

Let's look at an example! Using the chart below let's decode the pattern: 3945

Letter	Number	Letter	Number
<b>A</b>	1	<b>F</b>	6
<b>B</b>	2	<b>G</b>	7
<b>C</b>	3	<b>H</b>	8
<b>D</b>	4	<b>I</b>	9
<b>E</b>	5		

If you take each letter assigned to the numbers 3945, you get the word "code"!

## Using Patterns to Unlock Secrets!

Mathematicians and coders are like detectives who love to find patterns! When we use numbers to make secret codes, we are using patterns to solve a puzzle.

Think about our secret code chart above. What patterns do you see here?

- **Counting Up:** What happens to the numbers as you go from A to I? They go up by one each time! 1, 2, 3, 4, 5... This is a simple counting pattern.
- **Alphabet Order:** The letters are in alphabetical order, A, B, C, and so on. This is another pattern!

### How do these patterns help us?

1. **Focus on the Details:** When we look at a secret message like "3945," we need to focus on each number one at a time. Each number is an important detail.
2. **Plan Your Steps:** We have a plan to figure out the secret message:
  - **Step 1:** Look at the first number in the code (3).
  - **Step 2:** Find that number in our chart.
  - **Step 3:** See which letter goes with that number (C).
  - **Step 4:** Write down the letter.
  - **Step 5:** Do the same thing for the next number (9), and the next (4), and the next (5)!
  - This plan helps us logically order the steps to solve the problem.
3. **Break It Down:** The whole secret message "3945" might look a little tricky at first. But we can break it into smaller, easier parts: 3, then 9, then 4, then 5. Solving each small part helps us solve the whole big problem. This is like building with blocks – you put small pieces together to make something big!
4. **Connect What You Know:** You already know how to count and you know your alphabet! When we use this chart, we are connecting what you already learned (counting and alphabet) to a new, fun idea (secret codes!).

5. **Look for Similarities:** If you had another secret code like "125," you would use the *same pattern* and the *same steps* to solve it. This code is similar to "3945" because it uses the same number-to-letter pattern. Looking for similarities helps us solve different problems using the same tools!
6. **Big Problems from Small Solutions:** Imagine if a whole book was written in a secret code like this! If you can crack a short word like "code," you are learning the skills to crack a much longer secret message! The small solutions (decoding one letter at a time) help you understand how to solve bigger, more complicated secret codes.

When you use the pattern of numbers and letters, you are being a mathematician! You are using structure to understand and unlock secret messages. What other patterns do you think we could use to make secret codes?

## Critical Thinking Questions

1. Why do you think encryption is important for keeping information safe, such as passwords on a computer? How does it protect information?
2. Can you think of other times when secret codes might be helpful? How would they be helpful?

## Questions (5)

### 1. What is encryption?

MULTIPLE CHOICE

Choose the correct answer:

- A. A secret code
- B. A computer game
- C. A style of dance

### 2. Why is it important to use encryption?

MULTIPLE CHOICE

Choose the correct answer:

- A. Encryptions help you beat computer games.
- B. Encryptions keep your information safe.
- C. Encryptions help you save money.

### 3. Which of the following is an example of an encryption?

MULTIPLE CHOICE

Choose the correct answer:

- A. Emails
- B. Games
- C. Passwords

#### 4. True or false: Patterns make it possible for a message to be decoded.

MULTIPLE CHOICE

Choose the correct answer:

- A. True
- B. False

#### 5. Why do computers ask us to make passwords?

MULTIPLE CHOICE


Choose the correct answer:

- A. To protect our information
- B. To make our information available to others

## Games (2)

### 1. Encryption and Decoding Typing Game

Full Screen Audio Instructions Restart Pause



⌚ 0s 🎯 100%

An encryption is a secret

## 2. Encryption and Decoding Category Game

Full Screen

Audio

Instructions

Answer Key

Pause

Clear All

Check Order

Attempts: 0

A secret message




Username

Phone Numbers

Passwords

Example of Encryption

Not an Example of Encryption



# Blocks Pro Challenges (2)

## 1. Beach Day

### Beach Day

Use the letter decoding chart shown in the textbook.

Create the word "beach" by first dragging the letters onto the screen using the letter sprites.

Use the 'when space key is pressed' block and change *space* to the number that represents that letter via the chart. When that number is pressed, the letter will show.

IMPORTANT: You will need to hide each letter to begin.

#### Requirements

0/2

5 Looks

5 Event

Blocks must be connected to an Event block in order to pass the requirements

The image shows the Scratch code editor interface for the 'Beach Day' challenge. The 'Code' tab is selected, showing a sequence of motion blocks for a sprite named 'Sprite1'. The blocks are: 'move 10 steps', 'turn 15 degrees', 'turn 15 degrees', 'go to random position', 'go to x: 0 y: 0', 'glide 1 secs to random position', 'glide 1 secs to x: 0 y: 0', 'point in direction 90', 'point towards mouse-pointer', 'change x by 10', 'set x to 0', 'change y by 10', 'set y to 0', 'if on edge, bounce', and 'set rotation style left-right'. The 'Sprite' panel on the right shows 'Sprite1' with a size of 100 and a direction of 90. The 'Stage' panel shows a single backdrop.

## 2. Top Secret

### Top Secret

Create your own secret phrase by first dragging the letters onto the screen using the letter sprites. You will need at least 3 letter sprites in your phrase.

You can use the chart from the textbook to create your secret word or create your own. You can assign a number 1-9 to each of your letters.

Then, use the 'when space key is pressed' block and change *space* to the number that represents that letter. When the corresponding number is pressed, the letter will show.

IMPORTANT: You will need to hide each letter to start,

#### Requirements

0/2

3 Looks

3 Event

The image shows the Scratch code editor interface for the 'Top Secret' challenge. The 'Code' tab is selected, showing a sequence of motion blocks for a sprite named 'Sprite1'. The blocks are: 'move 10 steps', 'turn 15 degrees', 'turn 15 degrees', 'go to random position', 'go to x: 0 y: 0', 'glide 1 secs to random position', 'glide 1 secs to x: 0 y: 0', 'point in direction 90', 'point towards mouse-pointer', 'change x by 10', 'set x to 0', 'change y by 10', 'set y to 0', 'if on edge, bounce', and 'set rotation style left-right'. The 'Sprite' panel on the right shows 'Sprite1' with a size of 100 and a direction of 90. The 'Stage' panel shows a single backdrop.

---

## Answer Keys & Solutions

---

### Questions

---

#### 1. What is encryption?

MULTIPLE CHOICE

Correct Answer:

- A. A secret code ✓ Correct
- B. A computer game ✗ Incorrect
- C. A style of dance ✗ Incorrect

#### Explanation:

Encryptions turn information into code.

#### 2. Why is it important to use encryption?

MULTIPLE CHOICE

Correct Answer:

- A. Encryptions help you beat computer games. ✗ Incorrect
- B. Encryptions keep your information safe. ✓ Correct
- C. Encryptions help you save money. ✗ Incorrect

#### Explanation:

Encryptions are used as protection.

#### 3. Which of the following is an example of an encryption?

MULTIPLE CHOICE

Correct Answer:

- A. Emails ✗ Incorrect
- B. Games ✗ Incorrect
- C. Passwords ✓ Correct

**Explanation:**

We use encryptions to log onto computers.

**4. True or false: Patterns make it possible for a message to be decoded.**

MULTIPLE CHOICE

**Correct Answer:**

A. True ✓ Correct

B. False ✗ Incorrect

**5. Why do computers ask us to make passwords?**

MULTIPLE CHOICE

**Correct Answer:**

A. To protect our information ✓ Correct

B. To make our information available to others ✗ Incorrect

**Games****1. Encryption and Decoding Typing Game**

*Typing game - no answer key needed. Students practice typing the provided content.*

**2. Encryption and Decoding Category Game****Category Solutions:****Category 1: Example of Encryption**

- A secret message
- Passwords

**Category 2: Not an Example of Encryption**

- Username
- Phone Numbers

**Scoring:**

- Gold: 1 attempts or fewer
- Silver: 2 attempts or fewer
- Bronze: 3 attempts or fewer



*Students must sort items into their correct categories.*