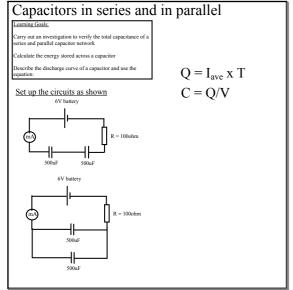
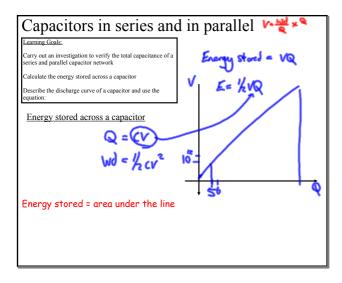


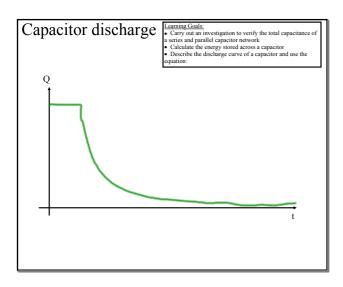
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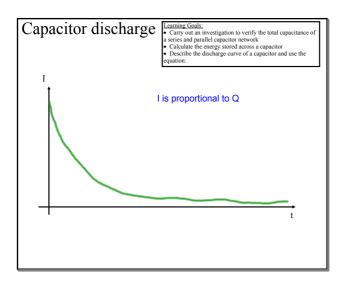
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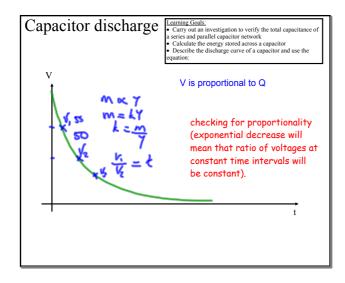
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Discharge equations

earning Goals:

• Carry out an investigation to verify the total capacitance of series and parallel capacitor network

• Calculate the energy stored across a capacitor

• Describe the discharge curve of a capacitor and use the

$$V = V_0 e^{-RC}$$

where:

V = voltage at time t

 V_0 = initial voltage R = resistance

C = capacitance

$$V = V_0 e^{-RC}$$
$$I = I_0 e^{-RC}$$
$$Q = Q_0 e^{-RC}$$

V, I and Q are all proportional, so as one decreases, so do the others at the same rate.

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Discharge equations

Learning Goals:

Carry out an investigation to verify the total capacitance of a series and parallel capacitor network

Calculate the energy stored across a capacitor

Describe the discharge curve of a capacitor and use the accustion:

$$V = V_0 e^{-RC}$$

$$I = I_0 e^{-RC}$$

$$Q = Q_0 e^{-RC}$$

The product of the capacitance and the resistance is known as the Time Constant.

Units of R are: volts per amp (v/A) - therefore sV/cUnits of capacitance are: coulombs per volt (c/V) So, their product is: $sV/c \times c/V = s$ (Units of time)

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Discharge equations

 $V = V_0 e^{-RC}$ solving the equations: Learning Goals:

Carry out an investigation to verify the total capacitance of a series and parallel capacitor network

Calculate the energy stored across a capacitor

Describe the discharge curve of a capacitor and use the

1) Take In to remove e

$$\ln V = \ln V_0 - RC$$

$$\frac{1}{V} = \frac{1}{V} - \frac{1}{V}$$

$$\ln \frac{V}{V_0} = -RC$$

2) When V has halved from its original value (V = $V_0/2$), then $ln(V/V_0)$ will equal $ln(^1/_2)$

Therefore, In0.5, (-0.693), is equal to -RC.

This means that 0.693RC is the time taken for the voltage to half from it's original value.

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