



# Number Sense Handbook

For Contest Directors, Coaches and Contestants

2023 • 2024

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# 2023 | 2024

## University Interscholastic League

### Number Sense Handbook

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The details in this handbook expand upon the information in the UIL Constitution & Contest Rules. In addition to this handbook, coaches, contestants and contest directors should read Sections 900-906 for information pertaining to all contests. See also the Academic Quick Reference Chart found at the end of this handbook and on the UIL website.

From the UIL Constitution & Contest Rules:

#### **Section 944: HIGH SCHOOL NUMBER SENSE CONTEST**

- (a) THE CONTEST.
  - (1) Purpose. The Number Sense Contest emphasizes the mental processes used to achieve mathematical calculations with no help from calculators, computers, or pen and paper and to develop the use of specific techniques and strategies to make mathematical judgments and develop useful strategies for handling numbers and operations.
  - (2) Format. The contest will consist of questions testing mental calculations of concepts from basic mathematics, algebra, geometry, trigonometry, analysis, number theory and calculus. Types of problems and concepts can be found on the Problem Sequencing Chart for the UIL High School Number Sense Test.
  - (3) Late Arrivals. Qualified contestants not present when the tests are distributed will be disqualified.
- (b) ENTRIES.
  - (1) Individual Competition. Each member high school may enter as many as four individuals in the district meet, or a maximum of six individuals with district executive committee approval.
  - (2) Team Competition. A school shall have a minimum of three contestants compete in order to participate in the team competition. All four members of the winning team will advance to the next higher level of competition.
- (c) QUALIFICATION. Individuals, teams and wild cards qualify for the next level of competition according to Section 902.
- (d) TIES.
  - (1) Individual Competition. No ties are to be broken.
  - (2) Team Competition. Refer to Section 902 (h)(3)(D).

# Number Sense

## Contest Rules and Procedures

1. **CONTEST ROSTER.** A contest roster listing contestants will be created from schools' online entries and provided to the contest director.
2. **NUMBERING CONTESTANTS.** Each contestant will be assigned a number. This number should be indicated on the contest roster and included on the contestant's test. Contestants shall not write their name or the name of their school on their test.
3. **ROLL CALL.** The contest director will call roll from the contest roster and replace any contestant who is not present with a certified substitute at district or the certified alternate or team substitute at regional and state. All persons except participating contestants, the contest director, assistants and monitors will be dismissed from the room before the contest begins.
4. **SUBSTITUTIONS AND ALTERNATES.** Schools may replace individual contestants on the official district meet roster with a substitute so long as the substitute presents the contest director with the appropriate documentation. Alternates may compete at region and state only in the absence of an individual who won first, second or third place in the preceding competition. If a member of a school's team cannot compete at region or state, only one substitution may be made. See the UIL Constitution and Contest Rules Sections 903-905 for clarification.
5. **SEATING.** Contestants will be seated sparsely around the room and away from other contestants from the same school. All persons except participating contestants, the contest director, assistants and monitors will be excluded from the room before the contest begins.
6. **LATE ARRIVALS DISQUALIFIED.** Qualified contestants not present when the tests are distributed will not be admitted and are disqualified.
7. **MATERIALS.** Contestants shall furnish their own pens or pencils. Contest directors shall provide contestants with a test. No other materials are allowed during the contest.
8. **TEST DISTRIBUTION.** Testing materials will be distributed and contestants shall not unfold the test prior to instructions from the contest director. The assigned contestant number should be written in the top right-hand corner of the folded test. Papers shall remain folded and lying flat on the desk and shall not be touched by the contestants until the start signal is given.
9. **MENTAL MATH.** This is a test in mental mathematics, and only the results of calculations arrived at mentally without the use of scratch paper or any calculating devices should be accepted. The director of the contest should disqualify a contestant for violating this rule.
10. **ANNOUNCEMENTS.** Following roll call and prior to the start of the test, contest directors shall read aloud to contestants the section of this handbook titled Announcements Prior to Conducting the Contest.
11. **LENGTH OF TESTING PERIOD.** Ten minutes will be allotted for the actual testing period exclusive of time required for instructions. When time is called, each contestant shall immediately stop writing, even if the answer is incomplete. Contestants shall put their writing implement down and sit back while the tests are collected individually by the

- person(s) designated to collect the test papers.
12. **START AND STOP SIGNALS.** Contest directors will give the signal to start. After exactly 10 minutes, the contest director will give the verbal notification to stop. No other time warnings shall be given.
  13. **TIMING AND ELECTRONIC DEVICES.** Contestants may use timing devices provided they do not emit audible signals during the contest. Cell phones, tablets, smart watches or any device that can wirelessly connect to the Internet, may not be used during the contest. Music players, headphones, etc. may not be used in the testing room. Electronic devices not allowed in the contest should be turned off and should not be accessible during testing. Emission of any audio signals of any kind during the contest will result in disqualification.
  14. **GRADERS.** Coaches are expected to serve as graders and should be selected by the contest director prior to the beginning of the contest. One grader will be designated as the Head Grader.
  15. **ANSWER KEY.** Prior to the start of grading, the Head Grader should communicate to the contest director any concerns of the graders and any suggested changes to the key.
  16. **ANSWER KEY ERRORS.** In the case of a suspected error on the answer key, the contest director should contact the UIL State Office and/or contact the state contest director to communicate the suspected error and to seek clarification before changing the key. Any error confirmed by the UIL State Office or the state contest director should be corrected on the key used for grading.
  17. **GRADING THE CONTEST.** Each paper should be independently scored twice, and papers contending to place should be scored a third or fourth time as needed.
  18. **SCORING.** Papers shall be carefully graded, awarding each contestant five points for each problem solved correctly. The sum of points thus awarded shall be considered the gross grade of the contestant. From the gross grades four points shall be deducted for each problem not solved correctly or skipped.
    - a. Scoring Problems. Those problems occurring after the last problem solved correctly or attempted are not considered skipped and hence no deduction for them is made. "Attempted problem" means having a mark in the answer blank. Only the answers to the problems should be written on the paper. No other writing is permitted. An answer once written shall be allowed to stand. Answers may not be crossed out. Erasures, mark-overs, and mark-outs are not permitted. Should there be an erasure, a mark-over, a mark-out, or an extraneous mark, that problem is to be counted incorrect. The contest director is empowered to determine if a number is legible.
    - b. Fractions. All answers written as a fraction shall be reduced to the lowest terms. Improper fractions are permitted. Decimal answers are permitted for those unstarred problems whose answers are exactly expressible as decimals. For example,  $\frac{3}{2}$ ,  $1\frac{1}{2}$  and 1.5 are all acceptable. Starred problems on test sheets require approximate integral answers, i.e., they permit five percent error; unstarred problems require exact answers.
    - c. Symbols. Symbols such as  $^{\circ}$  (degree symbol), % and \$ are usually printed on the test. It is the responsibility of the test writer to print the appropriate symbols on the test. If not printed, the student does not include the symbol in their answer. Therefore, answers require only the writing of numerals. Marks other than the numeric answer and commas, if used, are considered extraneous marks and are counted incorrect.

Commas are not required in the answer, however if the student writes the answer using commas they must be in the correct place or they will be considered as extraneous marks and will be counted incorrect.

- d. Dollars and Cents. In the agreement with the philosophy that answers should be complete, all dollars and cents problems shall be written to the nearest cent. That is, twenty-three dollars shall be written as 23.00. Sixteen cents would be written as .16.
  - e. Numerical Answers. Numerical answers should be written so that the answers are complete as in the two examples given. However, the answer should be written in the most efficient form possible. For example, if the answer is 16, the written answer 16.000 is not acceptable for the purposes of the number sense competition. Extraneous zeros are not to be used. For example, if .16 is the answer, 0.16 is not an acceptable answer.
  - f. Exponentials. An answer such as  $3 \times 10^3$  should be expressed as 3000 and not left in exponential form.
19. **PLACES AND TIES.** Contestants can qualify to the next level of competition as individual first, second and third place winners or members of the winning team or wild card team according to Section 902 of the UIL Constitution and Contest Rules.
- a. Individual Competition. First place is awarded to the contestant making the highest total score, second place to the contestant making the next highest, third place to the next highest and so on. No individual ties are to be broken.
  - b. Team Competition. First place is awarded to the team with the highest team score and second place to the team with the next highest. Team ties shall be broken according to Section 902 (h)(3)(D) of the UIL Constitution and Contest Rules. In district competition, the top four scoring contestants from a school will constitute the school's team. At all levels, the sum of the top three overall scores from each school constitutes the team score for the school. All four members of first place or wild card teams advance to the next level of competition. All team members who qualify to regional or state will compete for individual honors.
  - c. Wild Card. A wild card team will advance according to Section 902 of the UIL Constitution and Contest Rules.
21. **VERIFICATION PERIOD.** Following grading and input of unofficial results into the online entry system, contestants and coaches shall be allowed a time period to review contest materials (see After the Contest, Verification Period). Questions shall be resolved during the Verification Period. Contestants and coaches not present at verification waive their opportunity to ask questions and accept final results as official. The purpose of the verification period is to check accuracy in scoring, tabulation and data entry, not to challenge the test or answer key.
22. **ANNOUNCING OFFICIAL RESULTS.** Following the verification period, the contest director should announce, as official, the names and schools of contestants through sixth place and the top two teams. Official results, once announced, are final.
23. **NOTIFYING ALTERNATES.** If an individual qualifier cannot compete at the next higher meet, the alternate shall be notified and allowed to compete. If a member of a school's team is unable to compete at the next higher level of competition, only one substitution may be made. The substitute shall give the contest director a substitute eligibility form or a letter certifying eligibility, signed by a school administrator.
24. **RETURNING THE PAPERS.** If results are final and all test questions resolved, district papers may be returned no sooner than the end of the last contest day of the district week. Regional papers may be returned no sooner than Saturday of region weekend.

25. **CONFIDENTIALITY.** Coaches, contest directors and contestants shall maintain confidentiality of contest material until the official release date. Transfer of information relative to the test shall be considered a violation of the Academic Contest Ethics Code and subject to penalties as outlined in the UIL Constitution and Contest Rules.
26. **SWEEPSTAKES POINTS.** Points are awarded through sixth place and to first and second place teams according to Section 902 of the UIL Constitution and Contest Rules.

# BEFORE THE CONTEST

## ROOM

Secure a room of adequate size for the number of contestants expected with tables or large desks of proper height. Auditorium seating or fold-up desk tops are not acceptable.

## MATERIALS AND EQUIPMENT

The contest director will provide the following:

- Pens for grading
- Accurate clock for timing
- (DISTRICT) One 8 ½ x 11 envelope per school entered, for returning materials

## CONTEST PACKET

The League office will provide the following:

- A copy of the UIL Number Sense Handbook
- Copies of the tests and answer keys
- (REGION) State Meet information cards for state meet qualifiers (11)

The meet director may schedule a specific time and place for contest directors to pick up the test packet before the contest. Contest officials should inventory the contents before the contest. The packet should be checked to verify the correct materials are enclosed and the number of copies included is sufficient for the number of competitors. The test packet should then be resealed and not opened again until just prior to the beginning of the contest.

## PERSONNEL

Coaches of competitors may serve as contest directors, assistants, monitors and graders.

- Contest director.
- Assistant to the contest director.
- Room Monitor.
- Graders. Almost certainly your best graders will be coaches of the contestants, and we encourage you to use their skill and experience to ensure accurate and efficient grading of the test papers. Designate one grader as the Head Grader. Make these selections prior to the beginning of the contest.

## TIME

Allot a minimum of 30 minutes for the contest. Plan for at least 20 minutes for announcements, grader sign up, roll call, instructions and distribution of materials. Ten minutes of working time will be allotted for the actual testing period exclusive of time required for instructions. The 10 minutes begins when contestants are instructed to start. It is critical to stay on schedule, as some students may need to go to other events.

Arrange for and announce during the opening remarks the time and place of the verification period prior to the announcement of official results.



## **EVENT ROSTER & RESULTS WORKSHEET**

Obtain a copy of the contest roster from the meet director, which will be generated from the UIL Spring Meet Online Entry System. It will list the school, contestant number, contestant name, district or region number and will indicate the competitors and alternates. You also record scores and/or results on this form to give to the meet director, who will then enter the results/scores into the online system before verification is held for the event.

## **ORGANIZING MATERIALS**

Each contestant will be assigned a number indicated on the contest roster. As an example, the number will be listed on the roster as 6A-17 or 2A-4, indicating the conference and a number. The UIL recommends numbering the tests and answer sheets before the contest begins. Write the contestant number in the upper right-hand corner of the test. Check all tests to ensure that all pages are printed clearly and completely.

(REGION) If there is more than one conference at the meet, it is important to differentiate contestant numbers by conference.

## **SORTING ENVELOPES (DISTRICT)**

Provide and label a large (8 1/2 x 11) envelope for each school entered in the district meet. Write the name of the school and contest on the top of the envelopes. After the verification period, contestants' tests and keys should be placed in the appropriate envelope for return to each school.

# CONDUCTING THE CONTEST

1. Set up the room that will best facilitate the contest where contest officials can sit in view of the contestants.
2. Organize contest materials for easy distribution.
3. Call roll from the roster and provide students with their assigned contestant number. Replace any contestant who is not present with a certified substitute at district and the certified substitute or alternate at regional.
4. Seat the contestants sparsely around the room separating contestants from the same school.
5. Dismiss from the contest room all individuals, except the contestants, contest director and assistants. Instruct graders to report to the grading room before the test begins.
6. Distribute the test. Caution contestants not to open the test until instructed.
7. Read aloud the following:

## Announcements Prior to Conducting the Contest

- a. Do not unfold the test until instructed to do so.
- b. Write the assigned contestant number in the top right-hand corner on the answer sheet and the test. Check for accuracy if it has already been written by the contest officials.
- c. Contestants may use timing devices as long as they do not emit audible signals during the contest. Cell phones, smart watches or any device that can wirelessly connect to the Internet, electronic tablets, music players, headphones, etc. may not be used in the testing room. Electronic devices not allowed in the contest should not be accessible during testing. Emission of any audio signals of any kind during the contest will result in disqualification.
- d. This is a test in mental mathematics, and only the results of calculations arrived at without the use of pencil and paper will be accepted.
- e. Write the answer in the blank immediately following the problem without attempting to solve the problem on paper, in accordance with instructions on the test.
- f. Whispering, talking, or other unnecessary noise of any kind by contestants or those in charge of the contest is not permitted. Contest officials will refrain from making unnecessary noise, movement and any other action that may disturb the contestants during the contest.
- g. Verification period will be held\_\_(name room) at\_\_\_\_\_(give time). This is contestants' and coaches only time to verify grading and unofficial results.
- h. Are there any questions?
- i. You may begin the contest.

8. After exactly 10 minutes from the start signal, the director should, without warning, give the signal to stop. Contestants should immediately put down their writing implement and sit back while the tests are collected.
9. Collect all papers so that none are retained by contestants, coaches or other interested parties and deliver all materials to the grading room.
10. Submit the substitution forms/letters to the meet director to update the original entry in the online entry system.

# GRADING THE CONTEST

## **GRADERS**

Graders should report to the grading room as soon as the contest begins. The Head Grader will provide answer keys and surplus tests. Persons not assigned to grade should not enter the grading room.

Graders should review the test and verify the official answer key. The purposes of the review is to verify the official key. See Answer Key Errors. Problems should not be altered in any way or discarded without a ruling from the UIL state office and/or the respective state contest director.

Teams advancing to the Region and State Meet shall provide a qualified grader to score papers, unless excused for a valid reason by the contest director.

## **GRADING INSTRUCTIONS**

Do not sacrifice accuracy for speed. Score each paper independently twice, and score papers contending to place a third or fourth time as needed.

When marking the answer sheets, no mark should be made if the item is correct. Place an X over the question number that is incorrect. Do not mark over the contestant's answer. Do not write the correct answer if the answer written is incorrect. If any answer space is left blank, draw a line through the blank and after the last problem attempted.

## **SCORING**

Score points according to the guidelines in Number Sense Contest Rules and Procedures.

## **PLACES AND TIES**

Refer to Number Sense Contest Rules and Procedures.

## **IDENTIFYING PAPERS**

After papers have been ranked, indicate on the answer sheet the name and school of the student that corresponds with the contestant number. This will expedite the verification process.

# AFTER THE CONTEST

## **REPORT TO MEET DIRECTOR**

Individual contest directors shall give the contest roster/results form to the district director immediately after the contest papers are scored. The district meet director is responsible for entering results into the online entry system. All scores must be entered into the online entry system prior to verification and announcement of results. Enter all contestants' scores, not just the top six. All scores are needed to determine team results. Provide at least one copy of the unofficial results from the online entry system during verification.

## **VERIFICATION PERIOD**

Announce that no one present may use writing or erasing instruments during the verification period. If the key was changed during the grading process (with the approval of the UIL state office or the state contest director), the contest director shall announce the changes made. The contest director shall allow the contestants and coaches a time period not to exceed 15 minutes to look at all of the following items:

- Contestant's test
- An answer key, in its original form as supplied by the League office
- Display of scores after entry into the UIL Spring Meet Online Entry System

Do not allow anyone to take papers from the room. During this period, the contestants and/or coaches shall verify that they have the correct papers and look for possible errors in the grading, calculation or data entry of scores.

Display each contestant's score (not just the top 6 places) preferably by displaying the printed page from the online scoring system after scores were entered. This will allow data entry of score to be reviewed by contestants and coaches during the Verification Period.

At state meet only, the contest director may omit a display of data entry into the UIL Spring Meet Online Entry System if data entry has been carefully reviewed and verified by graders or other assistants during the grading and scoring period.

If errors in grading, scoring or online data entry are found during the verification period, the contest director shall make the corrections.

After resolving all questions, or the end of the 15 minutes, the contest director should announce that the Verification Period has ended. If papers are not being returned on the day of the contest, see Returning Papers below.

## **ANNOUNCING OFFICIAL WINNERS**

The contest director should make any necessary announcements regarding the return of papers if necessary and any instructions regarding the awards ceremony. The contest director will announce official results with the name and the school of each contestant who places individually first through sixth and announce the schools of the first place and alternate teams. These results, once announced as official, shall be final.

## **QUALIFICATIONS TO REGIONAL OR STATE**

Contestants can qualify to the next level of competition as individual first, second and third place winners or members of the winning team or wild card team as described in Section 902 (h)(3) of the UIL Constitution and Contest Rules.

## **RETURNING PAPERS**

If papers are not being returned, pick up all tests, answer sheets, scoring charts and keys so that none remain with a contestant or coach. Place the materials in the sorting envelopes by school. At the district meet, papers may be returned no sooner than the end of the meet on the last day of the district week. If the region meet is held on Saturday, the test, answer keys, scoring charts and answer sheets may be returned to the contestants the day of the meet.

# NUMBER SENSE QUICK REFERENCE CHART

Note: Grading time varies. For most events, allocate a minimum of two hours.

## Contest

### ROOMS

- 1 – testing
- 1 – grading

PREP TIME — 20

TEST TIME — 10

### CONTEST MATERIALS

UIL Packet: tests & keys, answer blanks.

Director Provides: contest roster and results form (generated from online entry system), contest rules, clock, calculators/pencils for graders, stapler, and one 8 1/2 x 11-inch envelope per school.

### PERSONNEL

- Director
- Head grader

### # OF ENTRIES

(District) 6 per school

(Region) 1st/2nd/3rd individuals per district; 1st place team per district; wild card team.

### TIES

- Individual — Break no ties.
- Team — Break tie with fourth team member score. If tie still exists, all teams involved in tie advance.

### GRADING/JUDGES

At least 3, preferably more. Graders may be coaches.

### AWARDS

Individual medals: 1<sup>st</sup> through 6<sup>th</sup>

Team medals: 1<sup>st</sup> and 2<sup>nd</sup> place teams

### POINTS

1<sup>st</sup> — 15

2<sup>nd</sup> — 12

3<sup>rd</sup> — 10

4<sup>th</sup> — 8

5<sup>th</sup> — 6

6<sup>th</sup> — 4

1<sup>st</sup> team — 10

2<sup>nd</sup> team — 5

### ADVANCE

Top 3 individuals and 1st place team. One wild card team per regional will also advance.

## Study Material

Shop the UIL Online Store at [store.uiltexas.org](http://store.uiltexas.org) to purchase study Materials. Some materials are available for free download.

- Number Sense study materials sets includes all tests through the state level from the previous year.

The Academics homepage of the UIL web site contains a variety of additional forms needed for academic programs, including the Professional Acknowledgment Form for all sponsors, coaches and directors of academic events and the Substitute Eligibility Form needed for contestants not listed on the original entry form for UIL meets.

The Number Sense Handbook includes a description of the current UIL contest format, rules and procedures. It is available as a free download: <http://www.uiltexas.org/academics/resources/contest-handbooks-manuals>

The generic forms needed to host invitational meets, such as grading rubrics, answer sheets and contest results form are posted, as are the Academic Meet Director Manual, the conflict pattern and various checklists for academic coordinators. Check the different web pages for speech and debate, theatre, and the A+ Program for current information and forms specific to those contests.



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