

# 04 Bipolar Transistor Test

## Your Name:

1. Draw the circuit diagram symbol of an NPN bipolar junction transistor. Label the three wires.
2. A transistor has a current gain of 150. If the base current is  $3\mu\text{A}$ , calculate the collector current. Assume the device is not saturated.
3. Draw a diagram of an NPN transistor used as a switch.
4. Add a Back-EMF protection diode to the diagram above.
5. Draw a diagram of an NPN transistor used as an emitter follower.
6. What is the voltage gain of the emitter follower circuit above?
7. A small \_\_\_\_\_ current controls a much larger collector current.
8. When a transistor is conducting, what is the approximate Base-Emitter voltage?
9. When a transistor is saturated, what is the approximate Collector-Emitter voltage?
10. When a transistor is saturated, if the base current is increased, what happens to the collector current?