

*Please use the following resources to learn about cryptography.*

**Watch this Video:** [SciShow video on Cryptography](#) (you can stop after 3:00 if you'd like)

**Answer these questions:**

- What are the two things you need in order to encrypt a message?
- What are two strategies for breaking a cipher?
- Which is easier to break, a longer cryptogram or a shorter cryptogram? Why?

**Activities:** Follow these directions to write secret messages with your own Scytale cipher, a cipher used by Roman soldiers!

You will need:

• 2 pencils	• paper	• tape	• scissors	• lab partner
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1. Cut a thin strip of paper (less than 1 inch).



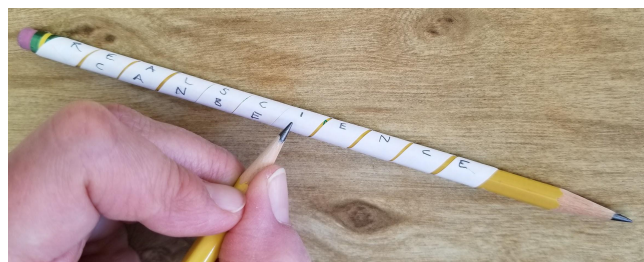
2. Wrap the strip of paper around one of the pencils.



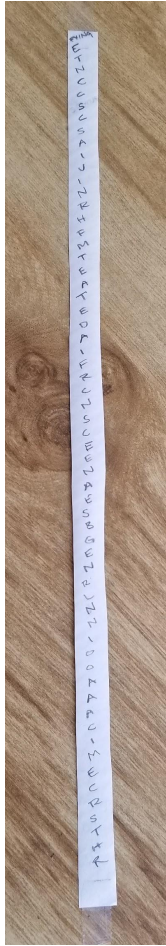
3. Tape down the ends of the paper.



4. Write a message on the paper, along the length of the pencil.



5. Carefully un-tape the paper from the pencil. Flatten out the paper. Your message is encrypted!
6. Pass the message to your friend. They need to wrap it around a pencil **of the same size** in order to read it!



*Is a pencil too small for you? Try using a marker to make your cipher instead. Here's one example:*



Questions to ask yourself:

- How secure is the Scytale cipher?
- What are its weaknesses?
- What could you add to make it more secure?

### **Make observations & use Claims, Evidence, and Reasoning!**

1. **Claim:** The key to an encrypted message may be a physical object.
  - **Evidence:**
  - **Reasoning:**
2. **Claim:** It is easy to accidentally give away clues to your cipher.
  - **Evidence:**
  - **Reasoning:**