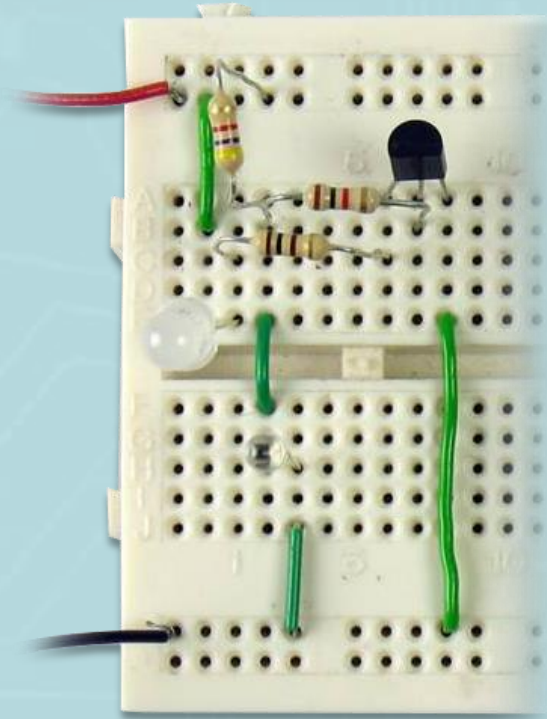


Breadboarding



In this presentation you will:

- investigate making a circuit on breadboard

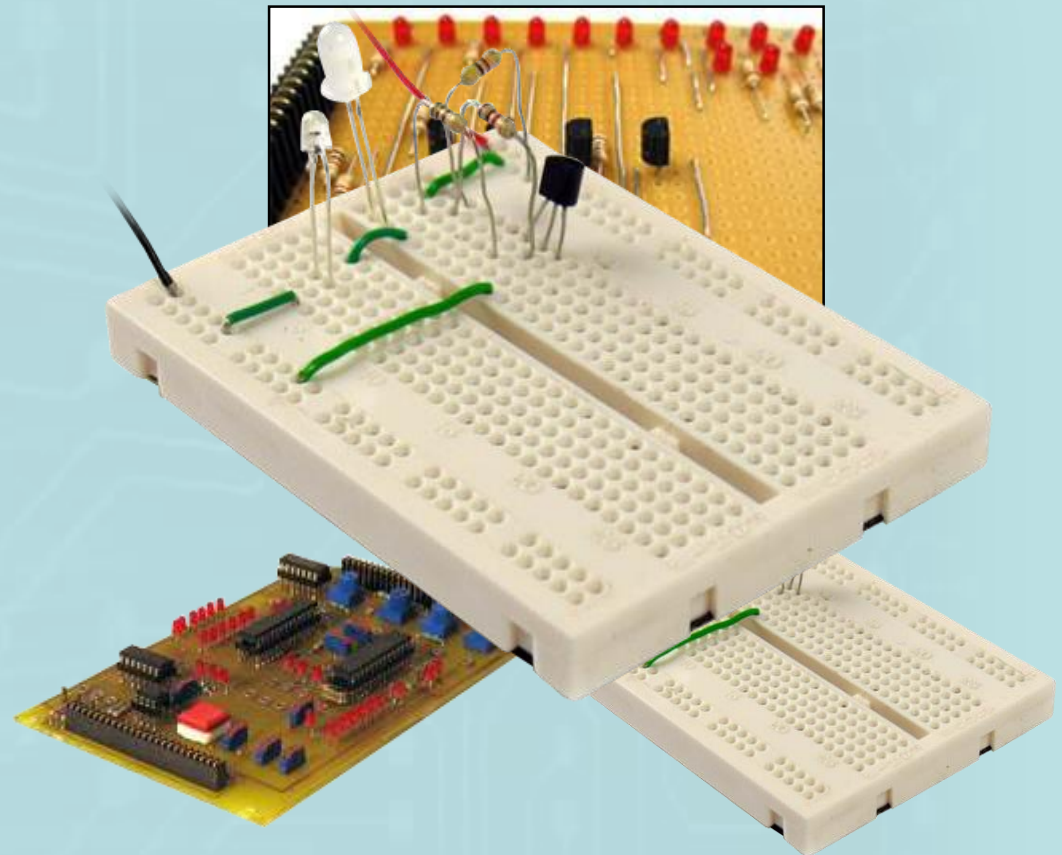
Introduction

There are many different ways to construct electronic circuits.

Circuit construction can be temporary or permanent.

A common form of temporary construction is breadboarding.

A breadboard is a matrix of holes that component leads can be pushed into. Internal connections join the components to form a circuit.



PCB

Breadboard

Question 1

“Breadboards are used to make permanent circuits.”

Is this statement true or false?

Question 1

“Breadboards are used to make permanent circuits.”

Is this statement true or false?

False

Breadboards are used to make temporary circuits. The components can be removed and replaced easily.

Breadboards

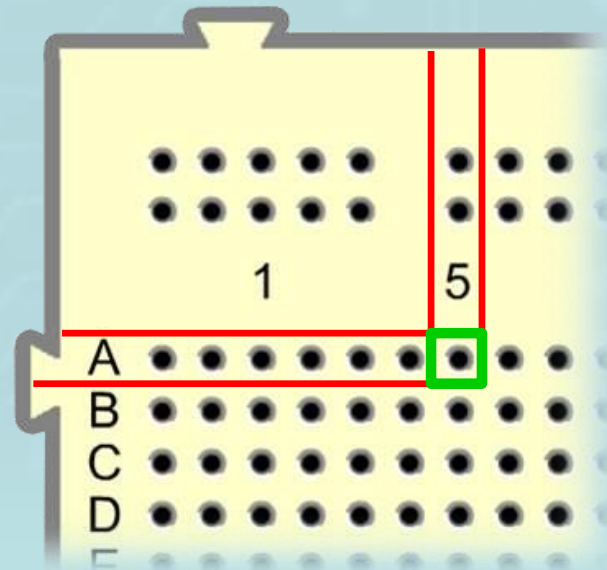
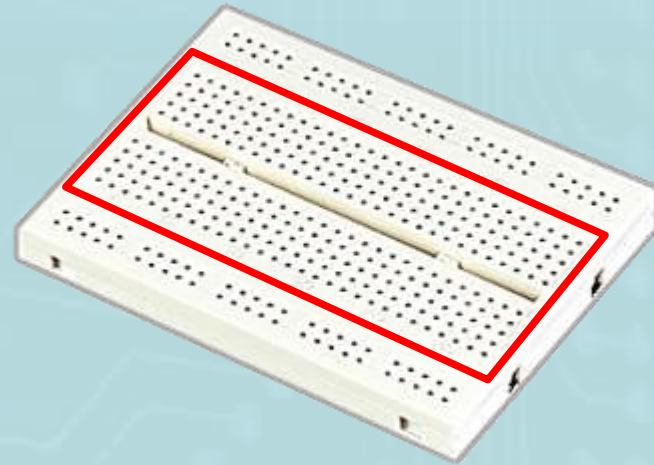
Breadboards come in a range of sizes.

The only difference is the number of connections.

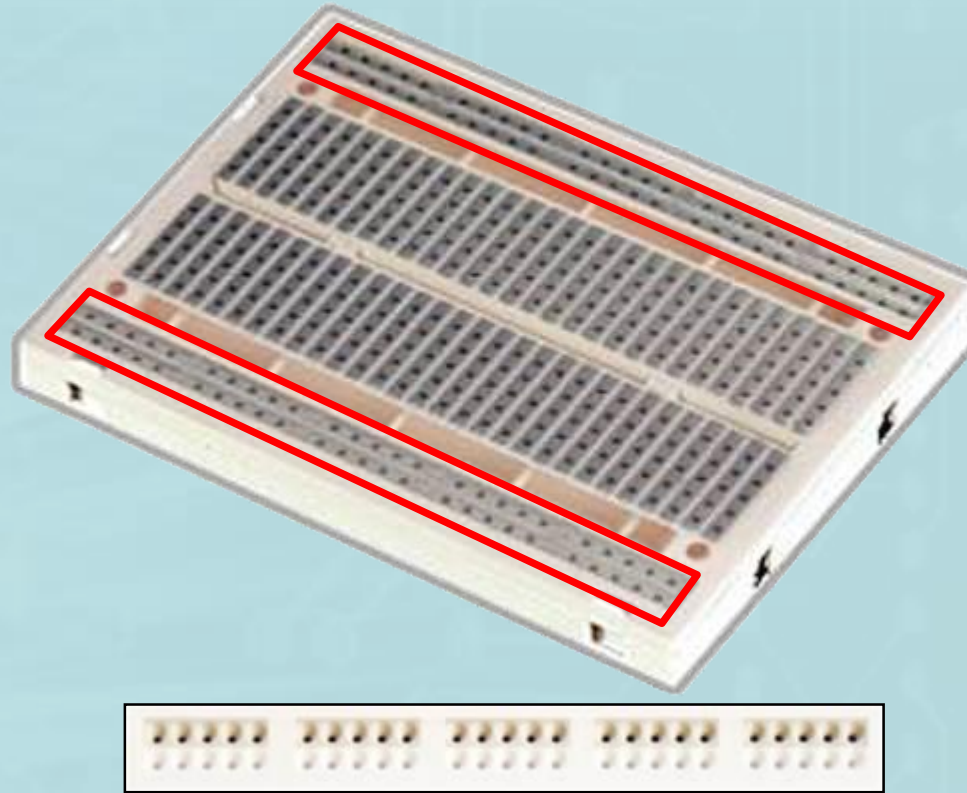
This breadboard has 390 connection points.

The centre block is made of rows (letters A to J) and numbered columns.

Each hole has a unique identifier, for example, A5.



Breadboard Internal Connections

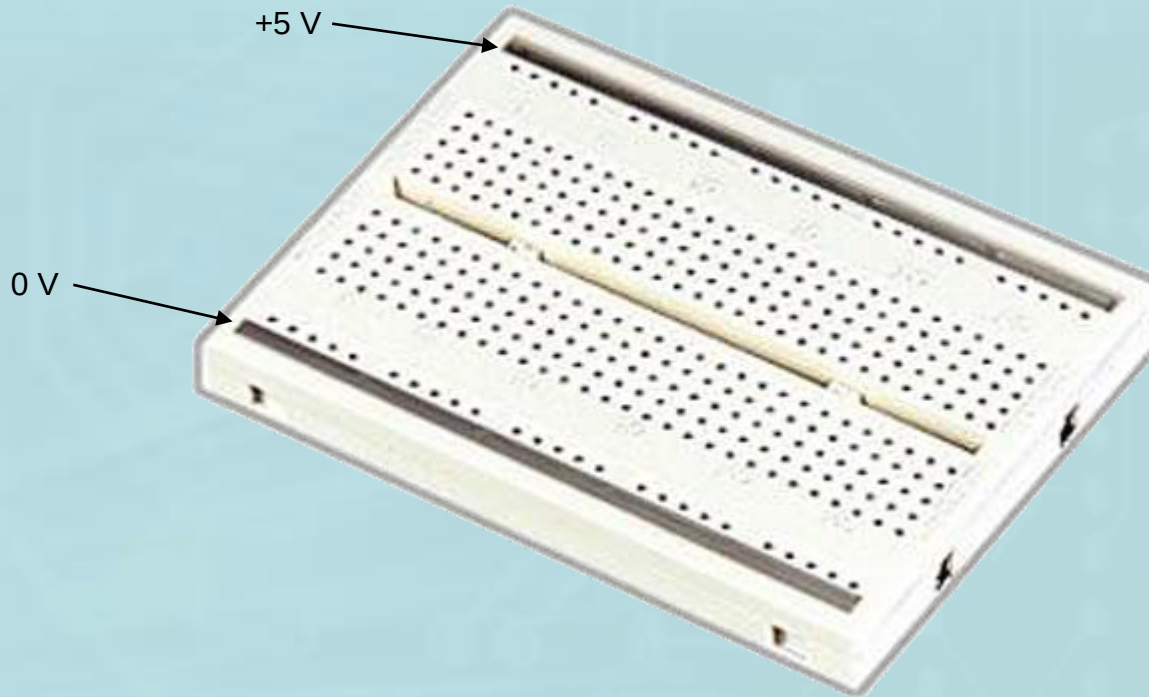


How are the holes connected?

There are metal strips inside, joining groups of holes together.

Look at the top two rows and bottom two rows. Each row has 5 blocks of 5 holes. The 25 holes in each row are connected, but there is no connection between each row.

Breadboard Internal Connections



The top and bottom two rows are usually used for the power rails.

In this example, one row is used for +5 V and another for 0 V.

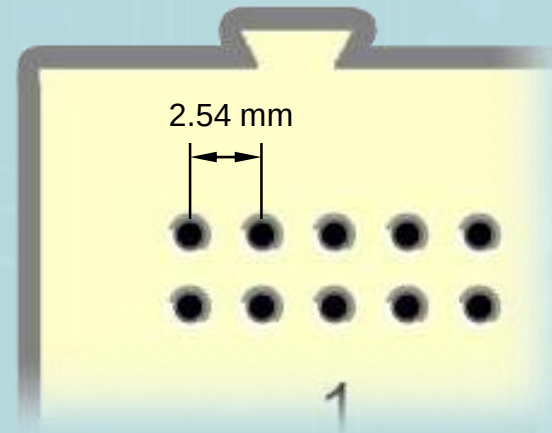
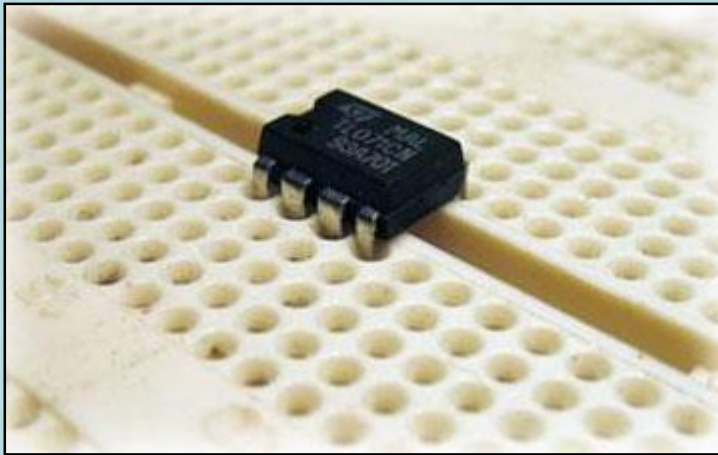
Breadboard Internal Connections



The centre block is split in half by a deep groove, or slot, with no connection across it.

Each column in the centre block has 5 connected holes.

Breadboard Internal Connections



The slot is used to separate the two sides of an integrated circuit, or IC.

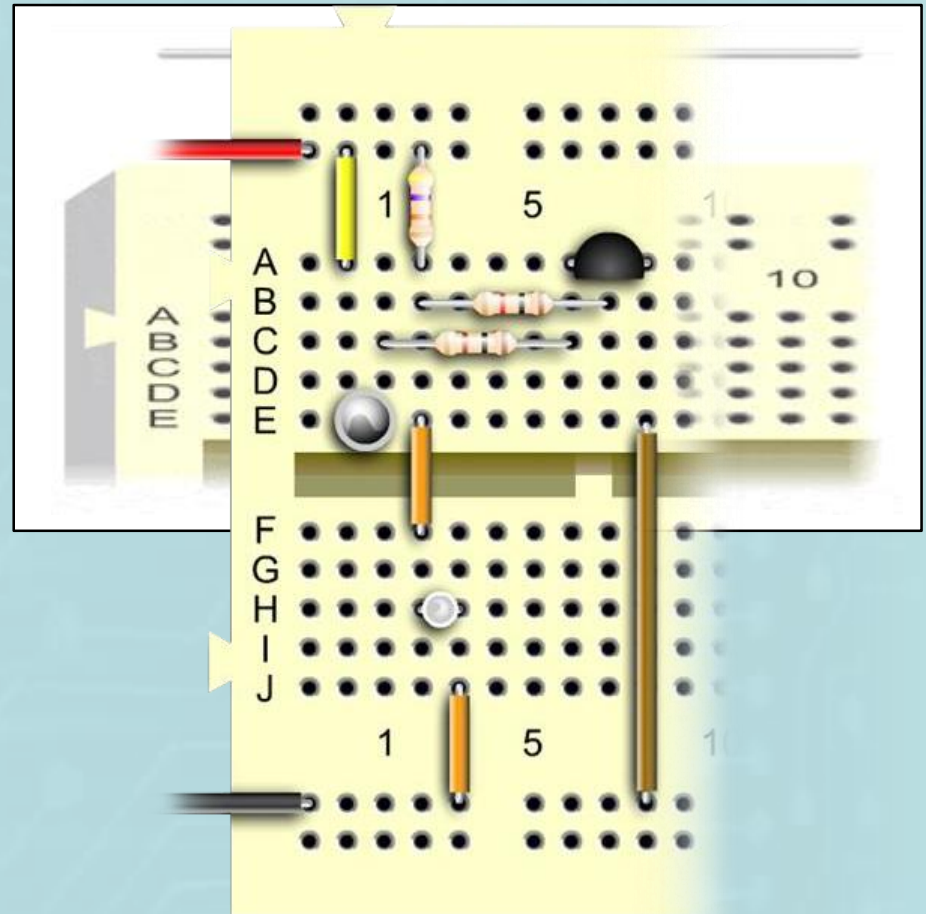
All the holes are exactly 2.54 mm apart. The holes are just the right size for most component leads to fit in with a push.

Assembling Components and Wire

Some components, such as resistors, are connected mainly in the centre block.

The leads of a component must not connect to holes in the same column.

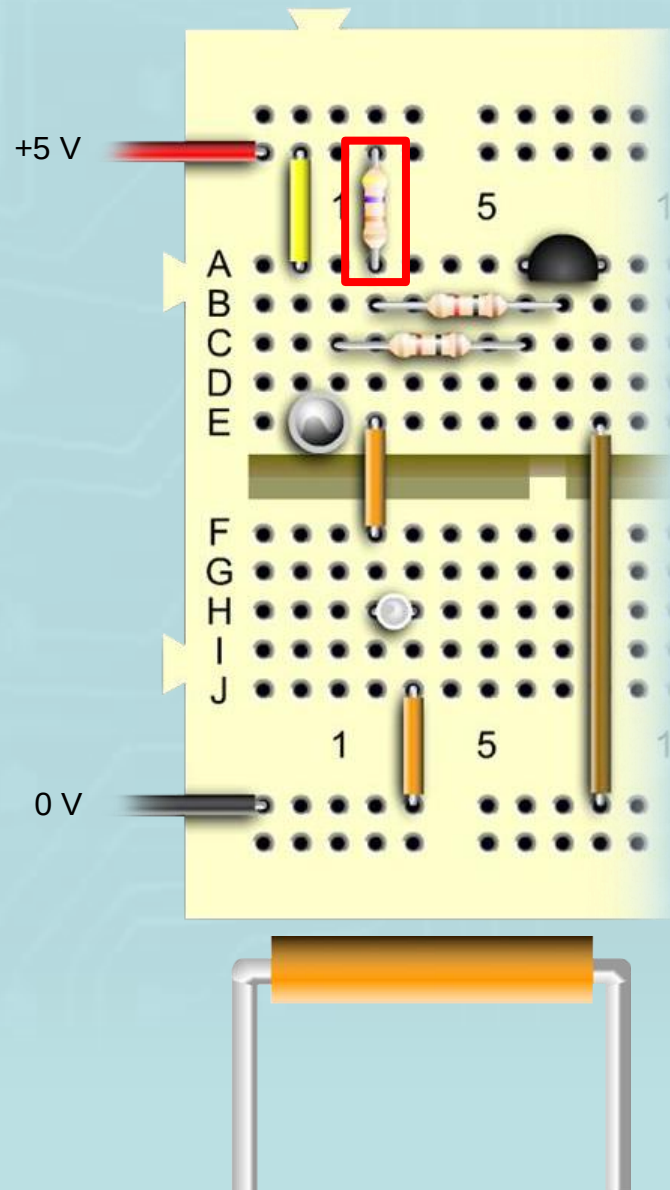
To keep the circuit neat and tidy, components are usually arranged horizontally or vertically.



Assembling Components and Wire

If a component connects to 0 V or +5 V, it is possible to use the component to bridge the gap to the power rail and the centre block.

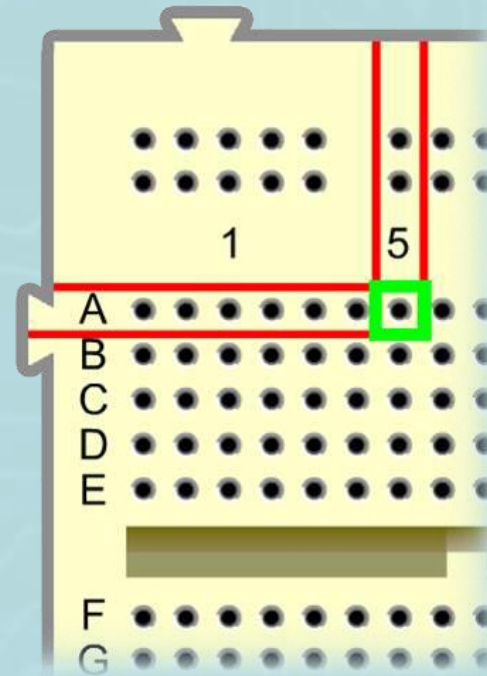
Solid connecting wire (wire link) is used to join components together if they cannot reach the next component.



Question 2

One lead of a resistor is put into A5. To avoid shorting out the resistor, which hole should the other lead NOT be put into?

- A) F5
- B) A10
- C) E5
- D) J5



Question 2

One lead of a resistor is put into A5. To avoid shorting out the resistor, which hole should the other lead NOT be put into?

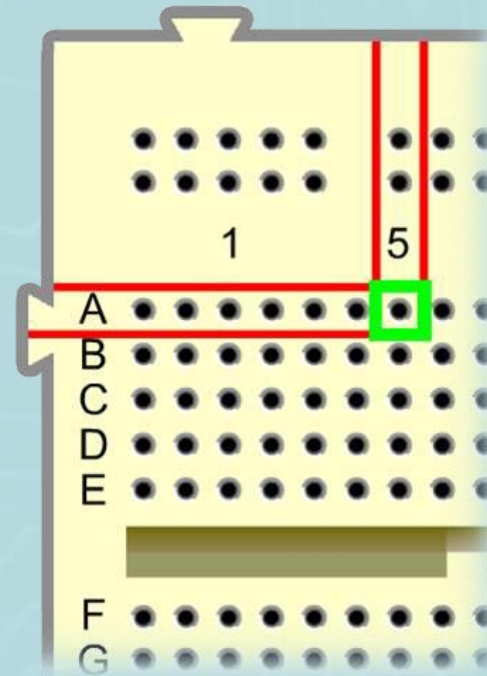
A) F5

B) A10



C) E5

D) J5

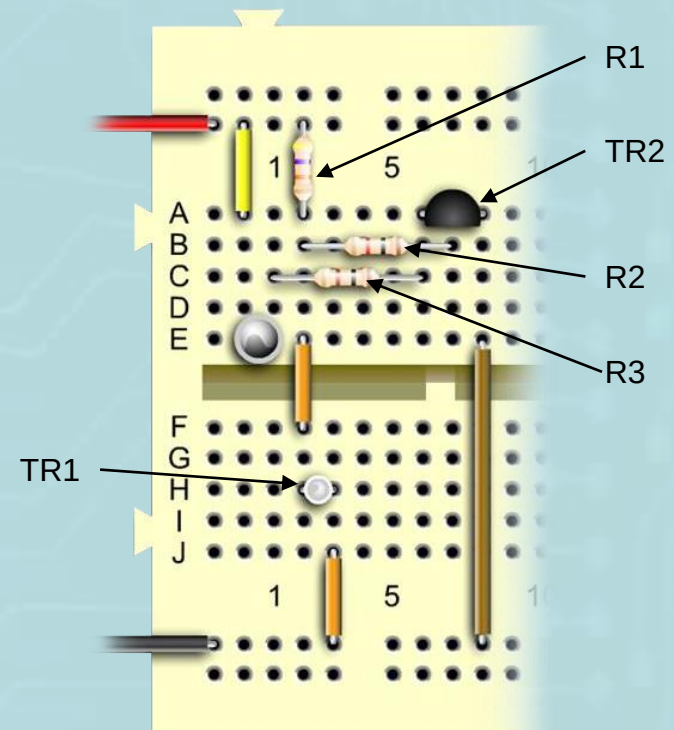


The holes in the central block are all connected in the same column. All the holes in column 5 (holes A to E) are connected internally. Connecting the other end of the resistor to any hole in column 5 will produce a short circuit.

Question 3

One lead of R1 is connected to +5 V. Which components are connected to its other lead?

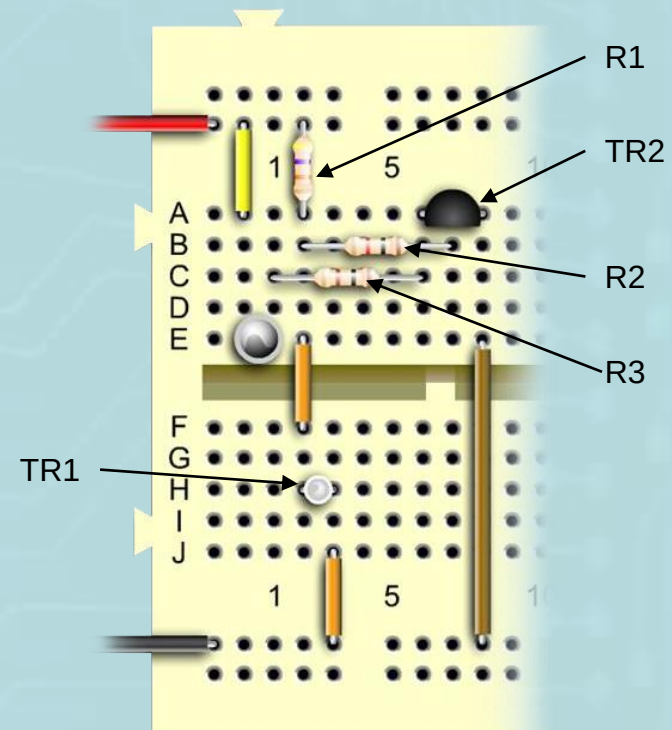
- A) R2 and R1
- B) TR1 and R3
- C) TR2 and R3
- D) R2 and TR1



Question 3

One lead of R1 is connected to +5 V. Which components are connected to its other lead?

- A) R2 and R1
- B) TR1 and R3
- C) TR2 and R3
- ✓ D) R2 and TR1



Resistor R1 is connected to the leg of R2 in the top block of 5 holes. It is also connected to the leg of TR1 in the bottom block via the connecting wire spanning the gap.

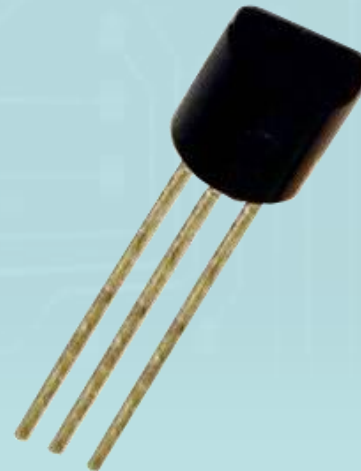
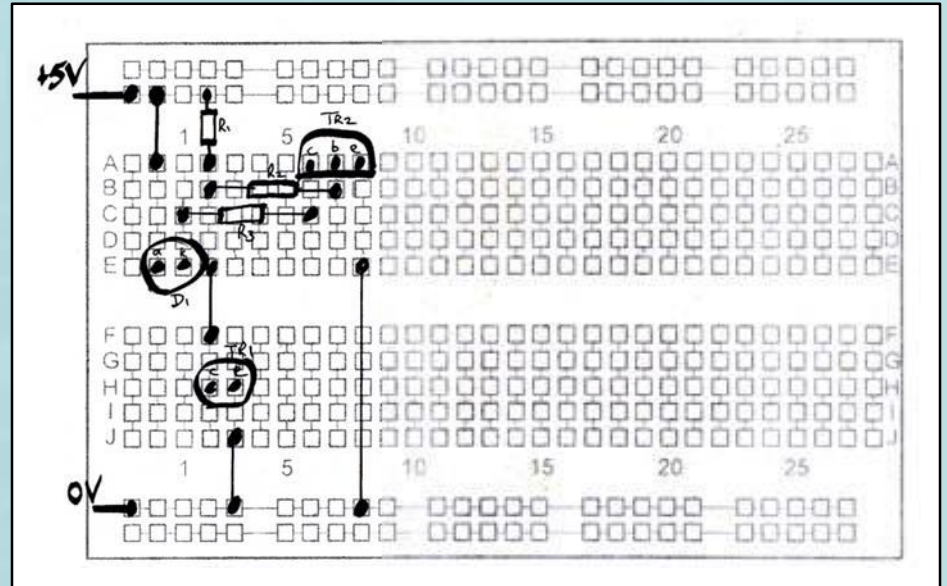
Planning

It is possible to go straight to putting components into a breadboard, but it is recommended that a planning sheet is used first.

The planning sheet provides valuable evidence of the work carried out.

It also improves the chances of making a successful circuit first time.

It is a good idea to start with the most complicated component – the one with the most leads.



Summary

In this presentation you have seen:

- how the breadboard holes are connected internally
- how to connect components and wire links on a breadboard