# I See the Light

**Name(s):** **Class:** **Date:**

Have you ever taken a test or a quiz and then had to wait for days to find out how you did? Wouldn't it be great if you could find out right away if your answers to the questions were correct or not? Well, the IFQ (Immediate Feedback Quiz) is the solution for solving this problem—and you get to build it!

Use your knowledge of circuits to build an IFQ to demonstrate your understanding and to use as a study guide for circuits. Swap IFQs with your classmates to further test your understanding.

### Part I: The Questions

1. Review the information presented on the Circuit Logic handout.
2. In Table 1, write four short questions that are based on this information.
3. Write a fifth question that can have more than one correct answer.
4. In your own words, write the answers for each of your questions. You should write two correct answers for the 5$^{th}$ question.

**Table 1: Questions and Answers**

| Question | Answer |
|---|---|
| | |
| | |
| | |
| | |
| | |

| | |
|---|---|
| | |

**Part II: Building the Instant Feedback Quiz (IFQ)**

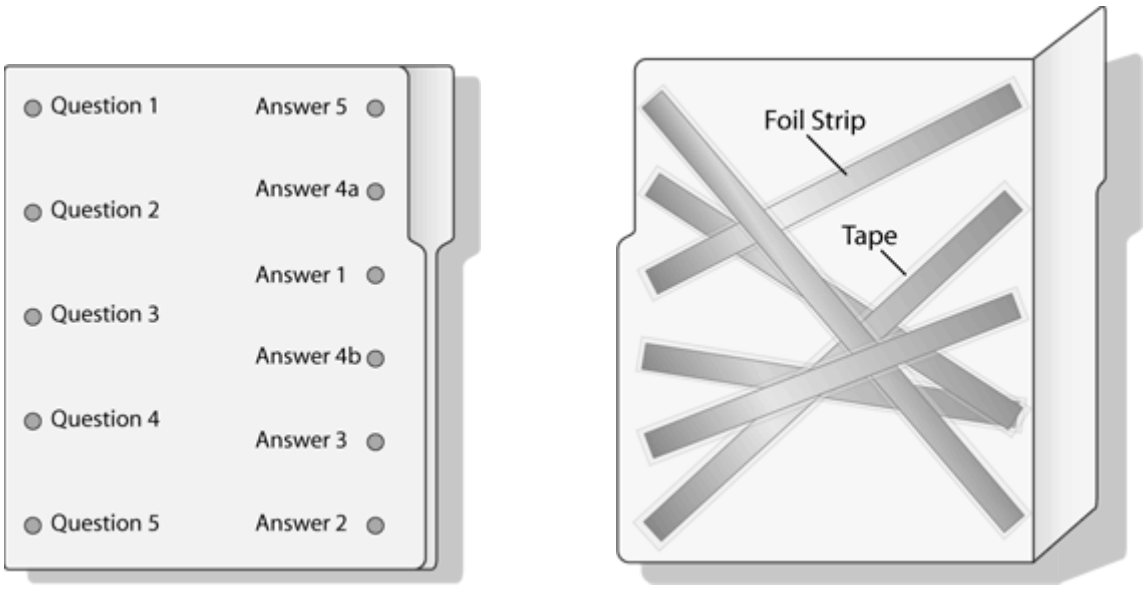
You will need the following materials: manila folder, scissors, aluminum foil, battery holder (2 AA), 2 AA batteries, masking tape, hole punch, three pieces of insulated wire (each wire cut in ~ 30-cm lengths with an alligator clip attached to each end), lightbulb, lightbulb holder.

## Making the Tester

1. Connect one alligator clip from the first wire to one of the terminals on the battery holder. Connect the other end of this wire to one of the terminals on the lightbulb holder.
2. Connect one alligator clip from the second wire to the remaining terminal on the battery holder. Leave the other end of this wire free.
3. Connect one alligator clip from the third wire to the remaining terminal of the lightbulb holder. Leave the other end of this wire free.
4. Insert the batteries in the battery holder. Insert the lightbulb in the lightbulb holder.
5. Touch the free ends of the wires together to make sure your tester works. The lightbulb should light up if everything is connected properly and the batteries are charged.

## Making the Quiz

**Diagrams of the Outside & Inside of the Folder**




6. Make sure the folder is closed before you punch the holes. You should punch through both halves of the folder.
7. Use the hole punch to punch five, evenly spaced, holes along one of the long edges of the folder. Write one of the questions from Table 1 next to each hole.
8. Punch six additional holes along the other long side of the folder. Write one of the answers from Table 1 next to each hole. Important: Make sure you scramble the order of the answers, so that the correct answer is not directly across from the question.
9. Cut the aluminum foil in long, one-inch-wide strips. Fold the strips lengthwise, so that you have long, 1/2-inch-wide strips (that are doubled).
10. Open the folder and lay it on your desk so that the questions and answers are face-down.

11. Lay a foil strip across the back of the flap so that one end of the foil covers the hole of the first question and the other end of the strip covers the hole of the correct answer to that question. Trim any extra foil from the ends of the strip.
12. Taking care not to move the foil, completely cover the strip with masking tape. It is important that none of the foil be exposed on the back side. The only places the foil should be exposed is through the holes on the front side.
13. Repeat steps 11 and 12 for each of the remaining questions. Be sure to completely cover the back of each foil strip with tape.

    **Note:** you will need to modify this procedure to connect the question with two correct responses to each of the answers. You need to make sure that, no matter which of the correct answers is chosen, the circuit is closed.

14. Once all of the foil strips have been taped and covered, close and tape the flaps of the folder.

## Taking the Quiz

15. Touch one of the free ends of your tester to one of the question holes. Select the most appropriate answer to the question and touch the free end of the second wire to the answer hole. Make sure that both of the free ends of the tester are touching the foil at the same time. You should know right away whether your choice is correct or not.
16. Repeat this process for each question. You want to make sure that the lightbulb lights, each time a correct answer is chosen, and that it does not light up when incorrect answers are selected.
17. Exchange quizzes with one of your classmates. Take the new quiz and record the name of your classmate and your score on his/her quiz in Table 2.
18. Repeat step 17 with four more classmates. Record their names and your scores in Table 2.

**Table 2: Quiz Results**

| Name | Score |
|---|---|
| | |
| | |
| | |
| | |
| | |

**Part III: Follow-up Questions (Homework)**

1. Why does the tester light up when you answer a question correctly?

2. Why does the tester not light up when you answer a question incorrectly?

3. Would your IFQ function properly if two different foil strips were touching? What might happen, in this case, if you answered a question correctly? What might happen, in this case, if you answered a question incorrectly? Explain your answers.

4. Describe how you connected Question 5 (Table 1) with both of its correct answers. What type of circuit did you make? Explain.

5. Compare your quiz results (recorded in Table 2). Did your scores improve as you progressed? Did immediate feedback help you? Explain.