

Codes and Ciphers

Codes and ciphers are all around us. If you send and receive emails, then chances are that your computer is using a kind of code or cipher to encrypt and decode the messages. Cryptography is the science of codes, and the word 'cryptography' comes from the Greek words *kryptos* (meaning secret) and *graphos* (meaning writing). Even though working with codes and ciphers can feel a lot more like **play**, there are people who work with codes and ciphers for a living. In this POW we will leave it to you to decide whether the problems feel more like **work**, **play**, or some combination of the two.

1. Codes and ciphers are not just a modern thing; people and cultures have been using them for thousands of years. Can you discover how codes and ciphers have been used throughout history? If you find any examples, bring them into class to share.

The following problems are known as cryptograms. Each letter in the code below has been substituted with another letter from the English alphabet. Can you decipher these examples?

2. JTQTIRVRBO ZNV LBOTGWYZ SBA FVPYZRNJAP EP VFATNLROM ROSBAGNJRBO
NEBWJ RJ, NV UTQQ NV YBOJAREWJROM JB JZT OTTL SBA.

—NQSATL ZRJZYBYX

3. EWNTAPC EV H PEL, H QEEJ AT H UHB'T QCTN VMACBP. ABTAPC EV H PEL AN'T NEE
PHMJ NE MCHP.

—LMEWIZE UHMY

4. Z XIAY NYBNXZQYP. Z XZFY WCY SCIIPCZQM PIVQN WCYO KBFY BP WCYO GXO RO.

—NIVMXBP BNBKP

5. PIIPCWXAUWS UO BUOOFM NS BPOW IFPIJF NFZLXOF UW UO MCFOOFM UA
PEFCLJJO LAMJPPTO JUTF QPCT.

—WKPBLQ LJEL FMUOPA

6. PZ PJ RT PKZNXNJZ ZR KRZN ZMHZ QMPDN JRON GRDYMPKJ HXN XNYRXZNG ZR
MHCN DNHXKNG NKADPJM — WY ZR TPTZL QRXGJ WJNG PK ERXXNEZ RXGNX — KR
MWOHK VNPKA MHJ VNNK XNYRXZNG ZR MHCN DNHXKNG GRDYMPKNJN.

—EHXD JHAHK

Puzzle Parade

Warning: Some of these are trick questions!

- 1) Can you place ten pennies in three empty cups so there is an odd number of pennies in each cup?
- 2) Put ten pennies in a circle. Each player may take one or two, but if you take two they must be right next to each other (with no counter or open space between them). The player who takes the last counter wins. Who has the advantage, first or second player?
- 3) Explain the order of these digits: 8, 5, 4, 9, 1, 7, 6, 3, 2, 0.
- 4) Cross out eleven letters in such a way that the remaining letters spell a single word!

N A I S N I E N L G E L T E T W E O R R S D

- 5) Four jolly men sat down to play,
And played all night till break of day.
They played for cash and not for fun,
With separate scores for every one.

Yet when they came to square accounts,
They all had made quite fair amounts!
Can you this paradox explain?
If no one lost, how can all gain?

- 6) Take a piece of paper, 4 inches by 8 inches, and divide it into 8 squares and number them (one side only) as shown. Fold up this map so the 1 is on top and all the numbers are in order below it.

1	8	7	4
2	3	6	5

- 7) There are two big glasses. One contains 8 oz. of water, and the other has 8 oz. of wine. One ounce of wine is added to the water and the mixture is stirred. Now one ounce of the mixture is poured into the wine. Is there now more wine in the water, or more water in the wine? Or are they equal? Explain!
- 8) A triangle has sides 17, 35, and 52 inches. What is its area in square inches?
- 9) Can you dissect an obtuse triangle into triangles, all of which will be acute triangles?

Work hard! Play a lot! Have fun!