DIRECTIONS

1. In Angel, in the Crypto Game folder on Lessons page, begin by clicking PRACTICE CryptoGame "Save the Bard" before attempting graded submissions.

2. All steps of the practice crypto game should be successfully completed, before attempting a graded game.

3. In Angel, every graded game attempt generates a new crypto game problem.

4. As explained below, each crypto game consists of two parts: First, clues are give to create a keyword using PSU Historical Markers, and second this keyword is used to decrypt an encrypted message of a Shakespeare (aka “the Bard”) quote.

5. In Angel, click "Save and Continue Later" as needed to work offline to create the keyword and decrypt the quote.

6. In Angel, click "Resume" to paste the decrypted quote into Angel and click submit.

7. This assignment may be completed individually, or with one partner.

8. If completed with a partner, only one graded submission per team by "Member1." In the graded submission, Member1 will provide partner Member2’s name and ID. Member2 separately logs in to Angel to complete a “Partner Confirmation” form, also in the Crypto Game folder on the Angel Lessons page.

PART 1: THE KEYWORD

1. The keyword uses a “book cipher” that is created by “concatenating” (i.e., joining without spaces) one word each from three University Park blue historical markers found online at [http://www.psu.edu/ur/about/markers/markers.html](http://www.psu.edu/ur/about/markers/markers.html).

2. When the problem is opened in Angel, the name of the marker will be given, followed by two numbers. The first number represents the row on the sign, where counting starts from the top or title row. The second number represents the specific word on that row.

3. For example, if the three words were found to be “in,” “Pennsylvania,” and “stadium,” the keyword would be concatenated as inpennsylvaniastadium (note that upper or lowercase in our keyword should not matter).

4. Take your time, as counting and spelling in this part is important!

PART 2: THE DECRYPTION

1. When the problem is opened in Angel, a string of corresponding encrypted text is also provided.
2. Carefully highlight and copy only the encrypted text. Check the highlighting to make sure that no blank spaces are copied before/after the text string. Refer to Figure 1 below for an illustration.

3. Separately, in a browser, open the Vigenère Square Tool found online at http://www.simonsingh.net/The_Black_Chamber/vigenere_square_tool.html

4. Paste the copied encrypted text into the Tool’s “Ciphertext” box.

5. Print or paste the concatenated keyword generated in Part 1 into the Tool’s “Keyword” box.

6. In the Tool, click “Decipher Plaintext.”

7. The solution is generated as a lowercase, concatenated string in the Tool’s “Plaintext” box. Although the plaintext string has no spaces, capitals, or punctuation, each word should be recognizable and spelled correctly. Visually check the string to make sure that no unusual letters display before the first word, or after the last word. If unusual letters should appear, repeat step #2 in this part to make sure no blank spaces are included in the encrypted string copy! If strange words or spellings appear, carefully repeat the keyword generation steps in Part 1, and try again.

8. Copy the legible, although concatenated string, displayed the Tool’s “Plaintext” box. Paste this string into Angel without editing. Specifically, do not add spaces, capitalization, or punctuation.

9. Click submit to complete and grade the assignment.

10. Students are permitted two graded submission attempts. Each attempt will generate a new problem.

11. Be sure to first successfully complete keyword generation, decryption, and Angel submission with the practice problem. If you have problems with the first graded submission, meet with faculty before attempting the new second graded attempt!

FAQ

1. Where do I get the historical marker keyword clues and encrypted text?

Clicking the practice or graded crypto game assignment in Angel is the only way to generate keyword clues and corresponding encrypted text. Each graded attempt generates a new set of keyword clues and encrypted text. Consider using Angel’s “save and continue later,” and “resume” features, to work offline.

2. Can I work with a team of three?

No teams of three or more. While we prefer students complete this assignment individually, we will permit students to work with ONE partner. Member1 submits the assignment for both partners, and must indicate the partner’s ID at that time. Member2 must separately complete a “partner confirmation” form in Angel within fifteen minutes of the Member1’s submission (i.e., any two partners should be working together to complete this assignment).
3. **What row do I start counting the rows on the historical markers?**

In Part 1, the historical marker name is given followed by two numbers. The first number refers to the row on the sign. Row counting begins with the top, or title, row on the sign. The second number given refers to the word in this row that you should find. Pictures of the historical markers are found online using the link in Part 1 above.

4. **The last word of my decrypted quote seems to be followed by a stray letter?**

Repeat the copy of the encrypted text from Angel. It is likely that you copied a blank space at the end of the ciphertext. Make sure the highlighting starts with the first letter, and ends on the last letter, before clicking “copy.” Refer to Figure 1 below for an illustration.

5. **Most of my decrypted quote is legible, but some of the words seem garbled?**

Repeat the keyword generation steps. It is likely that one or more of the words found on the historical markers are not correct.

6. **I had no problem completing the practice problem, but my first graded attempt did not work?**

It is important to not guess! Please meet with faculty (check office hours in Angel Calendar) to get help before attempting the second graded attempt. Remember that the second attempt will generate new keyword clues and ciphertext!

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**Figure 1** The top example above shows highlighting that will copy a blank space after the last ciphertext letter. This should be avoided! The bottom example correctly shows highlighting that ends on the last ciphertext letter.