Lesson Plan Title: Encryption, Expression, and Privacy

Concept / Topic To Teach: Fourth Amendment Issues - the Right to Privacy, and how encryption and encoding works on the Internet to maintain privacy in a very public forum.

General Goal(s): Students will be able to discuss the expectations of privacy on the internet, and how encryption and encoding is used to create privacy where it might not otherwise exist.

Specific Objectives:
- SWBAT identify the Fourth Amendment.
- SWBAT discuss the expectations of privacy.
- SWBAT examine the implications of privacy on the internet.
- SWBAT explain Public Key Theory.
- SWBAT decode sample messages.
- SWBAT discern the differences between privacy rights in the US and privacy rights in the European Union.

Required Materials:
- Tackle box (or other box that can lock)
- Candy
- Two locks with keys
- Computer with Internet
- PowerPoint

Anticipatory Set (Lead-In):
Review limits on the First Amendment. What “tests” are there to determine whether speech or an action is protected.
Review the Fourth Amendment. Are there similar tests to determine if there is a breach of privacy?

Step-By-Step Procedures:
1. Being PowerPoint.
   a. Privacy Suit titles - What can people sue for?
   b. Right to be Informed - Do people have the right to all truthful information?
      Secrets? What about “cleaning house” on the internet? What if something is no longer true?
   c. What are limitations to cleaning house? Have we ever re-written history? What about the EU’s “Right to be Forgotten?”
   d. Making Information Inaccessible - If we admit that we have limited expectations of privacy on the internet, what can we do to make some information inaccessible?
      i. Explain different types of encoding
      ii. Cipher text vs. plain text
      iii. Cipher shift
   e. Brute Force Hacking - Quantum Computers
2. How does Public Key Theory Work?
   a. Pick 5 students to stand in a line in front of the room.
   b. Pick one student on the end to be the “sender.”
   c. Pick the other student on the end to be the “recipient.”
   d. Middle student is the “bad guy.”
   e. Provide a tackle box as the container.
   f. A bag of candy is the “message.”
   g. Have the receiver put the “encrypted message” in the tacklebox.
   h. Have the “sender” send the locked box through the internet.
   i. Check to make sure the “bad guy” can’t get to it.
   j. Have the box send to the “receiver.”
   k. Can the “receiver” open the box with the “sender”s lock on it?
   l. Have the “receiver” put an additional lock on it?
   m. Pass back through the internet.
   n. Can the “bad guy” open it with the two locks? No.
   o. Continue to send the “sender.”
   p. “Sender” takes her/his lock off.
   q. “Sender” sends the box back to the “recipient” who can now unlock the box because only the “recipient” lock on it?
   r. This is how it works on the internet.

3. Once they get the Public Key encryption give students 3 different codes to break. Each student gets a reward once they break one of the codes. This can also be done in groups. Three people works well.

Closure (Reflect Anticipatory Set):

Review the following questions with the class:
- What is the Fourth Amendment?
- What are some tests on the Fourth Amendment?
- What is the difference between public and private?
- Make a connection between the First Amendment and the Fourth Amendment.

Assessment Based On Objectives:

This is part of a larger unit test. The goal is for students to understand that laws as well as technology protect access to information. This is usually tested through essays. For instance:
- 21st century technology has altered our cultural perspectives on privacy and the limits of privacy.
  - Give an example of a scenario where technology seems to change an expectation for privacy?
  - How does technology alter interpretations of the Fourth Amendment?
  - How do users still attempt to control or prevent access to information?

Adaptations (For Students With Learning Disabilities):
If you wanted to give a more in depth foundation to how the plain alphabet is altered by the cipher alphabet, cheap decoders are available or you can make your own by handing out strips of paper with the plain text alphabet written horizontally. Taking two of these strips, a student place one strip above the other and shift it as many times as they’d like to make a cipher alphabet.

**Extensions (For Gifted Students/PIB):**