

CODEBUSTERS

DESCRIPTION: Students will be tested on their ability to decode encrypted messages using cryptanalysis techniques and show skills with ciphers by decrypting a series of messages.

TEAM SIZE: 1 or 2 students

APPROXIMATE TIME: 30 minutes

Teams must bring:

- Pencils & eraser

Students will be provided:

- Resource Sheet with English letter frequencies, Atbash, Vigenère and **DancingMen** tables.
- Scratch Paper

THE COMPETITION:

Students may answer the questions in any order, working individually or in pairs. *Students will not be able to finish the test.* They will pick which problem they will attempt to solve.

Students must not open the exam packet until the test starts. Test can be taken apart so students can work independently on problems. Students must write their answers legibly.

The code types that may be used on the exam are:

Name	a.k.a.	Details
Atbash		A decryption table will be provided.
Caesar	Shift	A shift of no more than 5 characters in either direction.
Aristocrat		No letter can ever decrypt to itself. A hint may be provided depending on the level of difficulty.
Vigenère		A key and decryption table will be provided.
PigPen	Masonic	Decryption table is not included. Students must know how to create the table.
Tap Code		Decryption table is not included. Students must know how to create the 5 x 5 table with c and k sharing the same cell.
DancingMen		A decryption table will be provided

SCORING:

High score wins. Based on difficulty, each question will be worth a clearly indicated number of points. The points will be determined based on the number correct answers provided, and the respective point values for each. Bonus points will also be awarded for each cypher that is 100% correct.

Ties will be broken based on: 1) the number of problems that are decrypted 100% correctly; 2) the number of points awarded on the more difficult problems.

SUPPORTING RESOURCES:

Go to <https://toebes.com/codebusters/> for help with how each cipher works and for help creating practice tests. Thanks to John Toebes and his team, who created this event.

If a rule clarification is posted on the Macomb Science Olympiad website, the supervisor will score this event accordingly. Please visit: www.macombso.org/codebusters.