Virtual Laboratory Experiment Design Guidelines (VLEDG)

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Virtual laboratory definition

The Virtual Laboratory is an interactive environment for creating and conducting simulated experiments.

A playground for experimentation.

It consists of domain-dependent simulation programs, experimental units called objects that encompass data files, tools that operate on these objects.

A computer simulation, which enables essential functions of laboratory experiments to be carried out on a computer, is called a virtual laboratory (VL) (Harms, 2000).

Virtual laboratory definition

Science-simulation software falls into two main categories:

1. Virtual laboratories
2. Simulations of scientific phenomena

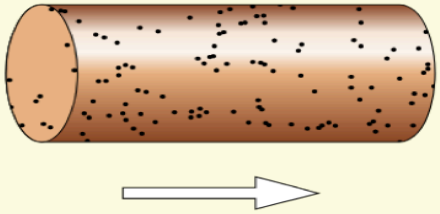
Virtual laboratories simulate on-screen the experiments that are traditionally performed in real school laboratories as part of biology, chemistry, and other science subjects.

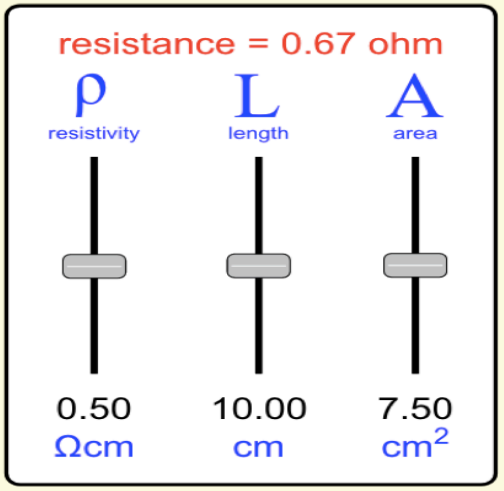
They provide opportunities to use virtual materials, equipment, and tools that are designed to replicate those in an actual laboratory.

(Kathleen Scalise et.al., 2011)

Difference between
Simulation of scientific phenomena and Virtual laboratory

$$R = \frac{\rho L}{A}$$





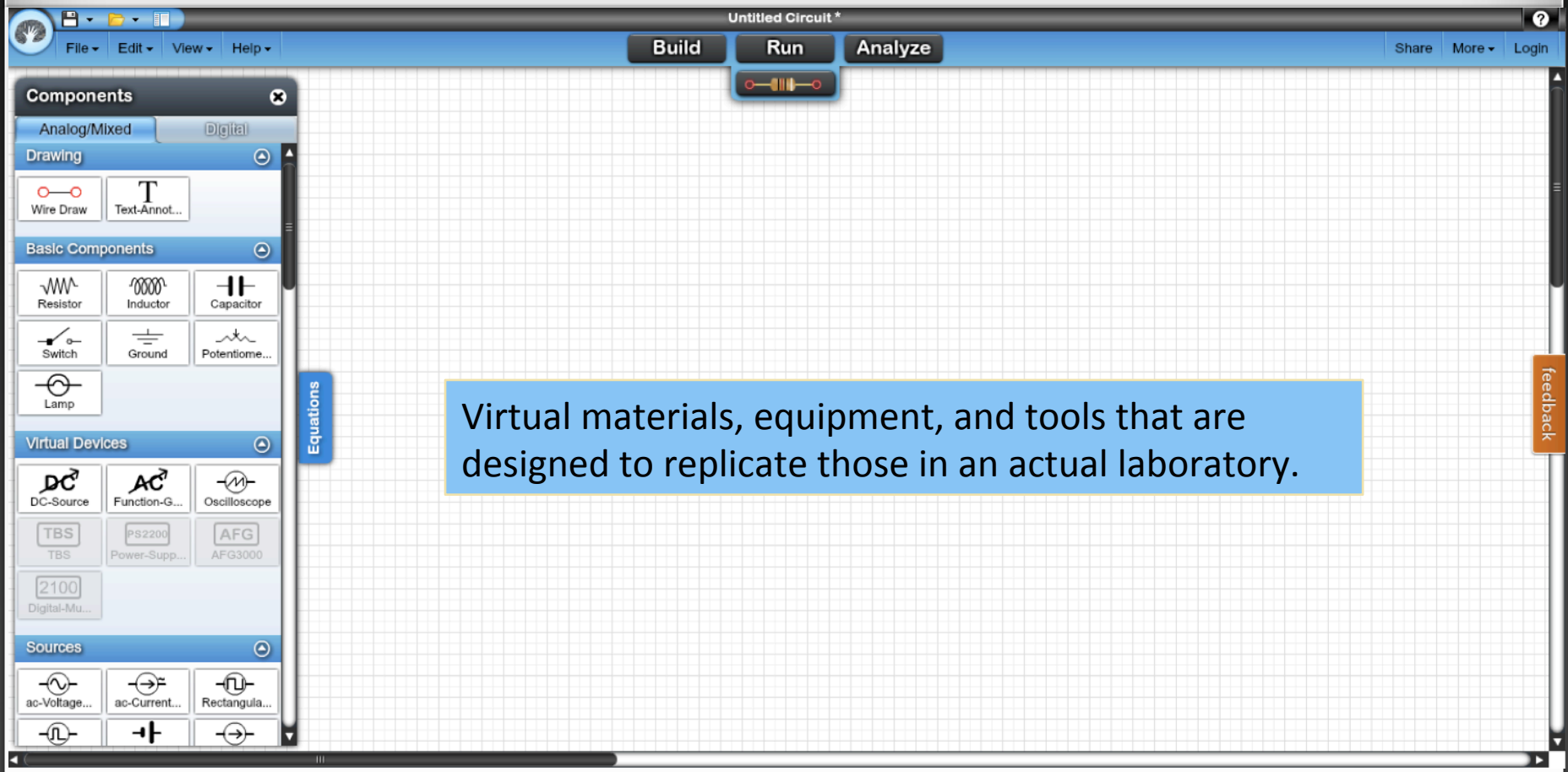
Simulation of scientific phenomena

Resistance in a Wire

PhET

https://phet.colorado.edu/sims/html/resistance-in-a-wire/latest/resistance-in-a-wire_en.html

Difference between
Simulation of scientific phenomena and Virtual laboratory



Virtual materials, equipment, and tools that are designed to replicate those in an actual laboratory.

What next?

Scientific Design of Virtual laboratory Experiments