

## Lesson 18: If and Only If!

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| Powerful Ideas of Computer Science                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Control Structures, Algorithms                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Powerful Ideas of Literacy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Literary Devices                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| PTD                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Content Creation                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Palette of Virtues                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Curiosity, Open-Mindedness                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Children will be able to...                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>Identify conditional situations in everyday life</li> <li>Create conditional KIBO programs using the Distance Sensor and Light Sensor</li> </ul>                                                                                                                                                                                                                                                                                       |
| Vocabulary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"> <li>Conditional: something that only happens during if something else happens</li> </ul>                                                                                                                                                                                                                                                                                                                                                   |
| Teacher Preparation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li><input type="checkbox"/> Read lesson plan.</li> <li><input type="checkbox"/> Refer to the following <a href="#">video</a> to learn more about If and End If statements.</li> <li><input type="checkbox"/> Refer to the following <a href="#">video</a> to learn more about how to use the distance sensor with repeat parameters.</li> <li><input type="checkbox"/> Open <a href="#">Lesson 18 Check for Understanding</a>.</li> </ul> |
| <p><b>Warm Up</b></p> <ul style="list-style-type: none"> <li><b>Four Corners</b> (<i>Suggested Time: 10 minutes</i>)             <ul style="list-style-type: none"> <li>Designate four corners of either the classroom, a carpet, or an open space as the game space.</li> <li>One child (or the teacher) stands in the center of the room and closes their eyes. Each child has to go to one of the four corners. When everyone is in a corner, the person in the center points in a random direction and opens their eyes. The person in the center then says, “IF you’re in this corner, THEN, you are out!” Everybody in that corner is out. This repeats, with the person in the center closing their eyes, everybody picking a corner, the person in the center choosing a corner, and</li> </ul> </li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

everyone in that corner being out. Continue until there is either one winner or 2-3 kids left.

- If time permits, the winner of the previous game can be in the center for a second round.

## Opening Tech Circle

- **Intro to Conditionals** (*Suggested Time: 10 minutes*)
  - Reflect on the four corners game. If your corner was pointed to, you were out. In order to determine if you were safe or out, you had to check where the person in the center was pointing. This is called a **conditional**.
  - Conditionals are when one thing has to happen before the next thing can happen. Discuss the following examples:
    - What do you check for before you put on a jacket? (If it is cold or raining)
    - What has to happen before you speak in class? (The teacher calls on you)
    - What has to happen before you eat? (Wash your hands)
    - What do you check before the car can go? (The light is green)

## KIBO Time

### Structure Challenge

- **If and End If** (*Suggested Time: 15 minutes*)
  - Introduce to children the If and End If Blocks. Explain to children that If statements allow KIBO to make a choice based on what it can sense (e.g., light, dark, near, far).
  - Similar to Repeat and End Repeat Blocks, If and End If Blocks are like the front and back covers of a book or the bread of a sandwich. KIBO will only follow instructions if they are inside the sandwich AND if KIBO detects it is light in a room, or if it is near another object.

## What is an If Statement?

**If Statements** allow KIBO to make a choice based on what it can sense, just like your students can! Use these four parameters with If Statements. Remember to attach the appropriate sensors!

Note that unlike Repeat Loops where KIBO will keep repeating the commands inside the loop until it senses something, KIBO's sensor will only check one time before moving to the next part of the program.



### Expressive Explorations:

- **Free Play** (*Suggested Time: 10 minutes*)
  - In groups, children will create programs using the If and End If blocks, along with the Distance and Light Sensors.

**Lesson 18 Check for Understanding:** Check your children's understanding of the new concepts they've just learned. Read each question to the children. Have children hold up 1, 2, or 3 fingers (corresponding to the first, second, or third choice). Stop and re-explain concepts as needed.

### Closing Tech Circle

- **Sharing Our Programs** (*Suggested Time: 10 minutes*)
  - Children share their programs from the free play time. Prompt children to talk about how they used the new blocks (If and End If) in their programs.