

# SnapLogic™

Makes learning digital  
Logic a Snap!™

The 175 page *Digital Basics* book topics are as follows:

- ✓ Basic electrical theory,
- ✓ Everyday logic switch examples,
- ✓ Boolean expressions,
- ✓ Combinational logic,
- ✓ Basic gates AND, OR, NOT (INVERTERS)
- ✓ Derived gates NAND, NOR, XOR,
- ✓ Single and 3-state BUFFERS,
- ✓ Sequential logic D-FLIP/FLOP,
- ✓ Discrete logic switches, resistors and wires,
- ✓ Status LED logic probes (H, L, Z),
- ✓ Discussions on equivalent gates, source-sink, open drain (Z), pull-ups, active low and high, basic schematic and circuit design using truth tables.
- ✓ Over twenty hands-on exercises.

## What are SnapLogic Cards?

A set of SnapLogic cards consists of 25 small, printed circuit boards (PCBs). Twelve of the cards in this set contain one of each of the most elementary *digital logic circuits*. On each of these cards, there is a tiny plastic case housing an *integrated circuit* (IC) that resides on a silicon *chip*. Traces called *leads* emerge from the case allowing outside electrical access to the chip within. In turn, these leads are connected to small sockets that are joined by little pins to build electronic digital logic circuits using the SnapLogic cards.



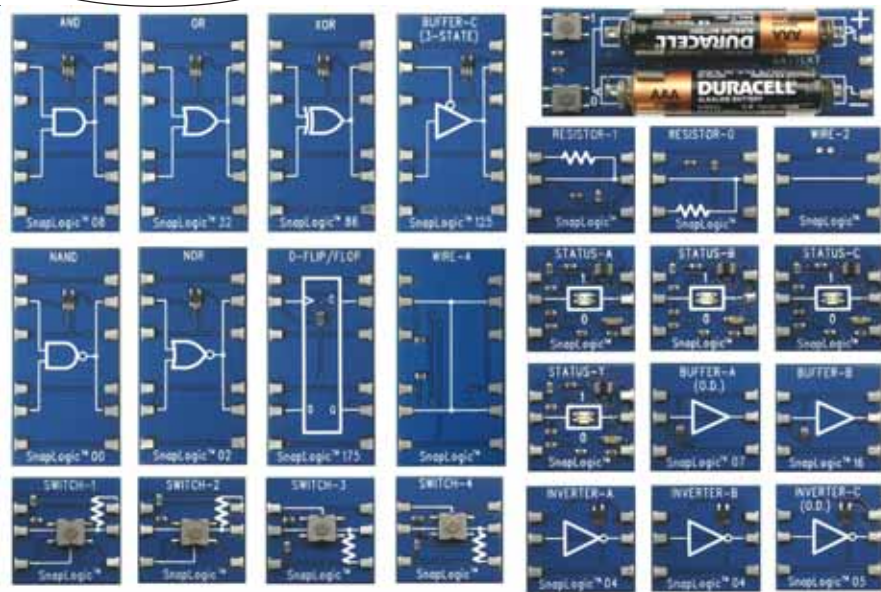
STOCK NO. 605-SNAPLOGIC-DLS  
www.mouser.com  
(800) 346-6873

*Digital Design Lab Set* contains:

- SnapLogic Set (25 pcs)
- SnapLogic Book (175+ pgs)
- Circuit Connector Pins
- Two AAA Batteries
- Prototyping PCB
- Prototyping ICs (4 pcs)
- Prototyping Header Pins
- Circuit Designer's CD



Book size is 5"x7"x1/2"

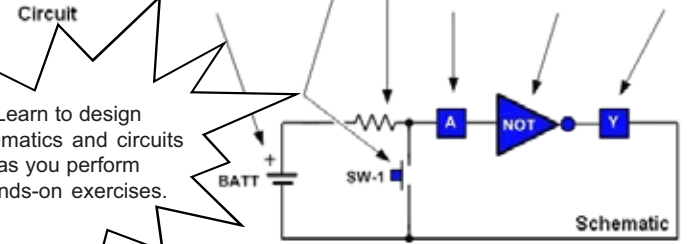


Card sizes are 1"x1", 1"x2" and 1"x3" for the battery card.

Truth Table

A	Y
0	1
1	0

Green = 0 = Low      Red = 1 = High



Learn to design schematics and circuits as you perform hands-on exercises.

# The SnapLogic™ Digital Basics book at a glance...

**George Boole**  
(1815 - 1864)

**Born:** November 2, 1815  
**Place:** Lincoln, Lincolnshire, England  
**Youth:** Father taught him mathematics, construct optical instrument, instructed him in Latin, translated an ode by the King. Although without a degree, school teacher at age 16.  
**Academic:** Did not attain any formal education.  
**Posts:** Owned a school of mathematics. Later became chair of mathematics. Published his works.  
**Honors:** Royal Society Medal, Elected a Fellow of the Royal Society, Honorary degree from University of Dublin.  
**Literary:** Articles in the Cambridge Mathematical Journal, Papers in the Transactions of the Royal Society, *An investigation into the Laws Which are founded the Mathematics of Logic and Probabilities.*

**Technical definitions made clear!**

**Brief biographies include:**  
 Andre Marie Ampere  
 George Boole  
 Augustus DeMorgan  
 Jack St. Clair Kilby  
 Georg Simon Ohm  
 Claude Elwood Shannon  
 Alessandro Volta  
 James Watt

**Significant electrical milestones covered!**

**What is an Integrated Circuit?**  
 An Integrated Circuit (IC) is a small silicon chip that contains microscopic solid state circuitry especially designed to do a particular job or *function*. Jack Kilby is credited with inventing the first IC at Texas Instruments in 1958. The IC functions in this book are restricted to those performing only digital logic. A *digital logic function* has roots in a set of logical behaviors defined by George Boole in the mid 1800s. Boole's work in the field of logic is the basis for all digital logic IC design. That is, the behavior of a digital logic circuit's output is a direct *result* or function of its inputs.

**Who is George Boole?**  
 George Boole was an English mathematician who introduced a system for mathematical logic in 1854. Boole's algebraic rules for logic provided for *expressions* (statements) that are either *true* or *false*. *Truthfully*, if it rains the ground will become wet. *Falsely*, all dogs have spots. Nearly one hundred years later, in 1938, C. E. Shannon developed *switching algebra* which adapted Boole's logic to electrical switch *states* as being either *on* or *off*. At the time, neither of these men realized the impact their work in the field of logic would have on modern electronics.

**International standard** — conventions that propose and adapt to national differences.

**INVERTER** — another name for a NOT gate.

**Isolated** — absence of a physical connection between electrical components.

**Comprehensive glossary containing more than 350 terms used in digital electronics.**

**Short and to the point explanations of related topics.**

**Over 175 pages with illustrations on just about every page!**

**22 hands-on Exercises for learning schematics, circuits, and truth table design.**

**Answer key to the Exercises.**

**Basic Electrical Theory**  
 In order to grasp an electrical switch's function in the upcoming logic circuits, some knowledge of basic electrical behavior is essential. Primarily, the student must understand the concept of electron flow as it relates to components in an ordinary electric circuit.

**Exercise Example: Step 2**

Align SWITCH-3 with STATUS-A card and connect pins.

**Exercise Example: Step 6**

Compare the constructed SnapLogic Circuit to the Schematic.

**P-MOSFET Test Circuits**

1	1	0	1	1	0	1	1	Z	1	1	1	1
1	0	1	1	1	1	0	0	1	1	1	0	1
0	0	1	1	0	0	0	0	0	0	1	1	0
1	0	1	0	1	1	1	1	1	1	1	0	0

Pg 98 Pg 99 Pg 100 Pg 101

A	Y	A	Y	A	Y	A	Y
0	Z	0	1	0	0	0	0
1	0	1	0	1	Z	1	1

Page 102	Page 103	Page 104	Page 105					
A	B	Y	A	B	Y	A	B	Y
0	0	0	0	0	0	0	0	1
0	0	0	0	1	1	1	1	1
0	0	1	0	1	1	0	1	1
0	1	1	1	1	1	1	1	0
1	1	1	1	1	1	0	1	1

Page 106	Page 107	Page 108	Page 109			
A	B	Y	A	B	C	Y
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0
0	0	0	0	0	0	0

**Complicated concepts explained easily through illustrations.**