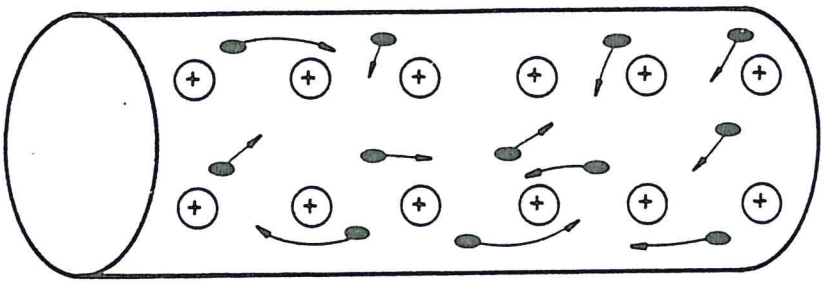
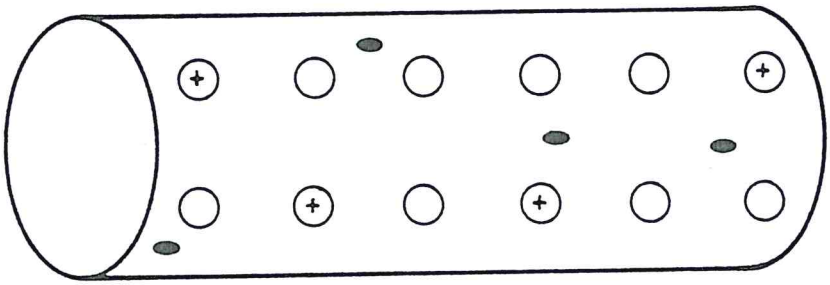
AUFBAU VON FESTEN KÖRPERN



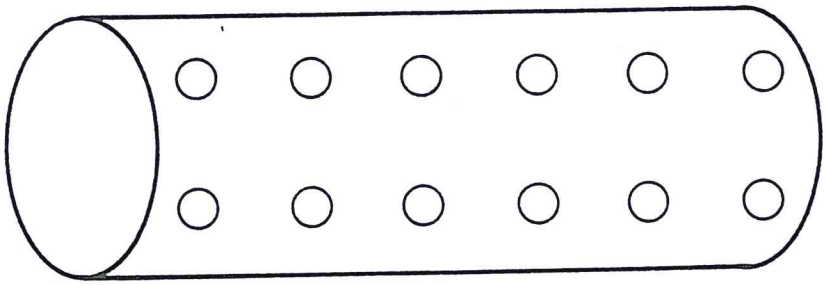
METALL:

Guter Leiter,
viele freie Elektronen
in ungeordneter
Bewegung



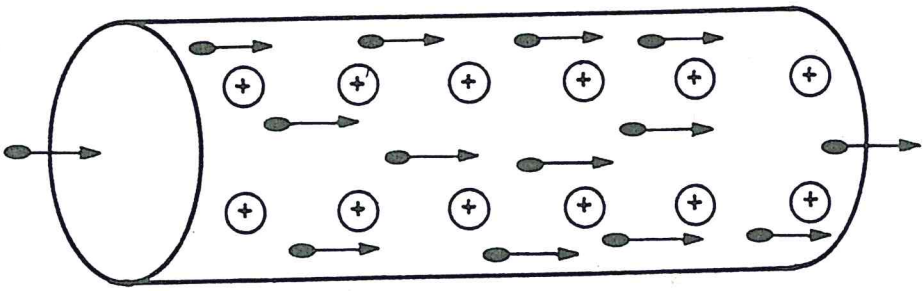
HALBLEITER:

Schlechter Leiter,
wenig freie Elektronen



ISOLATOR:

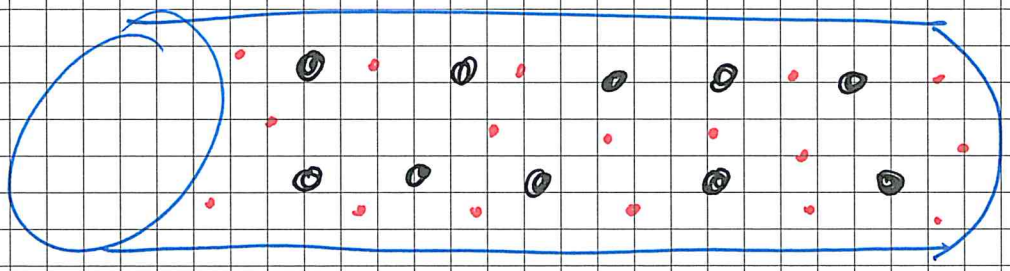
Keine freien Elektronen



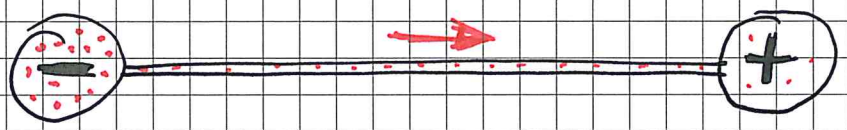
ELEKTRONENSTROM:

In einer Richtung
fließende Elektronen

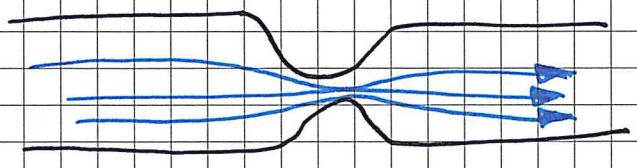
Elektrischer Strom
Elektrische Spannung



Wasserstrom versucht Pegelunterschied auszugleichen

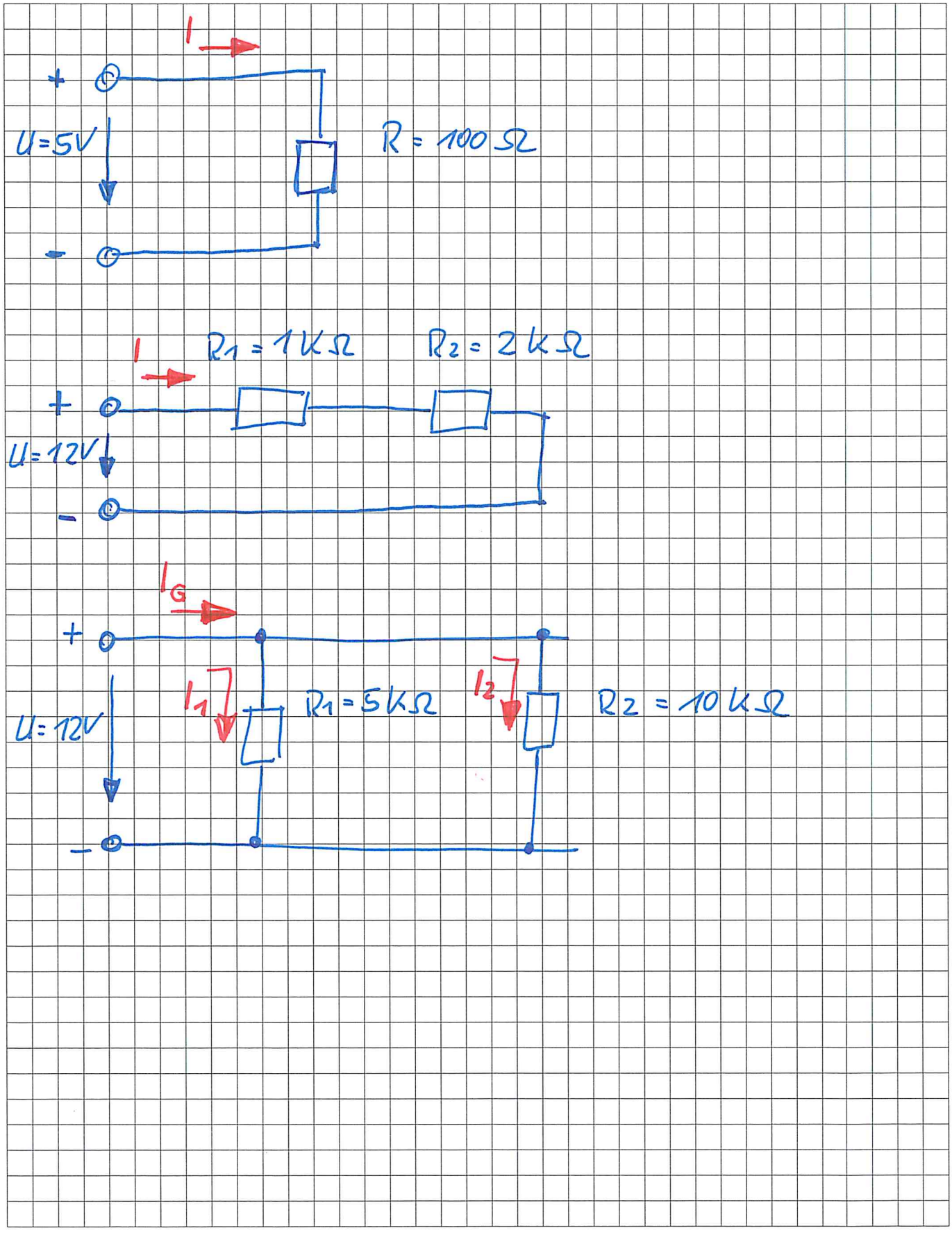


Elektronenstrom versucht Potentialunterschied auszugleichen



Hindernis im Wasserstrom

Hindernis im Elektronenstrom



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$$I = \frac{U}{R} = \frac{5V}{100\Omega} = 0{,}05A = 50\,mA$$

$$R_G = R_1 + R_2 = 1k\Omega + 2k\Omega = 3k\Omega$$

$$I = \frac{U}{R_G} = \frac{U}{R_1 + R_2} = \frac{12V}{3k\Omega} = 4\,mA$$

$$I_1 = \frac{U}{R_1} = \frac{12V}{5k\Omega} = 2{,}4\,mA$$

$$I_2 = \frac{U}{R_2} = \frac{12V}{10k\Omega} = 1{,}2\,mA$$

$$\frac{1}{R_G} = \frac{1}{R_1} + \frac{1}{R_2} = \frac{1}{5k\Omega} + \frac{1}{10k\Omega} \qquad R_G = 3{,}33k\Omega$$

$$I_G = I_1 + I_2 = 2{,}4\,mA + 1{,}2\,mA = 3{,}6\,mA$$

$$= \frac{U}{R_G} = \frac{12V}{3{,}3k\Omega} = 3{,}6\,mA$$

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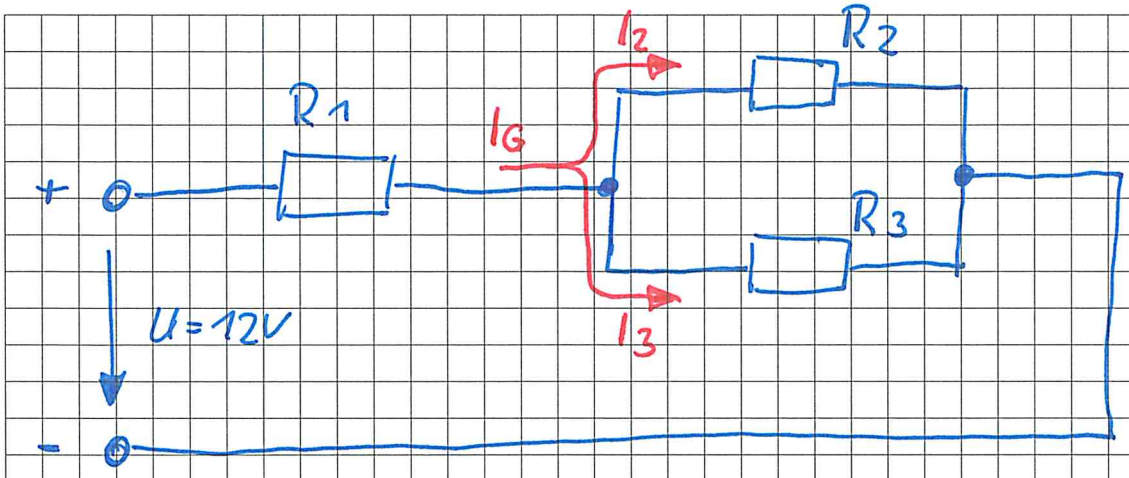

$R_3 = 800\,\Omega \qquad I_3 = 5\,mA \qquad I_2 = 4\,mA$

$$U_{2/3} = R_3 \cdot I_3 = 800\,\Omega \cdot 5\,mA = 4V$$

$$R_2 = \frac{U_{2/3}}{I_2} = \frac{4V}{4\,mA} = 1\,k\Omega$$

$$I_G = I_2 + I_3 = 4\,mA + 5\,mA = 9\,mA$$

$$U_1 = U - U_{2/3} = 12V - 4V = 8V$$

$$R_1 = \frac{U_1}{I_G} = \frac{8V}{9\,mA} = 888{,}88\,\Omega$$

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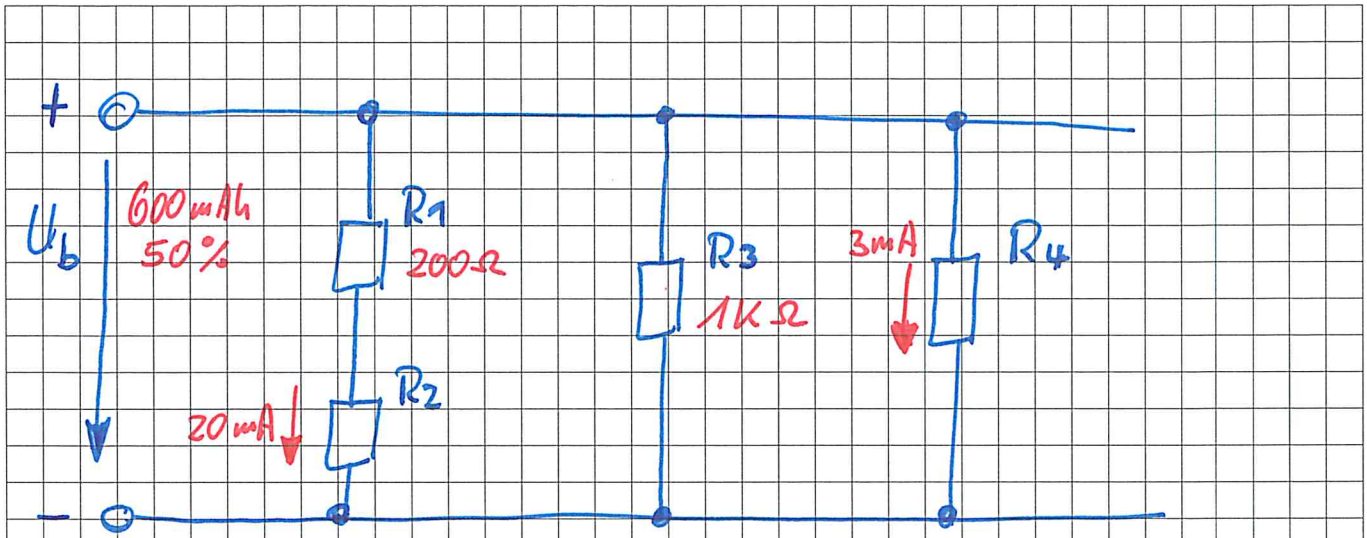

$R_1 = 200\,\Omega$ $I_2 = 20\,mA$

$U_2 = 2 \cdot U_1$ $I_4 = 3\,mA$

$R_3 = 1\,K\Omega$ $Q = 600\,mAh$ (50 %)

$U_1 = 4\,V$ $I_G = 35\,mA$ $R_2 = 400\,\Omega$

$U_2 = 8\,V$ $I_3 = 12\,mA$ $R_4 = 4\,K\Omega$

$U_b = 12\,V$ $t = 8{,}57\,h$ $R_G = 343\,\Omega$

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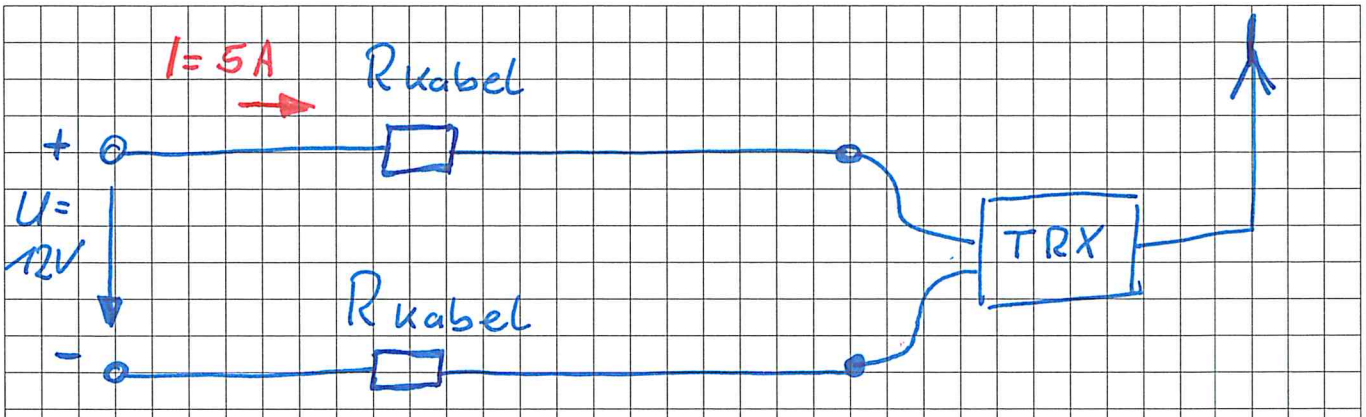

$L = 5{,}5\ m$

$S = 0{,}0178\ \frac{\Omega \cdot mm^2}{m} = \frac{1}{56}$

$R = \frac{S \cdot L}{A}$

$A = 0{,}25\ mm^2$

$R = 0{,}3916\ \Omega$ $\quad U_{kabel} = 2 \cdot 2V$

$A = 1{,}00\ mm^2$

$R = 0{,}0979\ \Omega$ $\quad U_{kabel} = 2 \cdot 0{,}5V$

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