The Global Learning Resource Connection
Supporting the Next Generation of Education

The Achievement Standards Network (ASN)
A JES & Co. Program

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An Application Profile for Mapping Educational Resources to Curriculum
The Facts…

• Large repositories of educational resources are being created
• Countries, states and territories have various forms of curriculum e.g., national curricula (Achievement Standards)
• Metadata mapping educational resources to curriculum supports teaching, learning and accountability
ASN Goals...

- Create a multi-national bank of curriculum in machine addressable form that
  - Are accurate digital representations of curriculum documents and their component statements (semantic units);
  - Are consistent in form; and
  - Are modeled in RDF and amenable to the emerging Semantic Web.
- Design an extensible framework to support evolving uses.
- Provide open access.
...And Travels Well Between States and Countries
Machine-addressable form

Curriculum Repository

Semantic-web amenable

Achievement Standards

Achievement Standards Define What Is Taught in the Classroom

Tight Coupling

Instruction

Assessment

Achievement Standards Define What Skills Are Tested
We Started with the 50 U.S. States
Process ...

- Gathered all current and historical curriculum documents in the United States
  (In the USA, 761 documents have been decomposed (atomized) into “statements” derived from document structure and content in excess of 350,000 learning objective statements)

- All documents and statements were assigned URIs and that are dereferencable over the Web
Two Basic Functions

Relate

Describe

In a Machine Readable Format
<table>
<thead>
<tr>
<th>Description</th>
<th>Administration</th>
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<tr>
<td>Temporal (aspects)</td>
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</table>
Relate the statements to each other and to resources.
• ARTSEdge lessons incorporate the National Standards for Arts Education.
• EconEdLink lessons address the Voluntary National Content Standards in Economics.
• EDSITEMent references the following standards, accessible from its reference shelf:
  o International Reading Association (IRA)/National Council of Teachers of English (NCTE) Standards for the English Language Arts
  o National Geography Standards
  o National Council for Social Studies Curriculum Standards
  o National Standards for Arts Education
  o National Standards for Foreign Language Education
  o National Standards for Civics and Government
• Illuminations lessons incorporate, or “illuminate,” the National Council of Teachers of Mathematics? (NCTM) Principles and Standards for School Mathematics.
• ReadWriteThink lessons address the IRA/NCTE Standards for the English Language Arts.
• Science NetLinks’ content is organized around the Benchmarks for Science Literacy.
• Smithsonian’s History Explorer lessons are aligned to the UCLA National Center for History in the Schools (NCHS) History Standards
• Xpeditions lessons are aligned to the National Geography Standards.

The following State Education Partners are working with Thinkfinity.org to review and validate the new state standards alignment project:
• Georgia Department of Education
• Massachusetts Department of Elementary and Secondary Education
• West Virginia Department of Education
• Wisconsin Department of Public Instruction
Welcome to the world of K-12 engineering education!

Now celebrating over 500 activities!

Engineers have a hand in designing, creating or modifying nearly everything we touch, wear, eat, see and hear. Introducing engineering into the K-12 classroom connects science and math concepts to the everyday engineering that surrounds us. This teacher resource, TeachEngineering.org, helps teachers enhance learning, excite students and stimulate interest in science and math through the use of hands-on engineering.

Just a cute kid with a great imagination... or an aspiring engineer who will shape our world?

The TeachEngineering digital library provides teacher-tested, standards-based engineering content for K-12 teachers to use in science and math classrooms. Engineering lessons connect real-world experiences with curricular content already taught in K-12 classrooms. Mapped to educational content standards, TeachEngineering's comprehensive curricula are hands-on, inexpensive, and relevant to children's daily lives.

There are many ways to access the materials in this collection:
- Search the collection by specifying keywords, grade levels, educational standards, or other criteria
- Browse curricular contents by subject area, curricular units, lessons or activities
- Access your favorite items and submit reviews in your own personalized MyTE area
Grade Level: 8 (6-8) Lesson #: 2 of 4
Time Required: 15 minutes Lesson Dependency: None
Keywords: weather, atmosphere, air pressure, air masses, wind, storms
Reviews: Read Reviews | Be the First to Write a Review

Related Curriculum:
- subject areas: Earth and Space
  Science and Technology
- curricular units: Weather and Atmosphere
- activities: Building a Barometer

Educational Standards:
Colorado Science

1. Standard 5: Students know and understand interrelationships among science, technology, and human activity and how they can affect the world. (Grades 0 - 12) [1995]
2. 4.2 Students know and understand the general characteristics of the atmosphere and fundamental processes of weather. (Grades 0 - 12) [1995]

Does this curriculum meet my state's standards?

Learning Objectives (Return to Contents)
After this lesson, students should be able to:
- Describe the effect of the sun on air masses in the Earth's atmosphere.
- Compare and contrast high- and low-pressure air systems.
- Explain that engineers design instrumentation, such as weather stations, to measure atmospheric conditions.

Introduction/Motivation (Return to Contents)
Have you ever blown up a balloon and let it go? The balloon gets bigger and bigger until it bursts. Why does this happen? That's because of the pressure difference between the air inside the balloon and the air outside. But there's more to it than that. Though we cannot see or feel the air, it actually has a mass. It also has pressure and density. So what does pressure mean for our atmosphere? Well, for one thing, there are many different air masses in our atmosphere. Air masses are masses of air that have similar characteristics. Air masses can affect the weather we experience even hundreds of kilometers away. We know that the sun plays a significant role in the weather we experience on Earth. But how does the sun relate to air masses? The sun heats up our atmosphere and the Earth's surface, but the heating takes place unevenly because the sun's rays hit different areas of the Earth at different angles. Variations on the Earth's surface provide even more room for uneven heating. The air above water, for example, is typically cooler than the air above land, and the air above lighter colored surfaces is typically cooler than the air above darker ones (very simply, because dark color absorb more heat)
In this video segment from Cyberchase, Harry plays a game of chess with a young friend and suggests a wager on the game. Harry's friend uses a story to explain how putting a penny on the first square and then doubling the amount on each square of the chessboard can generate a tremendous amount of money over time.
In this global economy, it is essential that Michigan students possess personal, social, upational, civic, and quantitative literacy. Mastery of the knowledge and essential skills ed in Michigan’s Grade Level Content Expectations will increase students’ ability to be cessful academically, and contribute to the future businesses that employ them and the runities in which they choose to live. Reflecting best practices and current research, the de Level Content Expectations provide a set of clear and rigorous expectations for all ents, and provide teachers with clearly defined statements of what students should know be able to do as they progress through school.

- [ ] Discipline 1 Science Processes  S1130075 (14420)
- [ ] Standard: Inquiry Process  S1130079 (14421)
  - K-7 Standard S.IP: Develop an understanding that scientific inquiry and reasoning involves observing, questioning, investigating, recording, and developing solutions to problems  S113007C (14422)
  - S.IP.M.1 Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.  S113007E (14454)
  - S.IP.06.11 Generate scientific questions based on observations, investigations, and research.  S11300B5 (14461)
  - S.IP.06.12 Design and conduct scientific investigations.  S11300B6 (14462)
Content Expectation(s):

- S.IP.M.1[S113007E] Inquiry involves generating questions, conducting investigations, and developing solutions to problems through reasoning and observation.
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<thead>
<tr>
<th>Subject &amp; Year Adopted</th>
<th>Status</th>
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<tr>
<td>Math, 9-12 (2006)</td>
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<tr>
<td>Science, 9-12 (2006)</td>
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<td>Social Studies, K-8 (2007)</td>
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<td>Technology, K-12 (2005)</td>
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</tbody>
</table>
Measure 4 Measure: Sites That Do the Work For You
Here is a collection of interactive Web sites that calculate, convert, or translate a variety of things. Topics for calculation range from health risks to height and weight calculators to converting magnetic flux. Morph words, determining word frequencies, changing names to Japanese - the opportunities are endless. Sites are organized alphabetically by subtopic. Subtopics include Science/Math, Health, Finance, All 'Round the House, and A Measure of Everything Else. full record

MendelWeb
"MendelWeb is an educational resource for teachers and students interested in the origins of classical genetics, introductory data analysis, elementary plant science, and the history and literature of science." Mendel's experiments in plant research are described in great detail. Site also includes a detailed biography of Mendel and a close look at his life. full record

Space Station Phyve
In this WebQuest, students will investigate what is required to create a space station. They will research and design a cost-effective...

For Math, 9-12 (2006):
Standard L1. Reasoning About Numbers, Systems and Quantitative Situations

L1.1 Number Systems and Number Sense

L1.1.1 Know the different properties that hold in different number systems, and recognize that the applicable properties change in the transition from the positive integers, to all integers, to the rational numbers, and to the real numbers.

L1.1.2 Explain why the multiplicative inverse of a number has the same sign as the number, while the additive inverse of a number has the opposite sign.

L1.1.3 Explain how the properties of associativity, commutativity, and distributivity, as well as identity and inverse elements, are used in arithmetic and algebraic calculations.

L1.1.4 Describe the reasons for the different effects of multiplication by, or exponentiation of, a positive number by a number less than 0, a number between 0 and 1, and a number greater than 1.

L1.1.5 Justify numerical relationships (e.g., show that the sum of even integers is even; that every integer can be written as 3m+a, where k is 0, 1, or 2, and m is an integer; or that the sum of the first n positive integers is (n(n+1)/2).

L1.1.6 Explain the importance of the irrational numbers √2 and √3 in basic right triangle trigonometry; the importance of π because of its role in circle relationships; and the role of e in applications such as...
Competency Example

A. A student should understand mathematical facts, concepts, principles, and theories.

1) understand and use numeration, including a. numbers, number systems, counting numbers, whole numbers, integers, fractions, decimals, and percents; and b. irrationals and complex numbers;

Addition Quiz 1

2) select and use appropriate systems, units, and tools of measurement, including estimation;

3) perform basic arithmetic functions, make
Joann’s Weekly Picks

Do you want to see how well the Gateway’s resources meet your State’s standards? Join us as we test our “standards suggestion”, provided by the Center for Natural Language Processing. It is as easy as 1 – 2 – 3. 1 – Use the faceting search engine to find a resource that meets your needs 2 – Click on the “View, share, comment” button 3 – Choose your state, subject and grade and push the “suggest standard” button. It is just that easy. Please send us your feedback to brucew@iesandco.org.

Battle of the Bulge

Childhood obesity has become a major concern for nations worldwide. Obesity and its associated diseases pose a major threat to public health and have serious economic consequences for individuals, families, employers, communities and the nation. The federal government is taking action to address childhood obesity and improve the health of our nation’s children.

Gateway members, we have exciting news. We are testing a “standards suggestion” tool. Please help us make the Gateway Your Gateway. Follow Joann’s simple 1, 2, 3 steps and send us feedback.
We expanded the Work to Include Australia and the UK.
VELS Level 3 Mathematics
Number
At Level 3, students use place value (as the idea that ‘ten of these is one of those’) to determine the size and order of whole numbers to tens of thousands, and decimals to hundredths.

Learning Area: Mathematics
Year Level: 3
Strand: Number …

http://purl.org/Dta46f649

*This slide was created in a working session with state and federal education leaders in May 2009, Melbourne, Australia, while consulting to them regarding Australia’s National standards efforts.
National curriculum*

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Math 6 - Act. 22: The Dice Game

Group Size: Small Groups

Bike Race

Are you ready to race?
Check out the Rules, then get started.
Remember to keep racing until you have a winner.

Spydax has nine cards numbered 1 to 9. He will show you a card, and you must predict whether the next card he shows you will be higher or lower. Try to win six chips!

Click on this text to close this activity window.
Linked Australia, the United States and the United Kingdom using Linked Data principles
Expand the Work to Include European Countries
Global interoperability

- Open source achievement standards data with globally unique, Web-resolvable identifiers (URI) support:
  - Efficient integration of data from disparate resource providers
  - Resource sharing and linking related resources
- Support of curriculum that is language independent
The Achievement Standards Network is part of the Global Learning Resource Connection; collaborating to *connect the dots* between education systems that support teaching and learning.

Questions?

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