

# Personalizing Search

Lynne Davis and Anne Diekema  
Panel at the NSDL Annual Meeting  
November 19, 2009

# **DISCOVERING USERS IN THEIR QUERIES**

# National **SCIENCE** Digital Library?

- edgar allan poe and short prose narrative
- longitudinal pathways and strong african american families
- Pacman
- Rasputin
- focus of attention at work and leader-follower relationships
- ravi chivukula business value information
- jesus and qu'ran

# Who wants to know?

- Student?
  - science fair projects
  - trigonometry and help
  - online classes
- Teacher?
  - inquiry learning
  - high school and georgia math and math i curriculum
- Parent?
  - tuition rising: why college costs so much

# The short end of the stick

- Symmetry
- Wind
- Microprocessors
- Leaf
- Recycle
- Reptiles
- Piracy
- Nano
- Rocks
- Pacman
- Packages

# What would you like to know about ...

- Math
- Mathematics
- Biology
- Physics
- Science
- Geometry
- Algebra
- Engineering

# Is there a doctor in the NSDL?

- Antibiotics and essential oils
- Cesarean sections
- Neck disorder
- Knee rehabilitation and acl injury
- Huntingtons disesase and new research [sic]
- Tamoxifen and breast cacer [sic]
- Self mutilation
- Ring worm
- Hepitites

# How can we improve search?

- Find out who the user is
  - teacher,
  - student (K-12, university)
  - researcher
  - general public
- Note the different contexts that brings them to the NSDL



# Finding out about the user

- Infer the user and his or her context
  - Mining query/search logs
  - Track previous queries
  - Take note of social tagging, bookmarking by user
- Target user intentionally
  - Focus groups
  - Interviews
  - Observations

Personalizing library resources  
via the  
Curriculum Customization  
Service

~ A Rich Learning Application using EduPak ~

# First Generation User-Centered Design

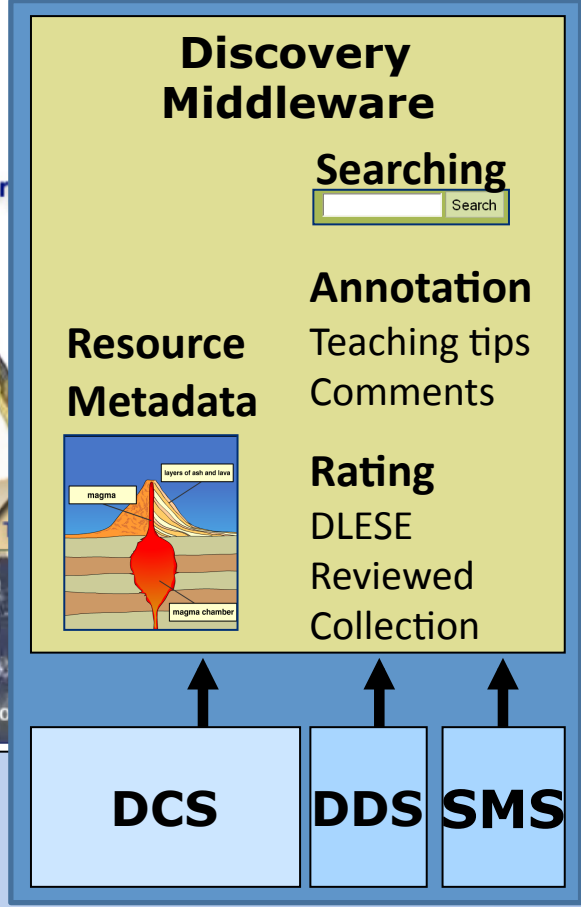
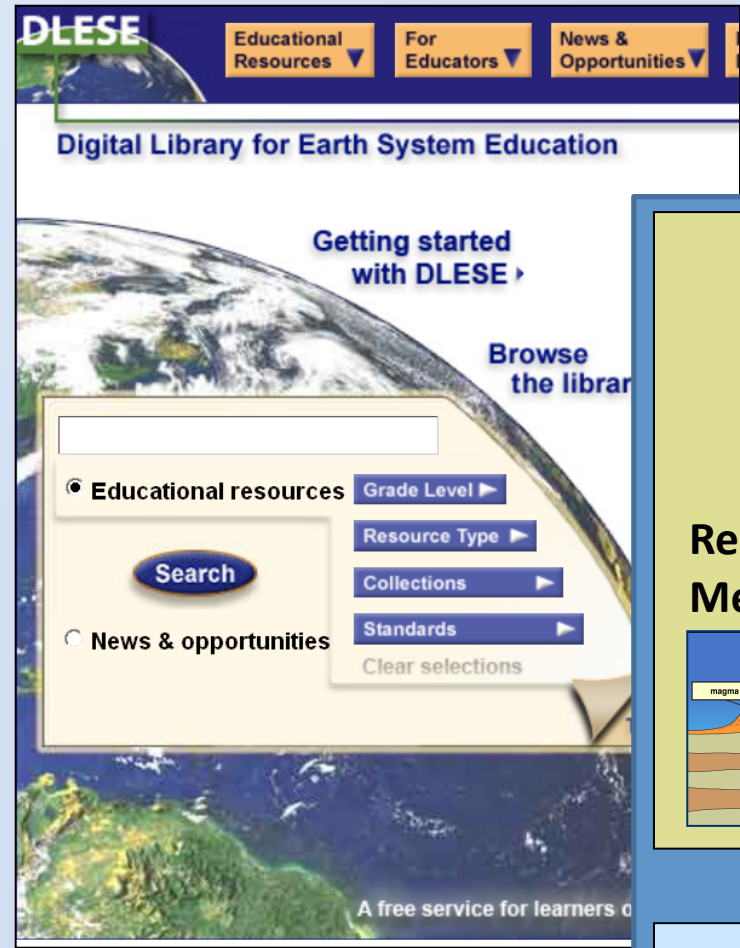
Circa 2000

## Search by:

- Grade range
- Resource type
- Collections
- Standards

Content in library is heavily reliant on collection builders and metadata cataloging efforts

But we knew teachers wanted more features to personalize resources



# Second-generation User-Centered Design

2008-09

- **Collaboration:**

Denver Public Schools (DPS)

NSDL

Digital Learning Sciences and University of Colorado, Boulder

Curriculum Publisher: It's About Time (partnering with AGI)

- **User-centered design**

Focus group/collab design: Early 2008

- **Evaluation:**

Pilot: Fall 2008: Teacher Advisory Board - 10 middle and high school teachers

Field Trial and evaluation underway now - 110 middle and high school teachers

- **Evolution of services architecture within NSDL (EduPak)**

# What we learned from the Teacher Advisory Board

Ready access to tools and resources to help teachers plan lessons and differentiate instruction in class

- [Support district curriculum and learning goals](#)
- [Integrate district teaching guides and curriculum text book materials](#)
- [Create personal collection and manage resources](#)
- [Add personal notes, descriptions, value indicators](#)
- [Respect teacher time and accommodate their personal approach to planning](#)
- [Access CCS anytime reliably from home or school for planning](#)
- [First year teachers want to leverage the experience of seasoned teachers](#)
- [Year-to-year reuse to build a successful, sustainable inventory of resources](#)

# Support district curriculum and learning goals

## Earth's Dynamic Geosphere

Lynne Davis (lynne) | [Sign off](#) | [My profile](#) | [Manage people](#) | [Manage curricula](#) | [Reports & admin](#) | [Units of Study](#)

### Volcanoes

Volcanoes are an important part of Earth's systems which have both hazards and benefits associated with them.

**Volcanoes**

Plate Tectonics

Earthquakes

[Units of Study](#) » [Earth's Dynamic Geosphere: Volcanoes](#) » Volcanoes Influence

[View All Stuff](#)

### Key Concepts

a. [Use Maps](#)

b. [Volcanoes on Land](#)

c. [Topography](#)

d. [Volcano Formation/Lava](#)

e. [Volcanic Hazards](#)

**f. Volcanoes Influence**

Volcanoes can influence all of Earth's systems -- including the water cycle and global climate -- both positively and negatively.

g. [Decisions and Mitigation](#)

### Volcanoes Influence

EarthComm Activities

Interactive Resources

Education Standards

My Stuff for this Concept

Shared Stuff for this Concept

Activity 3

Activity 4 +

Activity 5

#### Volcanoes: Activity 4: Airborne Debris

[http://ccs.dls.ucar.edu/dps/protected/iat/earth\\_dynamic\\_geosphere/chap...](http://ccs.dls.ucar.edu/dps/protected/iat/earth_dynamic_geosphere/chap...)

Page: G 31

Number of periods: 2

Classroom activity

Students investigate connections between volcanoes and the Earth system by considering the widespread distribution of volcanic material that enters the atmosphere. Students explore the connections between winds and volcanic ash transport. Students will draw upon knowledge of the relationship between magma composition and properties of magma to better understand why some volcanoes erupt explosively with widespread, sometimes global effects, whereas others erupt quietly and locally. Student explore some of the most famous recent examples of volcanic eruptions.



Keywords from Denver Public Schools: ash

+ essential learning: must grade

From: It's About Time

# Integrate district teaching guides and curriculum text book materials

**Earth's Dynamic Geosphere** Lynne Davis (lynne) | [Sign off](#) | [My profile](#) | [Manage people](#) | [Manage curricula](#) | [Reports & admin](#) | [Units of Study](#)

## Volcanoes

Volcanoes are an important part of Earth's systems which have both hazards and benefits associated with them.

**Volcanoes** | **Plate Tectonics** | **Earthquakes**

[Units of Study](#) » [Earth's Dynamic Geosphere: Volcanoes](#) » Volcanoes Influence ▶ [View All Stuff](#)

### Key Concepts

- a. [Use Maps](#)
- b. [Volcanoes on Land](#)
- c. [Topography](#)
- d. [Volcano Formation/Lava](#)
- e. [Volcanic Hazards](#)
- f. [Volcanoes Influence](#)**
- g. [Decisions and Mitigation](#)

Volcanoes can influence all of Earth's systems -- including the water cycle and global climate -- both positively and negatively.

### Volcanoes Influence

[EarthComm Activities](#) | [Interactive Resources](#) | [Education Standards](#) | [My Stuff for this Concept](#) | [Shared Stuff for this Concept](#)

[Activity 3](#) | [Activity 4 +](#) | [Activity 5](#)

**Volcanoes: Activity 4: Airborne Debris** Page: G 31  
Number of periods: 2


[http://ccs.dls.ucar.edu/dps/protected/iat/earth\\_dynamic\\_geosphere/chap...](http://ccs.dls.ucar.edu/dps/protected/iat/earth_dynamic_geosphere/chap...)

Classroom activity    Students investigate connections between volcanoes and the Earth system by considering the widespread distribution of volcanic material that enters the atmosphere. Students explore the connections between winds and volcanic ash transport. Students will draw upon knowledge of the relationship between magma composition and properties of magma to better understand why some volcanoes erupt explosively with widespread, sometimes global effects, whereas others erupt quietly and locally. Student explore some of the most famous recent examples of volcanic eruptions.

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- ▶ **Key Concepts for this Activity (3)**
- ▶ **Instructional Support Materials (5)**
- ▶ **Teaching Tips (4)**
- ▶ **Student Conceptions (1)**
- ▶ **Embedded Assessments (7)**

# Create a personal collection and manage resources

## Volcanic Hazards

EarthComm Activities   Interactive Resources   Education Standards   My Stuff for this Concept   Shared Stuff for this Concept

Top Picks (3)   Images / Visuals   Animations   Inquiry With Data

### Types and Effects of Volcano Hazards

<http://volcanoes.usgs.gov/hazards/> Edit Delete

Reference   Photograph   Scientific illustration

Rating: (not yet rated)  
\* \* \* \* \*

Saved by 3 users   From: DLESE Community Collection (DCC)

Tags:  
At grade 9 (1)  
5-15 min. (1)  
Above grade 9 (1)

My notes:  
Great source of info. and vocab. No interactive stuff or animations.

Grade fit: Above grade 9  
Saved to My Stuff in:  
• » Volcanoes » e. Volcanic Hazards | Activity 4: Volcanic Hazards: Airborne Debris+

### Volcanic Ash Fall

<http://pubs.usgs.gov/fs/fs027-00/> Save

Report   Map   Photograph

Rating: (not yet rated)  
\* \* \* \* \*

Saved by 2 users   From: DLESE Community Collection (DCC)

Tags:  
At grade 9 (1)  
5-15 min. (1)



# Create a personal collection and manage resources

## Volcanic Hazards

**Save this resource to My Stuff**

**Public information (if shared):**

File:

Title:

Description (optional):

Sharing:  
 Private  Shared (public)

**My notes (private):**

Save changes?

Tags:  
 ELA  
 GT  
 Extension  
 Math skills  
More tags (public) (comma-separated list):

Grade fit:  
 At grade level 9  
 Above grade level 9  
 Below grade level 9

Time required:  
 5-15 min.  
 15-45 min.  
 45-90 min.  
 90+ min.

Save to My Stuff in:

- ▶ [Understanding Your Environment](#)
- ▼ [Earth's Dynamic Geosphere](#)
  - ▼ [Volcanoes](#)
    - a. Use Maps
      - Activity 1: Where are the Volcanoes?
      - Activity 6: Volcanic History of Your Community\*
    - b. Volcanoes on Land
      - Activity 1: Where are the Volcanoes?
    - c. Topography
      - Activity 2: Volcanic Landforms\*
      - Activity 3: Volcanic Hazards: Flows
    - d. Volcano Formation/Lava
      - Activity 2: Volcanic Landforms\*
      - Activity 3: Volcanic Hazards: Flows
    - e. Volcanic Hazards
      - Activity 3: Volcanic Hazards: Flows
      - Activity 4 Volcanic Hazards: Airborne Debris+
      - Activity 5: Volcanoes and the Atmosphere
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      - Activity 4 Volcanic Hazards: Airborne Debris+
      - Activity 5: Volcanoes and the Atmosphere
      - Activity 7: Monitoring Active Volcanoes
  - ▶ [Plate Tectonics](#)
  - ▶ [Earthquakes](#)
  - ▶ [Earth's Natural Resources](#)
  - ▶ [Earth System Evolution](#)

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Debris+

Save

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# Create a personal collection and manage resources

The screenshot shows a web interface for managing educational resources. At the top, there are navigation tabs: "EarthComm Activities", "Interactive Resources", "Education Standards", "My Stuff for this Concept", and "Shared Stuff for this Concept". Below these is a search bar with a "Search" button and "Upload File | Add Link" options. A dropdown menu for "All resources" is open, showing categories like "All resources", "ELA", "GT", "Extension", "Math skills", and filters for grade level and duration. A resource card for "Abrasion Powerpoint" is visible, including a rating, file information, and tags. A red arrow points to the "All Stuff" label in the top right corner.

EarthComm Activities   Interactive Resources   Education Standards   **My Stuff for this Concept**   Shared Stuff for this Concept

All resources   Search   Upload File | Add Link

All resources  
ELA  
GT  
Extension  
Math skills

At grade level 9  
Above grade level 9  
Below grade level 9

5-15 min.  
15-45 min.  
45-90 min.  
90+ min.

**All Stuff**

All My Stuff   All Shared Stuff

All resources   Search   Upload File | Add Link

Resources 1 - 7 out of 7

**Abrasion Powerpoint**  
<http://ccs.dls.ucar.edu/dps/repository/resource/1248244637064>   Edit   Delete

Rating: \* \* \* \* \*

File: 4 - Rock Abrasion.ppt (43KB) » [Download](#)  
Submitted on Jul 22, 2009 by Cheryl Mosier » [camosier@jeffco.k12.co.us](mailto:camosier@jeffco.k12.co.us)

Saved by 2 users

Tags:  
Extension (1)  
Above grade 6 (1)  
15-45 min. (1)

Saved to My Stuff in:  
Loose stuff (not associated with any concept, activity or investigation)

# Personal notes, descriptions, value indicators

## Volcanic Hazards

EarthComm  
Activities

Interactive  
Resources

Education  
Standards

My Stuff for  
this Concept

Shared Stuff for  
this Concept

All resources

Search

[Upload File](#) | [Add Link](#)

Resources 1 - 2 out of 2

### Geo-Educational Animation Clips: Downloads (title provided or enhanced by cataloger)

Edit

Delete

<http://emvc.geol.ucsb.edu/downloads.php>

Video

Scientific  
visualization

Rating: (not yet rated)

\* \* \* \* \*

Saved by 6 users

Tags:

Extension (2)

At grade 9 (1)

This collection features animations of global tectonic movements, regional plate histories and geologic histories of western North America and California, and the Ice-Age Earth. There are also animations of the origin of petroleum deposits in the Santa Barbara Channel, formation of geologic features at Craters of the Moon National Monument, and the relationship between pore fluids in sediments and tectonic movements. The animations are available for download, or they can be played from the website.

From: DLESE Community Collection (DCC)

My notes:

Lots of links to animations. Includes anims on tectonic plates also.

My tags: Extension

Grade fit: At grade 9

Saved to My Stuff in:

• » [Volcanoes](#) » **e. Volcanic Hazards** | [Activity 3: Volcanic Hazards: Flows](#)

# Personal notes, descriptions, value indicators

## Volcanic Hazards

EarthComm  
Activities

Interactive  
Resources

Education  
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My Stuff for  
this Concept

Shared Stuff for  
this Concept

All resources

Search

[Upload File](#) | [Add Link](#)

All resources

ELA  
GT  
Extension  
Math skills

At grade level 9  
Above grade level 9  
Below grade level 9

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Extension (2)  
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ation Clips: Downloads (title provided or enhanced by

[Edit](#) [Delete](#)

[u/downloads.php](#)

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## Respect teacher time and accommodate their personal approach to planning

▼ **My Stuff for this Activity** 

All resources  Search [Upload File](#) | [Add Link](#)

Resources 1 - 1 out of 1

**Types and Effects of Volcano Hazards**  
<http://volcanoes.usgs.gov/hazards/>

Reference      This United States Geological Survey (USGS) provides information on different types (gas, lahars, landslides, lava flows, and pyroclastic flows) and the effect volcanoes have on people and land. Links to selected case studies of hazard. Links to more USGS information include a glossary, a site index, observatories, and more.

Photograph

Scientific illustration

Rating: (not yet rated)  
\* \* \* \* \*

Saved by 3 users


Tags:  
At grade 9 (1)  
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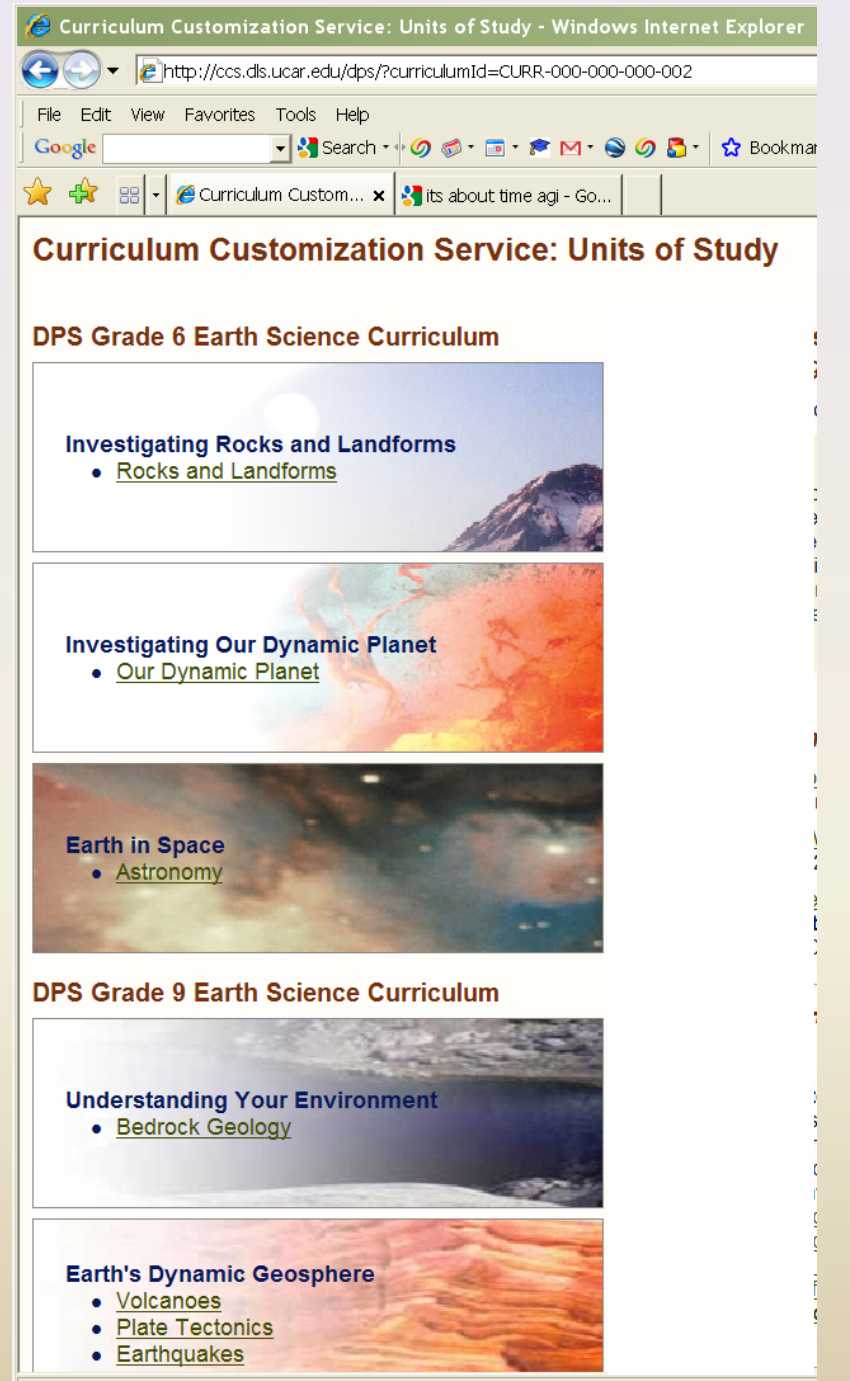
Save to My Stuff in:

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      - Activity 5: Volcanoes and the Atmosphere
      - Activity 7: Monitoring Active Volcanoes



[Access CCS work from home or school  
for planning](#)

Home page of CCS



The screenshot shows a Windows Internet Explorer browser window displaying the Curriculum Customization Service (CCS) website. The address bar shows the URL: <http://ccs.dls.ucar.edu/dps/?curriculumId=CURR-000-000-000-002>. The page title is "Curriculum Customization Service: Units of Study".

The main content area is titled "Curriculum Customization Service: Units of Study" and is organized into two main sections: "DPS Grade 6 Earth Science Curriculum" and "DPS Grade 9 Earth Science Curriculum".

**DPS Grade 6 Earth Science Curriculum**

- Investigating Rocks and Landforms
  - [Rocks and Landforms](#)
- Investigating Our Dynamic Planet
  - [Our Dynamic Planet](#)
- Earth in Space
  - [Astronomy](#)

**DPS Grade 9 Earth Science Curriculum**

- Understanding Your Environment
  - [Bedrock Geology](#)
- Earth's Dynamic Geosphere
  - [Volcanoes](#)
  - [Plate Tectonics](#)
  - [Earthquakes](#)

## First year teachers want to leverage the experience of seasoned teachers

**Unit 2: Earth's Dynamic Geosphere** Lynne Davis (lynne) | [Logout](#) | [My profile](#) | [Manage people](#) | [Manage curricula](#) | [Reports & admin](#) | [Units of Study](#)

**Volcanoes**  
Volcanoes are an important part of Earth's systems which have both hazards and benefits associated with them.

[Volcanoes](#) [Plate Tectonics](#) [Earthquakes](#)

[Units of Study](#) » [Unit 2: Earth's Dynamic Geosphere: Volcanoes](#) » [Volcanic Hazards](#) [View All Stuff](#)

**Key Concepts**

- [a. Use Maps](#)
- [b. Volcanoes on Land](#)
- [c. Topography](#)
- [d. Volcano Formation/Lava](#)
- [e. Volcanic Hazards](#)**  
Volcanic hazards include tephra, lava, lahars, pyroclastic flows, ashfall and gases.
- [f. Volcanoes Influence](#)
- [g. Decisions and Mitigation](#)

**Volcanic Hazards**

[EarthComm Activities](#) [Interactive Resources](#) [Education Standards](#) [My Stuff for this Concept](#) [Shared Stuff for this Concept](#) 

All resources  Search

Resources 1 - 10 out of 13 [Next >>](#)

**Volcano simulations** [Save](#)  
<http://www.nationalgeographic.com/forcesofnature/interactive/index.htm...>  
Rating: (not yet rated) Great web site for simulating all types of volcanoes  
\* \* \* \* \* Submitted on Oct 20, 2009 by Rhonda Albers » [rhonda\\_albers@dpsk12.org](mailto:rhonda_albers@dpsk12.org)  
Saved by 3 users  
Tags:  
At grade 9 (1)   
15-45 min. (1)

**Volumes of Volcanic Eruptions** [Save](#)  
<http://ccs.dls.ucar.edu/dps/repository/resource/1254607742701>  
Rating: (not yet rated) Powerpoint of all volcanoes listed in Activity 4

## Year-to-year reuse to build a successful, sustainable inventory of resources

### Volcanic Hazards

EarthComm  
Activities

Interactive  
Resources

Education  
Standards

My Stuff for  
this Concept

Shared Stuff for  
this Concept

All resources

Search

[Upload File](#) | [Add Link](#)

Resources 1 - 2 out of 2

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At grade 9 (1)

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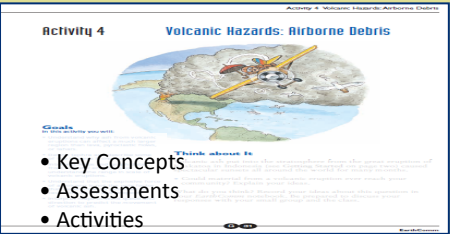
# Discussion

- Think of own search systems how you're using search systems
  - Content providers (pathway)?
  - Users of info systems?
- How to best understand and support the context of your audience?
- What customization can you talk about?
- What personalization or search features do your users like/not like, wish you had?

Denver Public Schools  
Curriculum  
User Interface

Authentication layer

**Curriculum & District Guides**



**Searching**

**Tagging**

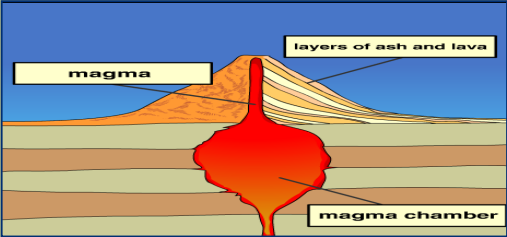
All resources

- ELA
- GT
- Extension
- Math skills

At grade level 9  
Above grade level 9  
Below grade level 9

5-15 min.  
15-45 min.  
45-90 min.  
90+ min.

**Resource Metadata**



**Rating** Rating:

**NSDL Collection System (NCS)**

**Curricula, Customizations Repository & Information Model**

**NSDL Search Services**

**Strand Map Service (SMS)**