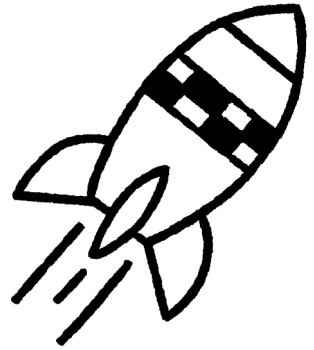


# Hagaajinta wareegyada khaldan

**Sayniska**

Cutub: Wareegyada taxanaha ah (Series circuits)



## Natiijo

Waxaan qeexi karaa sida loo dhiso wareeg tijaabo ah oo fudud, u isticmaalo in lagu hubiyo qaybaha khaldan, iyo helista khaladaadka wareegga korontada.

**filament**

**qayb khaldan (faulty component)**

**wareeg taxane (series  
circuit)**

**wareeg dhammaystiran  
(complete circuit)**

**wareeg tijaabo (test circuit)**

## Erayada muhiimka ah

Filament waa silig bir ah oo dhuuban oo ku yaal qaar ka mid ah nalalka, kaas oo iftiima oo siiya iftiin marka la kululeeyo.

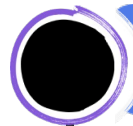
Qayb khaldan (faulty component) waa mid dhaawacantay ama aan si fiican u qaadin korontada.

Wareeg taxane (series circuit) waa wareeg koronto oo leh hal loop oo dhammaystiran oo ka bilaabma dhamaadka batteriga ilaa dhamaadka kale.

Wareeg dhammaystiran (complete circuit) waa mid aan lahayn meel bannaan, sidaas darteed korontadu waxay awood u leedahay inay ku wareegto wareegga.

Wareeg tijaabo (test circuit) waxaa loo isticmaalaa in lagu hubiyo haddii qayb (ama wareeg kale) u oggolaanayo korontada inay dhex socoto.

### Hagaajinta wareegyada khaldan



Dhibaatooyinka wareegga

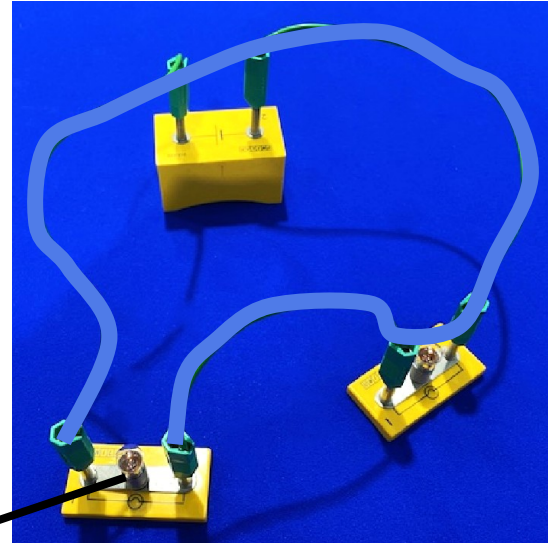


Dhismaha iyo isticmaalka wareeg tijaabo



Tijaabinta wareegyada markaad dhisayso

Wareeg taxane (series circuit), haddii qayb midna aan shaqeyn, wareeggu wuu jajabaa, mana aha wareeg dhammaystiran.



Haddii nalkani jajabo ...

... koronto ma socon karto, qaybaha kalena ma shaqeyn doonaan.

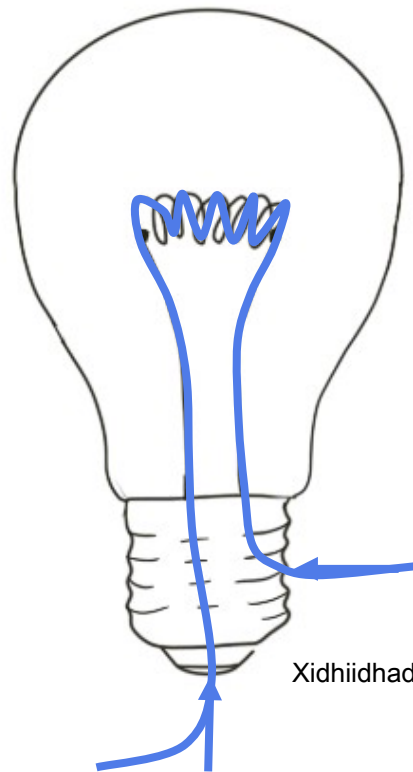
Nalka filament-ka wuxuu ka kooban yahay silig dhuuban oo iftiimiya.



filament

Filament-ka waxaa lagu xiraa saldhigga si loo sameeyo wareeg joogto ah (continuous loop).

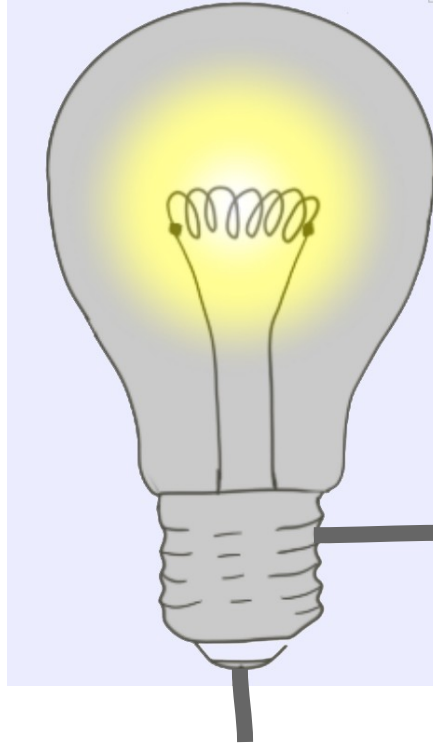
Waxaa laga sameeyaa bir (metal) waana koronto-sameeye (conductor).



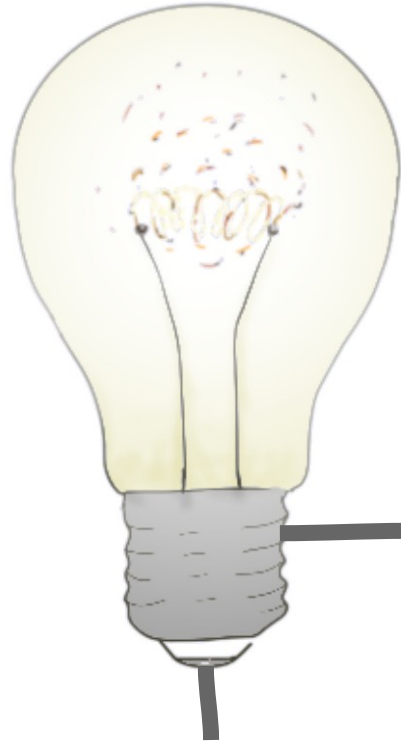
Korantada (current) waxay mari kartaa filament-ka

Xidhiidhada (connections) halkan ayaa la sameeyaa

Marka korontadu (electricity) ku qulqusho wareegga dhammaystiran (complete loop), filament-ku wuu iftiimiyaa oo nalku wuu shidmaa.



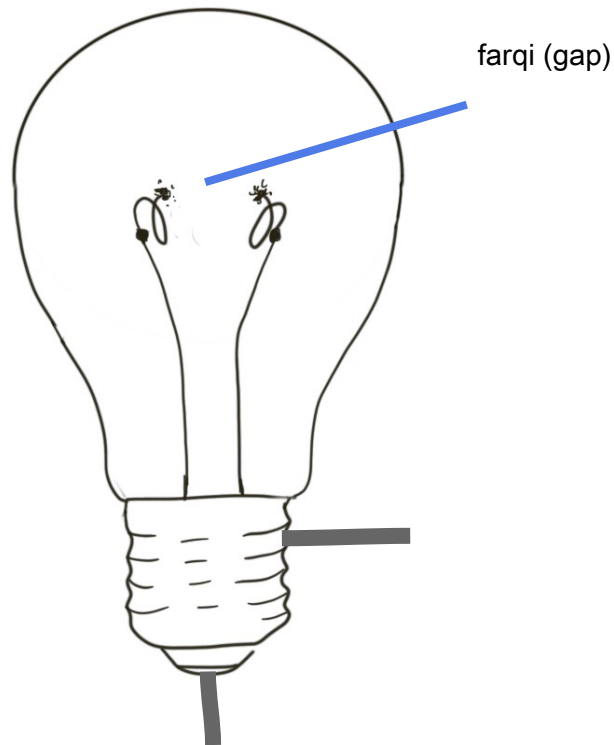
Haddii koronto badan (too much electricity)  
qulqusho,  
filament-ku wuu kululaan doonaa oo wuu dhalaali  
doonaa (melt).



Wareegga (loop) hadda wuu jabay, korontaduna (electricity) ma qulquli karto.

Mararka qaarkood waxaan nidhaahnaa, “nalkii wuu gubtay (blown)”.

Hadda waa qayb cilladaysan (faulty component).



Wareeggan (circuit), hal nalkii ayaa gubtay (blows).  
Maxaa ku dhici doona kan kale?

**a**

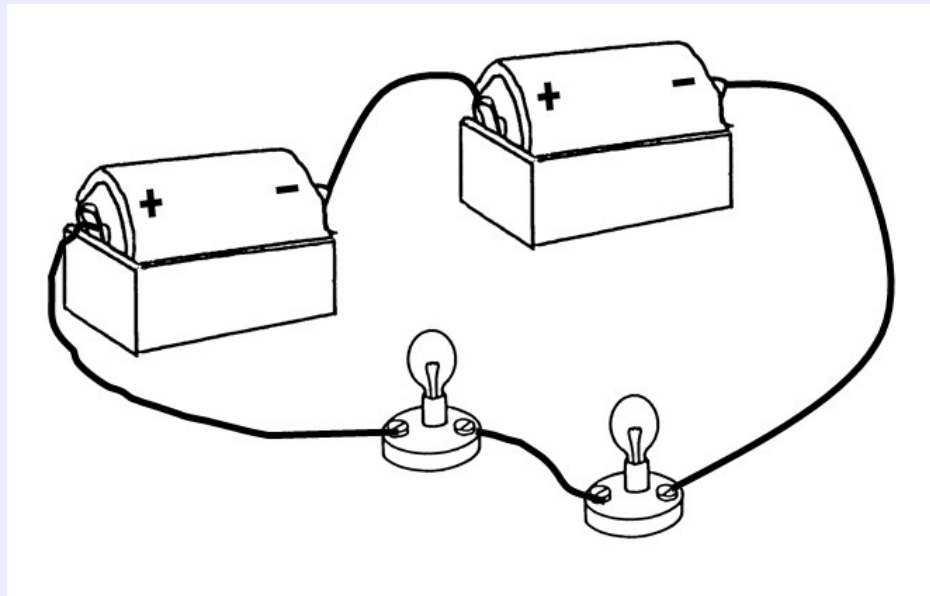
wuu sii shidi doonaa (stay lit)

**b**

waxay noqon doontaa mid iftiin badan

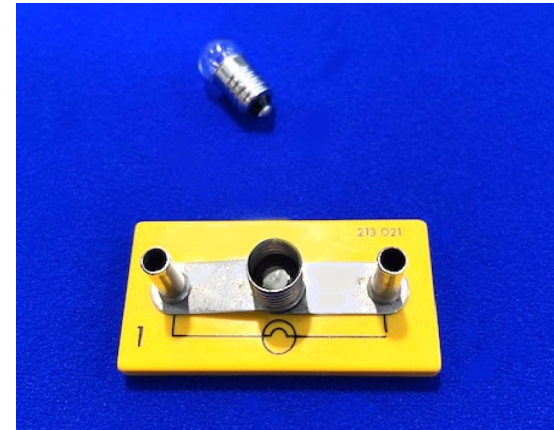
**c**

waxay bakhti doontaa

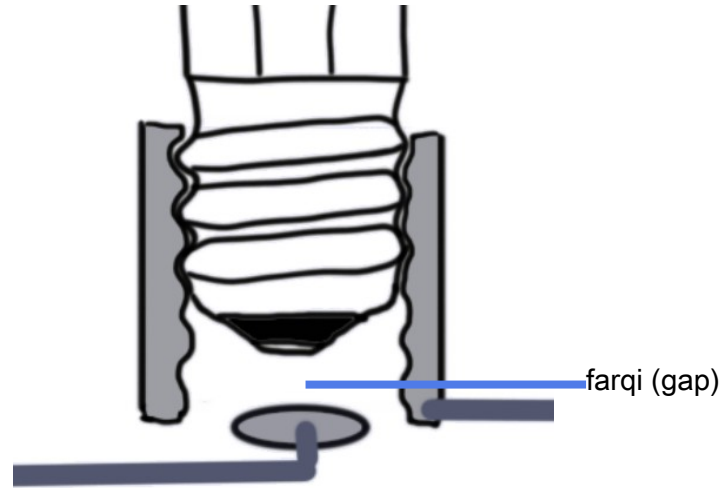
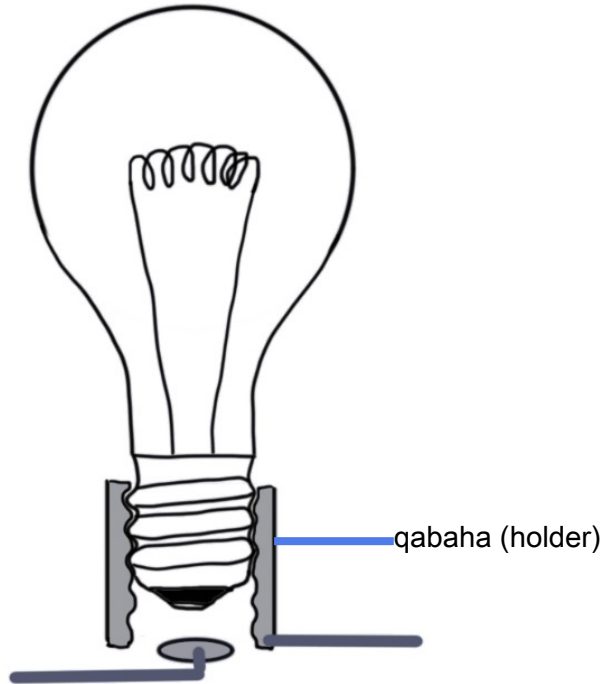


Waxaa jira sababo kale oo wareegga (circuit) uusan u shaqayn karin:

- Nalka (bulb) waa mid qiime aad u sarreeya oo u baahan koronto badan si uu u iftiimo. Weli wuxuu u oggolaanayaa korontada inay socoto, laakiin ma iftiimayo.
- Nalka (bulb) laga yaabaa inaan si fiican loogu maro gudaha qabaha (holder) oo uusan taaban xiriiriyeyaasha (connectors).

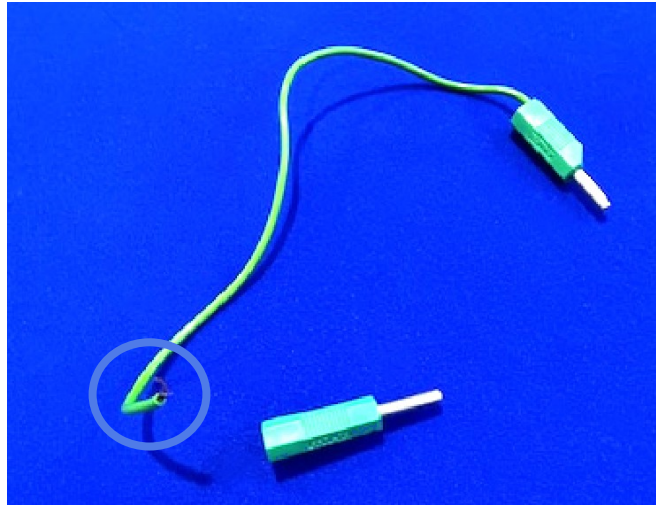


Nalkan (bulb) si fiican looguma marin.

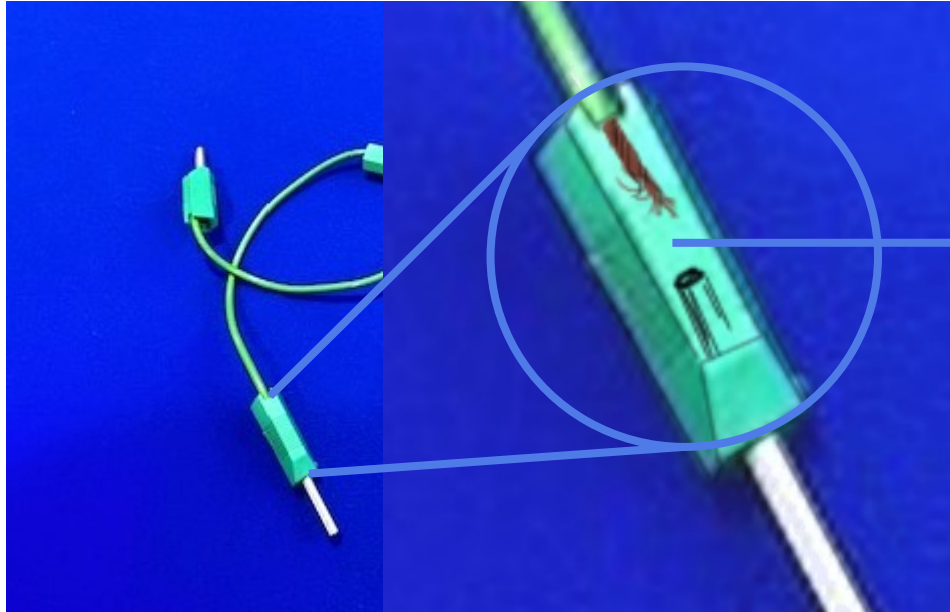


Waxaa jira farqi (gap), kaas oo jebiya wareegga (circuit).

Siligga (wire) birta ah ee gudaha fiilada (lead) wuu jabi karaa ama wuu kala go'i karaa.



Xataa fiilada (lead) u muuqata mid fiican waxaa laga yaabaa inay gudaha ku xumaatay.



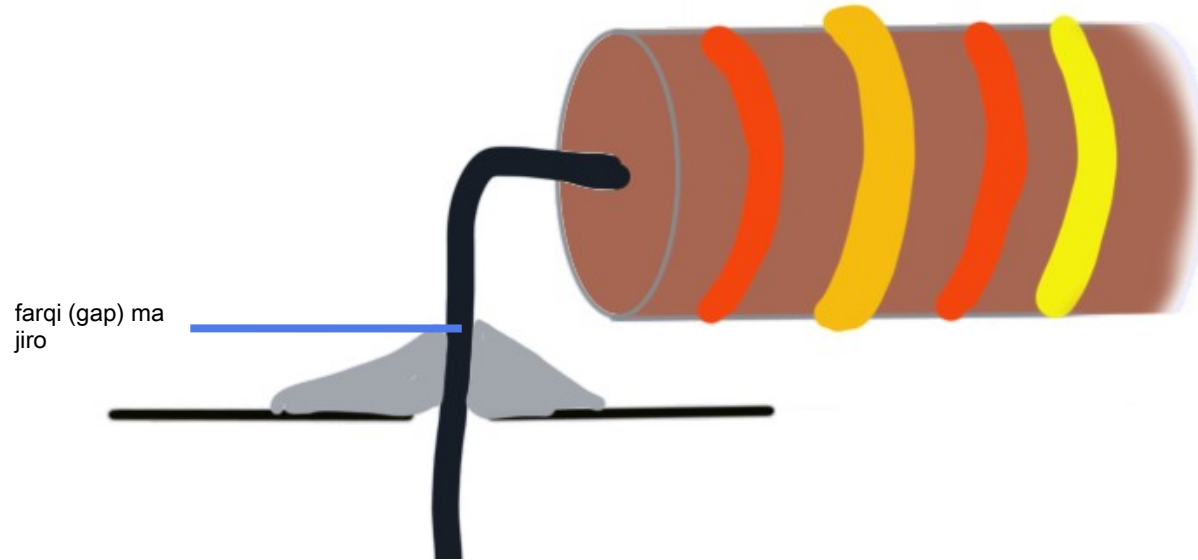
farqi (gap) u dhexeeya  
siligga (wire) iyo biinka  
(pin)

Xirmooyinka birta lagu shubay (soldered joints) waa jabi karaan ama waa dabci karaan.

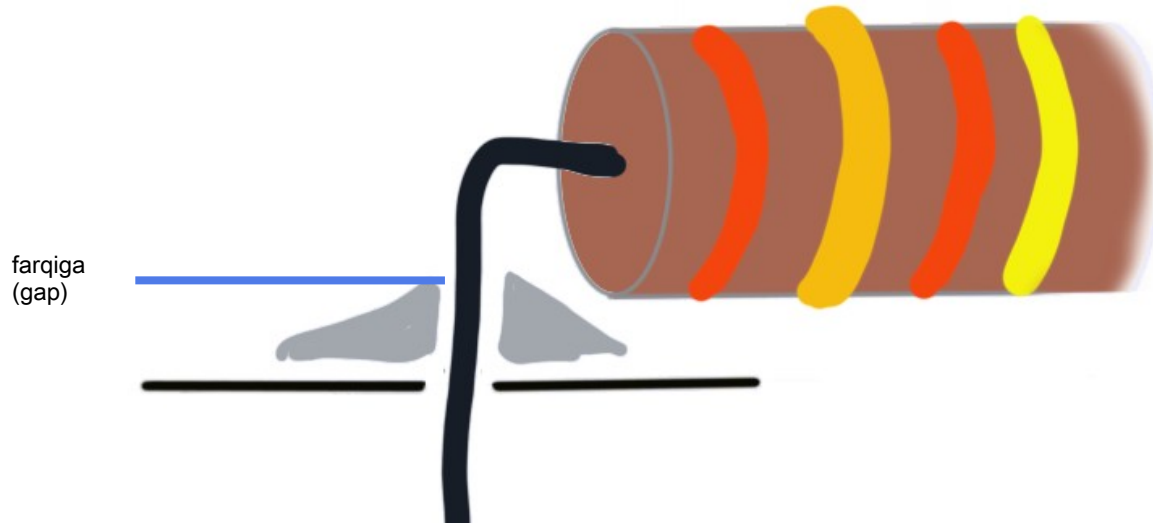
birta lagu  
shubo (solder)



Resistor-kaan wuxuu leeyahay xiriir wanaagsan, isagoo sameynaya wareeg (circuit) dhammaystiran.



Halkan, birta lagu shubay (solder) way dabacsan tahay oo wareegga (circuit) wuu jabay.



Dhibaatooyinkan midkee aan keenin farqi (gap) ku jira wareegga (circuit)?

**a**

fiilada (filament) way dhalaashaa

**b**

nalka (bulb) qiimihiisu wuu sarreeyaa oo ma shito



**c**

birta lagu shubay (solder) way dabacsan tahay

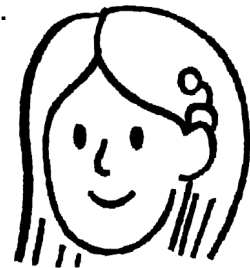
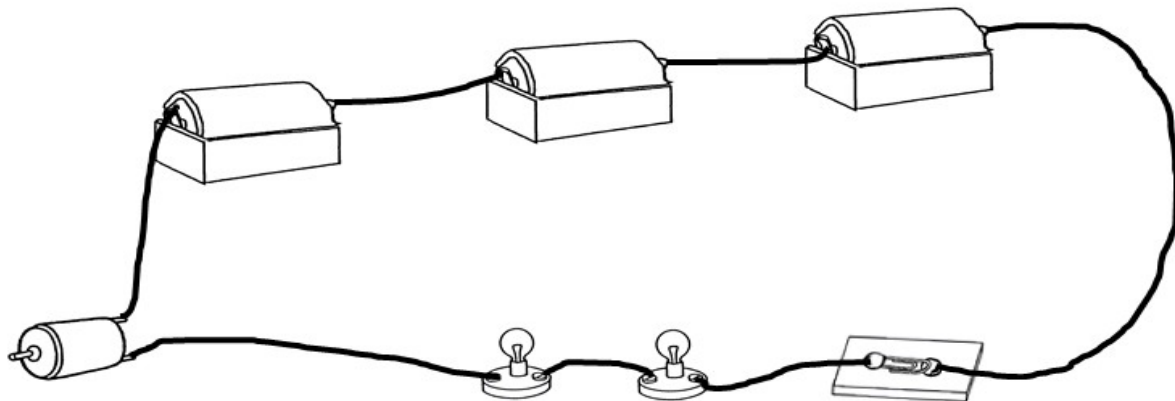
**d**

siliga (wire) ku jira hogaamiyaha (lead) wuu jabaa

Suad waxay samaysay wareeggan (circuit) si uu u shideeyo matoorka (motor) iyo laba nal (lamps).

Ma shaqeynayo.

Liis garo qaar ka mid ah hubinta (checks) ay samayn karto si ay u hagaajiso dhibaataada.



Qor qaar ka mid ah hubinta ay samayn karto si loo hagaajiyo dhibaataada.

Waxay samayn kartaa qaar ama dhammaan kuwan soo socda:

- Hubi in dhammaan unugyada (cells) ku jira baytariyada (battery) ay si sax ah u jihaysan yihiin.
- Hubi xidhidh kasta (connection) inuu dabacsan yahay iyo in kale.
- Ku beddel nalkasta (bulb), mid ka mid ah, mid aad ogtahay inuu shaqeeyo.
- Ku beddel matoorka (motor) mid aad ogtahay inuu shaqeeyo.
- Ku beddel hogaamiye kasta (lead), mid ka mid ah, mid aad ogtahay inuu shaqeeyo.
- Isku day inaad shidto oo damiso furaha (switch), ku beddel haddii loo baahdo.
- Tijaabi qayb kasta (component) adoo ku xidhaya nal (bulb) labada dhinac si aad u aragto haddii ay shaqeyso.
- Kala fur wareegga oo dib u dhis, bilow unug shaqeeya iyo nalka, ka dib ku dar hal qayb markiiba.

### Hagaajinta wareegyada khaldan



Dhibaatooyinka wareegga (Circuit)



Dhisidda iyo isticmaalka wareeg tijaabo ah



Tijaabinta wareegyada markaad dhisayso

Koronto-yaqaannadu waxay tijaabin karaan qaybaha (components) iyagoo isticmaalaya multimeter si ay u arkaan inay si sax ah u shaqeeyaan.

Badanaa, waa in la arko inay u oggolaadaan korontada inay dhex socoto.

multimeter

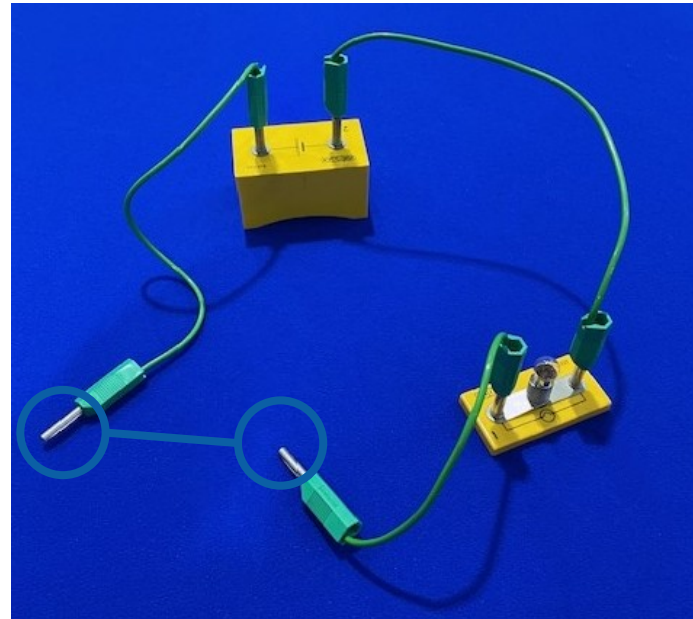


# Dhisidda iyo isticmaalka wareeg tijaabo ah

Waxaad dhisi kartaa wareeg tijaabo fudud oo leh unug, nalka, iyo xadhko (leads).

Hubi in wareeggu shaqeeyo adigoo si adag u taabtay xadhkaha (leads).

Nalku waa inuu iftiimaa.



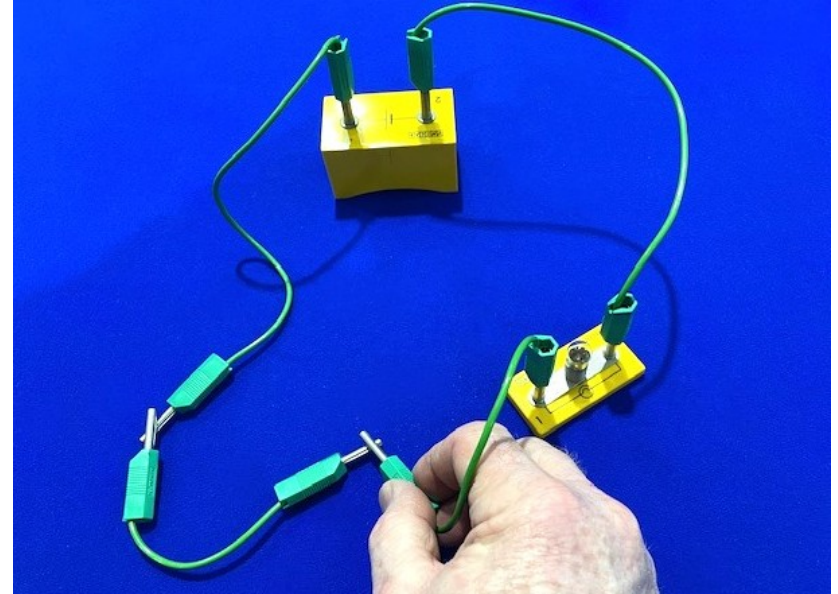
Haddii uusan shaqeeyn, beddel qaybaha, mid mid, ilaa uu shaqeeyo.

Wareegga tijaabada ah ayaa loo isticmaalayaa in lagu tijaabiyo xadhig (lead).

Nalku ma iftiimin.

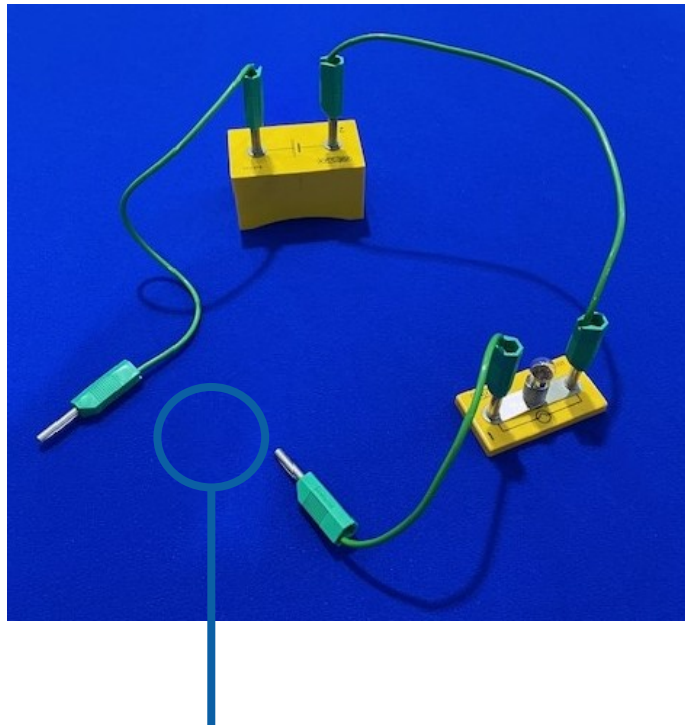
Tani waxay noqon kartaa sababtoo ah:

- xadhkuhu (leads) si fiican uguma cadaadinayaan
- xadhigga la tijaabinayo wuu khaldan yahay



Waxaad ku tababaran kartaa isticmaalka wareeg tijaabo ah si aad u aragto in qaybaha iyo walxaha kala duwan ay u oggolaadaan korontada inay dhex socoto.

Walxaha sidoo kale waa la tijaabin karaa si loo ogaado haddii ay yihiin kirishtoob (conductors) ama insulators (insulators).



ku dheji qaybta ama shayga halkan

Laba ka mid ah kuwan soo socda ayaa joojin lahaa laydhka (lamp) wareegga tijaabada inuu shido?

**a** girgirta tijaabada (test bulb) aad loo kudhiiday

**b** xadhkaha (leads) si ku filan looma riixin



**c** filament-ka (filament) girgirta tijaabada wuu dhalaalay



**d** unugga (cell) waa qaab qaldan

Dhis oo isticmaal wareeg tijaabo ah si aad u hubiso qaybaha iyo walxaha kala duwan inay koronto (electricity) mariyaan iyo in kale. Ku dheji natiijooyinkaaga miis (table).

| shay                                  | kirishtoob<br>(conductor) | insulator<br>(insulator) |
|---------------------------------------|---------------------------|--------------------------|
| girgir (lamp)                         |                           |                          |
| xadhig shaybaadh<br>(lab lead)        |                           |                          |
| resistor (resistor)                   |                           |                          |
| tusaale balaastiig<br>(plastic ruler) |                           |                          |
| maqas bir ah (steel<br>scissors)      |                           |                          |
| qalin 'lead' (pencil                  |                           |                          |

Dhis oo isticmaal wareeg tijaabo ah si aad u hubiso qaybaha iyo walxaha kala duwan inay koronto (electricity) mariyaan iyo in kale.

Ku qor natiijooyinkaaga miis.

| shay                                    | wareejiye<br>(conductor) | go'doomiye<br>(insulator) |
|-----------------------------------------|--------------------------|---------------------------|
| laambad (lamp)                          | haa                      |                           |
| fiilo shaybaar (lab lead)               | haa                      |                           |
| iska caabin (resistor)                  | haa                      |                           |
| xisaabta balaastigga<br>(plastic ruler) |                          | haa                       |
| maqas bir ah (steel scissors)           | haa                      |                           |
| qalin 'lead' (pencil lead)              | haa (si dhib yar)        |                           |

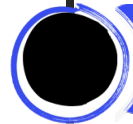
### Hagaajinta wareegyada qaldan



Dhibaatooyinka wareegga (circuit problems)



Dhisidda iyo isticmaalka wareegga tijaabada

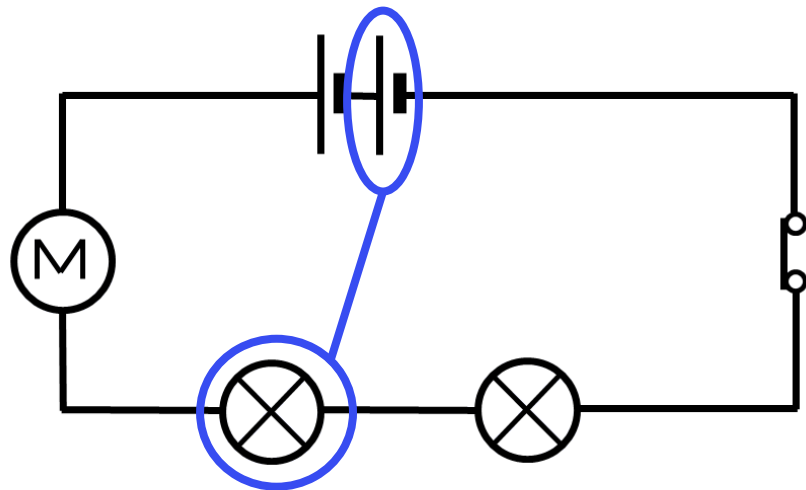


Tijaabinta wareegyada markaad dhisayso

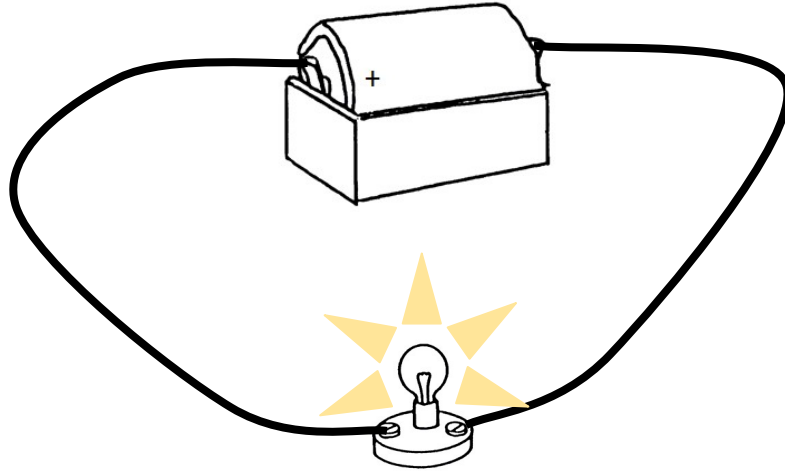
Haddii wareeggu (circuit) ka kooban yahay laydh (lamp), waxaa loo isticmaali karaa in lagu hubiyo in wareeggu (circuit) shaqeynayo sida loo dhisay.

Uma baahnid wareeg (circuit) tijaabo oo gaar ah.

Ku bilow dhisidda wareeggan (circuit) oo leh hal laydh (lamp) iyo hal unug (cell).

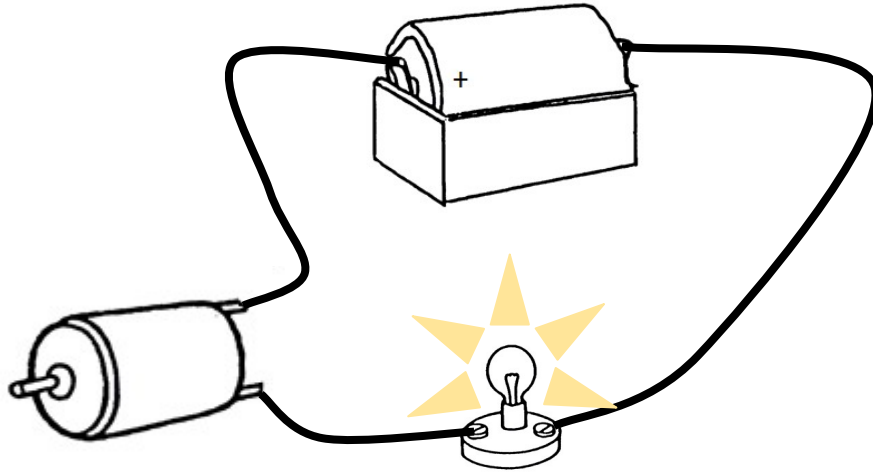


Haddii laydhku (lamp) shido, waxaad ogaataa in qaybaha (components) si sax ah u shaqeynayaan.



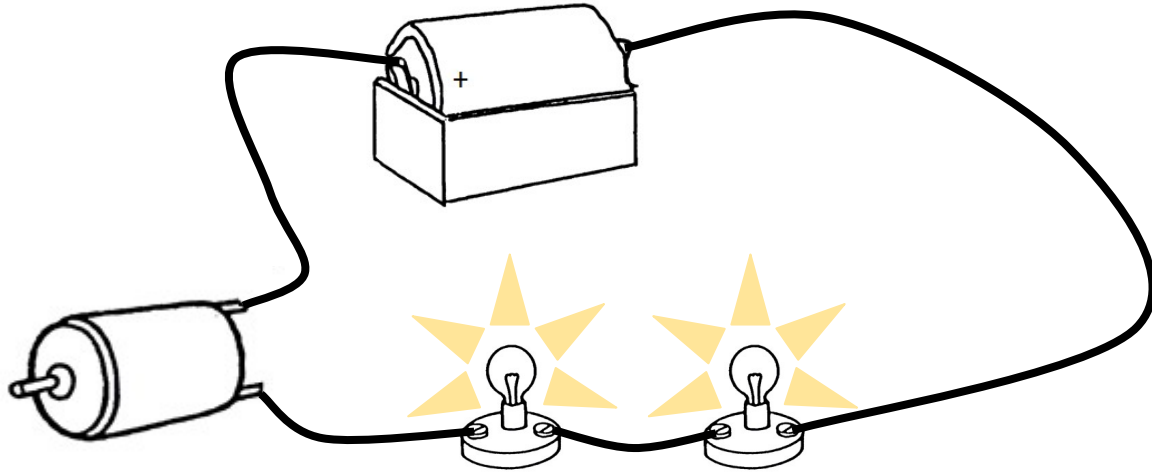
# Tijaabinta wareegyada (circuits) inta aad dhisaysid

Ku dar qayb (component) kale, oo hubi in laydhku (lamp) shaqeynayo.



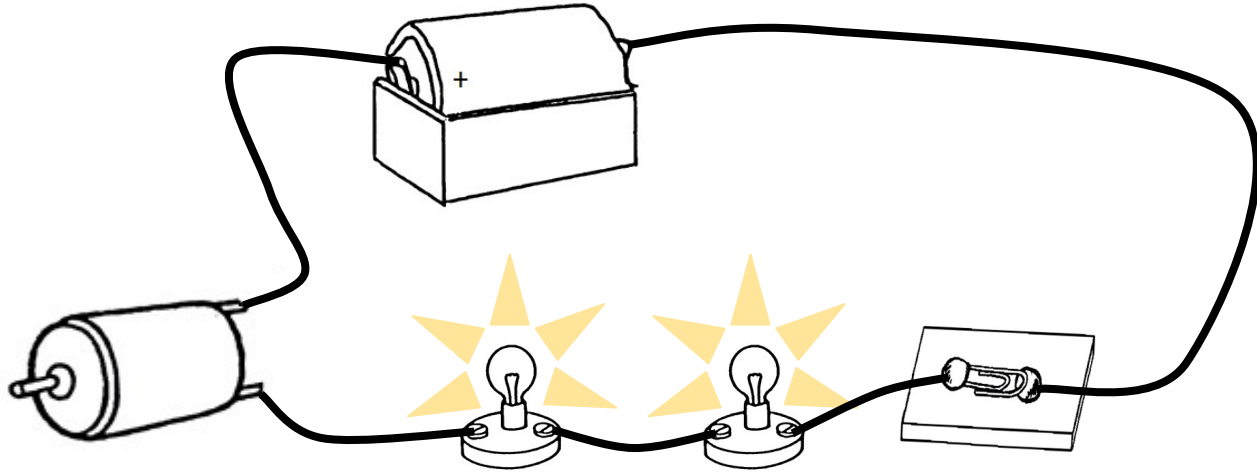
# Tijaabinta wareegyada (circuits) inta aad dhisaysid

Ku dar laydhka (lamp) xiga, oo hubi in labaduba shidaan.



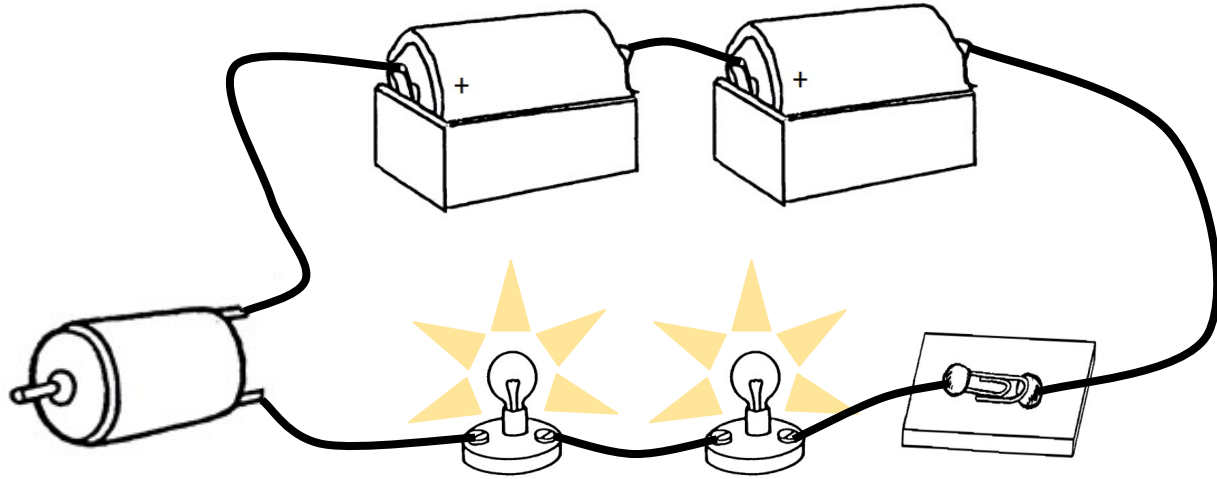
# Tijaabinta wareegyada (circuits) inta aad dhisaysid

Ku dar furaha (switch).



# Tijaabinta wareegyada (circuits) inta aad dhisaysid

Ku dar furaha (switch). Kadibna ku dar unugga (cell) labaad.



Haddii qayb (component) kasta uu sababo in laydhku (lamp) damiyo, waxaad ogaataa inay qalad tahay oo waa in la beddelaa.

# Tijaabinta wareegyada (circuits) inta aad dhisaysid



## Run mise been?

Haddii wareeggu (circuit) leeyahay cillad (fault), waxaa loo baahan yahay wareeg (circuit) tijaabo ah si loo hubiyo.



**Run**



**Been**



## Sabab u sheeg jawaabtaada

**a**

Wareegga (circuit) waxaa loo dhisi karaa qayb-qayb (component-by-component), adoo hubinaya inuu shaqeynayo mar kasta.



**b**

Ma suurto geli karo in la ogaado qaybta (component) cilladaysan (faulty) iyada oo aan la helin wareeg (circuit) tijaabo ah.

Layla iyo Yacquub waxay dhisayeen wareegyo (circuits) waxayna heleen qaybo (components) cilladaysan (faulty).

Qaybaha (components)  
cilladaysan (faulty) waxay ka  
dhigeen barashada mid adag.



Qaybaha (components)  
cilladaysan (faulty) waxay iga  
caawiyeen inaan si fiican u barto.



Sharax sababta labada ardayba u malayn karaan inay sax yihiin. Kadibna soo jeedi inay faa'iido leedahay iyo in kale in qalabka sheybaarka lagu hayo qaybo khaldan.

Sharax sababta labada ardayba u malayn karaan inay sax yihiin. Kadibna soo jeedi inay faa'iido leedahay iyo in kale in qalabka sheybaarka lagu hayo qaybo khaldan.

Qaybaha khaldan waxay noqon karaan dhibaato sababtoo ah waxay ka hor istaagi karaan ardayda inay si guul leh u sameeyaan tijaabooyinka, taasoo keenta inay waayaan barashada.

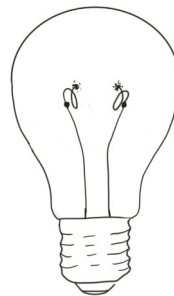
Dhanka kale, waxay siin karaan fursad ardayda ay ku tababartaan xirfadahooda oo ay mas'uuliyadda barashadooda ku qaataan.

Ardayda isku kalsoon waxay u arki karaan qaybaha khaldan fursad ay ku bartaan, halka kuwa aan isku kalsoonayn ay u baahan karaan taageero.

## Soo koobid Hagaajinta wareegyada khaldan

Qaybaha khaldan waxay abuuraan farqi (gap) ku dhex jira wareeg (circuit) dhammaystiran, taasoo ka hor istaageysa inuu shaqeeyo.

Nalka (bulb) wuxuu ka kooban yahay fiilo (filament) iftiimaysa, laakiin tani way dhalaali kartaa oo jebin kartaa wareegga.



Wareeg tijaabo (test circuit) ayaa kaa caawin kara inaad aqoonsato qaybaha khaldan.

Haddii wareeggu uusan shaqeyn, qayb kasta waxaa lagu tijaabin karaa si gooni ah iyadoo la isticmaalayo wareeg tijaabo si loo hubiyo inay shaqeyneyso.

