

# CODEBUSTERS A – Trial Event 2021

1. **DESCRIPTION:** Teams will cryptanalyze (decode) encrypted messages using cryptanalysis techniques and show skill with ciphers by decrypting a message.
2. **ESSENTIAL STANDARDS ALIGNMENT:**
3. **TEAM OF UP TO:** 2
4. **MAXIMUM TIME:** 50 minutes
5. **TEAMS:** must bring writing utensils. No other resource materials are allowed.
6. **EVENT LEADERS:** Will provide scratch paper for each team to use.
7. **SAFETY REQUIREMENTS:** None.
8. **IMPOUND:** No
9. **THE COMPETITION:** This event consists of participants using cryptanalysis techniques to decrypt messages on a written exam.
  - a. Teams must not open the exam packet nor write anything prior to the “start” signal, nor may they write anything after the “stop” signal.
  - b. Participants are free to answer the questions in any order, working individually or in pairs, attempting whichever of the questions seem right for them.
  - c. **The code types that may be used on the exam at competitions are as follows:**
  - d. Atbash Cipher (in English, not Hebrew)
  - e. The Caesar Cipher, also called a shift cipher, with a shift of no more than 3 characters in either direction. (e.g. ‘a’ can map to x,y,z,b,c,or d).
  - f. Mono-alphabetic substitution
    - i. Aristocrats with a hint - messages with spaces included, and with a hint
    - ii. Aristocrats - messages with spaces included, but without a hint
  - g. The Vigenère Cipher – Decrypting ciphertext given a key.
  - h. The PigPen Cipher, also called the Masonic Cipher – Decrypting ciphertext with no mapping table provided.
  - i. The Tap Code Cipher – Decrypting ciphertext encoded by a pair of numbers indicating a coordinate in a standard 5x5 table (not provided with the test) with c and k sharing the same cell.
  - j. Aristocrats Cipher - no letter can ever decrypt to itself.
  - k. The exam packet will include a resource sheet with English letter frequencies, AtBash and Vigenère tables but will NOT provide the PigPen or TapCode Cipher tables.
10. **SCORING:**
  - a. High score wins.
  - b. Based on difficulty, each question will be worth a clearly indicated number of points.
  - c. **The general point distribution by question type is:**
    - i. An “easy question” = 400-500 pts
    - ii. A “medium question” = 600-700 pts
    - iii. A “hard question” = 800-900 pts
    - iv. A “very hard question” = 1000 pts
  - d. For all questions, **the final points will be determined based on the number of errors found**
    - i. **Two or fewer errors will result in full credit**
    - ii. Each additional error results in a penalty of 100 points
    - iii. The penalty will not exceed the value of the question. For example, a 400-point question with 5 errors is worth 100 points whereas the same 400-point question with 7 errors would be worth 0 points, not -100 points.
  - e. The scores for each question will be added to determine the exam score.
  - f. Tie Breakers: For teams that are tied, select questions predetermined by the event supervisor, will be used to break the tie using the following criteria in this order: score, degree of correctness and attempted.
11. **EVENT RESOURCES:**  
See the Event Resources tab on our website for instructions, videos, and more.