

# SNAP CIRCUITS

**GAME-PLAY**

**PLAY 20+ GAMES**

*Learn about Electricity*

*Create Sound & Light*

*Easy Snap Construction*



**63 TOTAL PROJECTS**

**FULL ONLINE MANUAL**





**Snap Circuits®** uses building blocks with snaps to assemble real electronic circuits. Each block has a function: switch, light, battery, different length wire blocks, and more! With easy-to-follow project manual, **simply snap together to create working circuits!**



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### For Additional Projects:



Go to:  
[www.elenco.com/scgmply-manuals/](http://www.elenco.com/scgmply-manuals/)  
to download projects 24 - 63

Printed Projects found starting on  
page 3 of this manual.  
Projects 24-63 found starting on  
page 10 of this manual.



### Installing batteries:

- Remove the safety cover from the battery holder (if your holder has one) with a Phillips head screwdriver
- Insert three (3) 1.5V AA batteries (not included) in the holder. Be sure to orient the battery "+" as marked in the holder.
- Replace the cover (if your holder had one). When installing a battery, be sure the spring is compressed straight back, and not bent up, down, or to one side.
- Battery installation should be supervised by an adult.

**What is electricity?** Nobody really knows. We only know how to produce it, understand its properties, and how to control it. Electricity is a form of energy that can give things the ability to move and work. Everything in the world around us is made of particles called protons, neutrons and electrons. These three tiny particles are found in everything around us. When the electrons move, they create electricity.

## Important Safety Notes for Parents and Kids

- **Adult Supervision:** Because children's abilities vary so much, even with age groups, adults should exercise discretion as to which experiments are suitable and safe. Make sure your child reads and follows all of the relevant instructions and safety procedures, and keeps them at hand for reference.
- This product is intended for use by adults and children who have attained sufficient maturity to read and follow directions and warnings.
- Save the packaging and instructions. They contain important information.
- **Warning: Choking Hazard:** Small parts. Not for children under 3 years of age.
- **Warning:** This product produces flashes that may trigger epilepsy in sensitized individuals.
- **Warning: Shock Hazard:** Never connect Snap Circuits® to the electrical outlets in your home in any way!
- **Warning:** Always check your wiring before turning on a circuit. Never leave a circuit unattended while the batteries are installed. Never connect additional batteries or any other power sources to your circuits.
- Never modify your parts, as doing so may disable important safety features in them, and could put your child at risk of injury
- Save the packaging and instructions. They contain important information.

**Helpful Symbols:**  
Look for these symbols  
throughout the manual.



**GENERAL  
INFORMATION**  
• Definitions  
• "How it works?"



**SNAP CIRCUITS**  
Technical information  
using your parts.



**ADULT  
ASSISTANCE  
REQUIRED**  
Get an adult to help  
with your build



**Batteries:**  
**X3**



- Use only 1.5V AA type, alkaline batteries (not included).
- Insert batteries with correct polarity.
- Do not mix old and new batteries.
- Remove batteries when they are used up.
- Do not mix alkaline, standard (carbon-zinc), or rechargeable (nickel-cadmium batteries).
- Do not connect batteries or battery holders in parallel.
- Do not short circuit the battery terminals.
- Never throw batteries in a fire or attempt to open its outer casing.
- Batteries are harmful if swallowed, so keep away from small children.
- Non-rechargeable batteries should not be recharged. Rechargeable batteries should only be charged under adult supervision, and should not be recharged while in the product.

Ready for some fun? Here is a list of games you can build then play!

## Summary of Games

| #  | Name                             | Sample Project | Description                                                                                                                     | #  | Name                             | Sample Project | Description                                                                                                                                                                         |
|----|----------------------------------|----------------|---------------------------------------------------------------------------------------------------------------------------------|----|----------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | <i>Arcade</i>                    | 4              | Every few seconds it randomly turns on snaps 1, 4, & S-OUT, or plays a tune, or changes the LED display. Used in many projects. | 12 | <i>Home Run Derby Game</i>       | 15             | A baseball "pitch" occurs where the red, yellow and then green LEDs light up in sequence but at different speeds. You try to press a button at the right moment to "hit" the pitch. |
| 2  | <i>Fast Arcade</i>               | 5              | Same as Game 1 but changes faster.                                                                                              |    |                                  |                |                                                                                                                                                                                     |
| 3  | <i>Faster Arcade</i>             | 5              | Same as Game 2 but changes even faster.                                                                                         |    |                                  |                |                                                                                                                                                                                     |
| 4  | <i>Lucky Doubles</i>             | 9              | Rolls dice on the display, doubles plays a winning tune.                                                                        | 13 | <i>Baseball Game</i>             | 16             | Same as game 12, but has "outs".                                                                                                                                                    |
| 5  | <i>Lucky Sixes, Unlucky Ones</i> | 26             | Rolls dice on the display, 66 plays a winning tune and 11 plays a losing tune.                                                  | 14 | <i>Memory Game (Very easy)</i>   | 28             | A sequence of lights flash, and you try to repeat the order by pressing buttons.                                                                                                    |
| 6  | <i>Risk &amp; Reward</i>         | 27             | Game based on rolling dice on the display.                                                                                      | 15 | <i>Memory Game (Easy)</i>        | 29             | Same as game 14, but the sequence is faster.                                                                                                                                        |
| 7  | <i>3 Second Hold</i>             | 10             | Timing game based on holding a button down for 3 seconds.                                                                       | 16 | <i>Memory Game (Medium)</i>      | 30             | Same as game 14, but the sequence is faster.                                                                                                                                        |
| 8  | <i>5 Second Hold</i>             | 11             | Same as Game 7 but for 5 seconds.                                                                                               | 17 | <i>Memory Game (Hard)</i>        | 31             | Same as game 14, but the sequence is faster.                                                                                                                                        |
| 9  | <i>10 Second Hold</i>            | 12             | Same as Game 7 but for 10 seconds.                                                                                              | 18 | <i>Memory Game (progressive)</i> | 32             | Same as game 14, but the sequence gets faster as you play it.                                                                                                                       |
| 10 | <i>20 Second Hold</i>            | 13             | Same as Game 7 but for 20 seconds.                                                                                              | 19 | <i>Twenty-One</i>                | 14             | A game based on the card game Blackjack.                                                                                                                                            |
| 11 | <i>Numbers &amp; Letters</i>     | 24             | Cycles through letters & numbers that can be shown on the display.                                                              | 20 | <i>Binary Coded Decimal</i>      | 34             | Uses LEDs to show how numbers 1-7 can be displayed in binary, which has only 2 states.                                                                                              |
|    |                                  |                |                                                                                                                                 | 21 | <i>Changing Speed</i>            | 25             | Turns snaps 1 & 4 on/off at varying speed. Snaps 1 & 4 are always in opposite states. Used in many projects.                                                                        |



Model SC-GMPY

### PARTS LIST

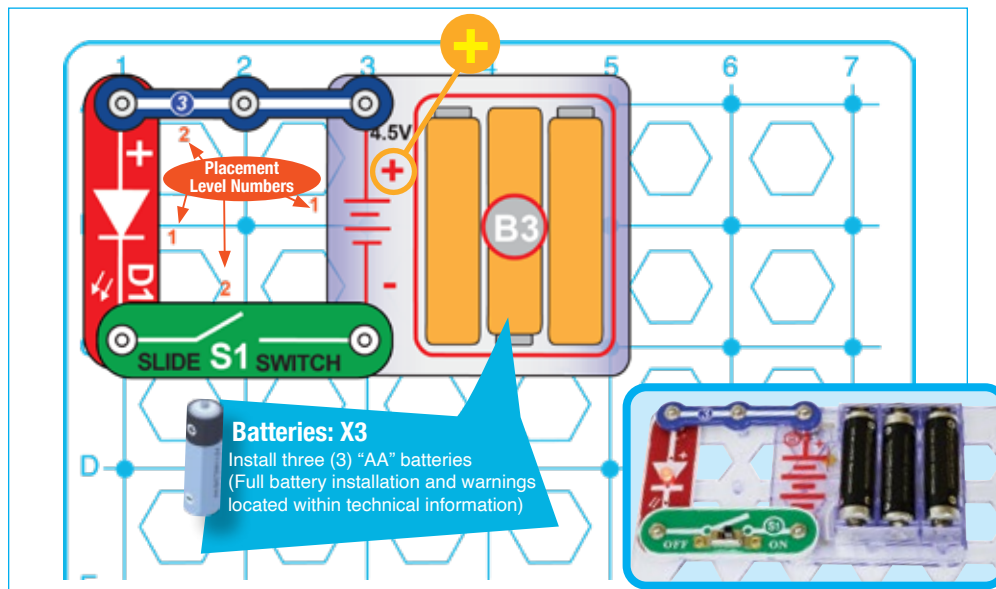
| QTY.                       | ID     | NAME                            | Part # |
|----------------------------|--------|---------------------------------|--------|
| <input type="checkbox"/> 1 |        | Base Grid (7.7x5.5)             | 6SCBGM |
| <input type="checkbox"/> 2 | 1      | 1-snap wire                     | 6SC01  |
| <input type="checkbox"/> 4 | 2      | 2-snap wire                     | 6SC02  |
| <input type="checkbox"/> 2 | 3      | 3-snap wire                     | 6SC03  |
| <input type="checkbox"/> 1 | 5      | 5-snap wire                     | 6SC05  |
| <input type="checkbox"/> 1 | B3 B3B | 3A Battery holder               | 6SCB3  |
| <input type="checkbox"/> 1 | D1     | Red LED                         | 6SCD1  |
| <input type="checkbox"/> 1 | D2     | Green LED                       | 6SCD2  |
| <input type="checkbox"/> 1 | D10    | Red/Yellow LED                  | 6SCD10 |
| <input type="checkbox"/> 1 |        | Jumper Wire Orange 8"           | 6SCJ3A |
| <input type="checkbox"/> 1 |        | Jumper Wire Yellow 8"           | 6SCJ3B |
| <input type="checkbox"/> 1 |        | Jumper Wire Green 8"            | 6SCJ3C |
| <input type="checkbox"/> 1 | S1     | Slide Switch                    | 6SCS1  |
| <input type="checkbox"/> 1 | S8     | Selector                        | 6SCS8  |
| <input type="checkbox"/> 1 | SP     | Speaker                         | 6SCSP  |
| <input type="checkbox"/> 1 | U29    | LED Display and Microcontroller | 6SCU29 |

**IMPORTANT:**  
If any parts are missing or damaged,  
**DO NOT RETURN TO RETAILER.**

e-mail us at:  
[support@elenco.com](mailto:support@elenco.com)

You may order additional/  
replacement parts:  
[elenco.com/replacement-parts](http://elenco.com/replacement-parts)

## Project 1: Red Light



Your battery holder may have a cover.

- Build the circuit shown on the left by placing all the parts with a red 1 next to them on the board first.
- Then, assemble parts marked with a 2.
- Install three (3) “AA” batteries (not included) into the **Battery holder (B3)** if you have not done so already. When installing a battery, be sure the spring is compressed straight back, and not bent up, down, or to one side. Battery installation should be supervised by an adult.
- Turn on the **Slide Switch (S1)**, and the **Red LED (D1)** lights.

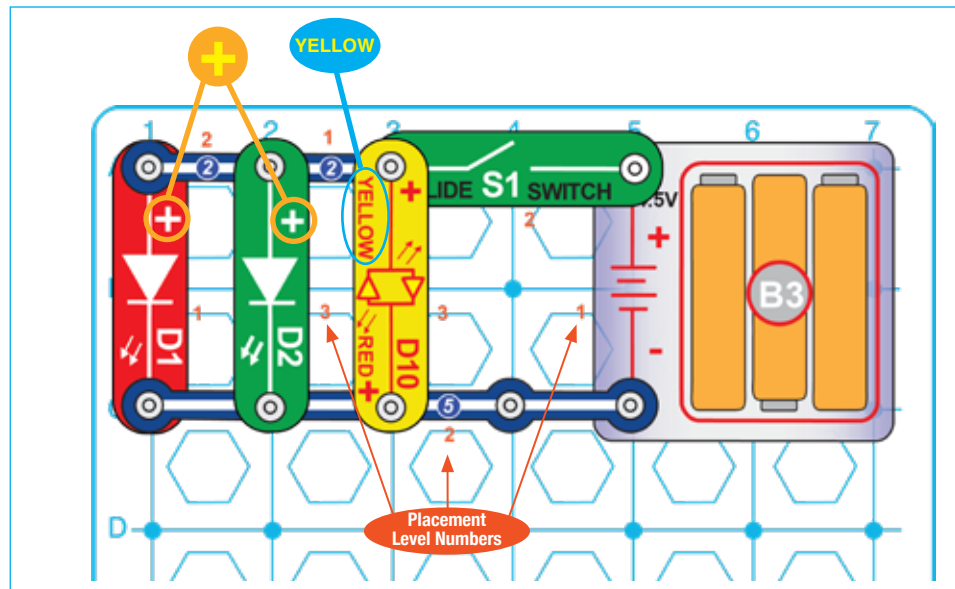


**NOTE:** this circuit (and many others in this book) have an LED being used without a resistor or other component to limit the electric current through it. Normally this could damage an LED but your Snap Circuits® LEDs include internal protection resistors, and will not be damaged. Be careful if you later use other electrical sets with unprotected LEDs.



When you turn on the slide switch, electricity flows from the batteries, through the red LED and back to the battery through the switch. If the switch is off, the flow of electricity is blocked, and the red LED won't light.

## Project 2: Lights



- Build the circuit shown here.
- Turn on the **Slide Switch (S1)**.  
The **Red, Green, and Yellow LEDs (D1, D2, & D10)** light.

## Project 3: Reverse Lights

Try reversing the position of the **Slide Switch (S1)**, **2-Snap Wire**, and each of the **LEDs (D1, D2, & D10)**, separately.

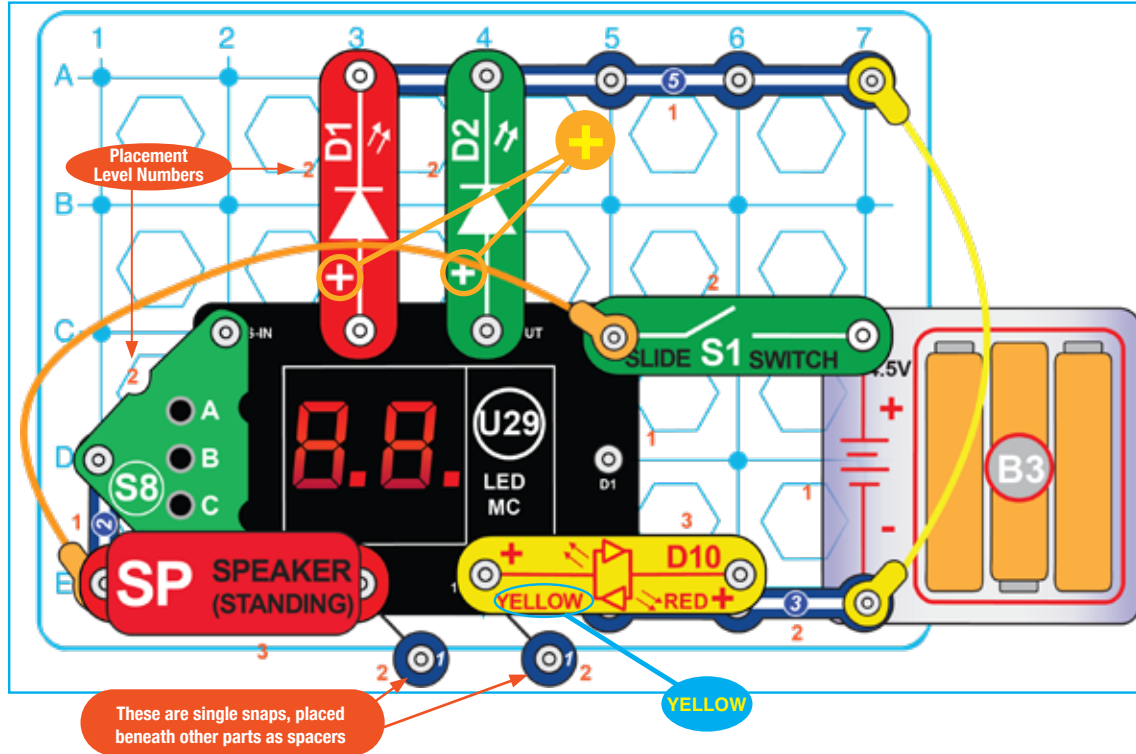


Reversing the slide switch and 2-snap wire has no effect. LEDs only work in one direction, so the red & green LEDs do not work in reverse, but the yellow LED (D10) is a bi-color LED, with separate red & yellow LEDs in opposite directions, as shown in its symbol.



LEDs are light emitting diodes, which convert electrical energy into light. The color of the light depends on the characteristics of the material used in them.

## Project 4: Arcade



- Build the circuit shown above by placing all the parts with a black 1 next to them on the board first. Then, place parts marked with a 2, and then parts with a 3.
- Connect the **Jumper Wires (yellow and orange)** as shown in the drawing. Install three (3) “AA” batteries (not included) into the **Battery Holder (B3)** if you have not done so already.
- Turn on the **Slide Switch (S1)**. The display on the **LED-MC (U29)** displays “00”.
- Make the display on the LED-MC show “01” by pressing the A button on the selector (S8) to increase the ones digit on the display.
- Press the B button on the selector to select the game (now game 1), and a mini arcade show begins.
- Every few seconds the speaker plays a tune, one or more of the **LEDs (D1, D2, & D10)** lights, and/or the U29 LED display shows a random pattern.
- If you want to change games then turn off S1 to reset the circuit.

## Project 5: Fast Arcade

- Use the project 4 circuit but select game 2 (instead of game 1).
- Some parts of the arcade show happen faster now, such as the changing random pattern on the **U29 LED display**.

## Project 6: Faster Arcade

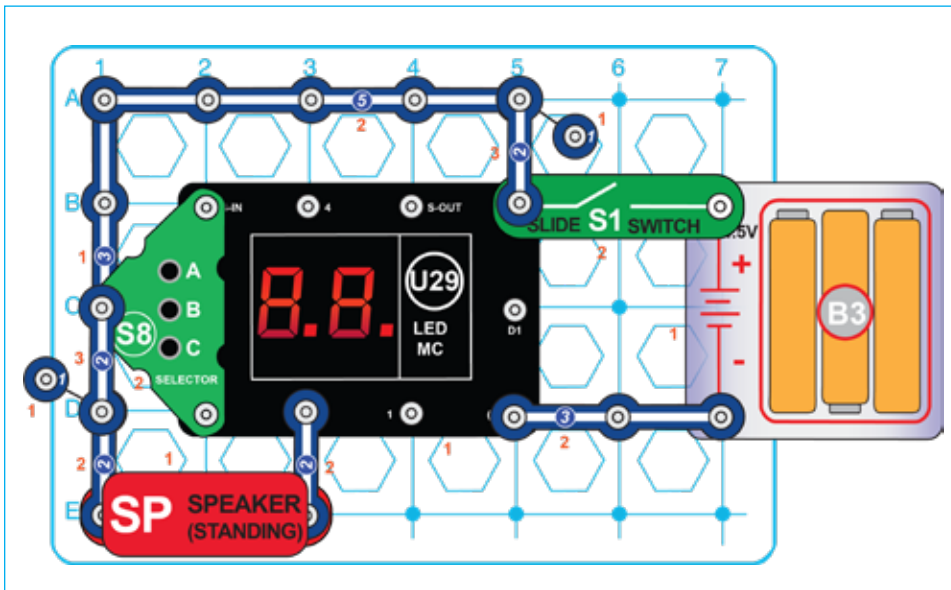
- Use the project 4 circuit but select game 3 (instead of game 1).
- Some parts of the arcade show happen faster now, such as the changing random pattern on the **U29 LED display**.

## Project 7: Arcade Dice

Use the project 4 circuit but select game 4 (instead of game 1), then press button B. When the display shows “Go” press button B to start the game.

- Hold down button C for a few seconds and then release it.
- Two random digits from 1 to 6 will be shown on the display (like rolling 2 dice).
- If the player rolls “doubles” (i.e. the two digits are the same), a winning song will be played, and the game starts over (“Go” is shown on the display again).
- If the player does not roll “doubles”, then they can keep trying by pressing button C again.

## Project 8: Games Selector



This simple circuit is intended as an introduction for how to select games on the **LED-MC (U29)**.

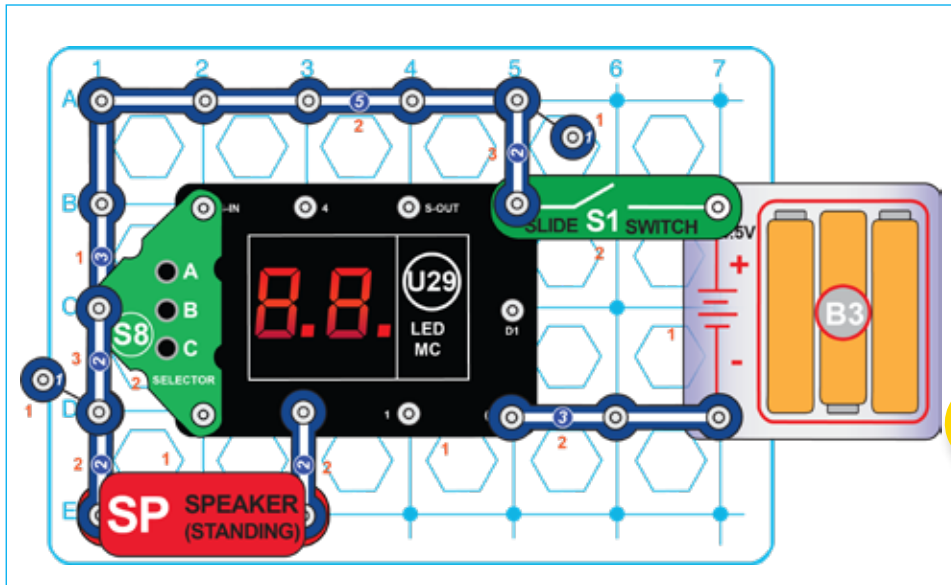
Turn on the slide switch (S1); the display on the LED-MC shows “00”. Press the A button on the selector (S8) to increase the ones digit on the display, and press the C button on the selector to increase the tens digit on the display. When the display shows the game number you want, press the B button on the selector to select it; you hear a beep and the display shows “Go” for most games.

Notes:

- There are 21 games available, but most cannot be played with this simple circuit, or would only have limited features.
- If you try to select a game number higher than 21, then the display will be reset to “00”.
- When the player wins, loses, or finishes a game, the display will say “Go” again and the player can play the game again.
- The only way to select a different game is by turning off the circuit and then turning it back on so that “00” appears on the display again.

Now you are ready to play games!

## Project 9: Lucky Doubles



Use the project 8 circuit but select Game 4 using the game selection procedure in project 8.

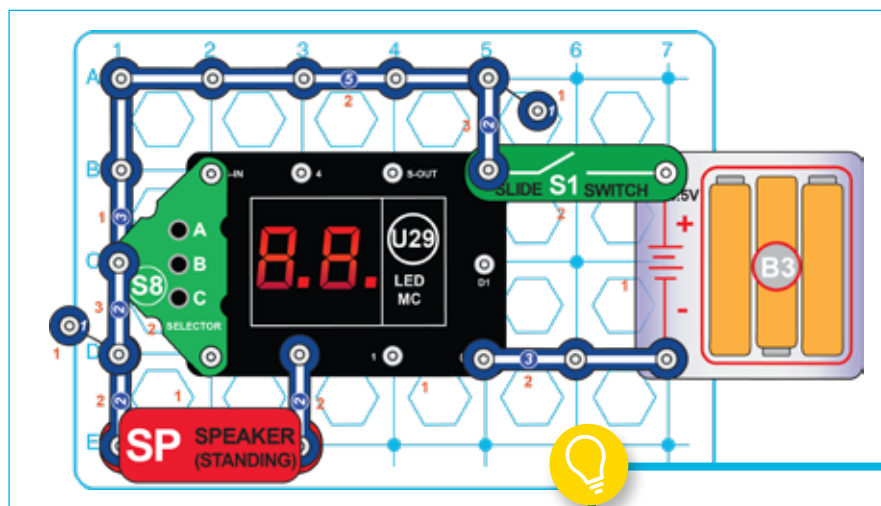
Once the player selects Game 4 and sees “Go” on the display, then:

- Hold down button C for a few seconds and then release it.
- Two random digits from 1 to 6 will be shown on the display (like rolling 2 dice).
- If the player rolls “doubles” (i.e. the two digits are the same), a winning song will be played and the game starts over (“Go” is shown on the display again).
- If the player does not roll “doubles”, then they can keep trying by pressing button C again.
- Have multiple people play to see who is the first to roll “doubles”, or who can roll the most “doubles” in 10 tries.



**This is a dice game**

## Project 10: 3 Second Hold



This is a timing game

Use the project 8 circuit but select Game 7 using the game selection procedure in project 8. Once the player selects Game 7 and sees “Go” on the display, then:

- Try to hold down button C for exactly 3 seconds, then release button C.
- The display will show the number of seconds the player held button C down.
- If the player held button C down for 3 seconds, a winning song will play, and the game starts over (“Go” is displayed to play the game again).
- If the player held button C down for less than 3 seconds or more than 3 seconds, a losing song will play and the game starts over (“Go” is displayed to play the game again).
- Play with multiple people to see who is the first to hold the button for exactly 3 seconds.

## Project 11: 5 Second Hold

Use the same circuit and instructions, but select game 8, and try to hold down button C for 5 seconds.

## Project 12: 10 Second Hold

Use the same circuit and instructions, but select game 9, and try to hold down button C for 10 seconds.

## Project 13: 20 Second Hold

Use the same circuit and instructions, but select game 10, and try to hold down button C for 20 seconds.

## Project 14: Twenty-One

This game is based on the card game “Blackjack”

Use the project 8 circuit but select Game 19 using the game selection procedure in project 8.

Once the player selects Game 19 and sees “Go” on the display, then:

- Press button C to get a first playing card (all jacks, queens, and kings are displayed as a 10). An Ace is displayed as an 11.
- The player then has the option to either:

- Press A to Stand – a winning or losing song will then play depending on what the computer player gets:

◊ If the computer player “busts” (i.e. goes over 21), then a winning song will play and the display will flash “Co” and then 22 indicating that the computer player went over 21. Then the game starts over by displaying a new card.

◊ If the computer player has more points than the player, but not greater than 21, then a losing song will be played and the display will flash “Co” and the total points the computer player had. Then the game starts over by displaying a new card.

◊ If the computer player has equal or less points than the player, then a winning song will be played and the display will flash “Co” and the total points the computer player had. Then the game starts over by displaying a new card.

OR

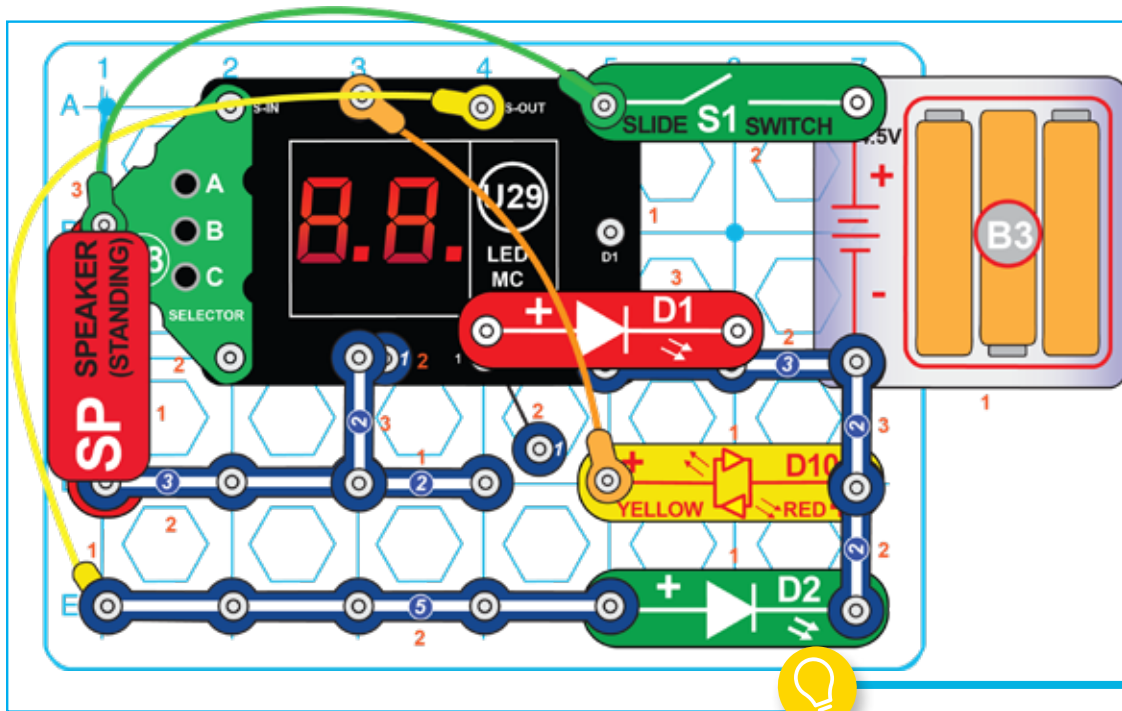
- Press C to Hit – Another card will be drawn and the value will be added to the previous card(s) value, and then:

◊ If the player “busts” (i.e. goes over 21), then a losing song will play and the display will show the total value of all cards for a few seconds. Then the game starts over by displaying a new card.

◊ If the total value of all player cards is still 21 or less, then the player must decide whether to Stand (press A) or take another Hit (press C again).

◊ Note that Aces are treated as 11 points, unless the total value of the cards exceeds 21, in which case Aces are treated as 1 point. Sometimes you may see that your total reduced after you take a Hit, which means you had an Ace that was being treated as 11, but now is treated as a 1.

## Project 15: Home Run Derby Game



See who can get the most home runs before getting 10 outs!

Use this circuit but select Game 12 using the game selection procedure in project 8.

Once the player selects Game 12 and sees “Go” on the display, then:

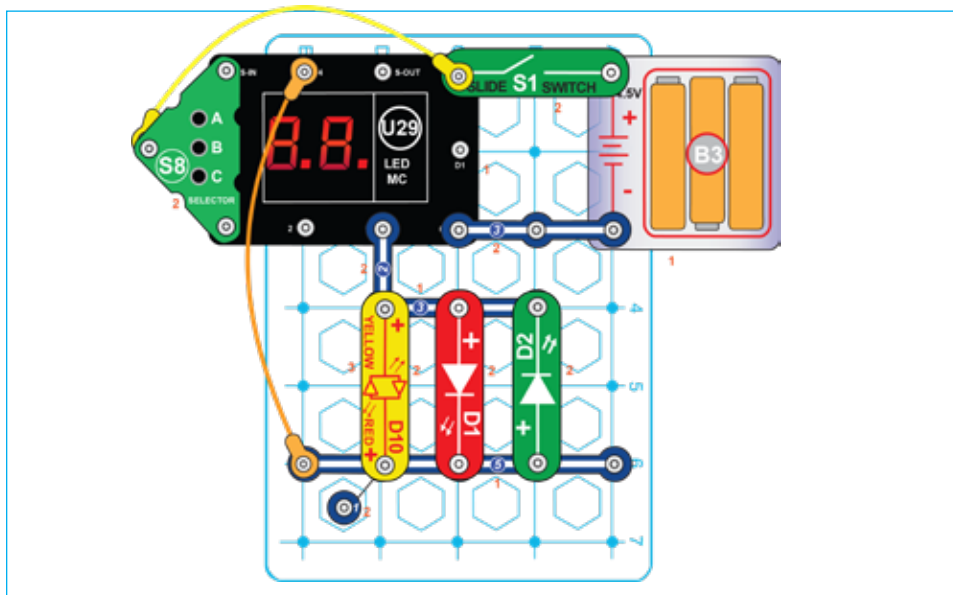
- Press & release button B, and the derby will begin.
- A baseball pitch occurs where the red, yellow, and then green LEDs light up in sequence but at different speeds.
- The player needs to press button B at just the right time (after the green LED is displayed) to hit a home run.
- If the player presses button B at just the right time, a winning song will play, the crowd will cheer, and the display will increase to indicate the number of home runs the player has. The next pitch will come automatically.
- If the player presses button B at the wrong time (either too late or too early), then a losing song will play and the display will flash the number of outs (or misses) the player has for a few seconds, and then go back to displaying the number of home runs the player has so far. The next pitch will come automatically.
- Once the player gets 10 outs, a losing song will play, the total number of home runs the player got is displayed for a few seconds, then the game starts over (“Go” is displayed until the next player presses button B).

## Project 16: Baseball Game

Use the same circuit and instructions, but select game 13, and try to hold down button C for 5 seconds. The game plays the same way except that each player gets 3 outs and then the game goes to the next inning.

- Once the player gets 3 outs, a losing song will play, the total number of home runs the player got in the inning is displayed for a few seconds, then the game starts over to go to the next inning (“Go” is displayed until the next player presses button B).
- Write down your scores after each inning and play a 9 inning game to see who scores the most runs!

## Project 17: Dual Bi-Color Lights



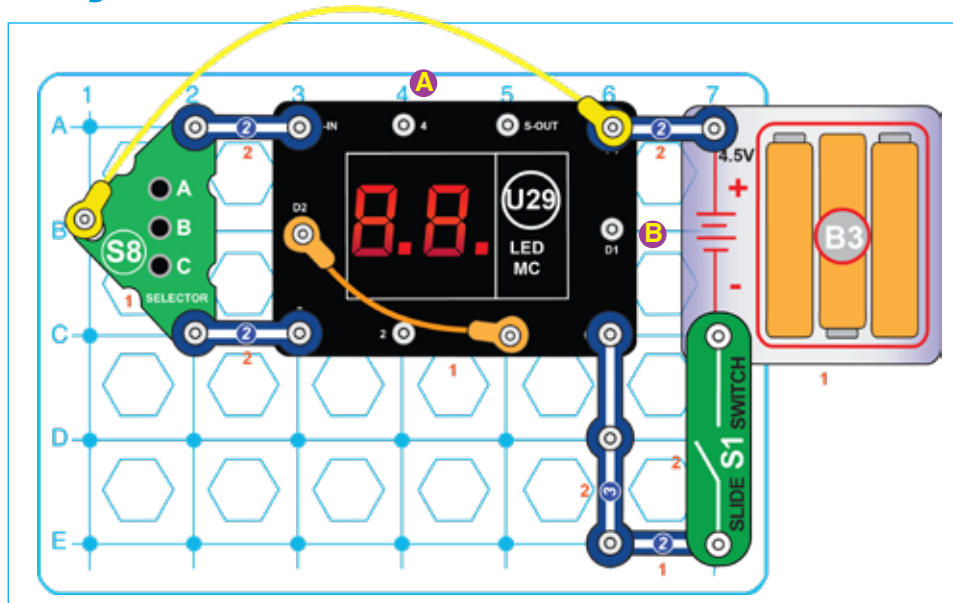
Turn on the **Slide Switch (S1)**; the display on the **LED-MC (U29)** shows “00”. Press the A button on the selector (S8) to increase the ones digit on the display, and press the C button on the selector to increase the tens digit on the display. When the display shows “21”, press the B button on the selector to start.

The **Red/Yellow LED (D10)** will be on continuously, but changing colors at varying speed. The **Red & Green LEDs (D1 & D2)** will be alternately between on and off, opposite each other, and synchronized with D10.



The red & green LEDs together act as a bi-color LED. Compare them to the red/yellow LED, which is a true bi-color LED.

## Project 18: Vibrato 2



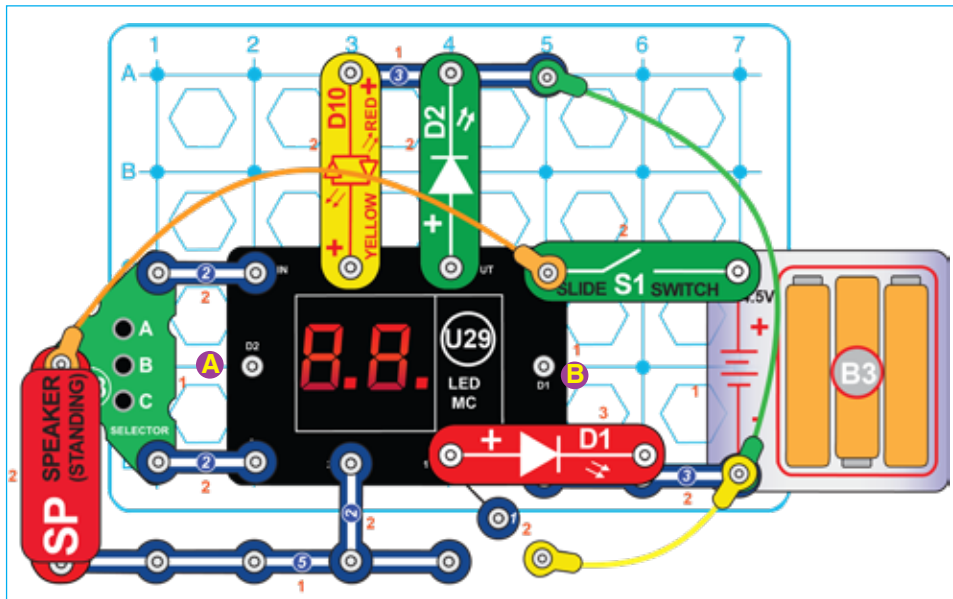
Turn on the slide switch (S1); the display on the **LED-MC (U29)** shows “00”. Press the A button on the selector (S8) to increase the ones digit on the display, and press the C button on the selector to increase the tens digit on the display. When the display shows “21”, press the B button on the selector to start.

The “2” in the display will be toggling on/off at a varying rate.

## Project 19: Vibrato 21

Use the preceding circuit, but add a green jumper between points A & B. Now both digits on the display are toggling, but opposite to each other.

## Project 20: LED-MC Test

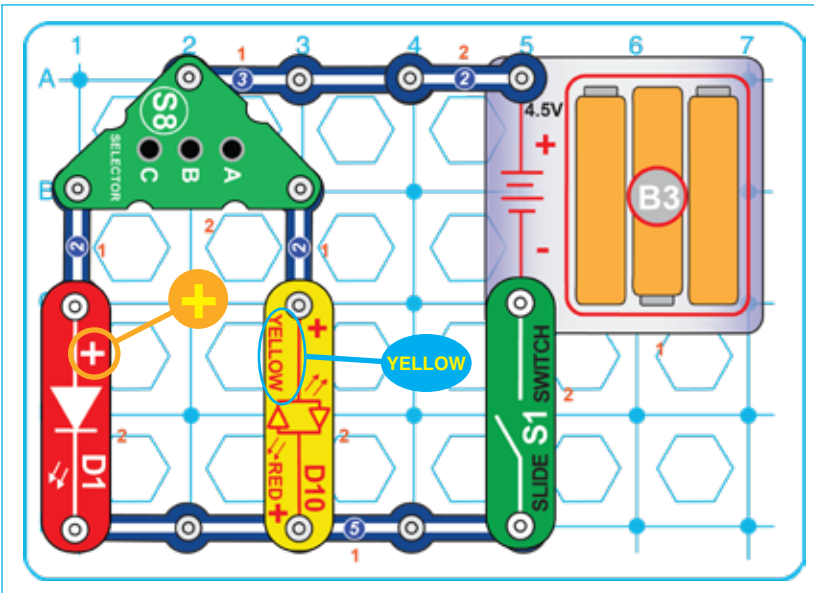


Some parts of this circuit do not fit on the base grid. Leave one end of the yellow jumper wire unconnected for now. Turn on the **Slide Switch (S1)**; the display on the **LED MC (U29)** should show “00”. Select game 1 by pressing the A button on the **Selector (S8)**, then the B button.

Every 2 seconds one or more of the following will happen, randomly changing: **D1 lights, D2 lights, D10 lights, SP plays a tune, the U29 LEDs display** a random pattern. Make sure that eventually all these parts are being controlled. If not, something is wrong. Also, connecting the loose end of the yellow jumper wire to point A or point B should turn off each side of the LED display on U29.

If desired, you can speed things up by turning S1 off and on (to reset the circuit), then selecting game 2 or game 3 by pressing the A button on S8, then the B button. The tunes played on the **Speaker (SP)** will play at the same speed as before.

## Project 21: Selector



Turn on the **Slide Switch (S1)**. Press button C on the **Selector (S8)** to light the **Red LED (D1)**, press button A on the selector to light the yellow **LED (D10)**, or press button B on the selector to light both LEDs.

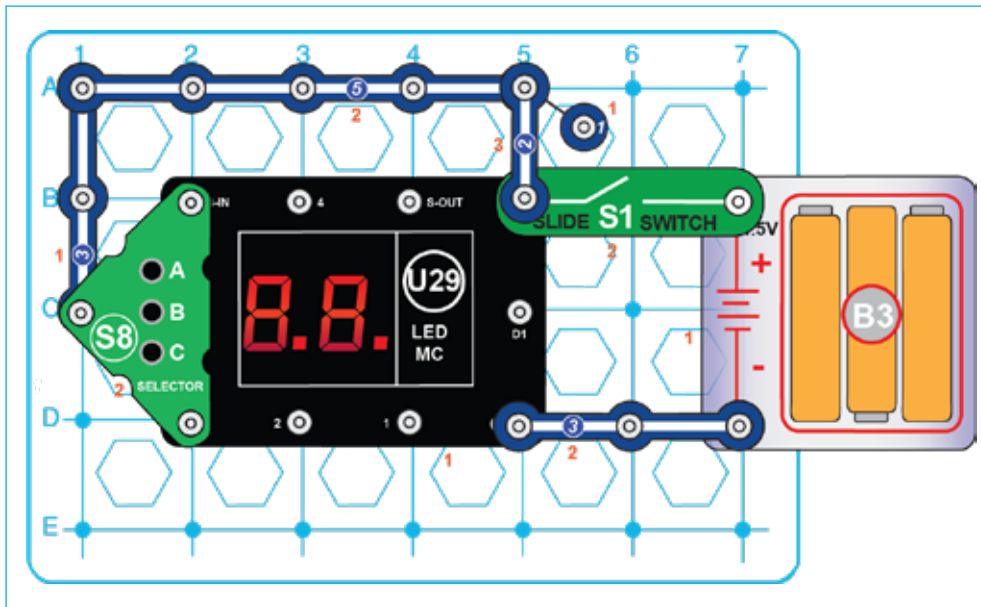
## Project 22: Red Selector

Use the preceding circuit, but reverse the orientation of the **Yellow Bi-Color LED (D10)**, to make it red.

## Project 23: Green Selector

Use the project 21 circuit, but replace either of the **LEDs (D1 or D10)** with the **Green LED (D2)**.

## Project 24: Numbers & Letters



Use this circuit but select Game 11 using the game selection procedure in project 8.

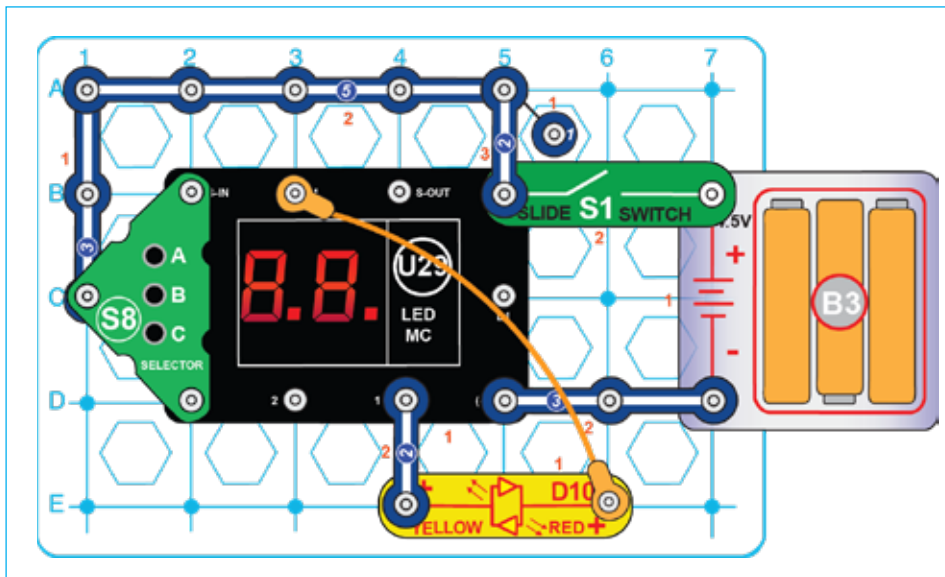
Once the player sees “Go” on the display, proceed as follows:

- Press button C, and a 0 is shown on the display.
- Press button C again, and a 1 is shown on the display.
- Continuing to press button C will cycle through the typical numbers and letters that can be shown on the display.



**Not all the letters in the alphabet can be easily created on the display since there are only 7-segment displays. Identify which letters are missing? One letter is skipped because a certain number looks the same. Identify what letter/number this is?**

## Project 25: Changing Speed



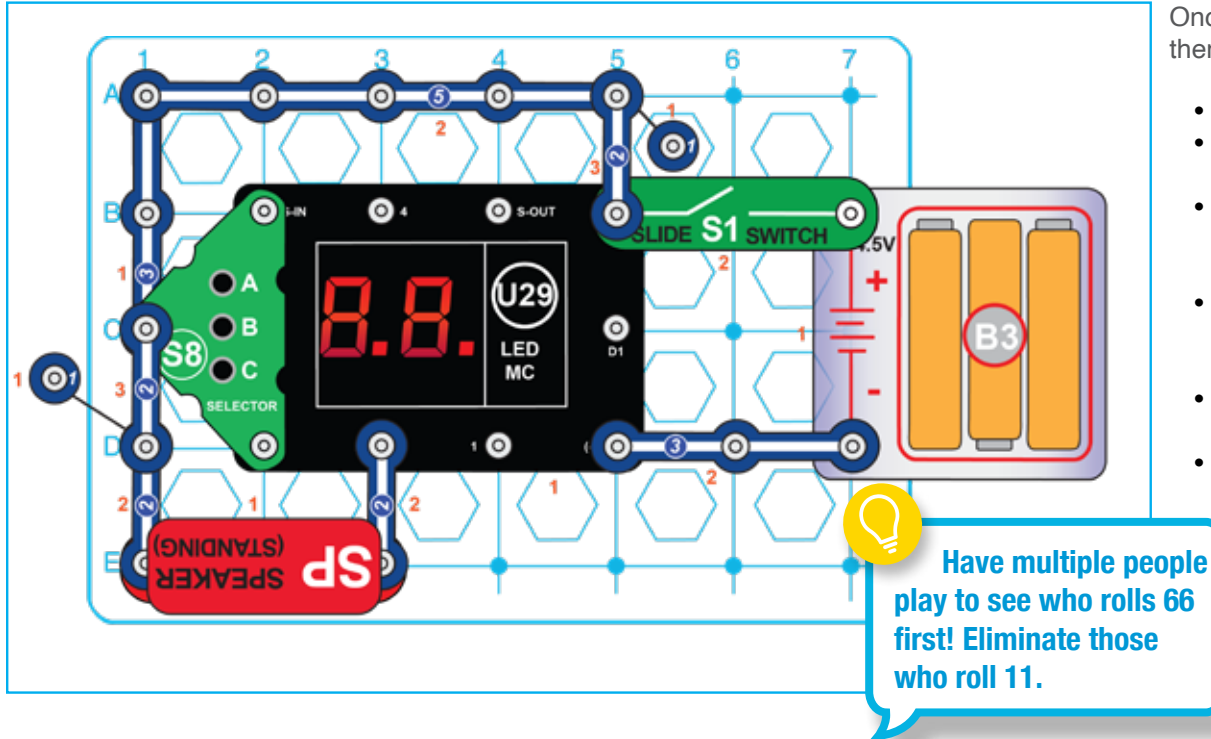
Turn on the slide switch (S1); the display on the LED-MC (U29) shows “00”. Press the A button on the selector (S8) to increase the ones digit on the display, and press the C button on the selector to increase the tens digit on the display. When the display shows “21”, press the B button on the selector to start.

The red/yellow LED (D10) will be on continuously, but changing colors at varying speed.



**The red/yellow LED (D10) is a bi-color LED, which means it has two LEDs (red & yellow) inside, connected in opposite directions. Notice that when D10 is changing colors quickly, its red and yellow colors tend to blend into orange.**

## Project 26: Lucky Sixes, Unlucky Ones



Use this circuit but select Game 12 using the game selection procedure in project 8.

Once the player selects Game 12 and sees “Go” on the display, then:

- Hold down button C for a period of time and then release it.
- When button C is released, two random digits from 1 to 6 will be shown on the display (like rolling 2 dice).
- If the player rolls “double sixes” (i.e. 66 on the display), a winning song will be played and the game starts over (“Go” is shown on the display again).
- If the player rolls “double ones” (i.e. 11 on the display), a losing song will be played and the game starts over (“Go” is shown on the display again).
- If the player does not roll 66 or 11, then they can keep playing by pressing button C again.
- Have multiple people play to see who is the first to roll 66, with those rolling 11 being eliminated from the game.

## Project 27: Risk & Reward

Use the same circuit but select Game 6 using the game selection procedure in project 8.

Once the player selects Game 6 and sees “Go” on the display, then:

Hold down button C for a period of time and then release it.

- When button C is released, two random digits from 1 to 6 will be shown on the display (like rolling 2 dice).
- If either of the digits is a 1, then a losing sound will be played and the player gets 0 points for that turn. “Go” is then displayed for the next players turn.

If neither of the digits is a 1, then the player has two options:

◇ Player can press button A and score the sum of the two digits on the display.

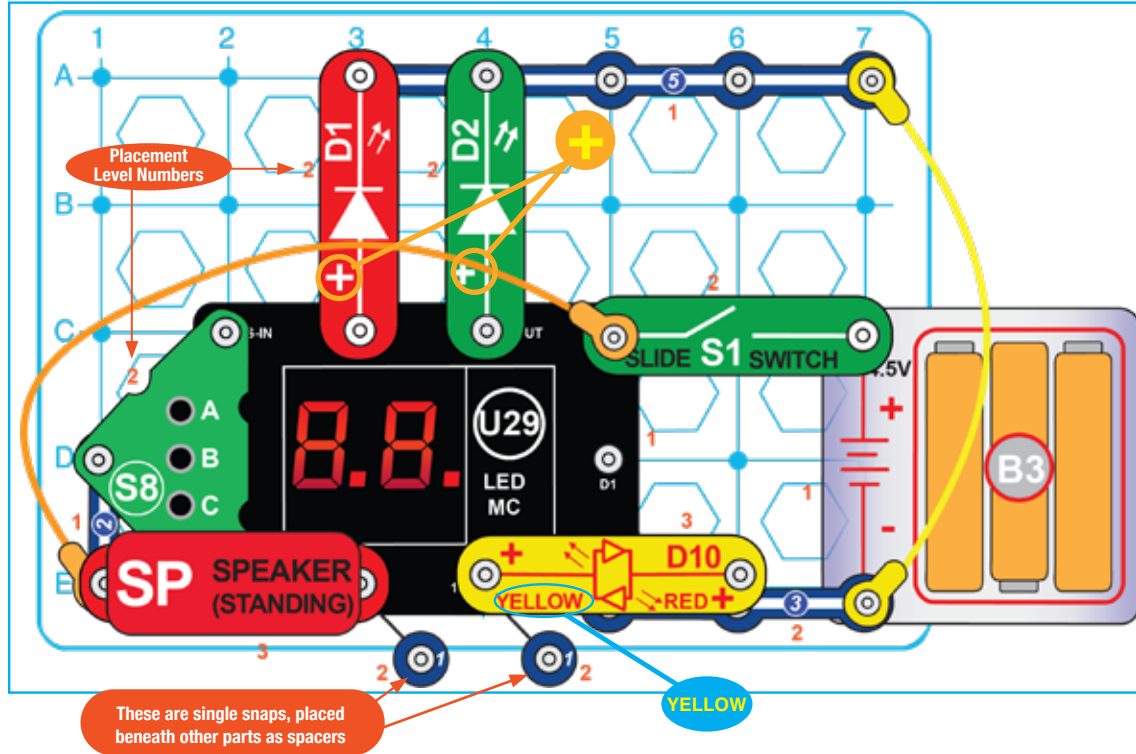
A winning song will be played and the players score will be displayed for a few seconds. “Go” is then displayed for the next players turn.

◇ Player can decide to go for more points by holding button C again for a period of time. After releasing button C again:

- If the player rolled a 1 in either digit, then a losing song will be played and the player gets 0 points for that turn (they lose all the points from their previous rolls). “Go” is then displayed for the next players turn.
- If the player again did not roll a 1 in either of the digits, then the sum of the digits will be added to the players score from previous rolls and they will again have a chance to decide whether to take the points they have accumulated (by pressing button A) or go for even more points (by holding button C again for a period of time).
- When the player decides to hit button A after multiple rolls, a winning song will be played and the sum of the players previous rolls will be displayed for a few seconds. “Go” is then displayed for the next players turn.

See how few turns you need to get 50 points. Are you lucky enough to get 50 in one turn? Have multiple people play. Write down your scores after each turn and see who is the first one to get to 100.

## Project 28: Memory Game (Medium Easy)



Use this circuit but select Game 14 using the game selection procedure in project 17.

Once the player selects Game 14 and sees “Go” on the display, then:

- Press button B and the game will begin.
- A random sequence of lights will slowly flash and then the player has to repeat that sequence in the correct order by pressing button A for the Red LED, button B for the Yellow LED, and button C for the Green LED.
- If the player gets 3 in a row right, the winning song will play, LEDs will flash, the U29 LED display will say “oh YA”, and the game will start over (“Go” will appear on the display).
- If the player enters the wrong sequence at any point, the losing song will play and the U29 LED display will say “oh no”, and the game will start over (“Go” will appear on the display).

## Project 29: Memory Game (Easy)

Use the project 28 circuit and instructions, but select game 15, and you need to get 8 in a row right to win.

## Project 31: Memory Game (Hard)

Use the project 28 circuit and instructions, but select game 17, the lights flash faster, and you need to get 12 in a row right to win.

## Project 30: Memory Game (Medium)

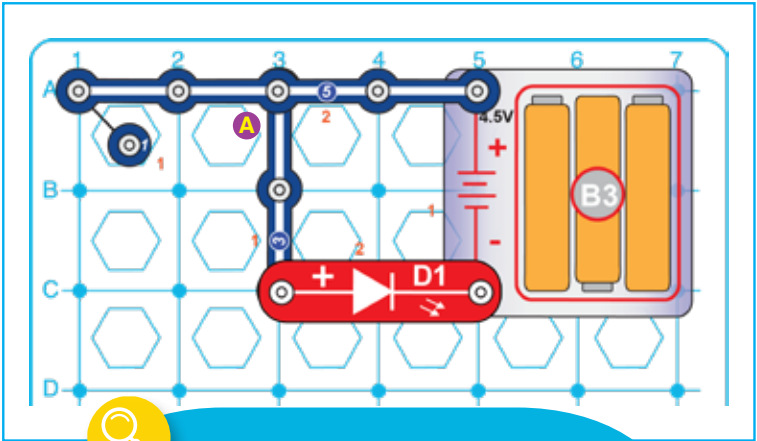
Use the project 28 circuit and instructions, but select game 16, the lights flash faster, and you need to get 8 in a row right to win.

## Project 32: Memory Game (Progressive)

Use the same circuit and instructions, but select game 18. Here the lights start out flashing slowly but the speed increases progressively the further into the game the player gets, and you need to get 12 in a row right to win.

# Project 33: Pressure Circuit

Build the circuit as shown, then push on point A with your finger to complete the circuit.



It may appear that the 3-snap and 5-snap wires are touching, but they do not actually touch unless you push them together.

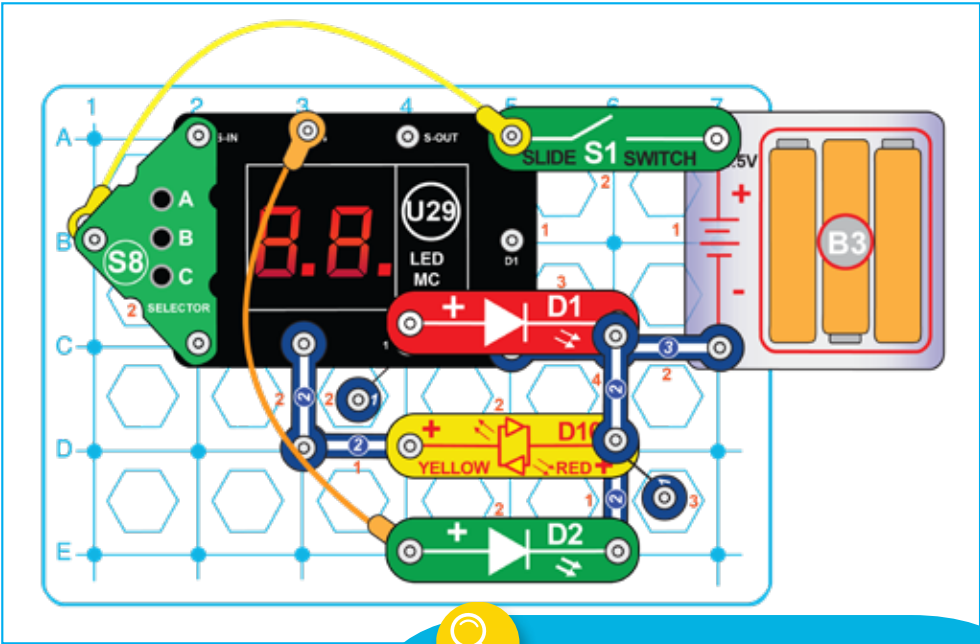
| U29 LED Display | Green LED | Yellow LED | Red LED |
|-----------------|-----------|------------|---------|
| 0               |           |            |         |
| 1               |           |            |         |
| 2               |           |            |         |
| 3               |           |            |         |
| 4               |           |            |         |
| 5               |           |            |         |
| 6               |           |            |         |
| 7               |           |            |         |

# Project 34: Binary Coded Decimal

Use this circuit and select Game 20 using the game selection procedure in project 17.

Once the player selects Game 20 and sees “Go” on the display, then:

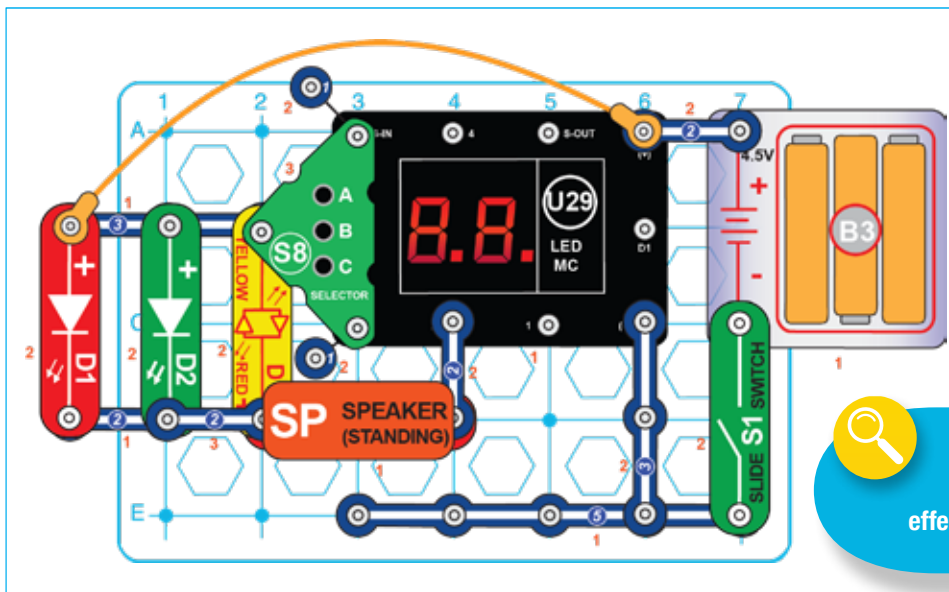
- Press button C and the LEDs will all go off and 0 will be on the U29
- Continue to press button C and the 7-segment LED will increase by 1 each time you press button C, and the LEDs will go through a sequence as shown below. These sequences correspond to the binary coded decimal representation of the number in the first column.



In this circuit, the U29 LED display shows an octal number (0-7), while 3 LEDs (red, yellow, & green) simultaneously display the corresponding binary representation.

Computers store numbers in binary, using only two states, 0 or 1, due to the nature of electronic memory circuits. Binary combines multiple 2-state numbers to represent larger numbers, like octal (8 states) or decimal (10 states).

## Project 35: Enhanced Dice Game

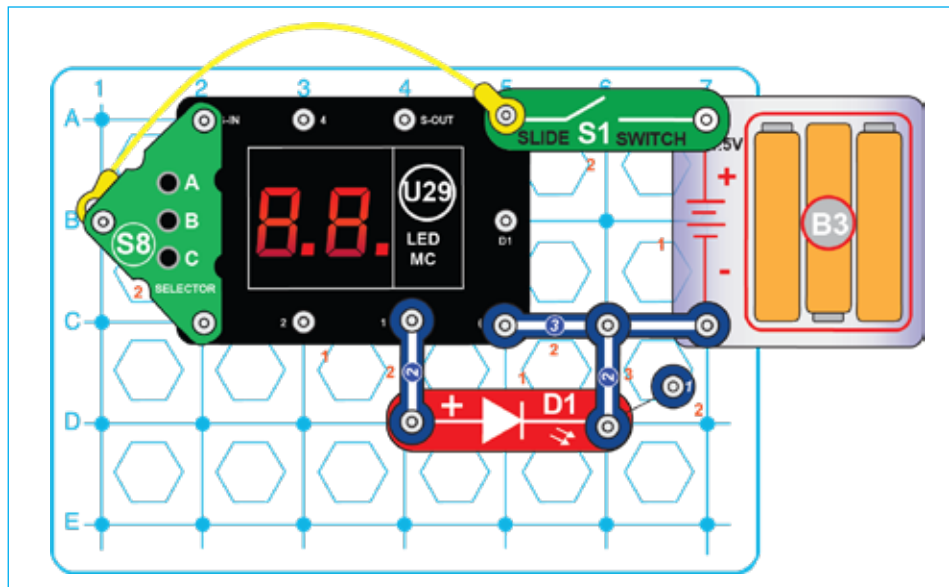


This circuit is like project 9 (Lucky Doubles), but adds more LEDs for extra effects, and the sound is not as loud.

Use this circuit but select Game 4 using the game selection procedure in project 8. Once the player selects Game 4 and sees “Go” on the display, then:

- Hold down button C for a few seconds and then release it.
- Two random digits from 1 to 6 will be shown on the display (like rolling 2 dice).
- If the player rolls “doubles” (i.e. the two digits are the same), a winning song will be played and the game starts over (“Go” is shown on the display again).
- If the player does not roll “doubles”, then they can keep trying by pressing button C again.
- Have multiple people play to see who is the first to roll “doubles”, or who can roll the most “doubles” in 10 tries.

## Project 36: Blink Rate Changer



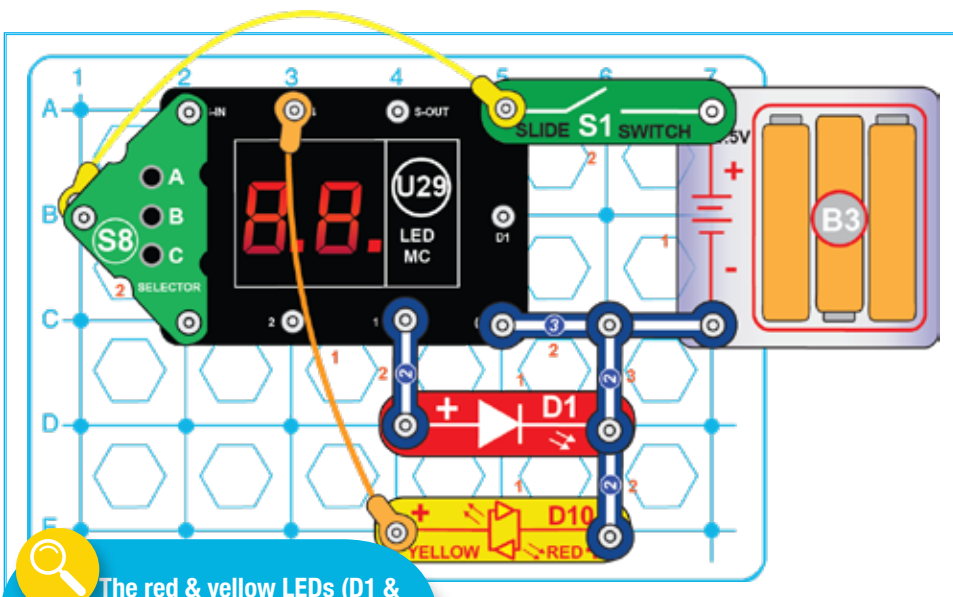
Turn on the slide switch (S1); the display on the LED-MC (U29) shows “00”. Press the A button on the selector (S8) to increase the ones digit on the display, and press the C button on the selector to increase the tens digit on the display. When the display shows “21”, press the B button on the selector to start. The red LED (D1) will be blinking, and its blink rate will be changing.

## Project 37: Click Rate Changer

Use the preceding circuit, but replace the red LED (D1) with the speaker (SP2). The circuit works the same way except that it is clicks at different rates instead of flashing.

## Project 38: Double Changing Blinker

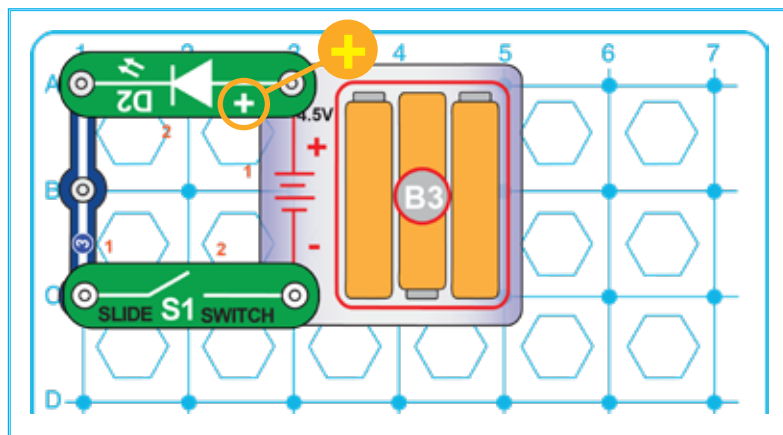
Modify the preceding circuit to be this one. It works the same way, except there are two blinking LEDs.



The red & yellow LEDs (D1 & D10) are alternating, and are never on at the same time.

## Project 40: Green Light

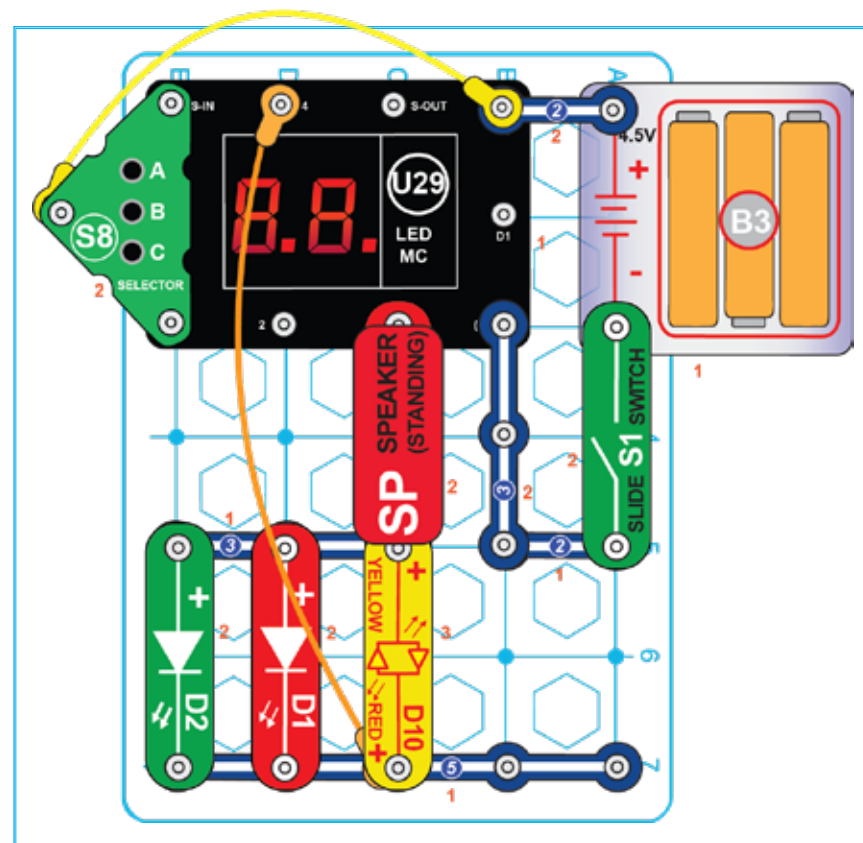
Turn on the slide switch (S1), and the green LED (D2) lights.



## Project 39: Super Lights Flasher

Turn on the slide switch (S1); the display on the LED-MC (U29) shows "00". Press the A button on the selector (S8) to increase the ones digit on the display, and press the C button on the selector to increase the tens digit on the display. When the display shows "21", press the B button on the selector to start.

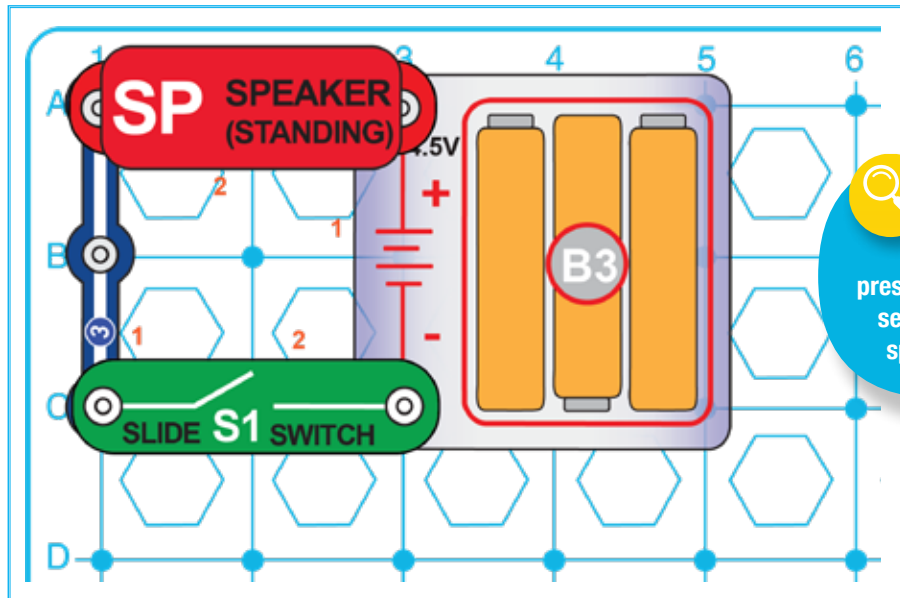
The red/yellow LED (D10) will be on continuously, but changing colors at varying speed. The red and green LEDs (D1 & D2) flash at varying speed. The sound will not be very loud.



## Project 41: Red/Yellow Light

Replace the green LED (D2) with the red/yellow bicolor LED (D10); try it in both directions (red on right, and yellow on right).

## Project 42: Pop On, Pop Off

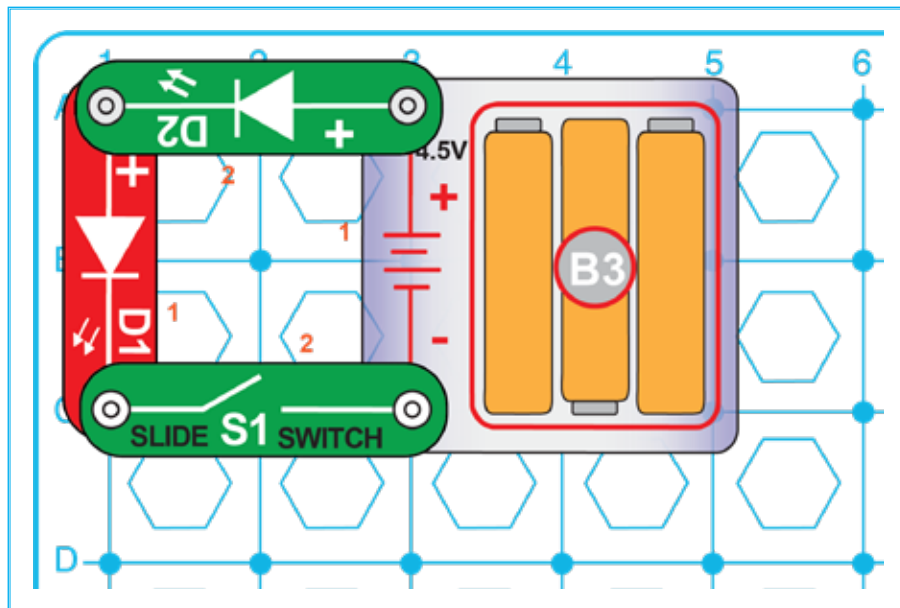


Turn the slide switch (S1) on and off several times. You hear static from the speaker (SP2) when you turn the switch on or off.



The speaker uses electromagnetism to create changes in air pressure, which your ears feel and interpret as sound. Think of the speaker as creating pressure waves in the air just like waves in a pool. You only see wave in the pool when you disturb the water, so the speaker only makes sound when the voltage changes.

## Project 43: Red & Green



Turn on the slide switch (S1) to light the LEDs (D1 & D2).

## Project 44: Red & Yellow

Use the preceding circuit, but replace the Green LEDs (D2) with the Red/Yellow LED (D10), yellow "+" on the right.

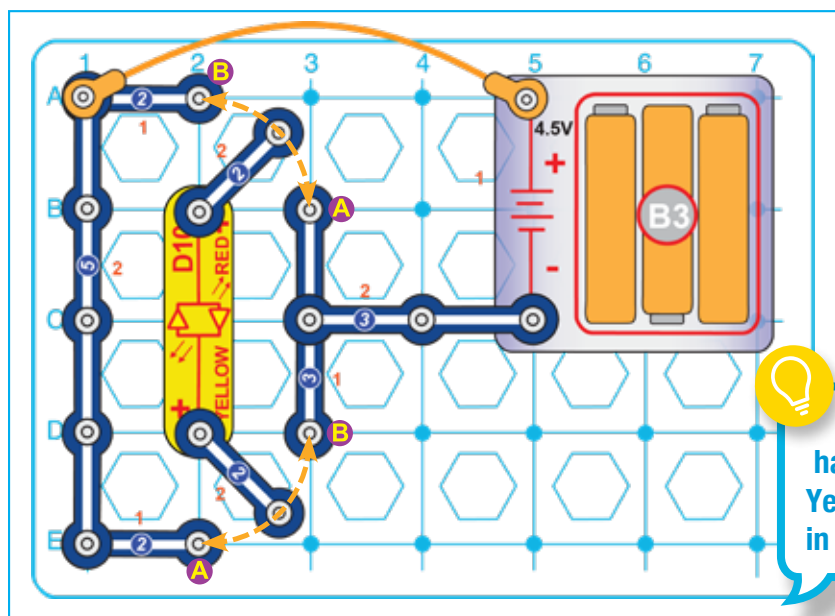
## Project 45: Red & Red

Use the preceding circuit, but replace the Red/Yellow LED (D10) so the red "+" is on the right.

## Project 46: Green & Yellow

Use the project 43 circuit, but replace the Red LED (D1) with the Red/Yellow LED (D10), yellow "+" on top.

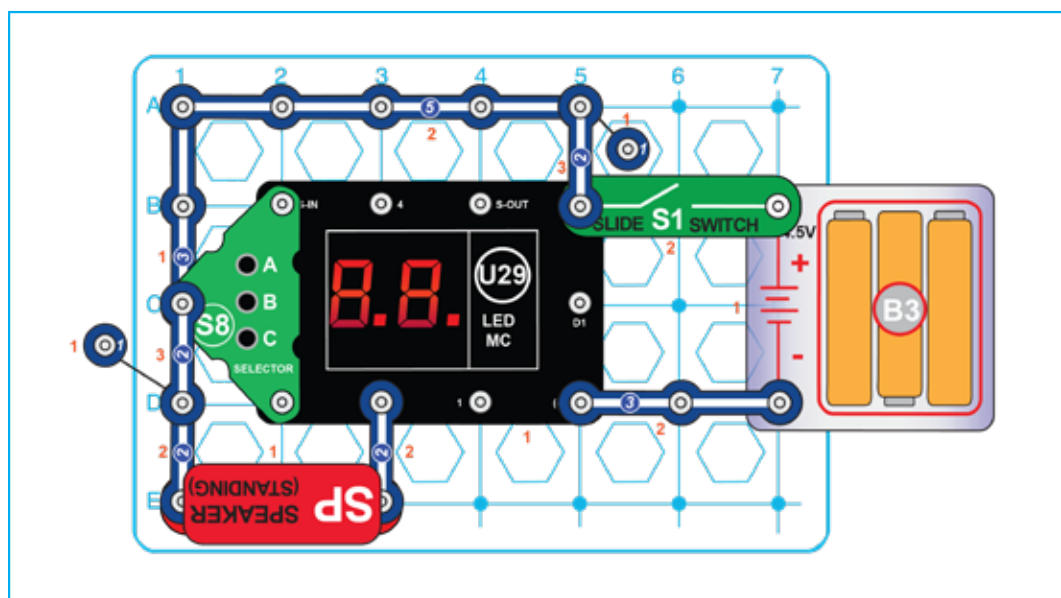
## Project 47: Bi-Color Swing Circuit



Build the circuit as shown, but note that two 2-snap wires are not snapped at one end but are left to swing between connections. Touch both of the loose 2-snaps to either the A or the B points on each side to complete the circuit and light the red/yellow LED (D10). The LED will be either red or yellow, depending on whether you touched it to the A or B points.

**The Red/Yellow LED has separate Red & Yellow LEDs connected in opposite directions.**

## Project 48: Memory Game (Medium Easy)



Use this circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game is for 2 or more players where each player has a number track as shown below (draw one track for each player). Players take turns rolling the six-sided dice by pressing button C for a period of time and then releasing it. The object of the game is to be the first player to reach the end of the track. Each player moves along the track by successfully rolling the next number on their track. For instance, at the start of the game a player needs to roll a 1, and then they can cross off the number 1 on the left and on their next turn try to roll a 2. If on their first turn they roll a 1 and a 2, then they can cross off both numbers and try to get a 3 on their next turn. The game continues until one player has crossed off all the numbers, thus reaching the finish line and winning the game.

|               |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| First Player  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| Second Player | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |

## Project 49: 6-Sided Dice Game: Difference Maker

Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game is for 2 or more players where each player starts with 500 points. Players should sit in a circle and take turns in a clockwise fashion rolling the six-sided dice by pressing button C for a period of time and then releasing it. Each player compares their roll to the previous players roll. If the current players roll is higher than the previous players roll, then the current player takes points away from the previous player based on the difference between their rolls. If the current player’s roll is lower than the previous player’s roll, then the current player gives points to the previous player based on the difference between their rolls. For instance, if Player 1 rolls a 35 and then Player 2 rolls a 50, then Player 2 takes 15 points away from Player 1 (so Player 1 is left with 485 points and Player 2 now has 515 points). If a player runs out of points, then they are out.

Note that if Player 1 only has say 10 points left and then Player 2 rolls a number 20 points higher than Player 1, then Player 1 is out and Player 2 gets 10 more points (not 20 more points because Player 1 only had 10 points to give Player 2). The last person to not run out of points is the winner.

---

## Project 50: 6-Sided Dice Game: Don't Go Low

Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game is for 2 or more players where each player starts with 5 lives. Players should sit in a circle and take turns in a clockwise fashion rolling the six-sided dice by pressing button C for a period of time and then releasing it. Each player decides whether they want to keep their first roll or roll the dice again, but if they decide to roll the dice again, they must stay with the number from their second roll. After each player has rolled, the player with the lowest score loses a life. The last player with lives remaining is the winner.

---

## Project 51: 6-Sided Dice Game: Free the Frogs

Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game is for 2 or more players where each player starts with 6 frog cages labeled 1 through 6. Every player also has 6 frogs. Before play begins, each player decides where to place their frogs. They could put 1 frog in each of the 6 cages, or they could put all their frogs in one cage, or anything in between (for example: two frogs in cage 1, three frogs in cage 4 and one frog in cage 6). Once every player has decided where to place their frogs, then the players should sit in a circle and take turns in a clockwise fashion rolling the dice by pressing button C for a period of time and then releasing it. If a player has a frog in the cage labeled by one of the numbers rolled, then they can release a frog from that cage. For example, if a player rolls 36, they can release one frog from cage 3 and one frog from cage 6 if they have frogs in those cages. If a player rolls doubles, for example 66, then they can remove two frogs from cage 6 if they have at least two frogs in cage 6. The first player to release all their frogs wins.

---

## Project 52: 6-Sided Dice Game: Free the Fish

Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game is for 2 or more players and is very similar to the Free the Frogs game. Each player starts with 6 fishbowls labeled 0 through 5. Every player also has 6 fish. Before play begins, each player decides where to place their fish. They could put 1 fish in each of the 6 bowls, or they could put all their fish in one bowl, or anything in between (for example: two fish in bowl 1, three fish in bowl 4 and one fish in bowl 5). Once every player has decided where to place their fish, then the players should sit in a circle and take turns in a clockwise fashion rolling the dice by pressing button C for a period of time and then releasing it. After rolling the dice, the player computes the difference between the two dice and can take one fish out of the bowl labeled with the difference of the two dice. For example if a player rolls 36, then  $6 - 3 = 3$  so the player can release one fish from bowl 3 if they have fish in this bowl. The first player to release all their fish wins.

## Project 53: 6-Sided Dice Game: Free the Foxes

Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game is for 2 or more players and is very similar to the Free the Frogs and Free the Fish games. Each player starts with 11 barns labeled 2 through 12. Every player also has 11 foxes. Before play begins, each player decides where to place their foxes. They could put 1 fox in 11 different barns, or they could put all their foxes in one barn, or anything in between (for example: two foxes in barn 3, five foxes in barn 8 and four foxes in barn 11). Once every player has decided where to place their foxes, then the players should sit in a circle and take turns in a clockwise fashion rolling the six-sided dice by pressing button C for a period of time and then releasing it. After rolling the dice, the player computes the sum between the two dice and can take one fox out of the barn labeled with the sum of the two dice. For example if a player rolls 36, then  $3 + 6 = 9$  so the player can release one fox from barn 9 if they have a fox in this barn. The first player to release all their foxes wins.

After playing all three games for a while (Free the Frogs, Free the Fish and Free the Foxes), do you see different strategies in where best to place the animals across the three different games? There are definitely different strategies that give you the best chance to win based on the probabilities of the dice numbers, differences, or sums being certain values.

## Project 54: 6-Sided Dice Game: Squares

Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game is for 2 or more players. Players should sit in a circle and take turns in a clockwise fashion rolling the dice by pressing button C for a period of time and then releasing it. After rolling the dice, take the difference between the two numbers. Then in the grid below, the player can shade in a line adjacent to the difference between the two dice. For instance, if a player rolled 36, then  $6 - 3 = 3$  so the player can shade in one of the dotted lines above, below, to the left, or to the right of the number 3 in the grid below. If the player is able to shade in the last dotted line around a box, then that player gets the number of points in the box. For instance, if one of the boxes with a 5 in it already has the top, bottom, and left sides shaded in, and then a player rolls a 61 (difference of 5), the player can then shade in the right side of the box and get 5 points. If a player rolls a difference for which there are no more dotted lines adjacent to the difference number, then the player loses their turn. After all dotted lines have been shaded in, the player with the most points wins.

|   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|
| 1 | 4 | 2 | 3 | 3 | 2 | 4 | 5 | 0 |
| 4 | 5 | 1 | 0 | 1 | 5 | 0 | 2 | 4 |
| 3 | 2 | 5 | 3 | 2 | 0 | 3 | 4 | 5 |
| 0 | 5 | 3 | 4 | 3 | 2 | 1 | 5 | 1 |
| 2 | 1 | 0 | 4 | 0 | 5 | 0 | 2 | 3 |
| 3 | 4 | 2 | 1 | 5 | 4 | 3 | 0 | 2 |
| 0 | 1 | 0 | 5 | 3 | 1 | 2 | 1 | 4 |
| 2 | 5 | 4 | 1 | 4 | 5 | 3 | 1 | 0 |

## Project 55: 6-Sided Dice Game: Coin Dice

| Dice Roll              | Heads (Player Wins) | Tails (House Wins) |
|------------------------|---------------------|--------------------|
| 12—16                  | 2 points            | -7 points          |
| 21, 23—26              | 6 points            | -9 points          |
| 31, 32, 34—36          | 10 points           | -11 points         |
| 41—43, 45, 46          | 14 points           | -13 points         |
| 51—54, 56              | 18 points           | -15 points         |
| 61—65                  | 20 points           | -16 points         |
| Doubles (11,...55, 66) | 30 points           | -25 points         |

You need a coin for this game. Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This is an individual game of player versus the house where the player starts out with 200 points. The player flips a coin and rolls the dice by pressing button C for a period of time and then releasing it. If the player flips a heads, then the player wins the number of points in the 2nd column of the table below depending on what number they rolled. If the player flips a tails, then the player loses the number of points in the 3rd column of the table below depending on what number they rolled. The player wins if they can get to 400 points, but lose if they lose all their points.

## Project 56: Pop On, Pop Off

Use the Project 48 circuit and select Game 5 using the game selection procedure in project 8. The game begins when you see “Go” in the display.

This game can be played in solitaire or with 2 people. Start by having the visitor team roll the six-sided dice by pressing button C for a period of time and then releasing it. The first number is then used in the lookup table below to determine whether the batter got a Hit (if the first number is 1 or 2) or an Out (if the first number is 3 or higher).

| 1st Number in Dice Roll | Result   |
|-------------------------|----------|
| 12—16                   | 2 points |
| 21, 23—26               | 6 points |

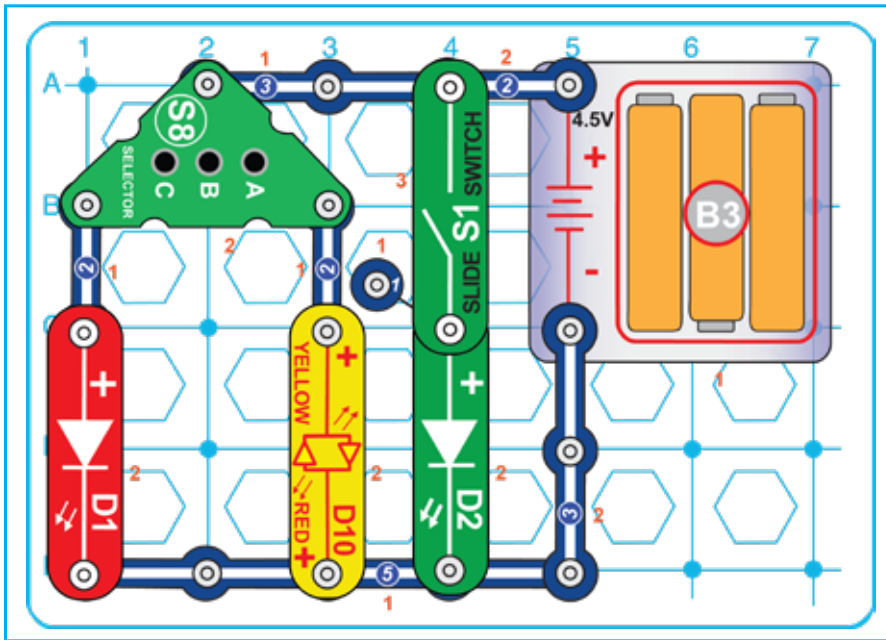
If the first number in the roll was a Hit, then use the second number in the roll to lookup the hit result in the table below. Note that runners only advance 1 base on a single and walk, and only advance 2 bases on a double unless indicated otherwise in the table.

| 2nd Number in Dice Roll | Result                            |
|-------------------------|-----------------------------------|
| 1                       | Single                            |
| 2                       | Walk                              |
| 3                       | Double                            |
| 4                       | Triple                            |
| 5                       | Single: Runner on 2nd base scores |
| 6                       | Home Run                          |

If the first number in the roll was an Out, then use the second number in the roll to look up the hit result in the table below.

| 2nd Number in Dice Roll | Result                                                                  |
|-------------------------|-------------------------------------------------------------------------|
| 1                       | Strikeout                                                               |
| 2                       | Groundout: All runners advance                                          |
| 3                       | Shallow Flyout: All runners hold                                        |
| 4                       | Deep Flyout: Runners on 2nd or 3rd base advance                         |
| 5                       | Groundout-Double Play: If Runner on 1st base, all other runners advance |
| 6                       | Error: Runner safe at 1st base, all other runners advance               |

## Project 57: Triple Select



This is similar to the project 21 circuit, but adds the green LED (D2). Press buttons on the selector (S8) and turn on the slide switch (S1) to light the LEDs.

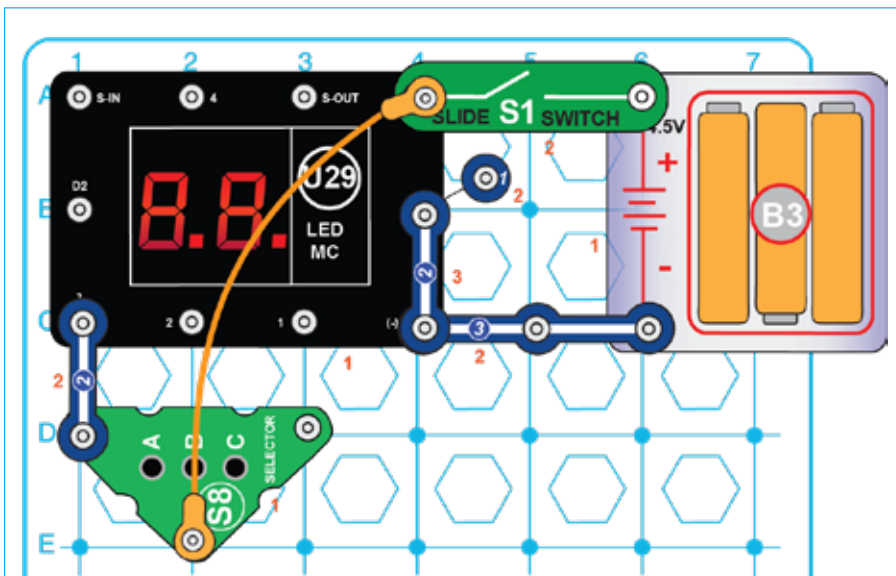
## Project 58: Red/Yellow Selector

Use the preceding circuit, but re-arrange the LEDs, so that the red & yellow ones get a turn with the S1 switch.



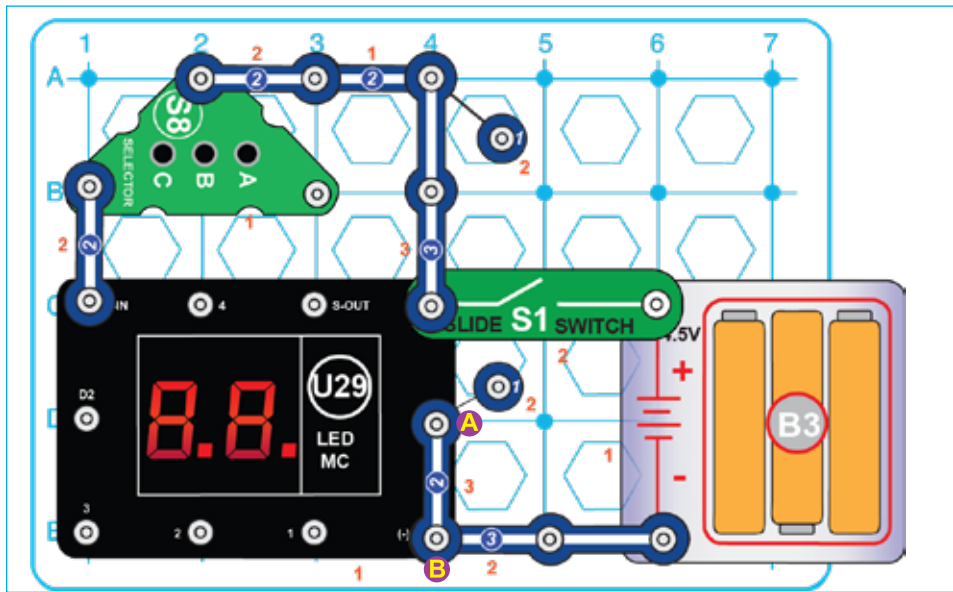
The buttons in the selector (S8) have more electrical resistance than the switch in the slide switch (S1), so the LEDs controlled by S8 may not be as bright as the one controlled by S1.

## Project 59: Add One



Turn on the slide switch (S1) and the LED-MC (U29) shows only a "0" in the left display. Press the A button on the selector (S8) and the number 1 shows. Every time you press the A button the number increases by 1, up to number 9. Then the LED-MC (U29) resets to "0" again.

## Project 60: Add Ten



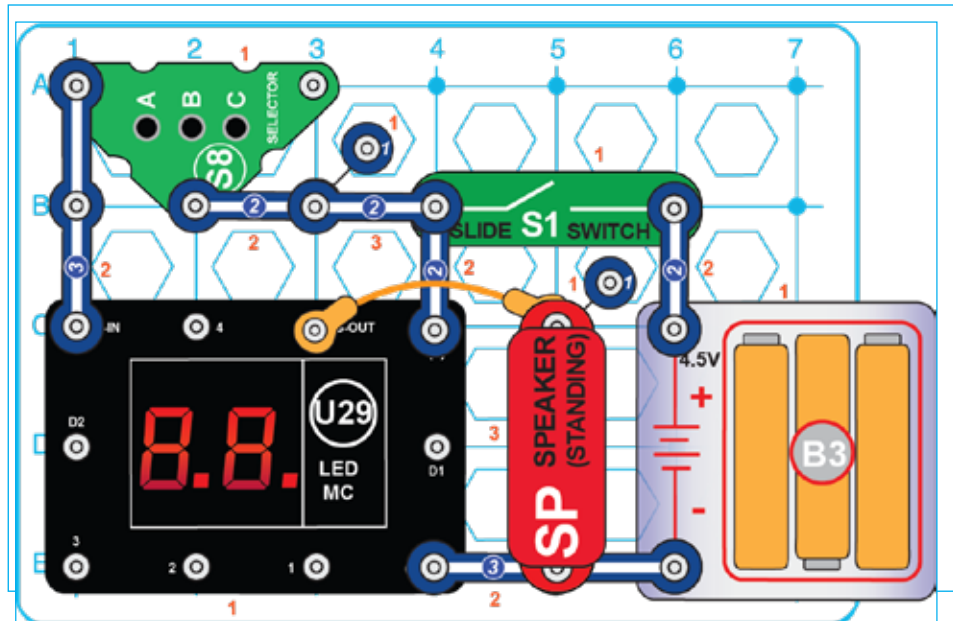
Turn on the slide switch (S1) and the LED-MC (U29) shows “0 ” in the display. Press the C button on the selector (S8) and the display doesn’t change. You need to press the C button ten times for the number to change.

## Project 61: Add One at a Time

Remove the 2-snap wire at points A & B. Turn on the slide switch (S1) and the LED-MC (U29) shows only “00”. Pressing the C button on the selector (S8) increases the number by 1, up to 99. Holding down the C button will automatically advance the number.

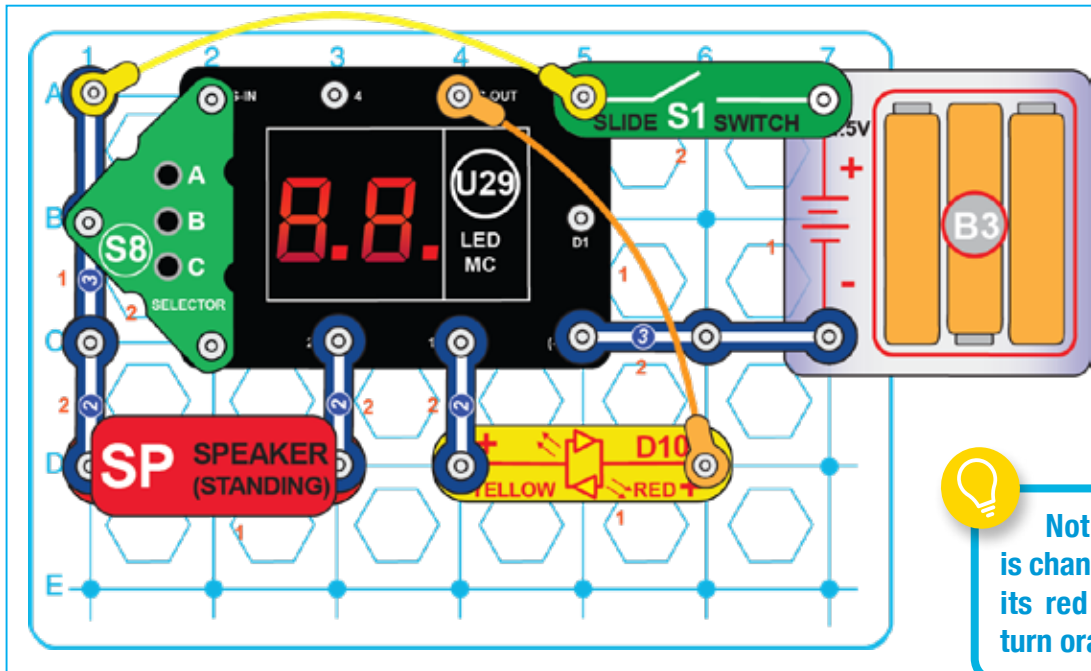
Play a guessing game. Cover the display and press the C button for a few short time and stop. Guess a number and then uncover the display.

## Project 62: +1 Buzzer



Turn on the slide switch (S1) and the LED-MC (U29) shows “00” in the display. Push the A button on the selector (S8) and the number 1 shows and the speaker sounds. Every time you press the A button the number increases by 1. Holding down the A button will automatically advance the number. The sound will not be very loud.

## Project 63: Random Bi-Color Light



Turn on the slide switch (S1); the display on the LED-MC (U29) shows "00". Press the A button on the selector (S8) three times to make the display show "03", then press the B button on the selector to start.

Every few seconds the speaker (SP2) randomly plays one of three siren sounds, the U29 LED display shows a random pattern, and the red/yellow LED (D10) will be either red, yellow, or off.

You can slow this circuit down by selecting game "01" or "02" on the display instead of game "03".



The red/yellow LED (D10) is a bi-color LED, which means it has two LEDs (red & yellow) inside, connected in opposite directions.



Notice that when D10 is changing colors quickly, its red and yellow colors turn orange.

## Basic Troubleshooting

1. Most circuit problems are due to incorrect assembly, always double-check that your circuit exactly matches the drawing for it.
2. Be sure that parts with positive/negative markings are positioned as per the drawing.
3. Be sure that all connections are securely snapped.
4. Try replacing the batteries.



ADULT  
SUPERVISION  
RECOMMENDED

## Advanced Troubleshooting

Elenco® is not responsible for parts damaged due to incorrect wiring.

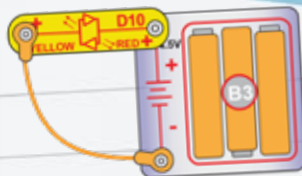
**If you suspect you have damaged parts, you can follow this procedure to systematically determine which ones need replacing:**

1. To Test:

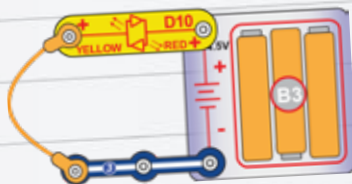
Red LED (D1)  
Green LED (D2)  
Red/Yellow LED (D10)  
Speaker (SP2)  
Battery Holder (B3)

- Place batteries in holder.
- Place the **Red/Yellow LED** directly across the battery holder in both directions, it should light red or yellow depending on which side was positioned towards the battery "+" side.
- Do the same for the **Red and Green LEDs**, but be sure to position their "+" side towards the battery "+" side.
- "Tap" the **Speaker** across the battery holder contacts, you should hear static as it touches.
- If none work, then replace your batteries and repeat, if still bad then the **Battery Holder** is damaged.

2. **Jumper wires:** Use this mini-circuit to test each jumper wire, the LED should light.



3. **Snap wires:** Use this mini-circuit to test each of the snap wires, one at a time. The LED should light.



4. **Slide switch (S1) and press switch (S2):** Build project 1; if the red LED (D1) doesn't light then the slide switch is bad. Replace the slide switch with the press switch to test it.

5. **Selector (S8):** Use project 21 to test it.

6. **LED-MC (U29, the LED display & microcontroller):** Use project 20 to test it.

### IMPORTANT:

If any parts are missing or damaged,  
DO NOT RETURN TO RETAILER.

Go to [elenco.com/replacement-parts](http://elenco.com/replacement-parts) or e-mail us at  
[support@elenco.com](mailto:support@elenco.com).

Note: A complete parts list is on page 2 in this manual.

**If you have any problems, contact:**

**ELENCO®ELECTRONICS, LLC**

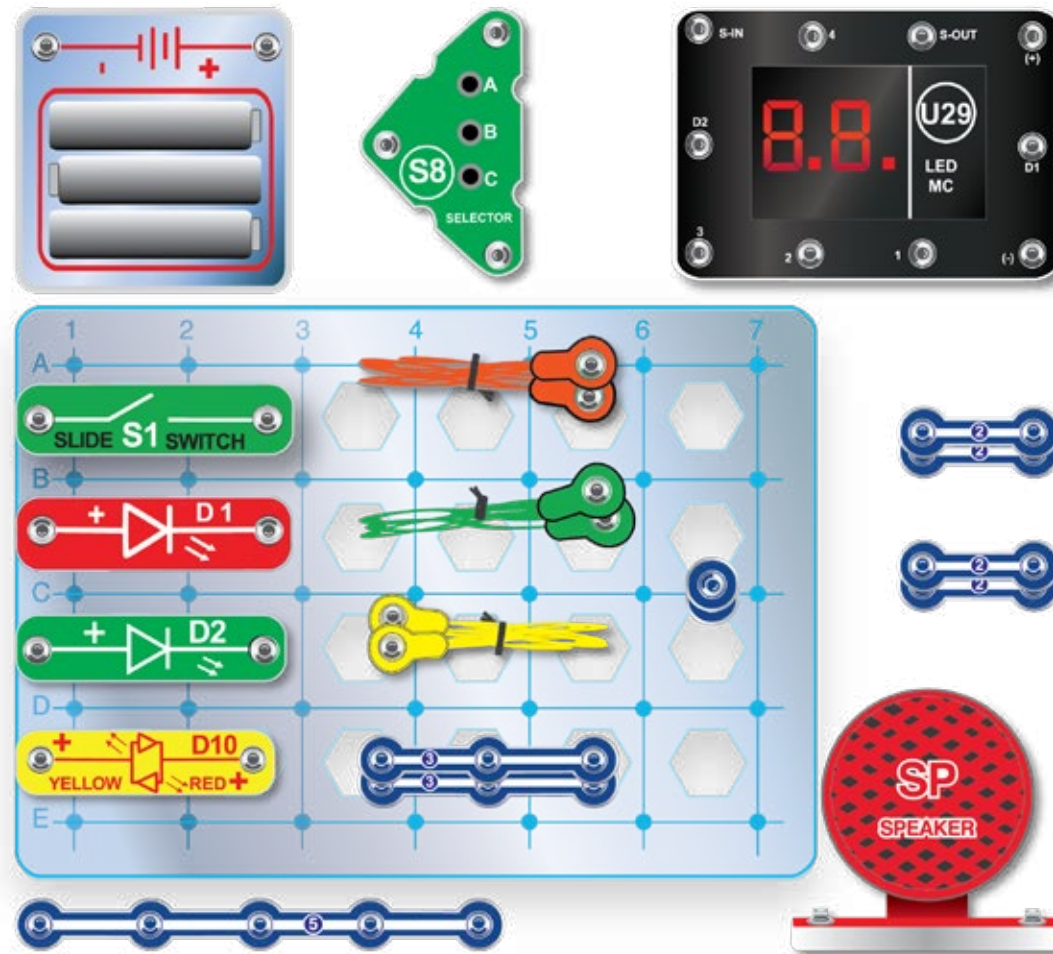
150 Carpenter Ave. Wheeling, IL 60090 | (800) 533-2441  
[elenco.com](http://elenco.com)

# Snap Circuits® Game Play Parts Layout

## IMPORTANT:

If any parts are missing or damaged, DO NOT RETURN TO RETAILER. Go to [elenco.com/replacement-parts](https://elenco.com/replacement-parts) or e-mail us at [support@elenco.com](mailto:support@elenco.com).

Note: A complete parts list is on page 2 in this manual.



Base Grid (7.7" x 5.5") overlays some parts.

**If you have any problems, contact: ELENCO® ELECTRONICS, LLC**  
150 Carpenter Ave. Wheeling, IL 60090 | (800) 533-2441 | [support@elenco.com](mailto:support@elenco.com) | [elenco.com](https://elenco.com)

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Model: SC-GMPY | Part # 753341 | Web Manual V1