Conditional Hot Potato

Educator's Guide

Overview

CS Hands-On is a 501(c)(3) nonprofit teaching computational thinking skills through technology-free lessons and activities. This curriculum is built to teach fundamental computer science concepts in an engaging, hands-on way. In this mission, students use if-then, else if, and else statements to play a remixed game of Hot Potato.

Prerequisite Knowledge

Students should have completed the Conditional Schedule activity, which introduces the concept of if statements.

Lesson Details

At Evaluatus, students will learn to evaluate judgements with Ellis. Students will learn the structure and syntax of an else if and else statement, then use if, else if, and else statements to play a modified game of hot potato.

This lesson was developed for students ages 8 to 13, and can be modified for students of all skills and ages. This lesson takes around 30 minutes.

Learning Objectives

Key Question

How can we make decisions using if, else if, and else statements?

Key Terms

Else statement: A conditional statement that performs an action when a condition is false.
Else if statement: A conditional statement that performs an action when the previous conditions were false but the current condition is true.

Curriculum Standards

Students should be able to...

- Explain how if, else if and else statements are created and used (Evaluation)
- Read, write, and interpret if, else if, and else statements (Literacy)
- Use if, else if, and else statements to play Conditional Hot Potato (Creative Arts)

View standards addressed here

Lesson Plan

Materials

- Conditional Hot Potato worksheet (per student)
- Hot potato object (ball, marker, stuffed animal)
- Tokens for each student
- 1 die (per group)

Setup

- Hand out a Conditional Schedule worksheet to each student
- Create space in your classroom for students to sit in a circle of 3-7 people

ANSWER KEY & LESSON ANNOTATIONS

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Mission 2

Name: _____ Date: _____

Conditional Hot Potato

Decisions, decisions, decisions!

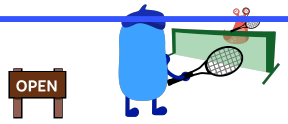
We make millions of decisions in our lives, every day, every second! Come along with Ellis to take a closer look at how she makes decisions at Evaluatus.

A Recap on If-then Statements

To recap, **if-then statements** are conditional statements used in computer science to perform an action when a condition is **true**. Let's revisit Ellis's schedule using if-then statements below!

Example:

If the Evaluatus park is open, ⟶ 1st condition
then Ellis will play tennis. ⟶ What Ellis will do if the 1st condition is **true**



Our if-then statement says that if the Evaluatus park is open, Ellis will play tennis. In our example above, the **condition** is **true**, as shown by the 'OPEN' sign. This means that Ellis will play tennis!

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Educator Note
Open this example up for students to modify it. Do they have a similar decision-making process using if statements? For instance, if Sunny Park is open, then I will play on the swings with my friend.

But wait, there's more: Else if statements!

You might be wondering: What if Evaluatus park is closed? Currently, we don't have any instructions on what Ellis will do in that circumstance.

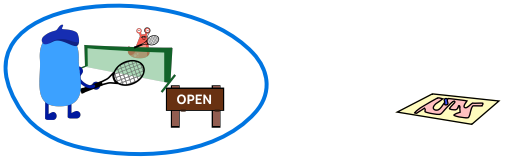
That's where else statements come to the rescue! **Else statements** perform an action when a condition is **false**.

Example:

If the Evaluatus park is open, ⟶ 1st condition
then Ellis will play tennis. ⟶ What Ellis will do if the 1st condition is **true**

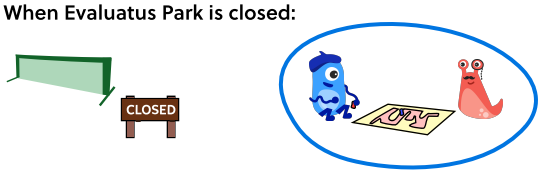
Else,
then Ellis will play board games. ⟶ What Ellis will do if the previous condition is **false**

When Evaluatus Park is open:



In the picture above, the park is open, so our **condition** is **true**. As a result, Ellis will play tennis as instructed in the if statement and ignore what is written in the **else statement**.

When Evaluatus Park is closed:



Now, the park is closed, so our **condition** is **false**. As a result, Ellis will play board games as instructed in the **else statement**.

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Educator Note

Once again, open this example up for students to modify it. Do they have a similar decision-making process using else statements? Referencing the example, students can brainstorm possible else statements. For instance, else, then I will go to the beach to surf.

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Hmm.. there's more again: Elif statements!

So far, we have instructions for what to do when a condition is true and when a condition is false. But what if we wanted to check for another condition if the original condition is false? For instance, if the Evaluatus park is closed, Ellis may want to check if the Evaluatus field is open to play baseball before deciding to play board games.

This is where else if statements come in! **Else if statements** check if a certain condition is true when the condition before it is **false**.

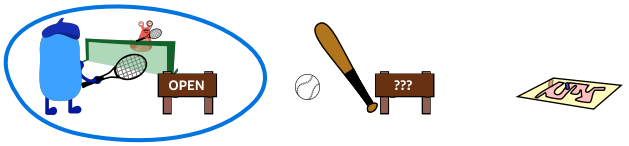
Example:

If the Evaluatus park is open, ⟶ 1st condition
then Ellis will play tennis. ⟶ What Ellis will do if the 1st condition is **true**

Else if the Evaluatus field is open, ⟶ 2nd condition
then Ellis will play baseball. ⟶ What Ellis will do if the 1st condition is **false** and the 2nd condition is **true**

Else,
then Ellis will play board games. ⟶ What Ellis will do if all of the previous conditions are **false**

When Evaluatus Park is open:



The park is open, so our **1st condition** is **true**. This means that Ellis will play tennis.

Note: When the 1st condition is true, Ellis will do what is instructed in the if statement and ignore what is written in the **else if and else statements**. (Ellis will not check if the Evaluatus field is open. There is no need to because the 1st condition is true).

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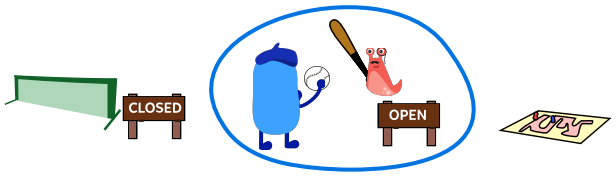
Educator Note

Once again, open this example up for students to modify it. What conditions can students check to use in else if statements? Referencing the example, students can brainstorm possible else if statements if the park is closed. For instance, else if the playground is open, then I will go to the playground with my friends.

When the Evaluatus Park is closed and the Evaluatus field is open:

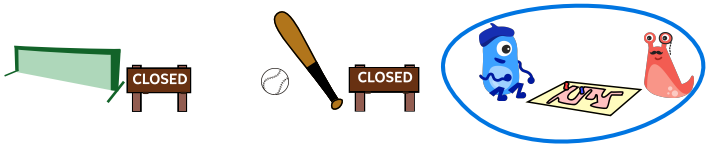


1st condition is **false**, since Evaluatus park is closed.

↓ Now we move to the else if statement!

2nd condition is **true**, since Evaluatus field is open. This means Ellis will play baseball.

When both the Evaluatus Park and the Evaluatus field are closed:



1st condition is **false**, since Evaluatus park is closed.

↓ Now we move to the else if statement!

2nd condition is **false**, since Evaluatus field is closed.

↓ Now we move to the else statement!

We perform the **else statement**, so Ellis will play board games.

Educator Note

We begin to have many possible outcomes as the if-else if-else statement gets longer. While evaluating the statement, it is important to remember that students will only check else if statements if the if statement is false. Students will only check the else statement if every statement before it is false.

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Even more else-if statements!

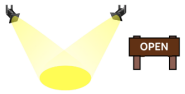
Let's add another else-if statement to Ellis's decision-making process. If both the Evaluatus park and Evaluatus field are closed, Ellis wants to see his friend Alon perform his all-time favorite pop song at the Evaluatus theater.

If the Evaluatus park is open, → 1st condition
then Ellis will play tennis. → What Ellis will do if the 1st condition is **true**

Else if the Evaluatus field is open, → 2nd condition
then Ellis will play baseball. → What Ellis will do if the 1st condition is **false** and the 2nd condition is **true**

Our new else-if statement

Else if the Evaluatus theater is open, → 3rd condition



then Ellis will watch Alon's show. → What Ellis will do if the 1st condition is **false** and the 3rd condition is **true**

Else,
then Ellis will play board games. → What Ellis will do if all of the previous conditions are **false**

So many choices!

Now, Ellis's decision-making process is more complex! With additional else-if statements, we have more conditions to check and a larger variety of actions we can perform.

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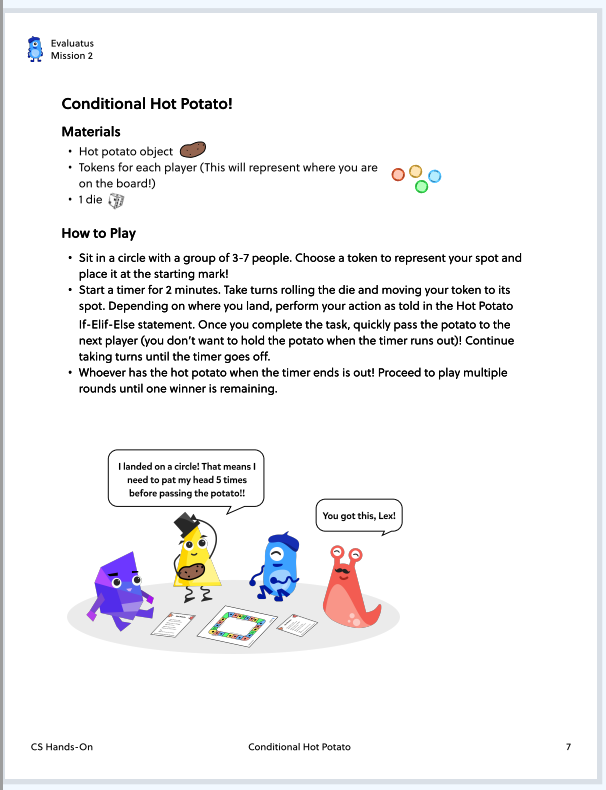
Reflect

How can else-if statements make our decision-making process more complicated? Can you think of any decisions you make that require lots of conditionals?



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Conditional Hot Potato!

Materials

- Hot potato object
- Tokens for each player (This will represent where you are on the board!)
- 1 die

How to Play

- Sit in a circle with a group of 3-7 people. Choose a token to represent your spot and place it at the starting mark!
- Start a timer for 2 minutes. Take turns rolling the die and moving your token to its spot. Depending on where you land, perform your action as told in the Hot Potato If-Elif-Else statement. Once you complete the task, quickly pass the potato to the next player (you don't want to hold the potato when the timer runs out)! Continue taking turns until the timer goes off.
- Whoever has the hot potato when the timer ends is out! Proceed to play multiple rounds until one winner is remaining.

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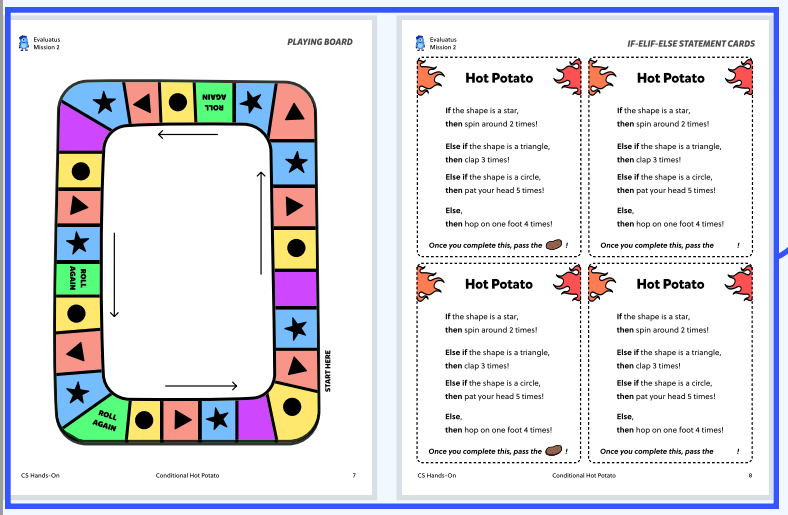

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PLAYING BOARD

CS Hands-On Conditional Hot Potato 7

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IF-ELIF-ELSE STATEMENT CARDS

Hot Potato

If the shape is a star,
then spin around 2 times!

Else if the shape is a triangle,
then clap 3 times!

Else if the shape is a circle,
then pat your head 5 times!

Else,
then hop on one foot 4 times!

Once you complete this, pass the !

Hot Potato

If the shape is a star,
then spin around 2 times!

Else if the shape is a triangle,
then clap 3 times!

Else if the shape is a circle,
then pat your head 5 times!

Else,
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then pat your head 5 times!

Else,
then hop on one foot 4 times!

Once you complete this, pass the !

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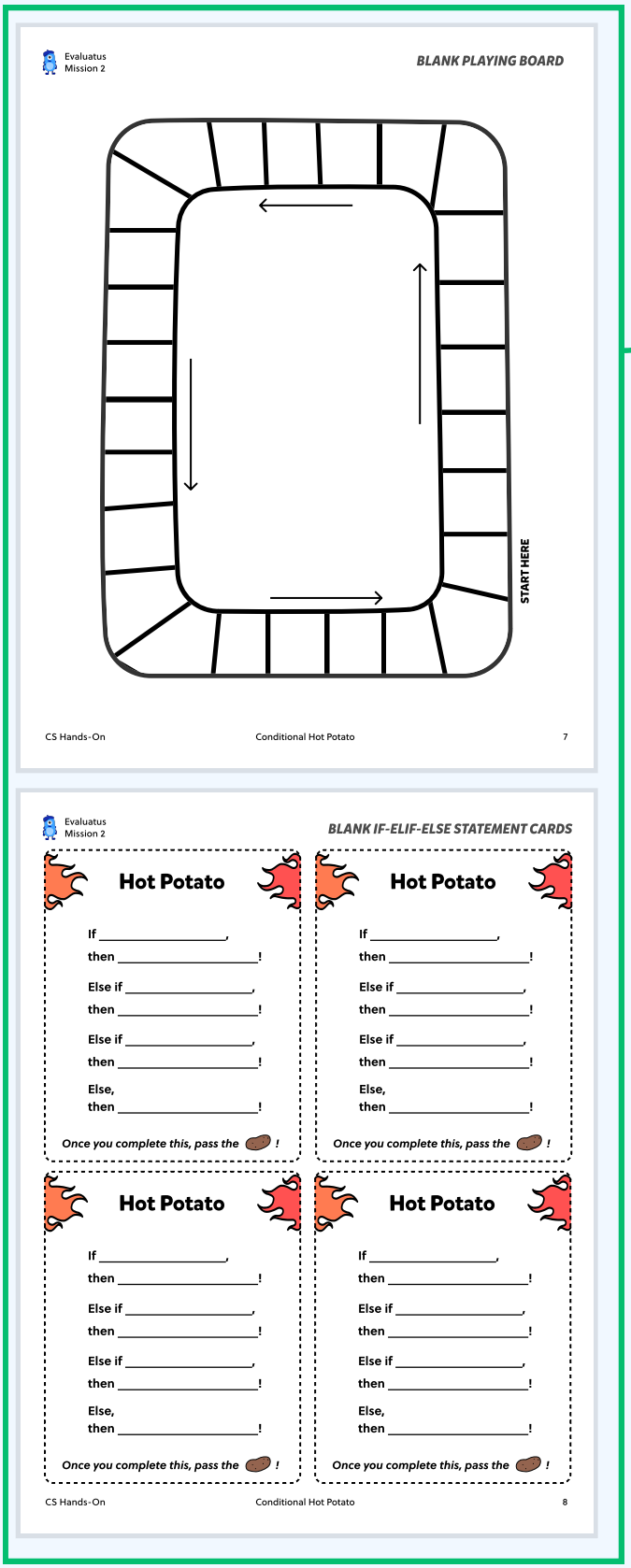
Educator Note

Each group will use one board template. Students may share the statement cards or have one for each group. It may be helpful for there to be one 'judge' of the game who ensures students accurately perform the actions they roll.



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BLANK PLAYING BOARD

START HERE

CS Hands-On Conditional Hot Potato 7

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BLANK IF-ELIF-ELSE STATEMENT CARDS

Hot Potato

If _____,
then _____!

Else if _____,
then _____!

Else if _____,
then _____!

Else,
then _____!

Once you complete this, pass the !

Hot Potato

If _____,
then _____!

Else if _____,
then _____!

Else if _____,
then _____!

Else,
then _____!

Once you complete this, pass the !

Hot Potato

If _____,
then _____!

Else if _____,
then _____!

Else if _____,
then _____!

Else,
then _____!

Once you complete this, pass the !

Hot Potato

If _____,
then _____!

Else if _____,
then _____!

Else if _____,
then _____!

Else,
then _____!

Once you complete this, pass the !

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Extension (optional)

Have students create their own Conditional Hot Potato game! Use the statement cards template and board template to create a personalized game.

Wrap up & reflect

Group students into pairs and have them discuss the following reflection questions. Afterwards, have students share their ideas as a class.

- When would we use else if statements? When would we use else statements?

  We use else if statements when the first condition is false, but we want to perform a specific action if a second condition is true.

  We use else statements when we want to perform a specific action when all of the conditions beforehand are false.