

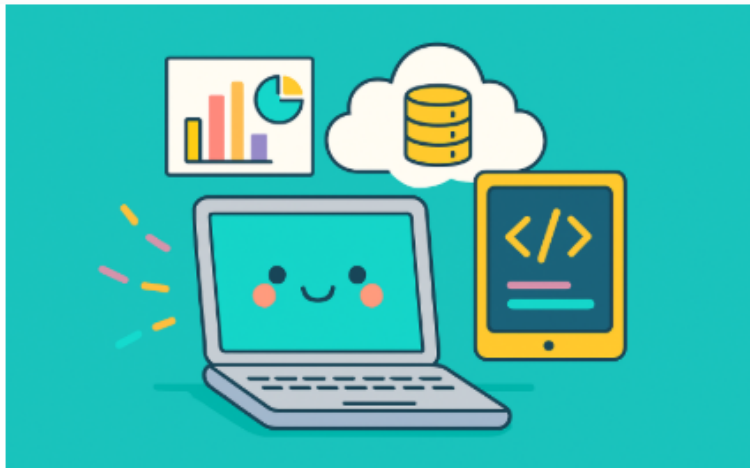
## Computers, Data and Variables

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### Textbook

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## Computers, Data and Variables



### "Memory Machines"

It was a sunny afternoon, and Reese and Parker were ready for their next lesson. Ms. George had told them they were going to learn about how computers store and remember things.

"Ms. George, how do computers remember stuff like the games we play or the drawings we make?" Reese asked, curious.

Ms. George smiled. "Great question, Reese! Computers are like big, smart storage boxes. They use data to remember things like scores, pictures, or words. Data is just information—anything you type, click, or create can be stored as data inside the computer."

"But how does the computer actually remember everything?" Parker wondered.

"Good question, Parker!" Ms. George said. "The computer uses something called storage to keep all that data safe. It's like when you save your homework in a folder or store your toys in a box. When you turn off the computer and turn it back on, the data is still there, just like how your toys stay in your box."

Reese raised her hand. "So, the computer keeps everything safe, like how my notebook keeps all my notes?"

"That's right!" Ms. George said. "When you save something, like a picture or a game score, the computer stores it as data. And just like you can look at your notebook whenever you want to see what you wrote, you can open the data on the computer anytime you need it."

Parker thought for a moment. "So, when I finish a game, and it shows my score, the computer saved that score as data?"

"Yes, exactly!" Ms. George said. "The computer remembers your score, and when you play again, it can show you your previous score or even add to it. This is how data works—it's saved, and you can use it later. That's what makes the computer so useful!"

## What is Data?

Data is information that a computer saves. This could be anything from your game score to a picture you create. Here are examples of data:

- **Numbers:** Like your score in a game (150 points)
- **Words:** Like your name or a story you write
- **Pictures:** Like a drawing you make on the computer
- **True or False:** Like whether a light is on or off

## What are Variables?

A variable is like a labeled box that holds data. Just like you might have a box labeled "Crayons" that holds your crayons, computers use variables to hold information.

For example:

- A variable called "Score" might hold the number 25
- A variable called "PlayerName" might hold the word "Reese"
- A variable called "LevelComplete" might hold True or False

Variables are important because they let the computer remember and use information in your programs. When you play a game, variables keep track of your score, your character's name, and what level you're on!

## How Computers Collect Data

Computers can collect data in many ways:

### Counting and Sorting:

- Count how many times you click a button
- Sort your files by name or date
- Total up your points in a game

### Recording Information:

- Save the pictures you draw
- Remember the coding projects you create
- Store the sentences you type

## Data Storage

Storage is where the computer keeps all this information safe until you need it again. Just like you can keep your things in a box and come back to them later, computers use data storage to remember things for you.

When you save something on the computer, it's like putting it in a special place so it can be opened again whenever you need it.

## Using Data in Your Projects

Remember the coding projects we've been creating? Those use data too:

- Your sprite's position on the screen is data
- The sounds your sprite makes are data
- The messages your sprites send to each other are data
- Variables help keep track of all this information

## Critical Thinking Questions

1. Why is it important for a computer to remember things like game scores or pictures? How would it affect your experience if it didn't?
2. What do you think might happen if the storage on a computer gets full? What could you do to solve that problem?
3. How is saving your work on a computer similar to or different from writing something down in a notebook?

## Sentence Stems

These sentence starters help us talk about data and variables:

1. **"Data is (blank) that computers can (blank)."**
2. **"When I save something, the computer (blank) so I can (blank)."**
3. **"A variable is like (blank) that holds (blank)."**

## Questions (5)

### 1. What is data on a computer?

MULTIPLE CHOICE

Choose the correct answer:

- A. A kind of candy
- B. A type of animal
- C. Information saved by the computer
- D. A new video game

### 2. What does storage do in a computer?

MULTIPLE CHOICE

Choose the correct answer:

- A. Deletes everything
- B. Keeps information safe
- C. Makes the computer louder
- D. Changes the color of the screen

### 3. What happens when you save a drawing on the computer?

MULTIPLE CHOICE

Choose the correct answer:

- A. The computer forgets it
- B. It disappears
- C. The computer stores it as data
- D. It prints by itself

### 4. When you play a game and it shows your score again later, what did the computer do?

MULTIPLE CHOICE

Choose the correct answer:

- A. Lost your score
- B. Saved your score as data
- C. Hid your score
- D. Turned off

### 5. Why is data important in a computer?

MULTIPLE CHOICE

Choose the correct answer:

- A. So the computer can sleep
- B. So the screen stays bright
- C. So you can use your information later
- D. So you can talk to your computer

## Games (2)

### 1. Computers and Data Typing Race


Full Screen

Audio

Instructions

Restart

Pause



0s100%

data is information saved

## 2. Computers and Data Categories

Decide if each item is data or not data

Full Screen

Audio

Instructions

Answer Key

Pause

Clear All

Check Order

Attempts: 0

Your friend's  
name in a  
contact list

A saved picture

A sandwich

A pencil on your  
desk

A homework file  
on the computer

A real backpack

A typed story

A game score



Data

Not Data

## Blocks Challenges (5)

### 1. Data Hop



#### Data Hop

Adding text to your scene is data! The program stores the text so you can see it. Add text to your scene. Place 3 different texts on your screen. Then program your sprite to move across the scene and giving a hop under each one. Practice changing the number in your motion blocks!

1 → 6 1



Submit ↑



### 2. Countdown



#### Countdown

It's time for the big show! Using the stage background, program a sprite to countdown to the start of the show from 3 as it moves around the stage. At the end of your algorithm use a sound block to start the show.

1 → 10 1 1



Submit ↑



### 3. Jumping Squirrels



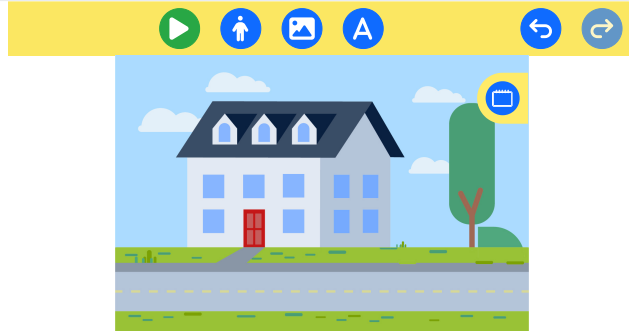
#### Jumping Squirrels

Squirrels can jump up to 4 to 5 feet high from a standing position! Their powerful hind legs help with balance on trees and obstacles. Place at least 3 sprites as obstacles in your scene. Place them at different levels of the scene. Program the squirrel sprite to have to jump over them as it moves across the scene. Add a sound for each jump.

Hint: Change the number on your hop motion block!

1 6 3 1

Submit ↑



### 4. Exploring Scenes



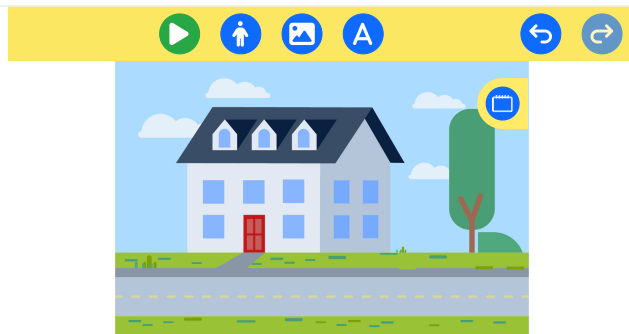
#### Exploring Scenes

Program your sprite exploring at least 3 different scenes. As the sprite moves from scene to scene practice changing the variable for your blocks.

For example if you have your sprite hop 1 in the first scene, change it to 3 in the next. Use at least one motion, look, sound, and control block in each scene.

3 3 3 3 3 3

Submit ↑





## 5. Busy Day



### Busy Day

Your sprite has a busy day! First the sprite goes to school. Then the sprite walks through the city to go to the zoo. Program your sprite in at least 3 scenes and explaining the day as it moves through the scenes. Remember you can add text to scenes as well!

2 15 3 3



Submit ↑



## Answer Keys & Solutions

### Questions

#### 1. What is data on a computer?

MULTIPLE CHOICE

**Correct Answer:**

- A. A kind of candy ✗ Incorrect
- B. A type of animal ✗ Incorrect
- C. Information saved by the computer ✓ Correct
- D. A new video game ✗ Incorrect

#### **Explanation:**

It's the information the computer remembers, like your game scores or pictures.

#### 2. What does storage do in a computer?

MULTIPLE CHOICE

**Correct Answer:**

- A. Deletes everything ✗ Incorrect
- B. Keeps information safe ✓ Correct
- C. Makes the computer louder ✗ Incorrect
- D. Changes the color of the screen ✗ Incorrect

#### **Explanation:**

Think about where you keep your toys or schoolwork so you don't lose them.

#### 3. What happens when you save a drawing on the computer?

MULTIPLE CHOICE

**Correct Answer:**

- A. The computer forgets it ✗ Incorrect

B. It disappears

✗ Incorrect

C. The computer stores it as data

✓ Correct

D. It prints by itself

✗ Incorrect

#### Explanation:

Saving is like putting your picture in a folder so you can see it later.

### 4. When you play a game and it shows your score again later, what did the computer do?

MULTIPLE CHOICE

#### Correct Answer:

A. Lost your score

✗ Incorrect

B. Saved your score as data

✓ Correct

C. Hid your score

✗ Incorrect

D. Turned off

✗ Incorrect

#### Explanation:

The computer remembered it like a notebook remembers your notes.

### 5. Why is data important in a computer?

MULTIPLE CHOICE

#### Correct Answer:

A. So the computer can sleep

✗ Incorrect

B. So the screen stays bright

✗ Incorrect

C. So you can use your information later

✓ Correct

D. So you can talk to your computer

✗ Incorrect

#### Explanation:

It helps the computer remember things for you, like homework or drawings.

### 1. Computers and Data Typing Race

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

### 2. Computers and Data Categories

**Category Solutions:**

#### Category 1: Data

- A game score
- A saved picture
- Your friend's name in a contact list
- A homework file on the computer
- A typed story

#### Category 2: Not Data

- A sandwich
- A real backpack
- A pencil on your desk

**Scoring:**

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

*Students must sort items into their correct categories.*