



# Defining and Finding Open Educational Resources (OER)

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***Professor, Information Systems, CSU Fullerton***

***Fulbright OER Specialist***

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# Overview

- What is “open” - why you should care?
- Categories of “open”
- Focusing on Open Educational Resources (OER)
- Ownership considerations
- MERLOT – the OER Gateway







— why —  
**OPEN**  
**EDUCATION**  
— matters —

Enables **instructors and researchers** to reuse, recycle, and/or build upon other people's work, materials, expertise

Provides **students** with a potential infinity of high quality learning resources





# Categories of Open

1. Open Source (OS)
2. Open Access (OA)
3. Open Source Hardware, Open Data, etc.
4. Open Educational Resources (OER)
  - Open Courseware (OCW)
  - Open Textbooks
  - (Open) Learning Objects



**OS**

**≠**



**OA**

**≠**



**OER**

**≠**



**OSH**

**≠**



**OD (etc)**

# Open Source

- Concerns software
  - Linux
  - Lucene
  - Moodle
  - Canvas (without support)
  - Instances of freeware
  - Spring Framework, Apache Web Server, Apache Tomcat, MySQL  
... and so many more...



# Open Access



- It's traditional **print** material
- Started with **journal articles** – usually peer reviewed
- Trend is to include **online textbooks**
- Readers can retrieve articles without financial or access barriers
- **No fees, registration, or membership**
- Proponents argue:
  - **It's on the WWW, so it should be free!**
  - Researchers contribute articles & review for free → their employers shouldn't have to pay to access the articles
  - Research funded by government agencies should be available for free



## About IEEE Open Access

Overview

**FAQs**

For Authors

Author Benefits

Author Processing Charges

For Institutions & Funders

Partnership Options

Institutional Partners

Publishing Options

Hybrid Journals

Topical Journals

IEEE Access

**What is IEEE doing?**  
**Visit [ieee.org](http://ieee.org)**

Home > About IEEE Open Access > FAQs

## FAQs

### Basic information about open access (OA)

#### What is the difference between “free” content and “open access” content?

Free content usually consists of editorial matter such as tables of contents, covers, advertisements, etc. This content is available to all within IEEE *Xplore* and it is not supported by article processing fees.

OA content is technical in nature, peer reviewed, supported by article processing fees, and available to all.

#### What do the terms “green” and “gold” open access refer to?

“Green” open access refers to practice of depositing a version of an article in a repository. Usually, that article version will be freely accessible to the public. If (for example) an author posts the accepted version of his or her NIH-funded article to PubMed Central, that article is said to be available through green open access.



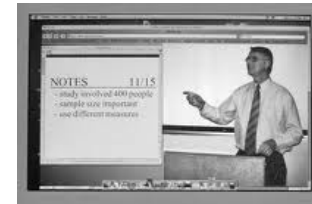
# Open Educational Resources (OERs)

- “Open Educational Resources” – term first adopted at UNESCO 2002 Forum, funded by Hewlett Foundation, on Impact of Open Courseware for Higher Education in Developing Countries
- Digitized teaching and learning materials offered freely and openly for educators, students, and self-learners to i) use and re-use ii) without charge for teaching, learning, and research
- OER reside in the public domain iii) released with an intellectual property license that permits free use or re-purposing by others.



# Some Kinds OERs

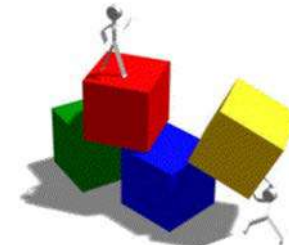
**Online Courseware**



**Online Textbooks**



**Online Learning Objects**



# Learning Objects

A new way of thinking about learning content. Traditionally, content comes in a several hour chunk. **Learning objects can be much smaller units or building blocks for instruction and learning, typically ranging from 2-15 minutes to much longer.**



They:

- Are **self-contained** – each learning object can be taken or used independently.
- Are **tagged with “metadata”** – every learning object has descriptive information allowing it to be easily found by a search.
- Can be **aggregated** – learning objects can be grouped into larger collections of content, including traditional course structures.
- Are **reusable** – a single learning object may be used in multiple contexts for multiple purposes.

# Learning Object Standards



- IEEE Learning Technology Standards Committee (LTSC) P1484
- Sharable Content Object Reference Model – SCORM
- Advanced Distributed Learning (ADL) Initiative
- IMS (Instructional Management System) Global Learning Consortium
- AICC: The Aviation Industry CBT (Computer-Based Training) Committee
- PROMETEUS: PROMoting Multimedia Access to Education and Training in European Society
- The Dublin Core: Metadata for Electronic Resource

Everything You Ever Wanted to Know About Learning Standards But Were Afraid to Ask. –Hodgins & Conner  
<http://www.linezine.com/2.1/features/wheyewtkls.htm>

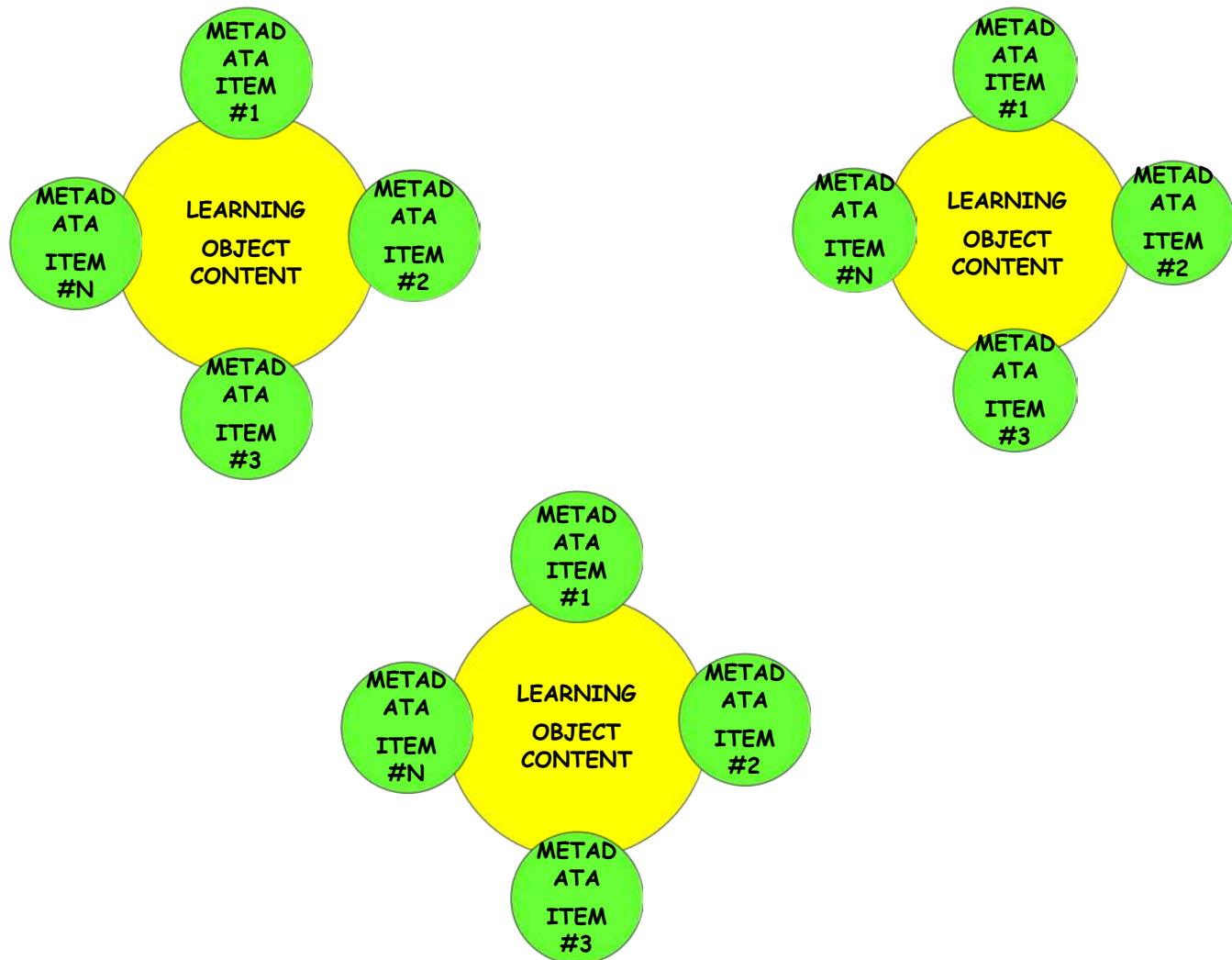
# Learning Object Definitions\*

- “Any entity, **digital** or non-digital, that may be **used** for **learning**, education or training” (IEEE)
- “Any **digital** resource that can be **reused** to support **learning**” (David Wiley)
- “A **digital** self-contained and **reusable** entity, with a clear educational purpose, with at least three internal and editable components: content, learning activities and elements of context. The **learning** objects must have an external structure of information to facilitate their identification, storage and retrieval: the metadata” (Chiappe, et al)
- “Web-based interactive chunks of e-learning designed to explain a stand-alone **learning** objective” (RLO-CETL)
- “A **digitized** entity which can be **used**, **reused** or referenced during technology supported **learning**” (Daniel & Mason)



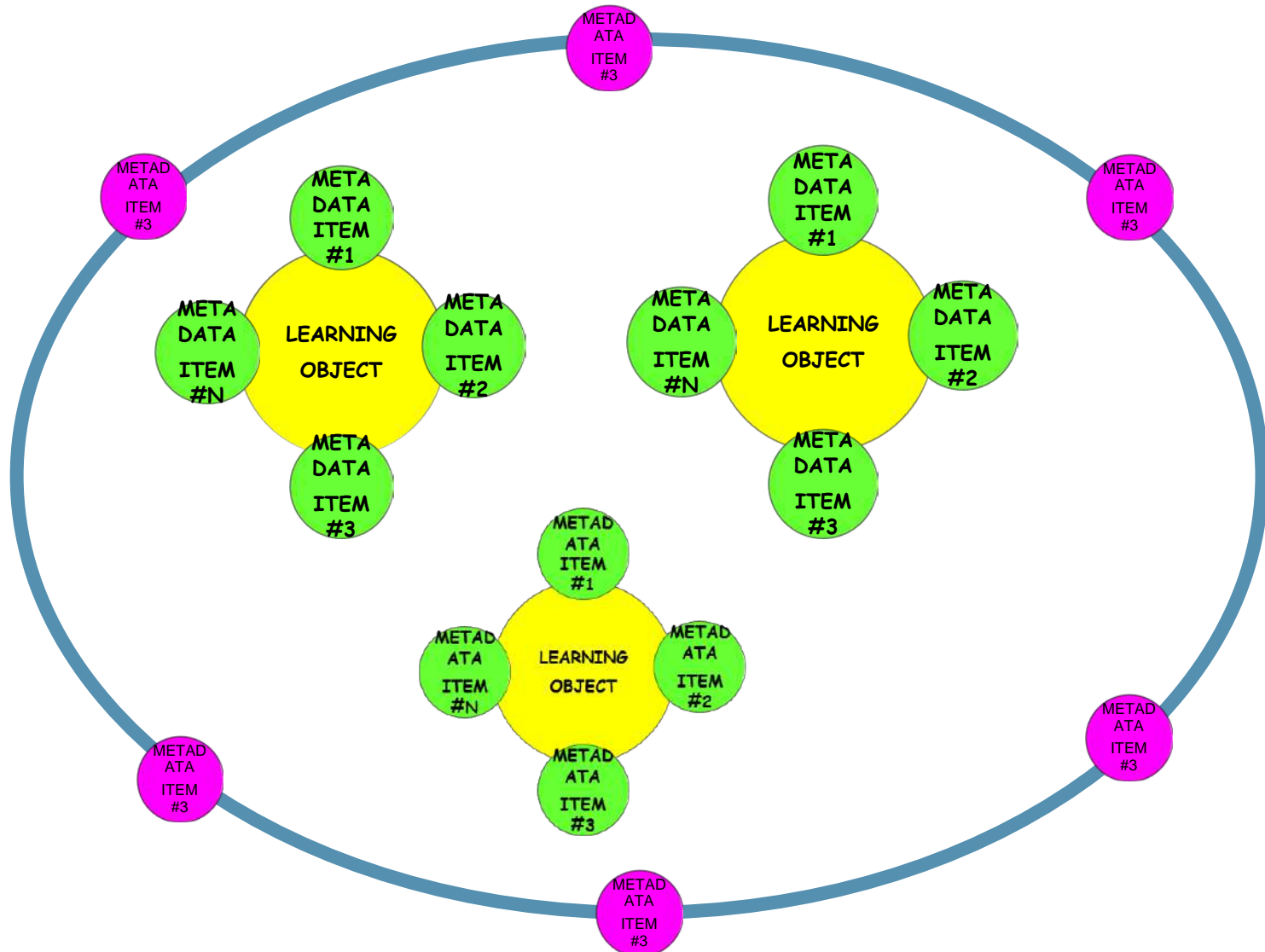
\*Wikipedia

# Individual Learning Objects



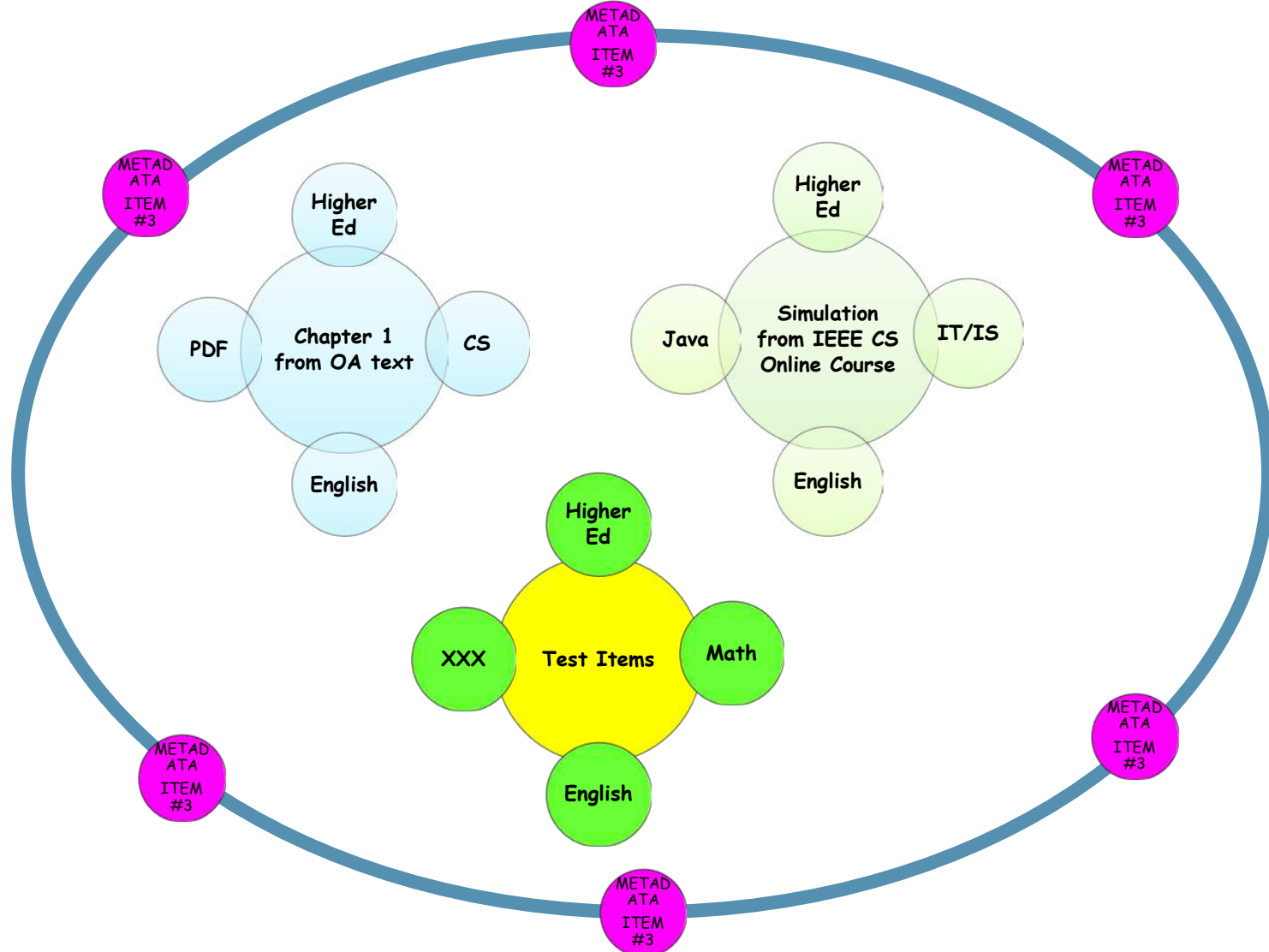


# Individual Learning Objects Aggregated to Form New Learning Object



# Individual Learning Objects

## Aggregated to Form New Learning Object Module



# Learning Object “Rights”



- Who **owns** “open” (OER) learning materials?
- What are the rights of the **developer**?
- What rights does an **instructor** have to use, to copy, to change a “discovered” learning material?
- Do these rights vary **internationally**?

**How do you know any of this if you find a material on the WWW?**





- 1. Can people make 'derivatives'?***
- 2. Can people use or reuse the object for commercial purposes?***
- 3. If the object is changed or redistributed, does the new object have to have the same license as the original?***



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# SEARCHING FOR OERs WITH



([www.merlot.org](http://www.merlot.org))



# The MERLOT Vision

To be a premiere online **community** where faculty, staff, and students from around a continually changing world share their **learning materials** and **pedagogy**.



# Brief History of MERLOT

- 1997 - MERLOT developed and hosted at Cal State University, Sonoma
- 1999 - University of Georgia System, Oklahoma State Regents for Higher Ed, Univ of North Carolina System, and California State University System formed MERLOT 'cooperative'
- 2000 - January – MERLOT cooperative sponsored 48 Biology, Physics, Business and Teacher Education faculty (12 from each system) to develop peer review standards/processes for on-line teaching-learning materials
  - April - other Higher Ed sys/institutions invited to join MERLOT cooperative.
  - July - 23 Higher Ed systems/institutions become MERLOT Institutional Partners
  - New release of MERLOT website
- 2006 (August) - – 3<sup>rd</sup> release of MERLOT of website
- 2007 (June) - – 47,000+ members and 17,000 materials
- 2009 (November) – Content Builder part of MERLOT (from Carnegie)
- 2011-2012 - Over 100,000 members and 35,000 materials. - Released Translation Tool
  - Content Builder and Web Services upgrades and new Web services
- October 2013 -
  - MERLOT II released at Educause 2013. Over 42,500 materials and 117,000 members
- June 2014
  - Released new Material and Member detail pages
  - Released new Join and contribute wizards
- **Through 2Q2018 – materials ≈81,000; ≈ 156,000 members; ≈ 1.25M+ visits/annually**

21

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S

The MERLOT system provides access to curated online learning and support materials and content creation tools, led by an international community of educators, learners and researchers.

# Search

Search keywords, title, URL, URL, or author

Advanced Material Search | Advanced Member Search | ISBN Search

OER SMART SEARCH  
MERLOT keyword



Browse by Discipline

All Disciplines

## OER SMART GATEWAY

- 1. MERLOT repository
- 2. Dozens of OER repositories
- 3. The WWW

Add a Material

Submit an online learning material you've found or created to the MERLOT Collection.



Create a Material

Use Content Builder to create a webpage or site to host your own learning materials.



Create a Course ePortfolio

Build your entire course - from prerequisites to online resources to assessment.

## Community Portals

MERLOT Community Portals include 1) academic discipline content supported and curated by content experts, 2) communities that support institutions, 3) those built and maintained by our partner institutions.



Academic Discipline Portals



Academic Support Portals



Partner Portals

MERLOT CONTENT BUILDER  
OER Website Construction Tool

OER ACADEMIC  
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COMMUNITIES

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Create your own materials, add materials to the MERLOT collection, and be a part of the community. All for free!

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Home / Materials Search results: "circuits"

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Show results for

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**Material Type**  
☒ Animation (88)  
☐ Assessment Tool (13)  
☐ Assignment (32)  
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☐ Collection (39)  
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☐ ePortfolio (2)  
☐ Learning Object Repository (2)  
☐ Other (1)

**PhET - Physics Education Technology...**  
  
A collection of simulations and virtual labs focusing on first-year college physics. PhET provides fun, interactive... see more  
**Material Type:** Simulation  
**Author:** Carl Wieman, Ron LeMaster, Mike Dubson, Sam Reid, Kathy Perkins, Wendy Adams, Noah Finkelstein, Noah Podolsky  
**Date Created:** March 3, 2004  
**Date Modified:** February 6, 2018  
Peer Review: ★★★★★  
User Rating: ★★★★★  
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**Graph Theory Lessons**  
  
The applets contain topics typically found in undergraduate graph theory and discrete structures classes like null... see more  
**Material Type:** Tutorial  
**Author:** Dr. Christopher P. Mawata  
**Date Created:** September 24, 2005  
**Date Modified:** July 21, 2017  
Peer Review: ★★★★★  
User Rating: ★★★★★  
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**The Ohm Zone**  
  
The Ohm Zone's Shockwave application that allows you to build your own DC circuits and measure the voltages and... see more  
**Material Type:** Simulation  
**Author:** The Article 19 Group  
**Date Created:** August 25, 2000  
**Date Modified:** September 11, 2017  
Peer Review: ★★★★★  
User Rating: ★★★★★  
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**Electricity Fundamentals**  
  
Tutorial and applet demonstrates Ohm's Law.  
**Material Type:** Animation  
**Author:** Sean Russell  
**Date Created:** May 13, 2000  
**Date Modified:** October 11, 2017  
Editor Review: ★★★★★  
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**A First Course in Electrical and...**  
  
This free textbook was written for an experimental freshman course, but is now an elective that most students take... see more  
**Material Type:** Animation  
**Author:** Louis Scharf  
**Date Created:** February 16, 2010  
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This is a free online textbook that is...

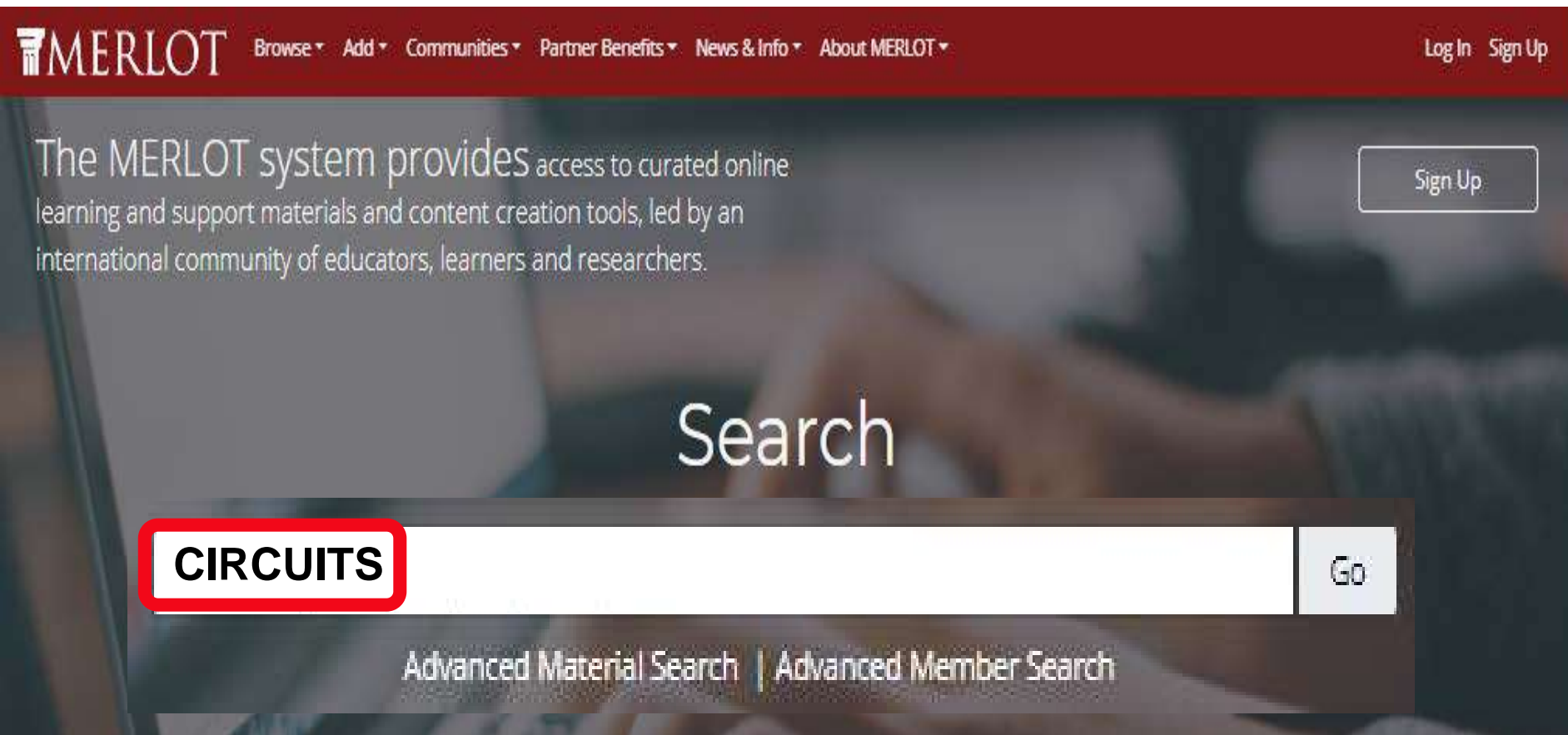
**All About Circuits - Volume II - AC**  
  
This is a free online textbook that is...

**All About Circuits - Volume VI - ...**  
  
This is a free online textbook that is...

**Circuit Construction Kit (DC only)**  
  
A Java application that functions as...

**Communication Systems**  
  
This free online textbook is part of...

# Choose a Keyword



The screenshot shows the MERLOT website interface. At the top, there is a dark red navigation bar with the MERLOT logo on the left and links for 'Browse', 'Add', 'Communities', 'Partner Benefits', 'News & Info', and 'About MERLOT' in the center. On the right side of the navigation bar are links for 'Log In' and 'Sign Up'. Below the navigation bar, a large banner area features a blurred background image of people. On the left side of the banner, text describes the MERLOT system: 'The MERLOT system provides access to curated online learning and support materials and content creation tools, led by an international community of educators, learners and researchers.' On the right side of the banner is a 'Sign Up' button. In the center of the banner, the word 'Search' is displayed in a large, white, sans-serif font. Below the 'Search' text is a search bar with a white input field and a grey 'Go' button. The word 'CIRCUITS' is typed into the input field and is highlighted by a red rectangular box. Below the search bar, there are two links: 'Advanced Material Search' and 'Advanced Member Search', separated by a vertical line.

MERLOT

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The MERLOT system provides access to curated online learning and support materials and content creation tools, led by an international community of educators, learners and researchers.


Sign Up

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**CIRCUITS** Go

Advanced Material Search | Advanced Member Search



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A Java application that functions as

Communication Systems



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VLSI Circuits and Systems Letter:  
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DIGITAL CIRCUITS - A...



The Fourth edition of this well-  
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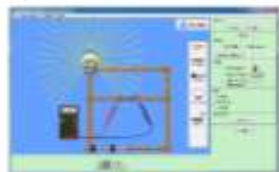
All About Circuits - Volume II - AC

All About Circuits - Volume VI - ...

Circuit Construction Kit (DC only)

Communication Systems

## Material Detail



### Circuit Construction Kit (DC only)

A Java application that functions as simple DC circuit simulator. Available components are batteries, bulbs, switches, and connecting wire. Component values can be varied by the user. Meters to measure voltage and current are available.

#### Disciplines:

Science and Technology / Physics / Electricity and Magnetism

More...

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### Quality

Peer Review ★★★★★

User Rating ★★★★★

Comments

Learning Exercises

Bookmark Collections (4)

Course ePortfolios

Accessibility Info

## More about this material

**Material Type:** Simulation

**Date Added to MERLOT:** November 29, 2004

**Date Modified in MERLOT:** December 30, 2017

**Author:** The PhET Project, University of Colorado

**Submitter:** Terry Bradfield

**Primary Audience:** High School, College General Ed

**Technical Format:** Website, Java Applet

**Mobile Compatibility:** Not specified at this time

**Technical Requirements:** Requires Java Runtime Environment

**Language:** English

**Cost Involved:** unknown

**Source Code Available:** unknown

**Accessibility Information Available:** no

**Creative Commons:** no

## Browse...

### Disciplines with similar materials as *Circuit Construction Kit (DC only)*



Science and Technology /  
... / Electricity and  
Magnetism



Science and Technology /  
... / Circuits



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... / Curriculum

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PhET - Physics  
Education Technology  
at the University of  
Colorado



The Ohm Zone



European Journal of  
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Work, Energy & Power

Heat & Thermo

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Light & Radiation

### ► Electricity, Magnets & Circuits

Biology

Chemistry

Earth Science

Math

By Grade Level

#### ► Elementary School

#### ► Middle School

#### ► High School

#### ► University

By Device

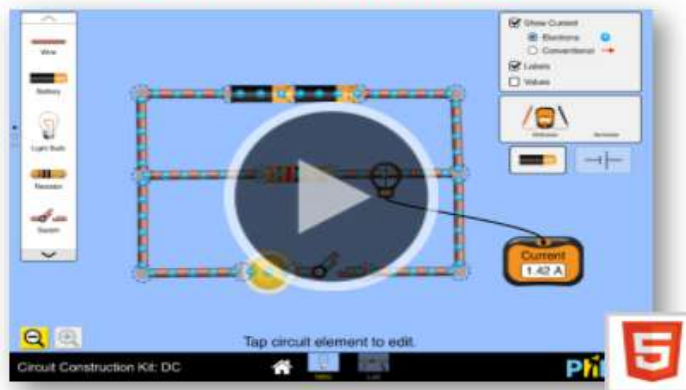
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All Sims

Translated Sims

## Circuit Construction Kit: DC



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- Series Circuit
- Parallel Circuit
- Ohm's Law

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EXTENDED LIF for OLC/MERLOT: Renewed 2018 Conf. due by Nov. 1st

## MERLOT Collection




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All disciplines




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Submit an online learning material you've found or created to the MERLOT Collection.



**Create a Material**

Use Content Builder to create a webpage or site to host your own learning materials.




**Create a Course ePortfolio**


Build your entire course - from prerequisites to online resources to

## Community Portals


MERLOT Community Portals include 1) academic discipline content supported and curated by content experts, 2) communities that support institution-wide academic programs, and 3) those built and maintained by our partner institutions.



**Academic Discipline Portals**




**Academic Support Portals**



**Partner Portals**

## Join MERLOT



Create your own materials, add materials to the MERLOT collection, and be a part of the community. All for free!

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# Community Portals



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As you scroll this page, you will find many Engineering resources. This includes the added Engineering material and members; journals and publications and Engineering alerts and twitter feeds.

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Rajeshwar Jadhav

**PROFESSIONAL ORGANIZATIONS**

American Society for Quality (ASQ)  
American Society for Engineering Education

**JOURNALS & PUBLICATIONS**

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Accordingly, the MERLOT IT discipline portal has been endorsed by both Society and IEEE Education Society, and that endorsement is noted with

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Journal of Cybersecurity

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IEEE COMPSAC

Special track: Computing Education and Learning Technologies (CELT)

Tokyo, Japan - July, 2018  
WWW.COMPSAC.ORG

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Architecture and Organization (19)  
Computational Science (40)  
Discrete Structures (18)  
Graphics and Visualization (9)  
Human-Computer Interaction (132)  
Information Assurance and Security (15)  
Information Management (154)  
Intelligent Systems (398)  
Networking and Communication (69)  
Operating Systems (21)  
Parallel and Distributed Computing (6)

**PROFESSIONAL ORGANIZATIONS**

IEEE Computer Society

**JOURNALS & PUBLICATIONS**

IEEE Computer Magazine

**COMPUTER SCIENCE ON TWITTER**

"1 percent of online users are active"

**Endorsed by IEEE  
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**Defining and Finding Open Educational Resources**

# Computer Science & IT/IS Leaders



Computer Science  
Chair – Henry Chan – Hong Kong Poly



Info Technology/Info Systems  
Chair – Edmundo Tovar – Universidad Politécnica de Madrid



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