PIPER

Name: _____

Assessment
Blink

1) What is a Raspberry Pi Pico?
   a) A type of robot
   b) A microcontroller module
   c) A type of fruit
   d) A type of breadboard

2) What does the acronym LED stand for?
   a) Light Emitting Diode
   b) Low Energy Device
   c) Long Electrical Device
   d) Light Electronic Display

3) What happens if you don't use a resistor with an LED in your circuit?
   a) The LED won't turn on
   b) The circuit will not work at all
   c) The LED may burn out due to too much electricity
   d) The light will blink faster

4) Which pin number controls the onboard LED on the Raspberry Pi Pico?
   a) GP0
   b) GP15
   c) GP25
   d) GP1

5) Why is it essential to connect the long lead (anode) of the LED to the positive side of the circuit?
   a) It makes the light blink faster
   b) It helps electrons flow in the correct direction
   c) It doesn't matter which lead connects where
   d) It prevents the LED from overheating

6) How could you use this tutorial's teachings of circuits and GPIO pins to create a real-world project? Describe your project and how it would work.

7) Imagine you need to design a landing signal for a spacecraft like in the tutorial. How would you modify the code to make the LED blink in a pattern that is unique and easy to recognize from far away? Explain your approach.

8) The project Python code above makes an LED connected to GP15 turn on for 5 seconds and then turn off for 1 second, repeating this pattern forever. How could you change the code to make the LED blink faster? Try adjusting the `time.sleep()` values so the LED stays on for 2 seconds and off for 0.5 seconds. What changes did you make to the code?

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Answer Key
Blink

1) B - A microcontroller module

2) A - Light Emitting Diode

3) C - The LED may burn out due to too much electricity

4) C - GP25

5) B - It helps electrons flow in the correct direction

6) *Example:* Students might describe various projects, such as a blinking light to show a pet feeding schedule, a homemade traffic light system, or a simple burglar alarm. The key is for students to connect the concept of circuits and GPIO pins to practical applications.

7) *Example:* Students should discuss changing the wait times, using loops, or adding multiple LEDs with different colors or blink patterns to create a recognizable signal. The focus should be on making the light's pattern stand out and be effective as a landing signal.

8) *Example:*

```
## ---- Code ---- ##
while True:
  GP15.setPin(1)
  time.sleep(2)  # LED stays on for 2 seconds
  GP15.setPin(0)

  time.sleep(0.5)  # LED stays off for 0.5 seconds
```

Explanation:
This question encourages students to analyze the given code and understand how the time.sleep() function controls the blinking speed and makes adjustments to achieve a different blinking pattern.