QUICK START TUTORIAL

CREATING A PROJECT STEP-BY-STEP

Welcome! We assume that you have successfully installed Pintar ***VirtuaLab***$_{TM}$ Electricity on your computer and are now ready to create your very first virtual experiment with the Pintar ***VirtuaLab***$_{TM}$ Electricity! An experiment is created by linking together electrical components into a circuit, and testing its validity. In this tutorial, the goal is to put together a simple circuit that would verify Ohm's Law.

For a novice user, the quickest way to become familiar with Pintar ***VirtuaLab***$_{TM}$ Electricity is to follow this step-by-step tutorial. Pintar ***VirtuaLab***$_{TM}$ Electricity is designed to be very 'user-friendly'. Throughout this tutorial, you will find quick references to the detail description, indicated by this symbol ? . Now, have fun with your first experiment.

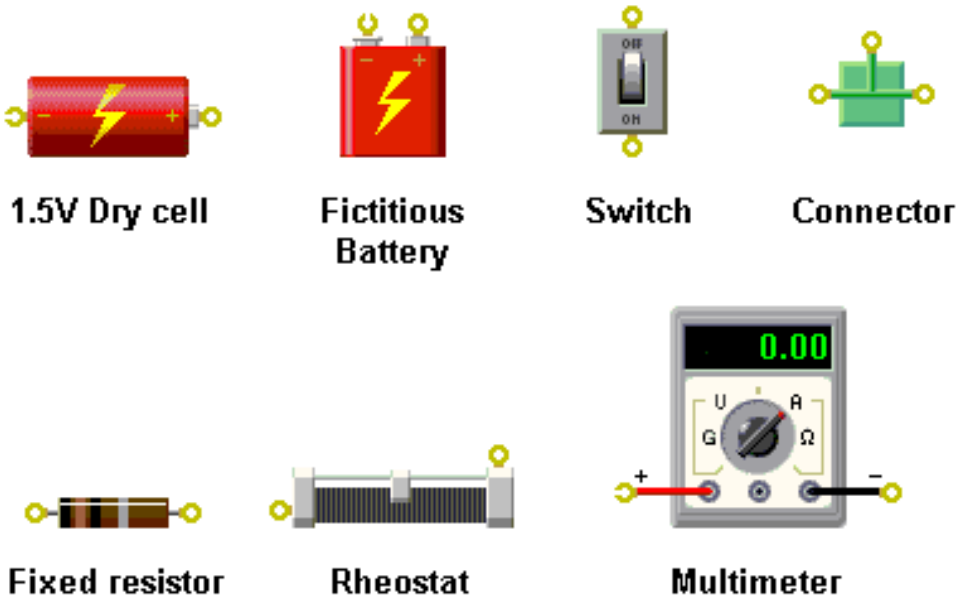
OBJECTIVE:

To determine the relationship between current, resistance, and voltage in a DC circuit.

TUTORIAL

COMPONENTS USED:

For this experiment, you would need the following components:



METHOD:

1. Starting up Pintar *Virtua*Lab$_{TM}$ Electricity

Double-click on ELEC.EXE

2. Start a new project

Select 'New' from the File menu. You will see a blank Workbench named 'Untitled-1'.

? • **Starting a new experiment**

3. Placing a component on the Workbench

All components are kept in the Components Menu. Select the components you need (see 'Components Used' above) for your experiment and place them on the Workbench.

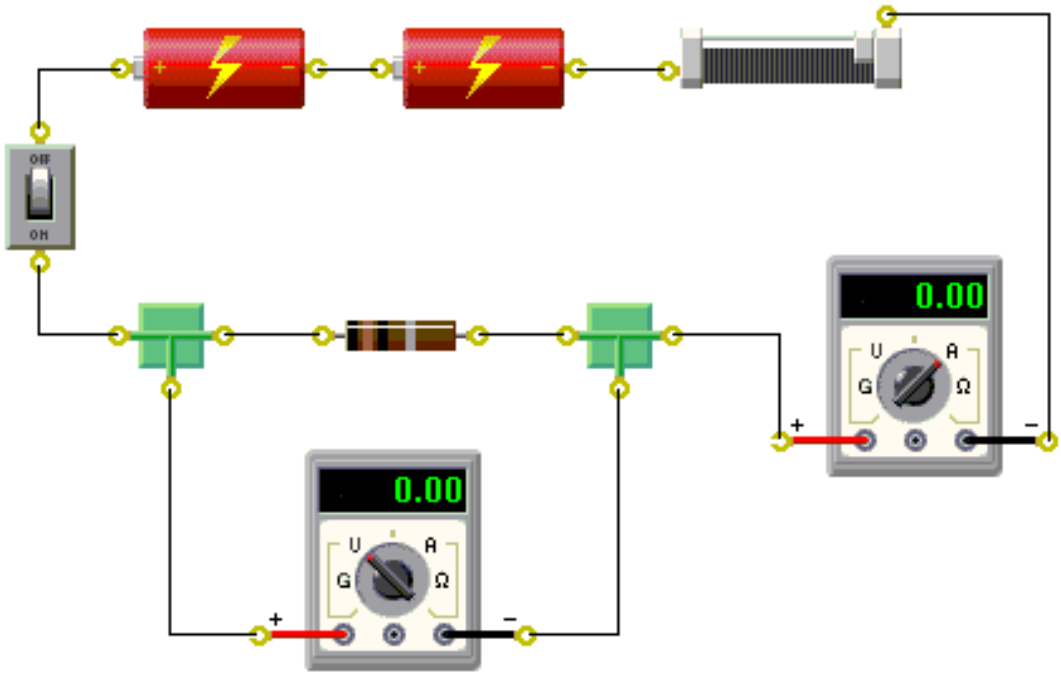
a. Click on the Components menu. A categorical list of components appears.
b. Slide your cursor down the list; and for each category of components, a second tier menu listing the individual components appears.
c. Click on the components you seek. The cursor changes into the shape of the component.
d. Move the cursor to the spot on the Workbench where you want to place the component and click. The chosen component is transferred onto the Workbench.
e. Repeat Step 2 until you have placed all the required components onto the Workbench.

You can also select the components you need from the components bar at the left.

? • **The Workbench Environment**

4. Connect the components to create a circuit

After transferring the required components onto the Workbench, you may then proceed to connect the components, so that your circuit resembles that shown in the diagram below.



? • **Connecting Components Together**

? • **Rotating a component on the Workbench**

? • **Creating a bend in a connection**

5. Set appropriate parameters for components

Set the properties for the components:

Multimeters : set one multimeter to an ammeter, and the other one to a voltmeter.

Fixed resistor : Set the fixed resistor to 1 ohm.

? • **Specifying the parameters of a component**

6. Annotate your experiment

It is always a good practice to annotate or label your experiment. To add an annotation:

a. Select the Text component from the Component menu.
b. Move the cursor to the Workbench and click at the location where you wish to place the text. A text object with the default word "Text" appears at the position where you clicked.
c. Next, double-click on the text object and the text properties dialog panel appears.
d. In the scrolling field enter the appropriate text that you wish to display.
e. Choosing from the options available, set alignment and font.
f. When satisfied with the setting, click 'OK'.

7. Save your experiment

Save the project by selecting 'Save As...' from the File menu. Name the project. You may want to save your project in the Examples folder.

? • **Saving an experiment**

8. Play your experiment

You are now ready to play your experiment. Click on the 'Play' or 'Run' button at the bottom of the Workbench. Then close the circuit by clicking on the 'switch' component.

Change the resistance in the circuit by sliding the saddle on the rheostat. Make a note of the new readings in the meters. Repeat the process for about ten different readings.

On a piece of paper, write down the readings in each of the multimeters, for example,

	Voltmeter Reading	Ammeter Reading
1.	0.00	0.00
2.	0.04	0.04
3.	0.06	0.06
4.	0.12	0.13
5.	0.30	0.30
6.	0.50	0.50
7.	0.70	0.70
8.	1.50	1.50
9.	2.20	2.20
10.	3.00	3.00

9. Stop your experiment

After obtaining the ten readings, stop the project by clicking on the 'Construct' or 'Stop' button.

10. Re-edit your project

Change the circuit (substitute the two 1.5V dry cell batteries to a single fictitious battery) to reflect the diagram below.

a) Change the parameters of the following components to:

Voltage (fictitious battery) : 6 volts

Fixed resistor : 30 ohms

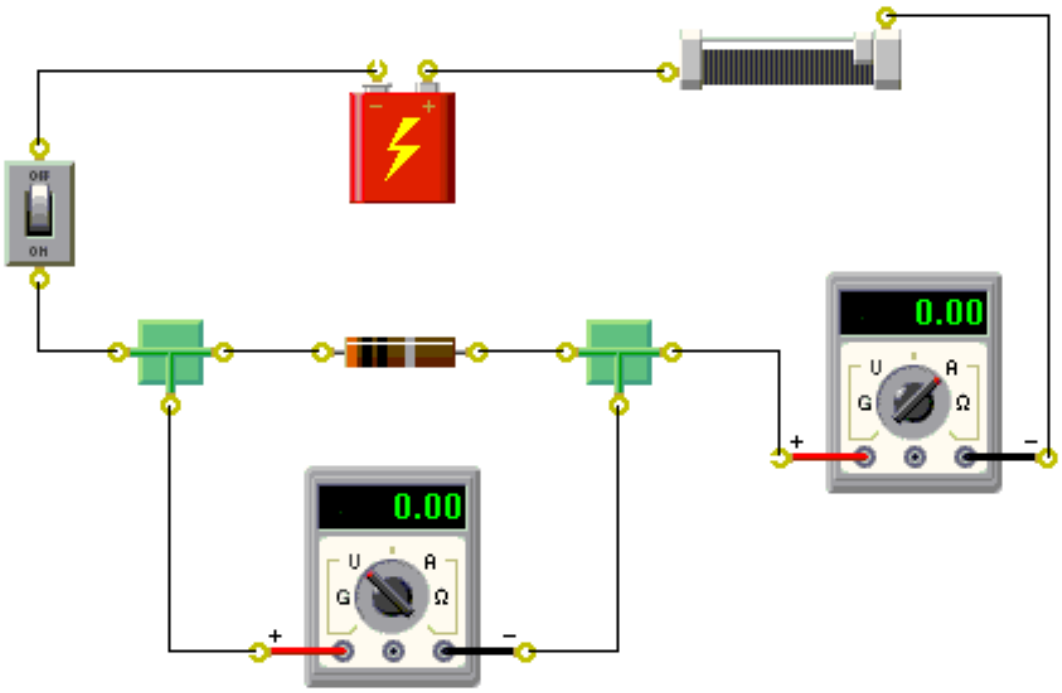
Repeat steps 8 to 10.

b) Once again, change the parameters of the following components to:

Voltage (fictitious battery) : 15volts

Fixed resistor : 10 ohms

Repeat steps 8 to 10.

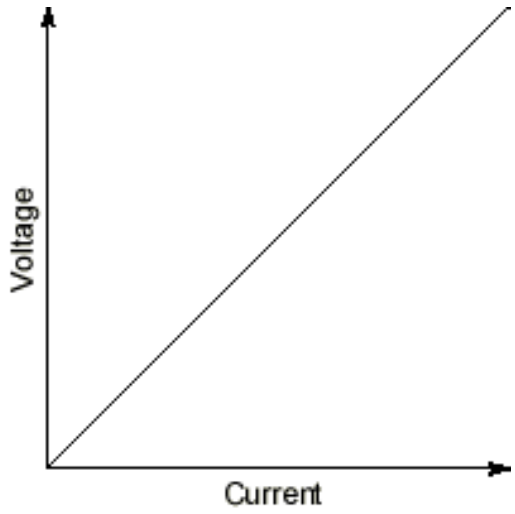


11. Ending your work session

Finally, when you are ready to call it a day, select 'Exit" from the File menu.

OBSERVATIONS:

For the three sets of data that you have collected, draw a graph with each set of data, with the y-axis representing voltage and the x-axis for current.
The diagram below shows the plot for the set of data in the example in Section 8 above. You will notice that in each of the three graphs, a straight line has resulted produced from the plot in each case.



INTERENCE:

A straight line through the origin' graph conforms to the general equation,

$y = mx$ where, m is a constant

In this experiment, resistance (fixed resistor) has been kept constant, while the current is varied via the rheostat. The change in voltage in the circuit was noted. Therefore, it can be deduced by substitution into the equation above.

voltage = current x resistance

go to top