forms a new oceanic crust.
5. Human activities have contributed to the formation of [acid rain](#). Common causes of acid rain include the burning of fossils, typically produced by vehicles and factories.

Math

1. The [average](#) (also known as the “mean”) of a set of numbers is calculated by dividing the sum of all numbers in the set with the number of values. You should also be familiar with the meaning of the terms “median” and “mode.”
2. A [parabola](#) is a symmetrical plane curve in the shape of the letter U. It can be formed by graphing a quadratic function.
3. [Real numbers](#) are values found on an infinite number line. Real numbers include all Rational and Irrational numbers.

Physics

1. The [Manhattan Project](#) was an American-led collaborative effort to develop the atomic bomb during World War II.
2. A [screw](#) is a simple machine used to hold objects together. The structure of a screw consists of an inclined plane wrapped around a cylinder.
3. [Leonardo da Vinci](#) was an Italian polymath during the Renaissance. His innovations include the aerial screw, which is similar to the structure of today’s helicopters.
4. [Inertia](#) is an object’s tendency to resist a change in its state of motion.
5. [Protons](#) are subatomic particles that contain a positive charge. They are found in the nucleus of an atom, along with the neutrally-charged neutron.
6. The [refractive index](#) measures the bending of light as it passes through another medium.
7. The four fundamental states of matter are [liquid](#), [solid](#), [gas](#), and [plasma](#).