VIRTUAL National Science Bowl®
Official Academic Competition Rules for 2022 Virtual Regional Competitions
~~Simplified~~

Some Regional competitions will be virtual events in 2022.
- **Teams will not play head-to-head matches** in the virtual regional competitions. Instead, teams are competing against all of the other teams in the competition. Only one team will be in a “room” at a time.
- Each competition will have a **Preliminary Tournament** (2 or 3 rounds), in which each individual team will be read the same set of 18 toss-up questions and earned bonus questions. The teams with the highest combined point totals from all preliminary rounds will advance to the **Elimination Tournament** (at least 3 rounds).

Due to the virtual format, teams must agree to the following requirements:
- Each student must be available via computer with web camera or smartphone for a Zoom meeting.
- In addition, another device with a camera must also be on the Zoom call via the Zoom app, to show the student’s workspace and surrounding area during the competition and to help the officials ensure the students and coaches are not breaking any rules.
- Each coach and co-coach may also be in the Zoom meeting. For each coach, another device with a camera must also be on the Zoom call via the Zoom app, to show the coach’s entire person from the side. Any other adults in the same room with the students should also have a camera facing them.
- **After play of the tournament, players, coaches, and spectators must not communicate about the questions with anyone outside their team, other than National Science Bowl® officials, until the questions are shared on the NSB website.**

The Questions
- Two types of questions will be used: **toss-up questions, worth 4 points**, and **bonus questions, worth 10 points**.
- A toss-up question may be answered by any of the members of the team. **Players must raise their hand**, wait to be verbally recognized, and then answer the question.
- A team answering a toss-up question correctly will always get a chance to answer a
bonus question. **Communication among team members is allowed on both toss-up and bonus questions;** this communication may be verbal, visual, or written in the Zoom chat box.

- A team will have only one opportunity to answer a toss-up question. If it does not answer a toss-up question correctly, the moderator will proceed to the next toss-up question.

Questions are either multiple-choice or short-answer.

- A participant may answer a **multiple-choice question** with either the letter answer (W, X, Y or Z) or the verbal answer; however, if the verbal answer is given, it must be **exactly as indicated in the question** or as read by the moderator.
- If a participant gives both a letter answer and a scientific answer to a multiple-choice question, both parts must be correct.
- When mathematical expressions that would be conventionally written in symbols are the choices, common alternate expressions of the answer shall be accepted. For example, “square root of 2” and “square root 2” would both be accepted; “sine x” and “sine of x” would both be accepted.
- **Answers to short-answer questions do NOT have to be exact**
- **Once read in its entirety, a question will not be re-read.**
- For toss-up and bonus questions, the **first player seen by the officials to raise their hand earns the right to answer the question.** This player must be **recognized** before the answer is given, but there are no penalties for blurring. **Answers will only be accepted from the student recognized by the official.** Other players should remain quiet while an answer is being given.
- A participant who raises their hand on a toss-up or bonus question must answer the question promptly after being verbally recognized by the official. After a participant is recognized, the moderator will allow for a natural pause (up to 2 seconds), but if the moderator determines that stalling has occurred, it will be treated as a wrong answer.
  - Any prefacing remarks that do not directly answer the question, such as “my answer is” or repeating the question, will be considered delaying the game and counted as an incorrect answer. (Note: a very short “um”, “er”, or vocal stumble is acceptable, provided the officials do not consider it delaying the game.)

**Timing**

- The match is played until all of the toss-up questions (and earned bonuses for correct toss-ups) have been read (15 toss-up questions for middle school and 18 toss-up questions for high school).
- After reading a toss-up question, the moderator will allow **7 seconds** for the team to respond. Timing begins after the moderator has completed reading the toss-up question, including all choices on a multiple-choice question. **Note:** The 7 seconds is based on the moderator’s timing, which begins upon completion of the question.
  - One of the officials must see someone’s raised hand **BEFORE 7 seconds has elapsed on the moderator’s timer.** (Teams should be aware that they will most likely **NOT have the complete 7 seconds due to a variety of factors, including internet bandwidth.**)
  - If no player raises their hand before the 7 seconds elapses, the moderator will
announce that time has expired, and proceed to the next toss-up question.

- After a team member has answered a toss-up question correctly, the team is given the opportunity to answer a bonus question. The team will have **22 seconds** for a team member to raise their hand to be recognized to give an answer to the bonus question. The signal "**5 SECONDS**" will be given by the moderator after 17 of the allowed 22 seconds have elapsed. **Note:** the 22 seconds is based on the moderator’s timing, which begins upon completion of the question.
  - One of the officials must see someone's raised hand BEFORE 22 seconds has elapsed on the moderator’s timer. (Teams should be aware that they will most likely NOT have the complete 22 seconds due to a variety of factors, including internet bandwidth.)
  - If no player raises their hand before the 22 seconds elapses, the moderator will announce that time has expired, and proceed to the next toss-up question.

**Scoring**  
Toss-up questions are worth 4 points, and bonus questions are worth 10 points.

**Challenges**  
**Challenges must be made before the moderator begins the next question**, or, for the last question of a round, within 3 seconds of the end of that question. No challenges may be made during the play of a question. All challenges must come from the players. The coach may not become involved in challenges or their discussion.

Challenges may be made either to **scientific content** (i.e., whether an answer is scientifically correct or not) or to the **administration of the rules** (e.g., whether the rules are being correctly interpreted and applied). **Challenges may NOT be made to judgment calls** by the officials, including but not limited to whether 7 seconds have elapsed before a player raises their hand on a toss-up, whether 22 seconds have elapsed before a player raises their hand on a bonus, whether two verbalizations of a mathematical expression are equivalent, whether a stall or blurt has occurred, whether a player has given a first response, whether an answer has been pronounced correctly, or whether an answer to a multiple-choice question is exact.

Challenges to scientific content will be limited to 2 unsuccessful challenges per team per round. Challenges to rules may be made at any time a question is not in play.

**Miscellaneous Rules**  
Students may have up to four sheets of 8.5 x 11 paper as scratch paper and a pen or pencil on the competition table. Nothing may be written before the match starts.

Players may use the NSB Zoom chat box to communicate with their teammates, including note-taking as the question is read by the moderator. Verbal communication among the students within the NSB Zoom session and written communication within the NSB Zoom chat box are the only allowable methods of electronic communication during gameplay. Players may not communicate, in any way, with anyone else, including the team coach, during a game.
Partial List of Question Conventions

The following conventions will be followed regarding the form of an answer to a short answer question, unless the question specifies otherwise:

Numerical answers – All numerical answers must be given in exact and simplest form.

i) Answers that are integers must be expressed in integer form (e.g., $2^3$ should be expressed as 8).

ii) Fractions and ratios that are part of answers must be in lowest terms. Fractions with absolute values greater than 1 may be expressed as either improper fractions or mixed fractions, and answers must not contain negative exponents.

iii) Answers that contain irrational numbers must be exact rather than approximate (e.g., the area of a circle of radius 3 should be expressed as $9\pi$).

iv) Answers containing radicals must express the radical part in simplest rationalized radical form.

v) Answers that involve a trigonometric angle $\theta$ must satisfy $0 \leq \theta < 2\pi$ in radians or $0 \leq \theta < 360$ in degrees.

vi) Answers that are non-real complex numbers must be expressed in $a + bi$ form; if either $a$ or $b$ is 0, stating the 0 term is optional. If trigonometric (polar) form is requested, the magnitude must be positive and the angle $\theta$ must satisfy $0 \leq \theta < 2\pi$ in radians or $0 \leq \theta < 360$ in degrees.

vii) Answers that are vectors must be expressed using the unit vectors $i, j,$ and $k$ (e.g., $4i + 3j - 2k$).

viii) If a coefficient is 0, that term may be omitted (e.g., $4i + 0j - 2k$ may be expressed as $4i - 2k$).

ix) Answers that are polynomials must be expressed in standard polynomial form, with terms in order of decreasing degree (e.g., $(x + 3)^2$ is expressed as $x^2 + 6x + 9$).

x) If the factored form of a polynomial is requested, the polynomial must be factored completely over the integers (e.g., $x^3 + x^2 - 2x - 2$ is factored as $(x^2 - 2)(x + 1)$).

xi) Equations must be solved over the real numbers (e.g., the solutions of $x^4 - 9 = 0$ are $\pm\sqrt{3}$).

xii) Numerals in bases other than 10 should be pronounced as individual digits (e.g., 234 base 6 should be pronounced as “two-three-four”). However, pronunciations such as “two hundred thirty-four” in the previous example will also be acceptable.

Units do not need to be stated in numerical answers; however, if they are stated, they must be correct and equivalent to the units requested.