

CIRCUIT BOXES ACTIVITY (L-62)

You're familiar enough now with the principles of circuits to interpret and predict the behavior of simple circuits. In this activity, you'll use an online simulation to get familiar with basic circuit combinations and notation, then apply that to actual circuit boxes with unknown internal configurations.

Part 1: exploring simple circuit configurations (15-20 minutes)

On your device, please go to <https://universeandmore.com/crackthecircuit/> . Select "New Game" and follow the instructions. The first few levels are pretty straightforward, but they do get a bit trickier near the end! Pay attention to which level you're on – when you complete levels 10 and 11, answer the following question. (note that if you need to go back to a previous level, click the Home button at the top left, then select the level).

1. Both levels 10 and 11 had three lightbulbs with no switches, yet they are very different circuits. Sketch the two circuits below (please label which is which) and beneath, briefly describe what you observed that differentiated the two.

Continue working through the levels. When you complete level 17, answer the following question:

2. Sketch the circuit you found for level 17. Why does closing the switch cause the behavior you see in the lightbulbs? Explain using Ohm's Law.

Part 2: circuit boxes

There are 5 circuit boxes in the classroom, each containing three lightbulbs and two switches in various combinations. Your task: to determine how two of the boxes are wired. For each box, you should record your observations of the circuit's behavior in the left hand column, then sketch your interpretation of the circuit's configuration in the right hand column, using standard symbols. Bullet points are fine for the observations, but they should be detailed enough to explain.

Box # _____

Observations:

Circuit sketch:

Box # _____

Observations:

Circuit sketch: