| *Narration* | *Action* | *What’s on Screen* |
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| MUX/DEMUX |  | Caption: Multiplexers and Demultiplexers |
| In this video we’re going to look at how multiplexers and demultiplexers work. | Intro by SME | Schematic |
| A multiplexer is a device that has many input channels and selects one of the inputs to be transmitted to the output. A de-multiplexer has one input that can be transmitted to one of many outputs. Multiplexers and demultiplexers are widely used in data communication systems. |  | “ |
| First, we will see one input channel selected and transmitted to the output of the multiplexer.  Next, we will see the input channel switched to one of the outputs of the de-multiplexer. |  | “ |
|  | <PAUSE FOR RESET??> |  |
| Multiplexer Demo |  | Title: Multiplexer (MUX) |
| Here’s a diagram of a 4-channel multiplexer. It has 4 input channels, 1 output channel, and 2 select inputs. The data input channels are labeled A, B, C and D. The output is labeled Y. The select inputs are labeled S0 and S1. | Point out each part on logic diagram. | Logic diagram, truth table, and bread board circuit. |
| These are the select inputs. Because there are 2 selects that means there are 4 different select combinations. Each unique combination of select values will pass 1 of the 4 input signals to the output. | Point to data and select inputs of logic diagram. | “ |
| Here we have an SN74HC153N DIP chip. Each input channel to the chip has a different duty cycle so you can easily see which channel is selected for the output. | Point out the component on the bread board. | MultiSim schematic of circuit and breadboard |
| This microcontroller is putting out 4 different duty cycles. | Point to Arduino. | Arduino, Logic diagram, truth table, and bread board circuit |
| The microcontroller could easily be replaced with 4 different signal generators, as we’ve shown in the electronic schematic. |  | MultiSim schematic with function generators circled |
| The duty cycles can be seen by using these LEDs. The status of input A is shown with a green LED, the status of input B is shown with a yellow LED, the status of input C is shown with a red LED, and the status of input D is a blue LED. | Highlight the components on the bread board. | Logic diagram, truth table, and bread board circuit  Caption:  A - Green LED  B - Yellow LED  C - Red LED  D - Blue LED |
| The duty cycle for input A is 10%. | “ | Breadboard circuit image with Green LED lit:  Caption: A - Green LED  Duty Cycle 10% |
| The duty cycle for input B is 30%. | “ | Breadboard circuit image with Yellow LED lit:  Caption: B - Yellow LED  Duty Cycle 30% |
| The duty cycle for input C is 60%. | “ | Breadboard circuit image with Red LED lit:  Caption: C - Red LED  Duty Cycle 60% |
| The duty cycle for input D is 90%. | “ | Breadboard circuit image with Blue LED lit:  Caption: D - Blue LED  Duty Cycle 90% |
| On the output of the multiplexer is a red LED. The red LED indicates if the output is high or low. | Highlight the components on the bread board. | Logic diagram, truth table, and bread board circuit |
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| We’ve finished looking at the demultiplexer and can verify that each unique combination of select inputs passes the input signal to a different output channel. | Highlight truth table. | “ |
|  | Pause for reset |  |
| SUMMARY |  | Title: Multiplexer and Demultiplexer Summary |
| To summarize, we’ve looked at multiplexer and demultiplexer circuits. | Highlight logic diagrams. | Logic diagram, truth table, and bread board circuit. |
| Remember: |  | “ |
| A multiplexer selects one of its data inputs and passes it to the data output channel. | Highlight truth table. | “ |
| A demultiplexer selects one data output channel and sends its data input to that channel. | “ | “ |