Grade 6 & 7
Time: 40 min

Smart Timer

Get ready for an exciting exploration into the world of colorful patterns and timekeeping!

Today, we will create a pattern using coloured lights. We shall also include a beeper which will produce different tones to represent the passage of time. Together, the timed LED patterns and beeper sound will produce a timer which will help us to calculate how much time has passed and when not in use, we can turn it OFF using a switch.

1 Challenge of the day

Use PeeCee to create a smart timer that can be turned ON or OFF using a switch.

2 Gear Up

Hardware

PeeCee	-	1
Dual Switch Module	-	1
Port Connector	-	1
USB Type C Cable	-	1
Power Bank	-	1

Software

- PLODE App - 1

Design Sheets

- PeeCee Circuit Design Sheet - 1
- PeeCee Algorithm Sheet - 1

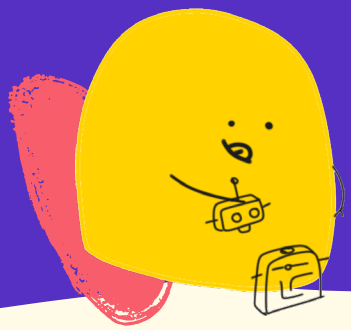
#

#dual_switch_module #timed_patterns
#ISTE_1.5.a_Computational_Thinker #CSTA_2-AP-12_Algorithms_&_Programming

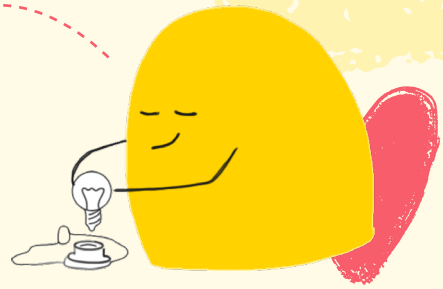
3 Get Crafty

Let us get ready to explore and learn together!

Scan the QR code to watch our instructional video and get started, or wait for your mentor to play the instructional video for the whole class.



4 Test & Tweak



Uh-oh, roadblocks ahead? No worries, we have got you covered!
Take a look at the following tips for troubleshooting:

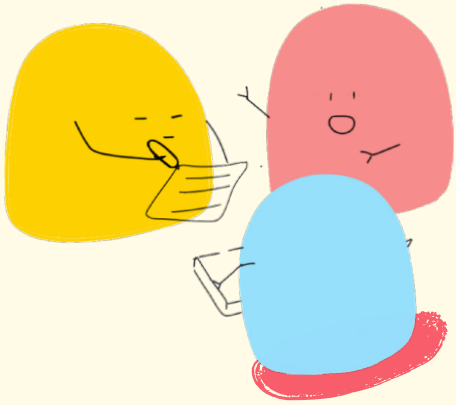
1. The LEDs remain off even when the dual switch is set to position 1!

- **Hardware**
  - ☐ Make sure that the switch is in position 1, as the program is designed to activate the lights when the switch is in that position.
- **Software**
  - ☐ Review the code to confirm that it corresponds to position 1. If the code is written for position 2, adjust the switch to position 2 and verify if it functions correctly.

2. The beeper does not consistently produce sound!

- **Software**
  - ☐ Ensure that the Beeper is enabled in all the Action blocks and the frequency value is increasing by 500 units in each one.

5 Think & Reflect



1. Which of the following blocks will help us make a choice based on the state of the dual switch?

A.

B.

C.

D.

2. Which of the following can be used to describe a program in which we use a Dual switch to create a left or sided scrolling pattern from RGB LEDs?

A. Sequential Program
B. Conditional Program
C. Non-Sequential Program
D. Structured Program

3. Why does the dual switch have numbers 1 and 2 on it even though ON and OFF states of switch are represented by 1 and 0?

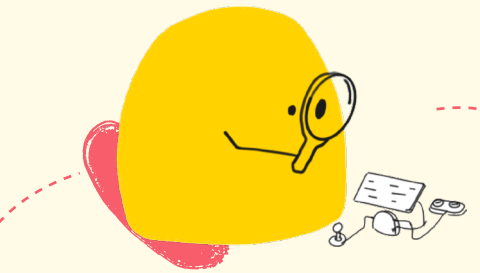
A. The values 1 and 2 denote two states of the switch and not ON and OFF.
B. The values 1 and 2 indicate the amount of power being drawn by the switch.
C. The values 1 and 2 determine the color of the switch's LED lights.
D. The values 1 and 2 represent the different types of materials used to make the switch.

4. **Can the Dual Switch module be used to resume the timer from where it was turned off last time?**

A. Yes

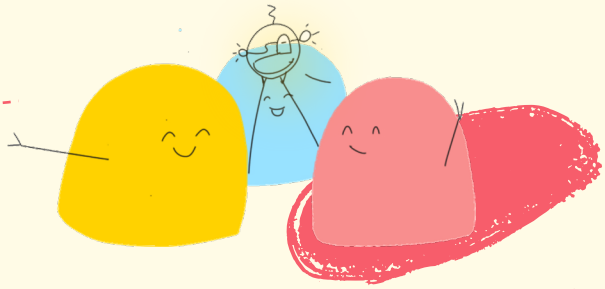
B. No

6 Collab & Explore



Now that we have created different a timer that can be turned off using a switch, let us now think out of the box and innovate:

- Create a code using the switch, which will allow us to switch between two different time intervals. The LED will display which interval is currently selected by blinking the RGB LEDs in different colors. Remember to use our knowledge of conditional programming to create this code.
- Create a fun and interactive vehicle turn indicator using the Dual switch input device and the RGB LEDs in the eyes of PeeCee. The indicator should display a scrolling pattern from left to right or right to left, depending on the input from the dual switch.



7 Research & Innovate

- Research and find out the various applications of dual switches in our daily lives, such as in home appliances, electronic devices, and vehicles. Also, explore how dual switches are used in computer and mobile applications.
- Check out all the different types of cool timers used in everyday life, like old school mechanical timers, electronic timers that beep, and digital timers that show numbers on a screen! Compare the upsides and downsides of each type, and see if you can think of some machines or gadgets that use each kind of timer.
- To set up an alarm in your phone, you need to set the time at which the alarm should buzz. Explore how you can make this process automated, such that the alarm should turn up automatically in the morning without setting up any time. Research on the devices that help us to achieve this.