LEDs & Resistors

20 Exercises
Requires SC-300 or larger

Exercise Listing

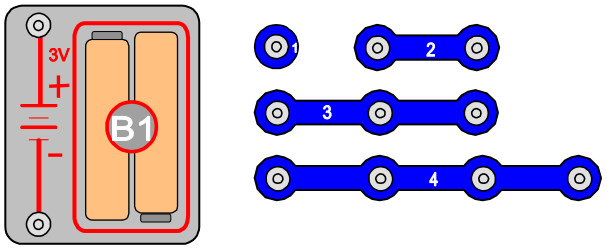
1. Turning on the LED Using the Slide Switch
2. Turning on the LED Using the Slide Switch and the Press Switch
3. Turning on the LED Using the Slide Switch and Turning Off Using the Press Switch
4. Increasing Lighting of the LED Using the Press Switch
5. Decreasing Lighting of the LED Using the Press Switch
6. Turning on of Two LEDs with the Slide Switch
7. Turning on Two LEDs with Different Lighting
8. Turning on of Two LEDs Using the Slide Switch and Turning off Using the Press Switch
9. Turning on of Two LEDs Using the Slide Switch and Turning off one of them Using the Press Switch
10. Increasing the Lighting of Two LEDs Using the Press Switch
11. Decreasing the Lighting of Two LEDs with the Press Switch
12. Turning on two LEDs, increasing lighting of one and decreasing lighting of second one Using the Press Switch
13. Change the Lighting of LED Using the Adjustable Resistor
14. Increasing lighting and turn off of LED Using the Adjustable Resistor
15. Opposite Lighting of Two LEDs Using the Adjustable Resistor
16. Changing Lighting of LED using the Adjustable Resistor, Lighting in Center and not Lighting in Side
17. Changing Lighting of the LED using the Adjustable Resistor, Low Lighting in Center and High Lighting in Side
18. Turning On Two Leds, Decreasing the Lighting Of One LED Using the Press Switch And The Lighting Of the Second One invariable
19. Turning On Two Leds, Increasing The Lighting Of One LED Using the Press Switch And The Lighting Of The Second One invariable
20. Turning On Two Leds. Changing The Lighting Of One LED Using the Adjustable Resistor And The Lighting Of The Second One invariable

LEDs & Resistors - Exercise #1

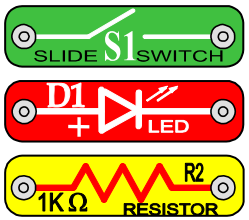
Turning on the LED Using the Slide Switch

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Resistor (R2)



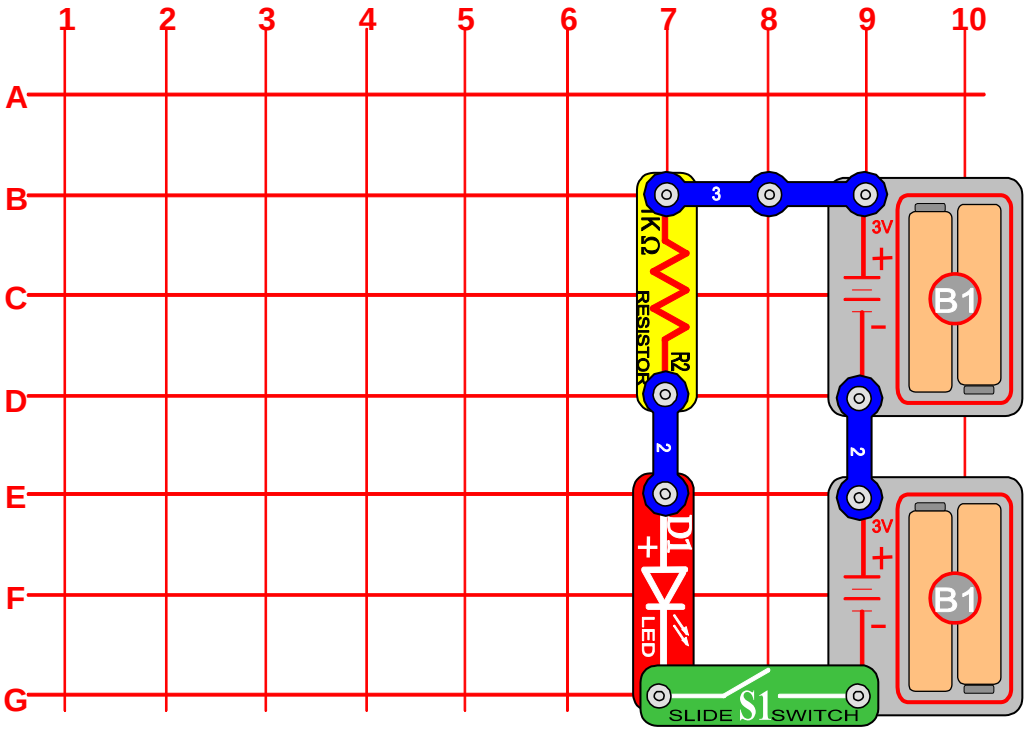
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1) Red LED (D1) should light. When the slide switch is opened (S1) Red LED (D1) shouldn't light.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Now replace the resistor (R2 **1KΩ**) with the resistor (R3 **5,1KΩ**) and you can see, that lighting of the LED should decrease.

Questions:

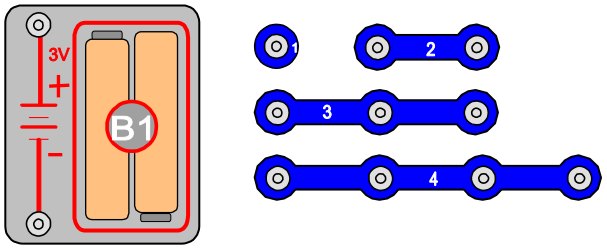
1. What happens, if you replace the resistor (R3 **5,1KΩ)** with the resistor (R5 100K**Ω**)?
2. What happens, if you replace the resistor (R5 **100KΩ**) with the resistor (R3 **10KΩ**)?

LEDs & Resistors - Exercise #2

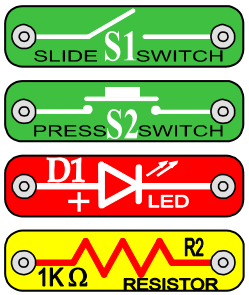
Turning on the LED Using the Slide Switch and the Press Switch

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Resistor (R2)



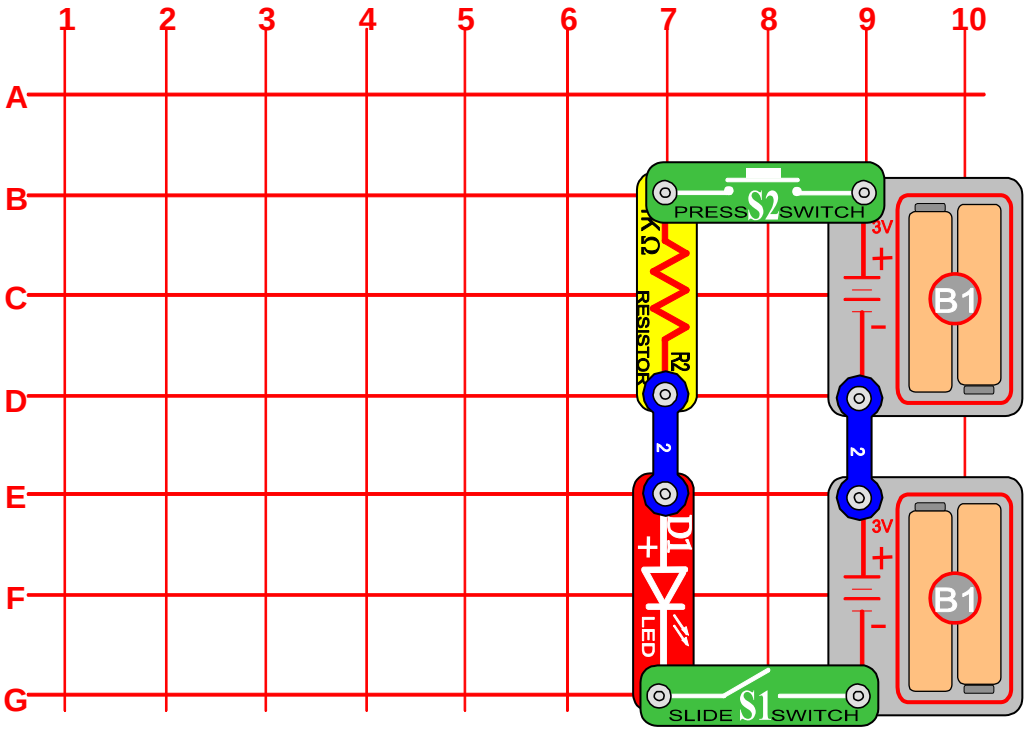
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1) Red LED (D1) shouldn't light. When you press the press switch (S2) Red LED (D1) should light.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

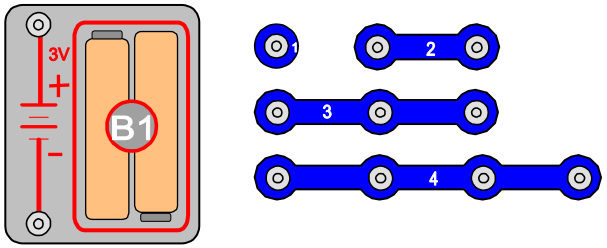
1. What happens, if you would change location of the Switch (S2) and the Resistor (R2)?
2. What happens, if you would change location of the Switch (S2) and the Red LED (D1)?

LEDs & Resistors - Exercise #3

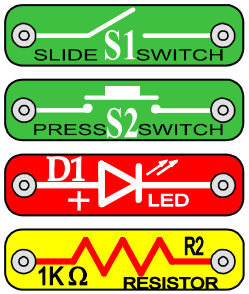
Turning on the LED Using the Slide Switch and Turning off Using the Press Switch

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Resistor (R2)



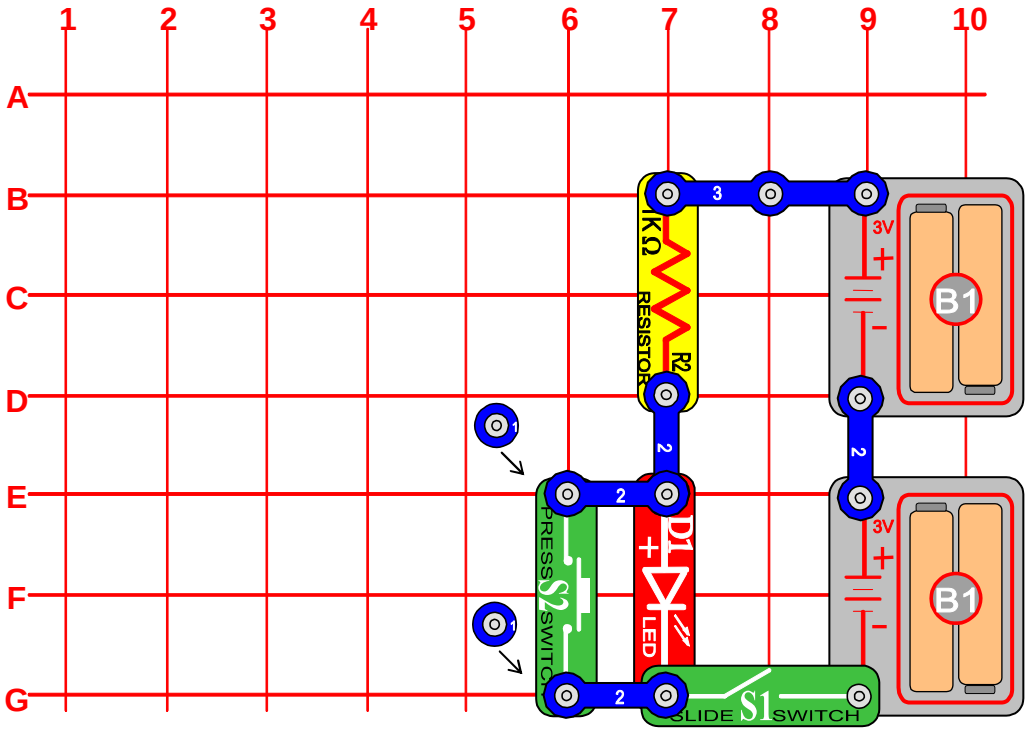
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1) Red LED (D1) should light. When you press the press switch (S2) - Red LED (D1) shouldn't light.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

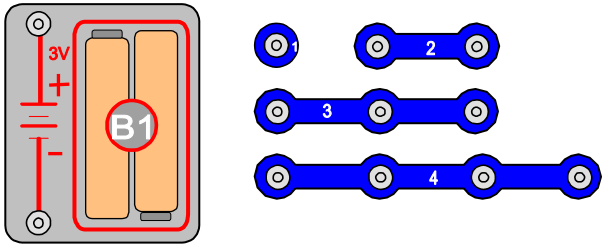
1. What happens if you replace the resistor (R2 **1KΩ**) with the resistor (R4 **10KΩ**)?

LEDs & Resistors - Exercise #4

Increasing Lighting of the LED Using the Press Switch

Use parts listed below:

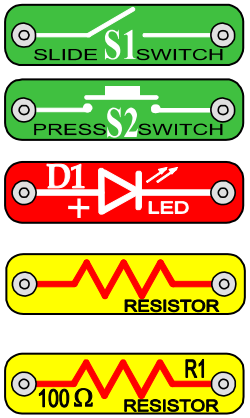
1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Two or More

Resistors (R2, R3, R4, R5)

Don't use R1 Resistor.



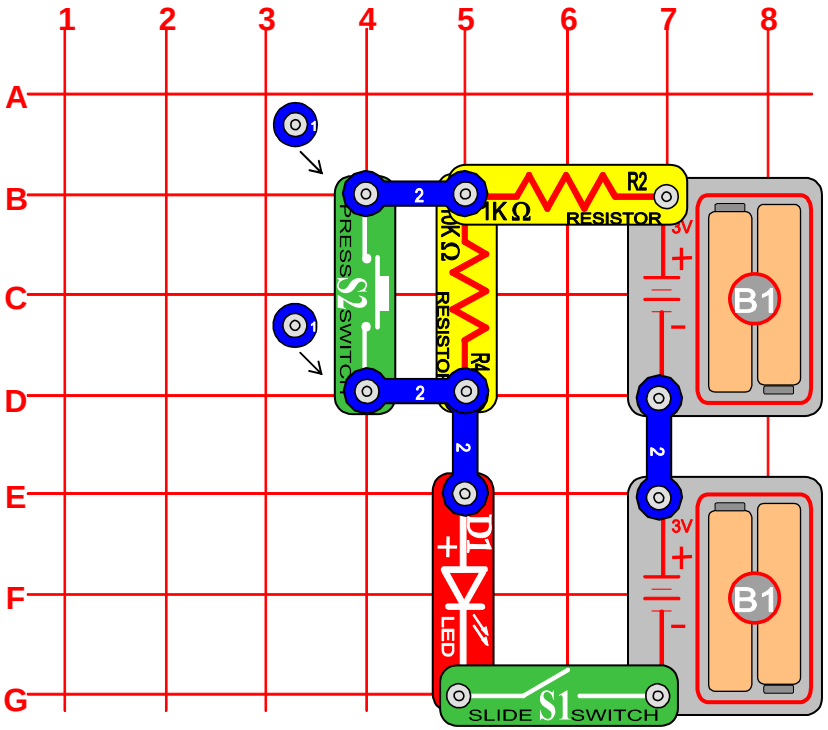
Build the circuit using only listed parts.

Your constructed circuit should work so:

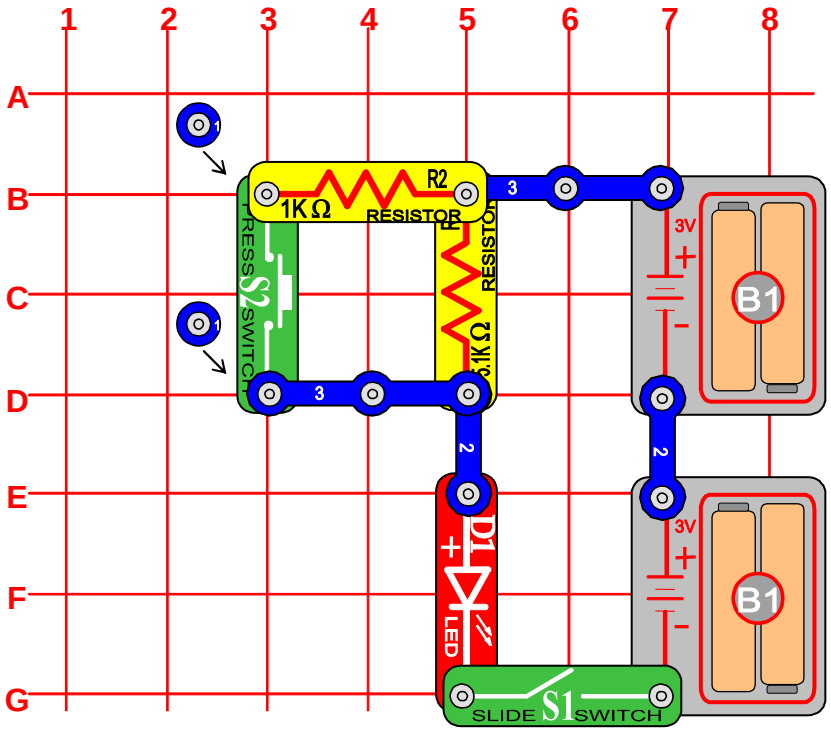
When you close the slide switch (S1) the Red LED (D1) should light. When you press the press switch (S2) lighting of the Red LED (D1) should increase.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



I Version



II Version

Questions:

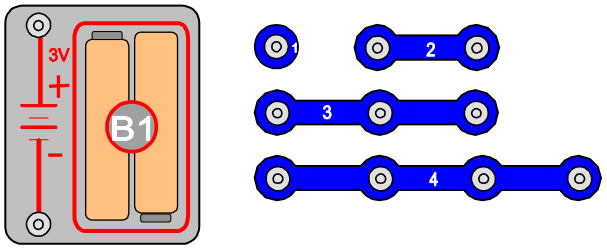
1. What happens in ***I Version***, if you replace the Resistor (R4 **10KΩ**) with the 3-snap wire?
2. What happens in ***II Version***, if you would change location of the Resistor (R2 **1KΩ**) and the Resistor (R3 **5.1KΩ**)?

LEDs & Resistors - Exercise #5

Decreasing Lighting of the LED Using the Press Switch

Use parts listed below:

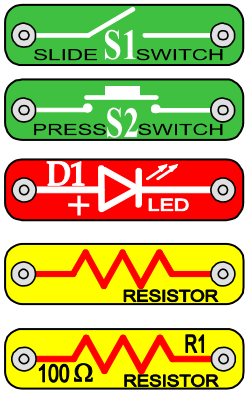
1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Two or More

Resistors (R2, R3, R4, R5)

Don't use R1 Resistor.



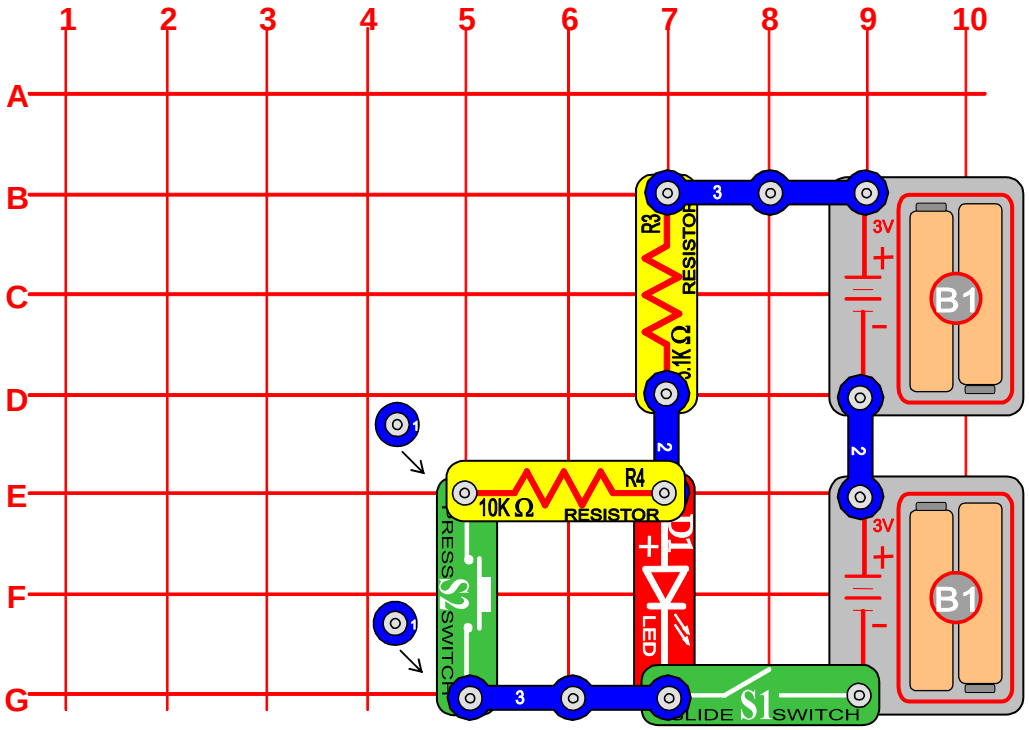
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1) the Red LED (D1) should light. When you press the press switch (S2) the Red LED (D1) lighting should decrease.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

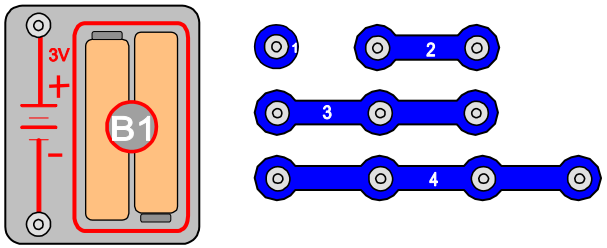
1. How will work the circuit, if you replace the Resistor (R4 **10KΩ**) with the 3-snap wire?

LEDs & Resistors - Exercise #6

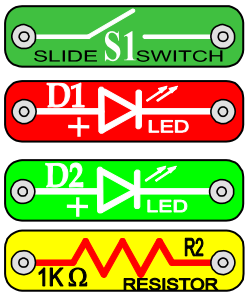
Turning on of Two LEDs with the Slide Switch

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Green LED (D2)
5. Resistor (R2)



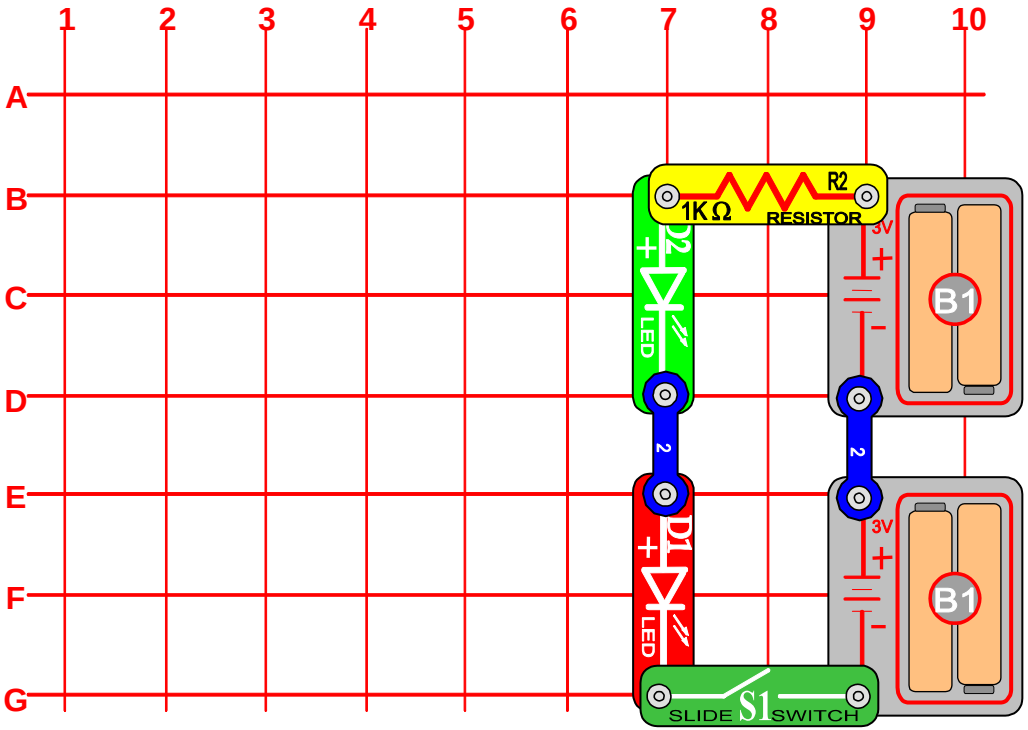
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1) the Red LED (D1) and the Green LED (D2) should light.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

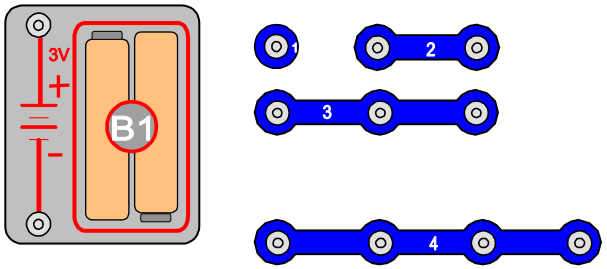
1. What happens, if you replace the Resistor (R2 **1KΩ**) with the Resistor (R3 **5.1KΩ**)?
2. What happens, if you would change location of the Resistor (R2 **1KΩ**) and the Red LED (D1)?
3. What happens, if you would change location of the Red LED (D1) and the Green LED (D2)?

LEDs & Resistors - Exercise #7

Turning on Two LEDs with Different Lighting

Use parts listed below:

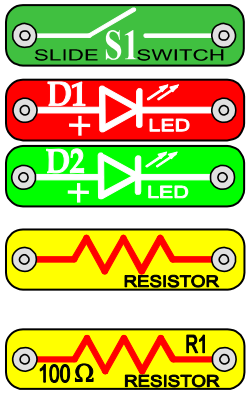
1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Green LED (D2)
5. Two or More

Resistors (R2, R3, R4, R5)

Don't use R1 Resistor.



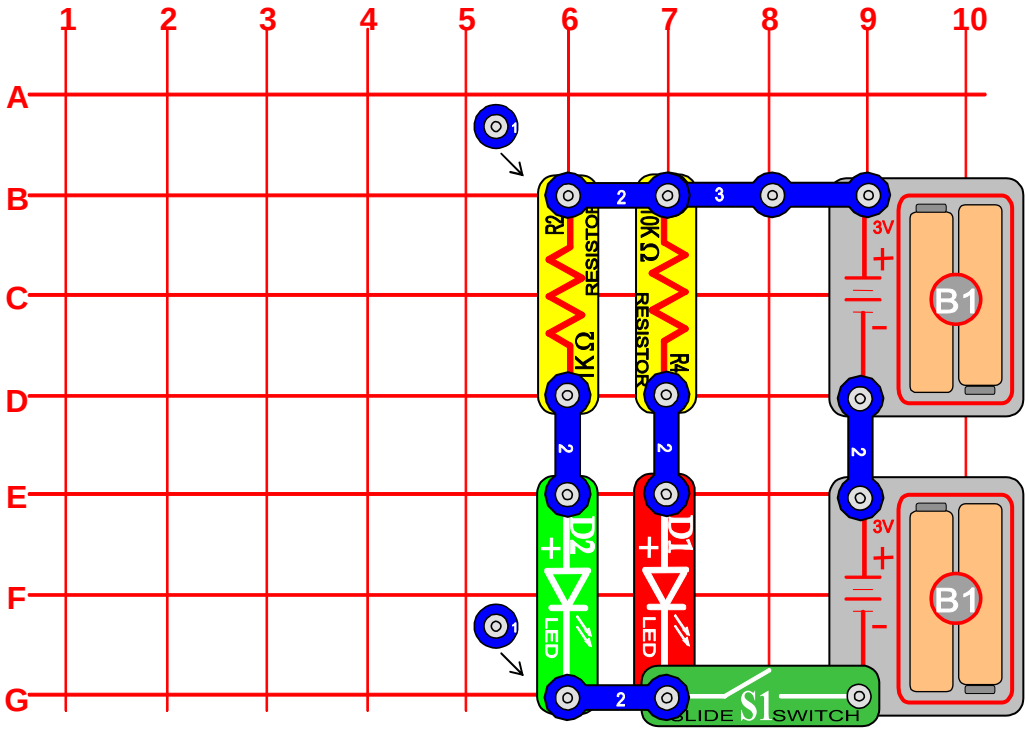
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1) the Green LED (D2) should light better, than the Red LED (D1).

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

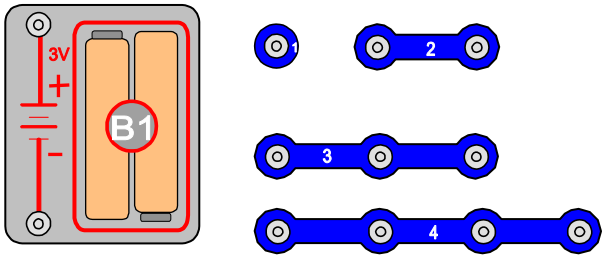
1. What happens, if you would change location of the Resistor (R2 **1KΩ**) and the Resistor (R4 **10KΩ**)?

LEDs & Resistors - Exercise #8

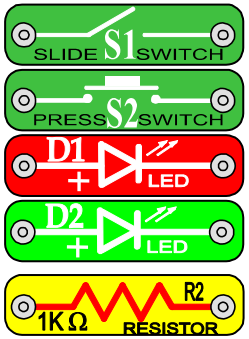
Turning on of Two LEDs Using the Slide Switch and Turning off Using the Press Switch

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Green LED (D2)
6. Resistor (R2)



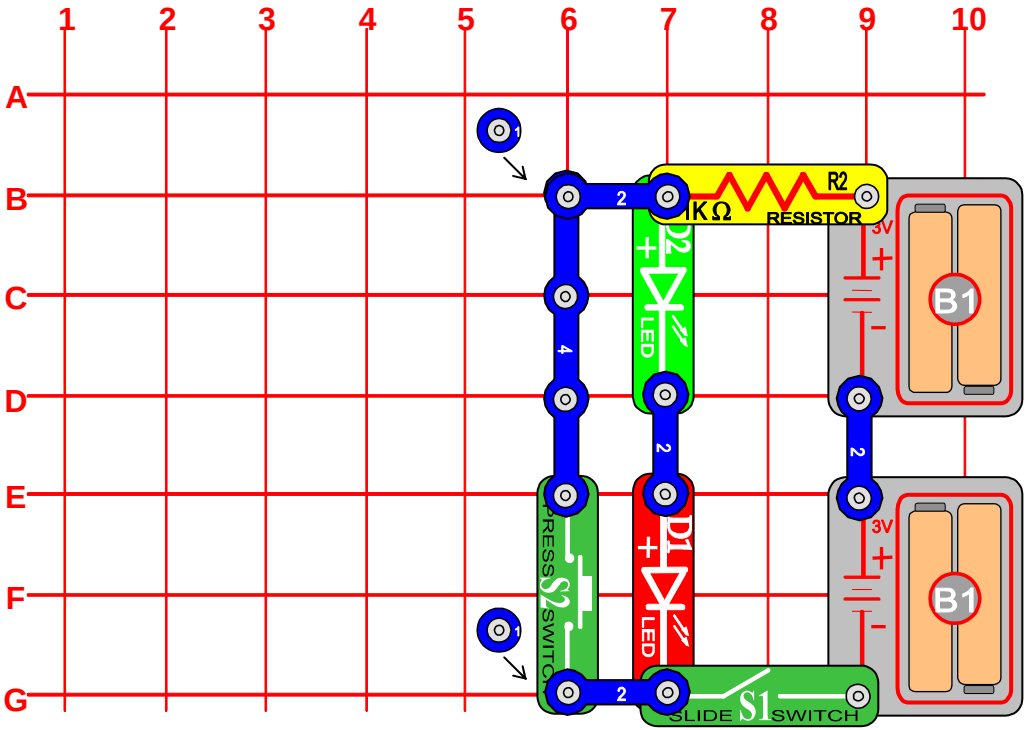
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1) the Red LED (D1) and Green LED (D2) should light. When you press the press switch (S2) both LEDs shouldn't light.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

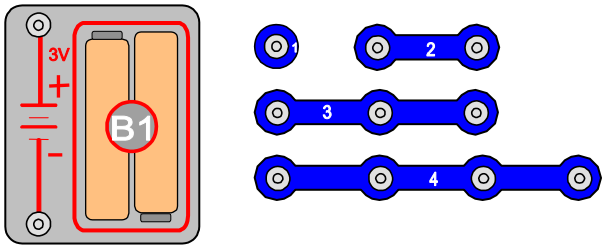
1. What happens, if you would change location of the LED (D1) and the LED (D2)?

LEDs & Resistors - Exercise #9

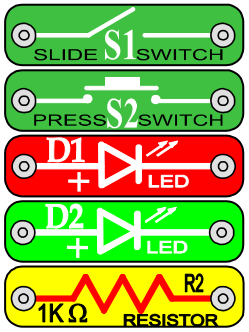
Turning on of Two LEDs Using the Slide Switch and Turning off one of them Using the Press Switch

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Green LED (D2)
6. Resistor (R2)



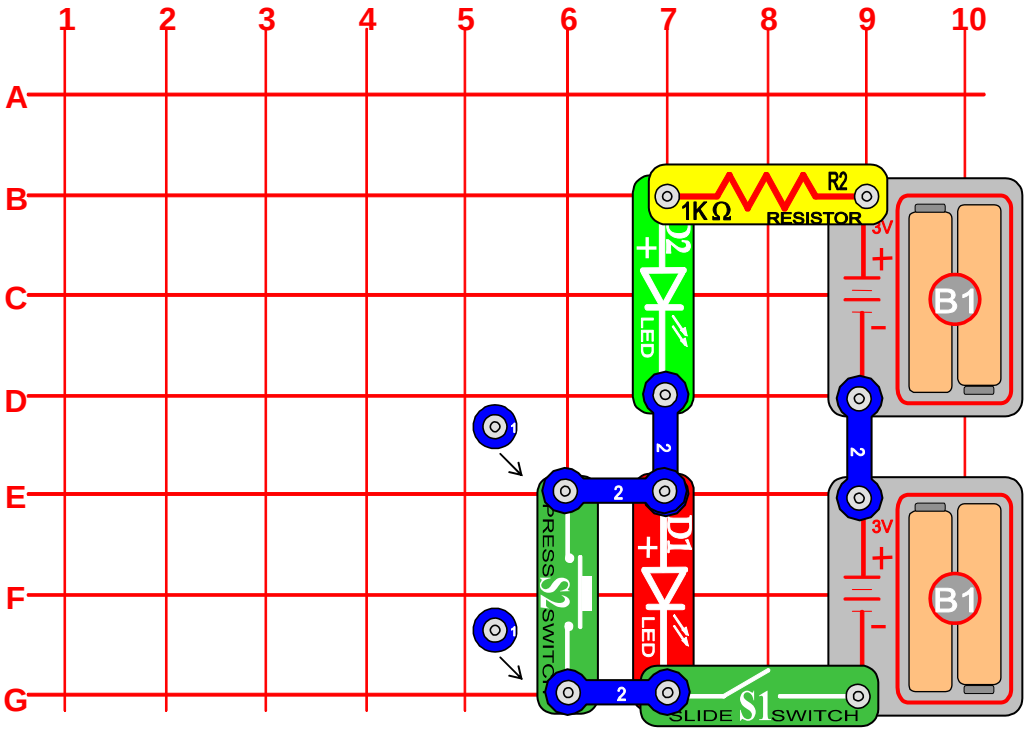
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1), the Red LED (D1) and the Green LED (D2) should light. When you press the press switch (S2) only the Red LED (D1) should turn off.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

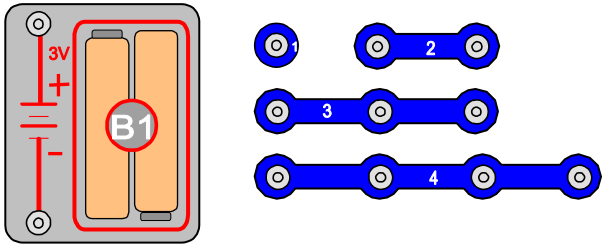
1. What happens, if you turn LED (D2)?
2. Rebuild the circuit so; when you press the press switch only the green LED (D2) should turn off (don't change location of LEDs (D1, D2)).

LEDs & Resistors - Exercise #10

Increasing the Lighting of Two LEDs Using the Press Switch

Use parts listed below:

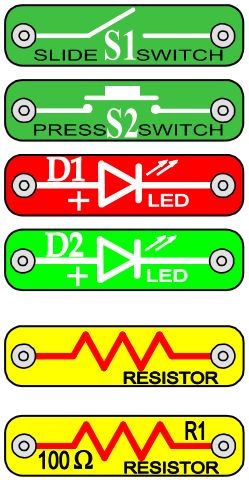
1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Green LED (D2)
6. Two or More

Resistors (R2, R3, R4, R5)

Don't use R1 Resistor.



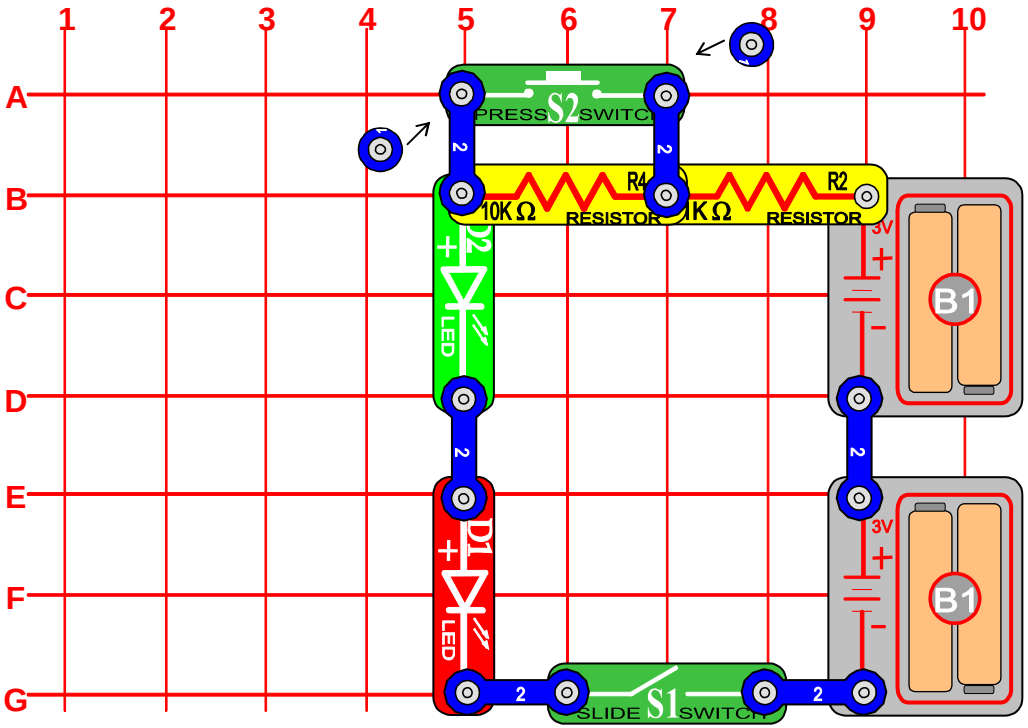
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1), the Red LED (D1) and the Green LED (D2) should light. When you press the press switch (S2) the lighting of two LEDs should increase.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

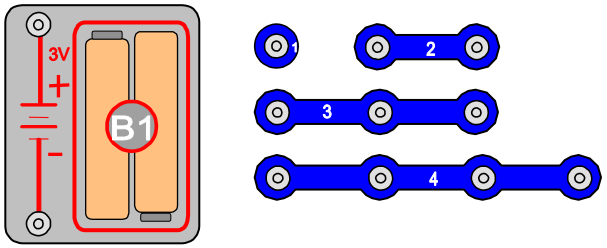
1. If you will replace the resistor (R2 1K**Ω**) with the esistor (R4 10K**Ω**), the lighting of two LEDs will increase more or less?

LEDs & Resistors - Exercise #11

Decreasing the Lighting of Two LEDs with the Press Switch

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)

3. Press Switch (S2)

4. Red LED (D1)

5. Green LED (D2)

6. Two or More

Resistors (R2, R3, R4, R5)

Don't use R1 Resistor.

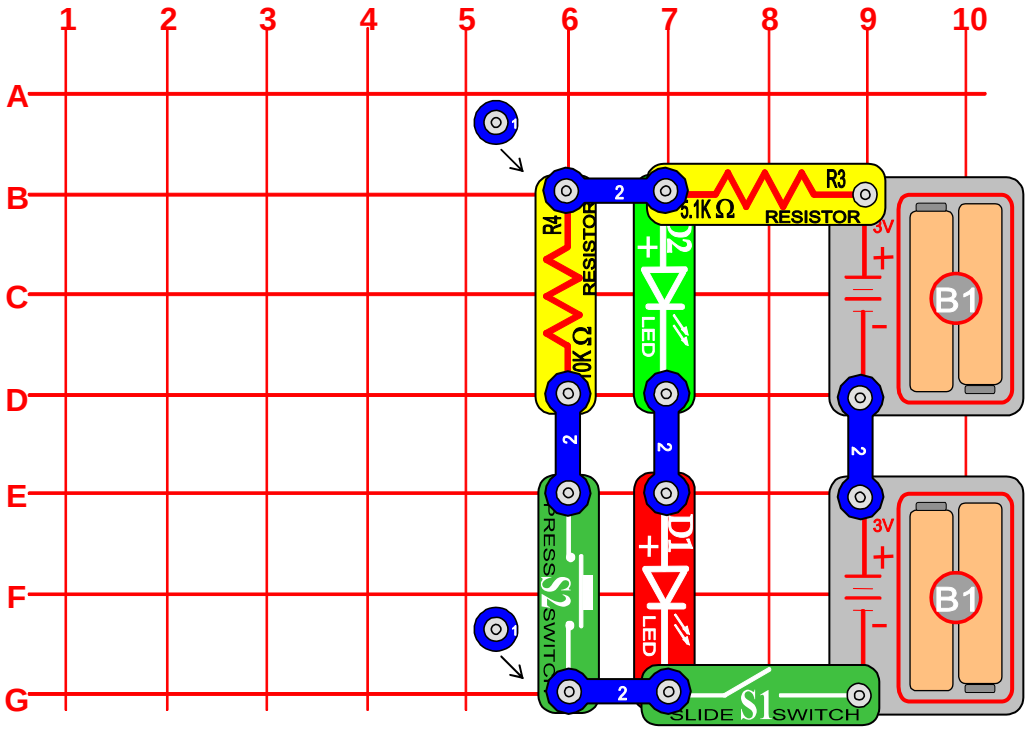
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1), the Red LED (D1) and the Green LED (D2) should light. When you press the press switch (S2) the lighting of two LEDs should decrease.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

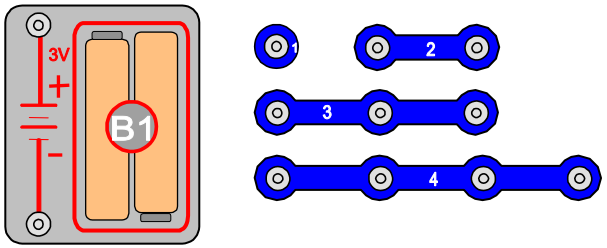
1. What happens, if you would change location of the Press Switch (S2) and the Resistor (R4 10K**Ω**)?
2. What happens, if you would change location of the Press Switch (S2) and the LED (D1)?

LEDs & Resistors - Exercise #12

Turning on two LEDs, increasing lighting of one and decreasing lighting of second one Using the Press Switch

Use parts listed below:

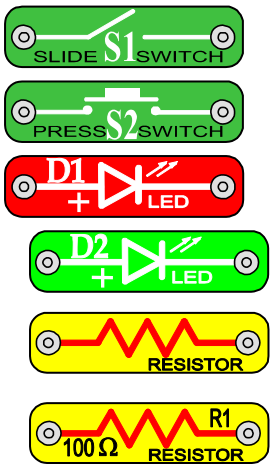
1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Green LED (D2)
6. Two or More

Resistors (R2, R3, R4, R5)

Don't use R1 Resistor.



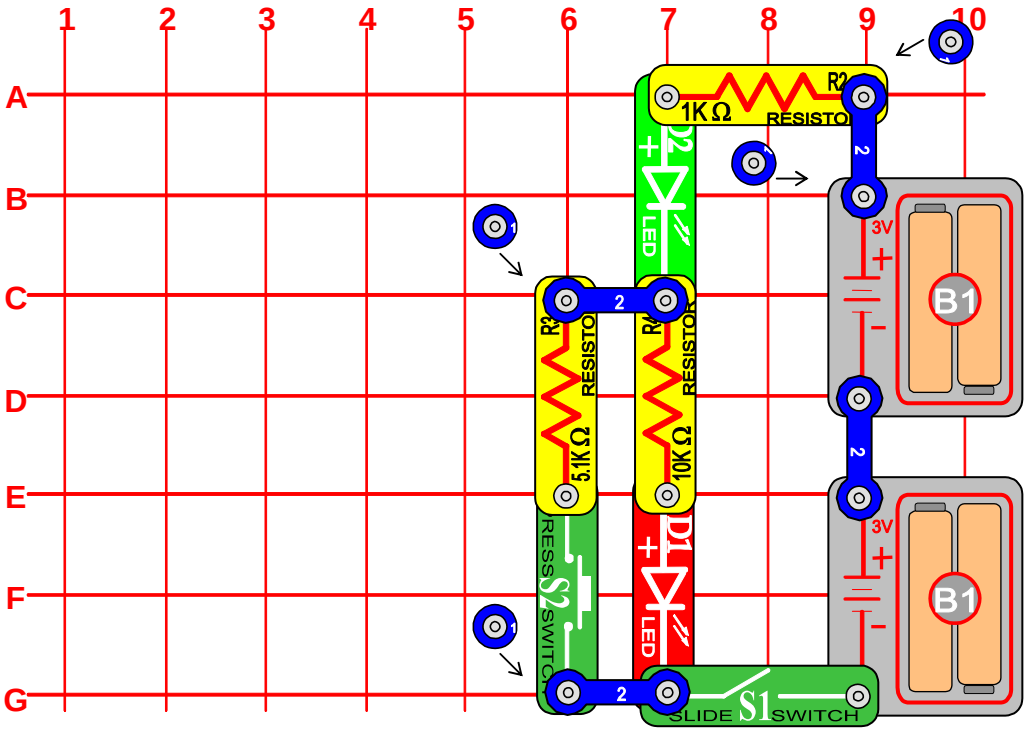
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1), the Red LED (D1) and Green LED (D2) should light. When you press the press switch (S1) the lighting of the Red LED (D1) should decrease, but the lighting of the Green LED (D2) should increase.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

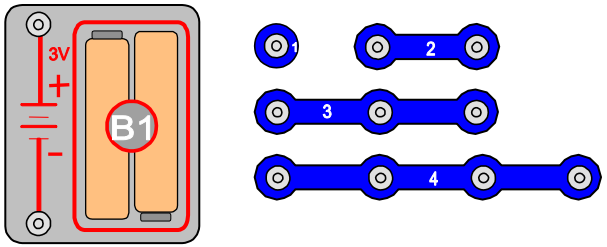
1. What happens, if you replace the Resistor (R3 5.1K**Ω**) with the 3-snap wire?
2. What happens, if you turn the LED (D1)?

LEDs & Resistors - Exercise #13

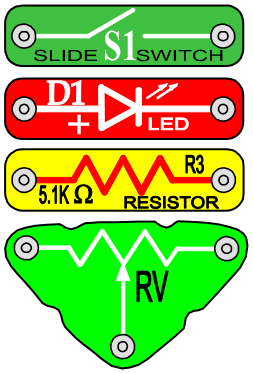
Change the Lighting of LED Using the Adjustable Resistor

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Resistor (R3)
5. Adjustable Resistor



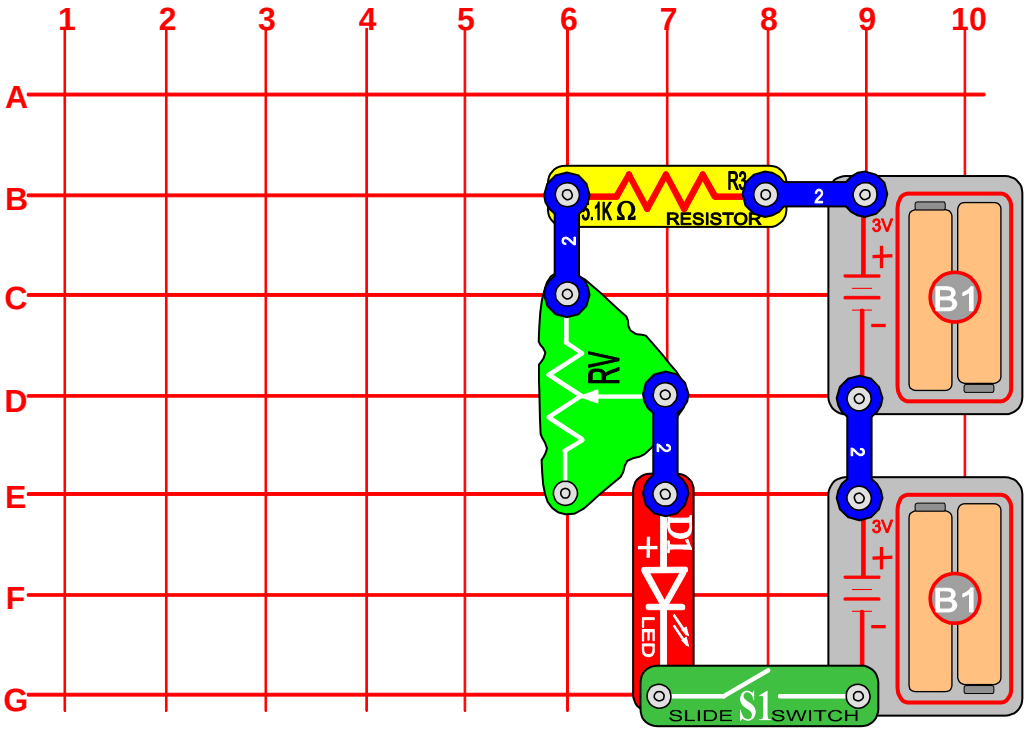
Build the circuit using only listed parts.

Your constructed circuit should work so:

Move the slider of the variable resistor (RV) in the center, turn on the slide switch (S1) and the Red LED (D1) should light. When you move the slider to one side a lighting of the Red LED (D1) should increase, when you move the slider to opposite side a lighting of the Red LED (D1) should decrease.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

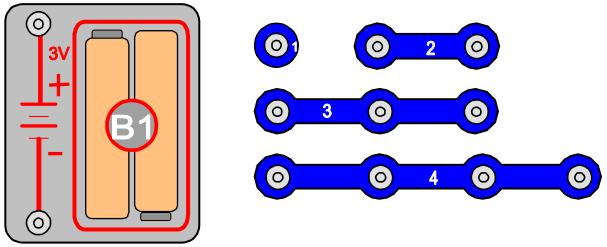
1. What happens, if you would change location of the LED (D1) with the Resistor (R4 5.1K**Ω**)?

LEDs & Resistors - Exercise #14

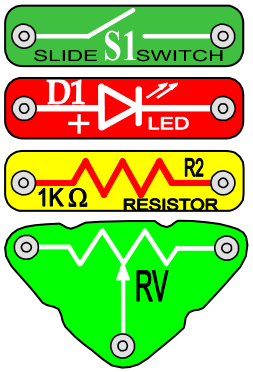
Increasing lighting and turn off of LED Using the Adjustable Resistor

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Resistor (R2)
5. Adjustable Resistor



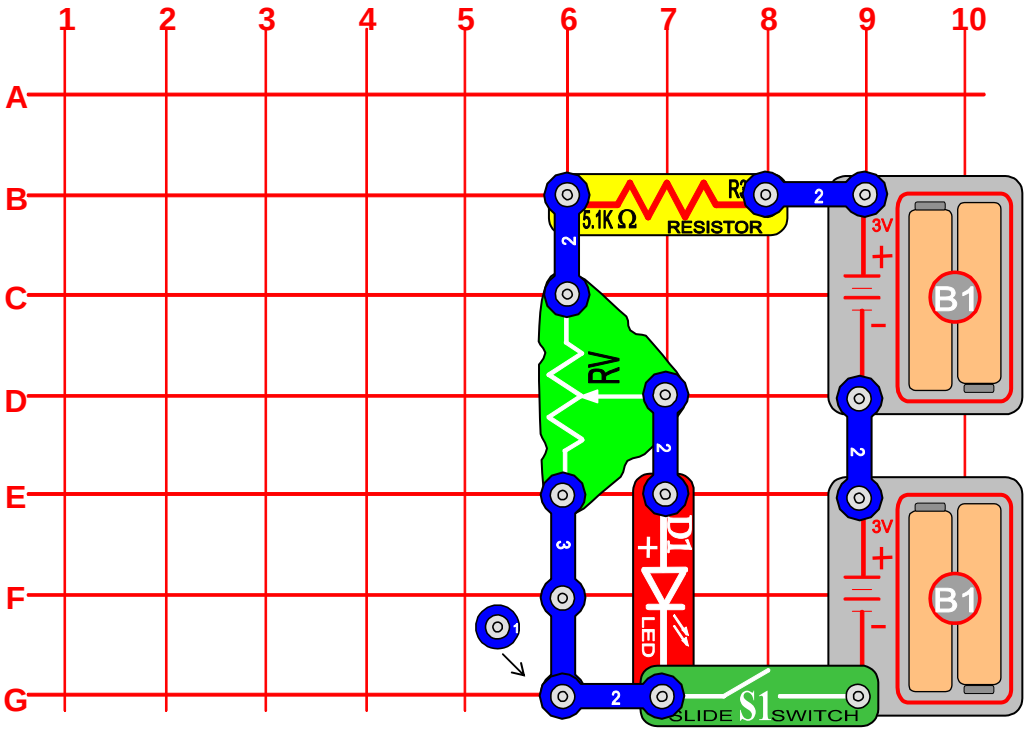
Build the circuit using only listed parts.

Your constructed circuit should work so:

Move the slider of the variable resistor (RV) in the center, turn on the slide switch (S1) and the Red LED (D1) should light. When you move the slider to one side a lighting of the Red LED (D1) should increase, when you move the slider to opposite side a lighting of the Red LED (D1) should decrease and turn off.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

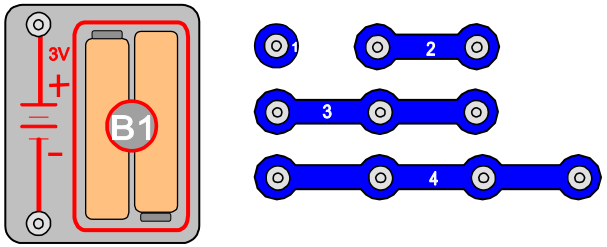
1. What happens, if you replace the LED (D1) with the LED (D2)?

LEDs & Resistors - Exercise #15

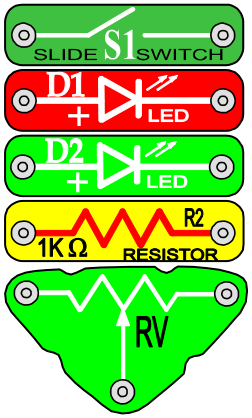
Opposite Lighting of Two LEDs Using the Adjustable Resistor

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Green LED (D2)
5. Resistor (R2)
6. Adjustable Resistor



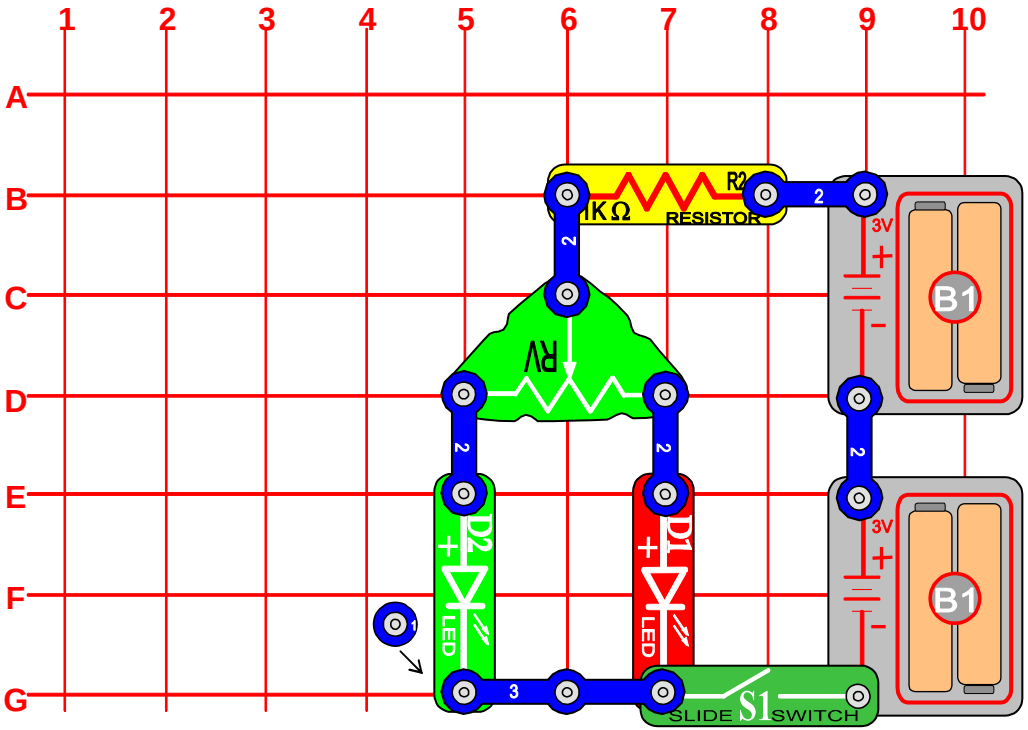
Build the circuit using only listed parts.

Your constructed circuit should work so:

Move the slider of the variable resistor (RV) in the center, turn on the slide switch (S1) and both the Red LED (D1) and Green LED (D2) should light. When you move the slider to right side a lighting of the Green LED (D2) should increase and a lighting of the Red LED (D1) should decrease. when you move the slider to opposite side a lighting of the Red LED (D1) should decrease and turn off. When you move the slider to left side the lighting of LEDs should be opposite.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

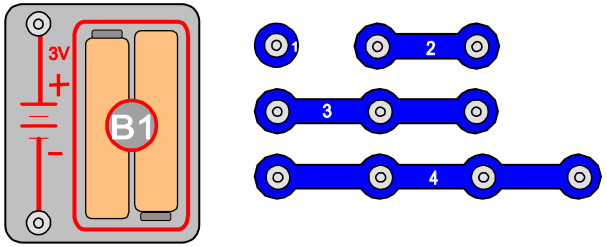
1. How will work the circuit, if you replace the LED (D2) with the Press Switch (S2) (when slider will move left and right side)?

LEDs & Resistors - Exercise #16

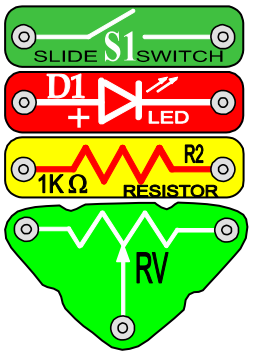
Changing Lighting of LED using the Adjustable Resistor, Lighting in Center and not Lighting in Side

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Resistor (R2)
5. Adjustable Resistor



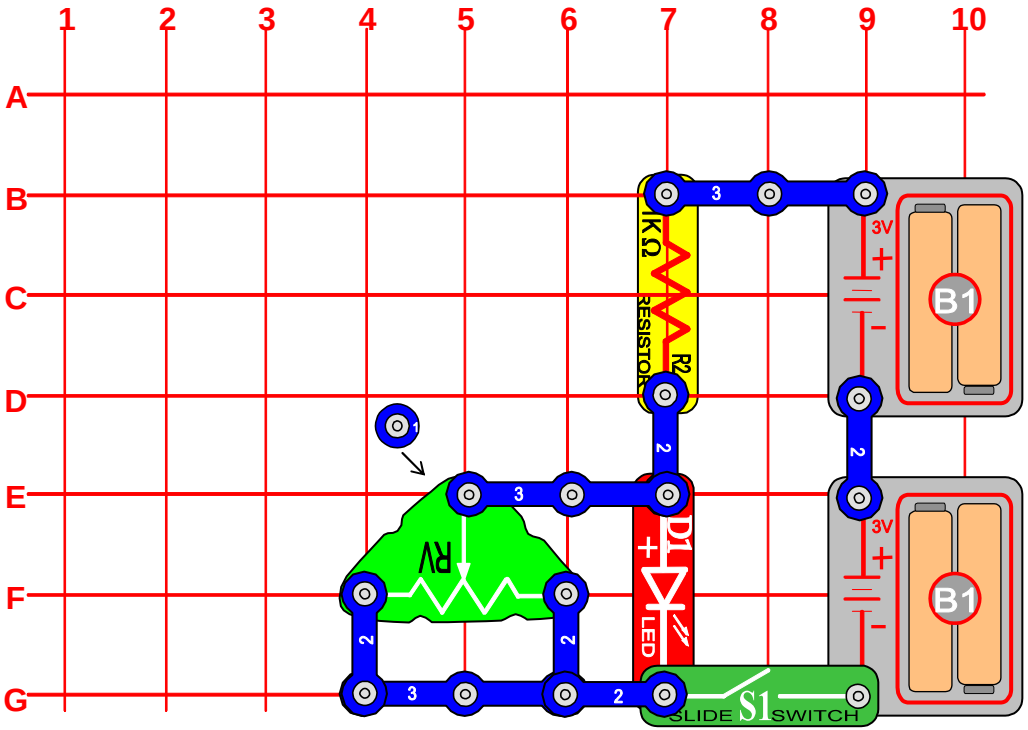
Build the circuit using only listed parts.

Your constructed circuit should work so:

Move the slider of the variable resistor (RV) in the center, turn on the slide switch (S1) and the Red LED (D1) should light. When you move the slider either on the right side or at the left side a lighting of the Red LED (D1) should decrease and turn off.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

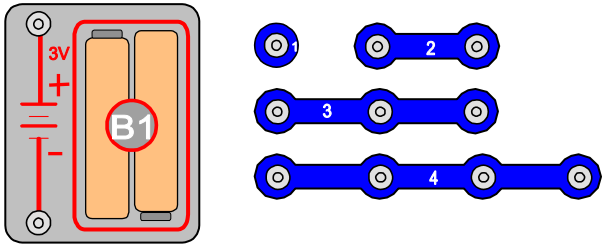
1. What happens, if you take out from the Adjustable Resistor (RV) the right 2-snap wire?
2. What happens, if you take out from the Adjustable Resistor (RV) the left 2-snap wire?

LEDs & Resistors - Exercise #17

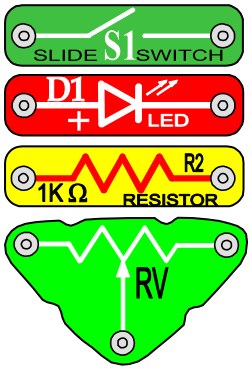
Changing Lighting of the LED using the Adjustable Resistor, Low Lighting in Center and High Lighting in Side

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Resistor (R2)
5. Adjustable Resistor (RV)



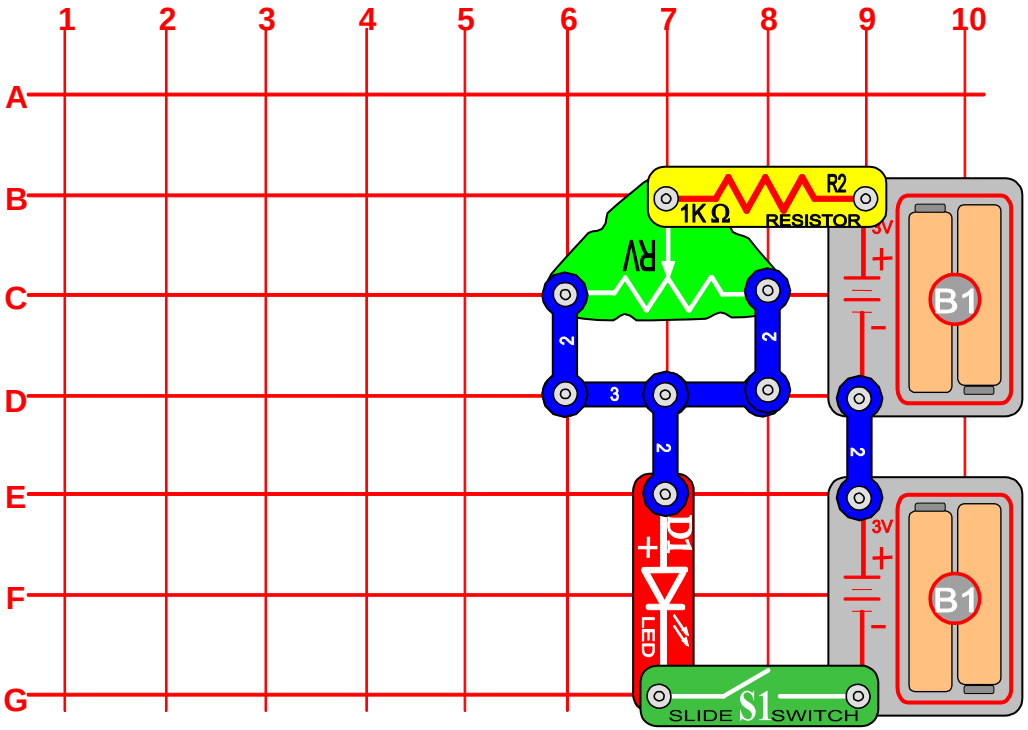
Build the circuit using only listed parts.

Your constructed circuit should work so:

Move the slider of the variable resistor (RV) in the center, turn on the slide switch (S1) and the Red LED (D1) should light low. When you move the slider of the variable resistor (RV) either on the right side or at the left side the lighting of the Red LED (D1) should increase.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

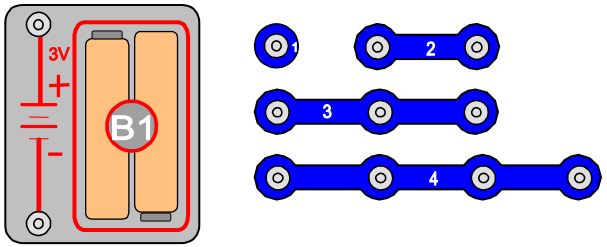
1. What happens, if you take out from the Adjustable Resistor (RV) the right 2-snap wire?
2. What happens, if you take out from the Adjustable Resistor (RV) the left 2-snap wire?

LEDs & Resistors - Exercise #18

Turning on Two Leds, Decreasing the Lighting of One LED Using the Press Switch and the Lighting of the Second One invariable

Use parts listed below:

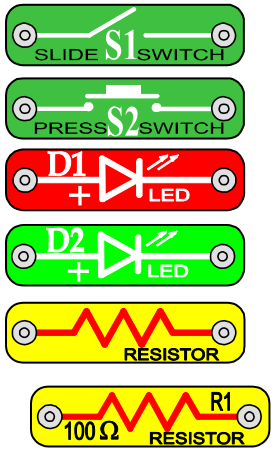
1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Green LED (D2)
6. Two or more Resistors

(R2, R3, R4, R5)

Don't use R1 Resistor.



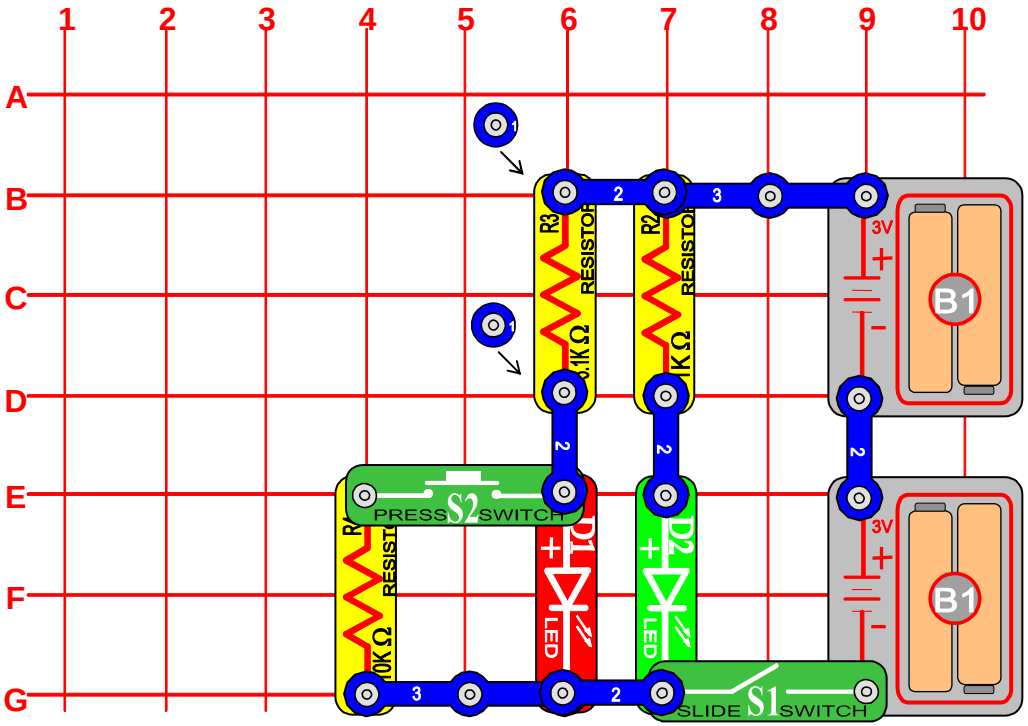
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1), the Red LED (D1) and the Green LED (D2) should light. When you press the press switch (S2) the lighting of Red LED (D1) should decrease, but the lighting of the Green LED (D2) should be invariable.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Question:

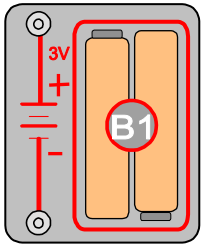
1. How will work the circuit, if you replace Resistor (R4 **10KΩ**)) with the 3-snap wire?

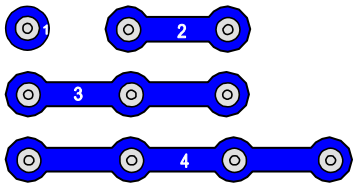
LEDs & Resistors - Exercise #19

Turning on Two Leds, Increasing the Lighting of One LED Using the Press Switch and the Lighting of the Second One invariable

Use parts listed below:

1. Two Battery Holder (B1) and Snap Wires.

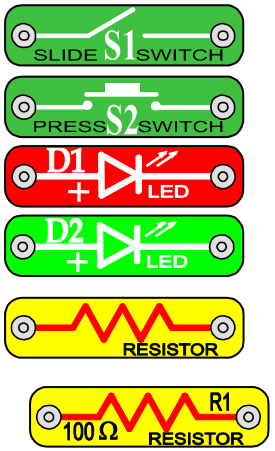




2. Slide Switch (S1)
3. Press Switch (S2)
4. Red LED (D1)
5. Green LED (D2)
6. Two or more Resistors

(R2, R3, R4, R5)

Don't use R1 Resistor.



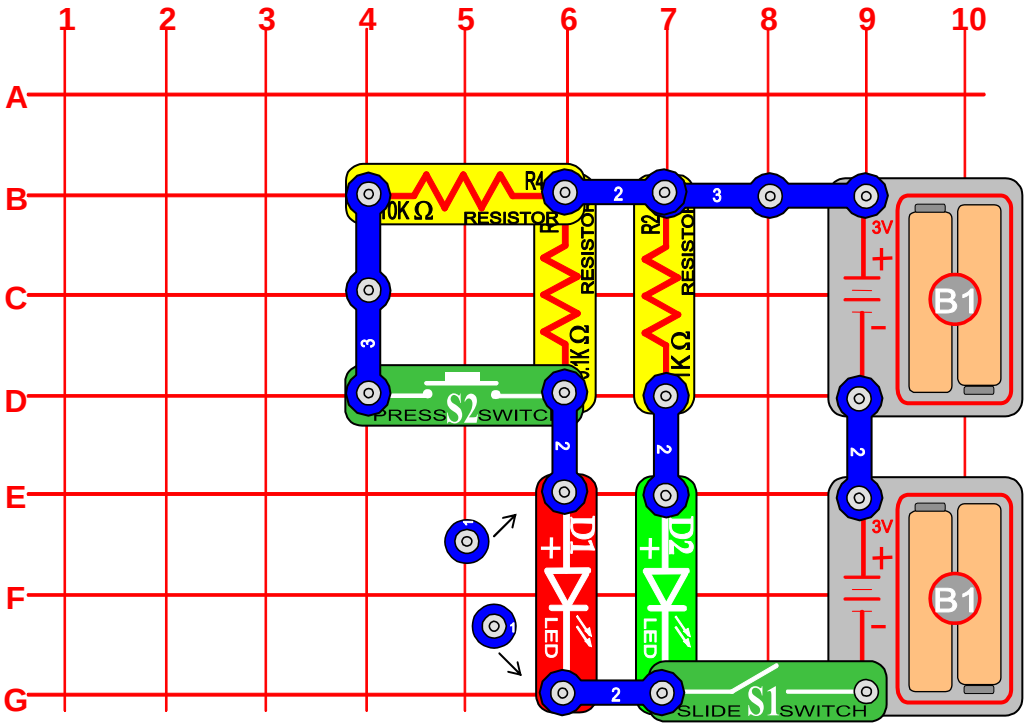
Build the circuit using only listed parts.

Your constructed circuit should work so:

When you close the slide switch (S1), Red LED (D1) and Green LED (D2) should light. When you press the press switch (S2) the lighting of Red LED (D1) should increase, but the lighting of Green LED (D2) should be invariable.

Do not switch the circuit before it is not checked!

Do not switch the circuit before it is not checked!



Questions:

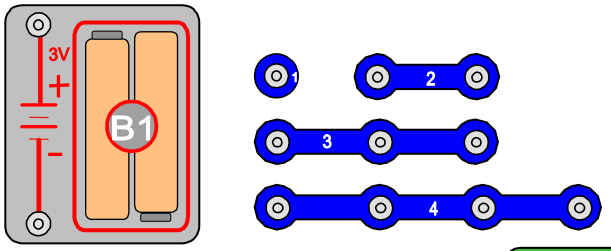
1. What part should you remove from the circuit that pressing on the press button (S2) wouldn't change a lighting of the red LED?

LEDs & Resistors - Exercise #20

Turning on Two Leds, Changing the Lighting of One LED Using the Adjustable Resistor and the Lighting of the Second One invariable

Use parts listed below:

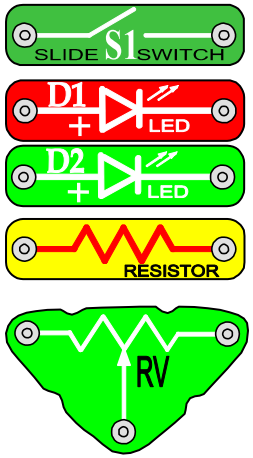
1. Two Battery Holder (B1) and Snap Wires.



2. Slide Switch (S1)
3. Red LED (D1)
4. Green LED (D2)
5. Two or more Resistors

 (R2, R3, R4, R5)

6. Adjustable Resistor (RV)



Don't use R1 Resistor.

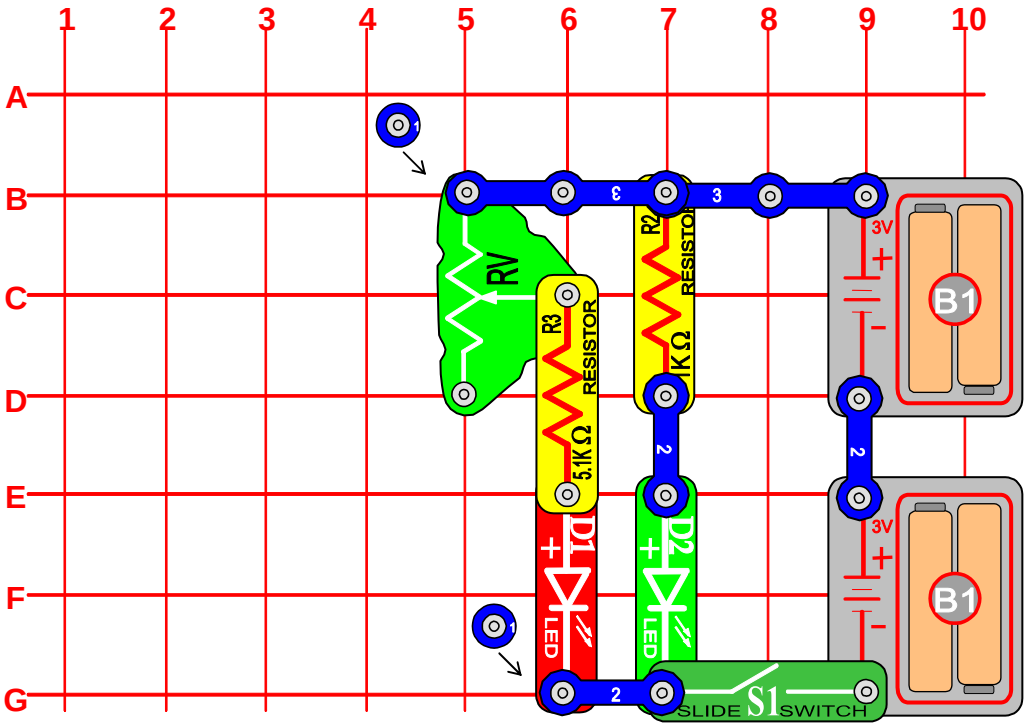
Do not switch the circuit before it is not checked!

Build the circuit using only listed parts.

Your constructed circuit should work so:

Move the slider of the variable resistor (RV) in the center, turn on the slide switch (S1) and the Red LED (D1) and the Green LED (D2) should light. When you move the slider of variable resistor (VR) a lighting of the Red LED (D1) should increase or decrease, but the lighting of the Green LED (D2) should be invariable.

Do not switch the circuit before it is not checked!



Questions:

1. Rebuild the circuit so; when you move the slider of variable resistor (RV) a lighting of the Red LED (D1) should decrease and switch off.