STEM Learning is Educational and Fun
Program Components

Multiple pathways to STEM content raises achievement for all students while accelerating performance of high achievers in the same classroom:

- Core STEM curricula aligned to state standards
- Inquiry-based labs and field investigations combine scientific rigor and relevance
- Engaging educational games, videos and social media bring content to life
- Live interactive webcasts connect students with diverse STEM career role models
- National competitions promote student centered, project based learning
- Citizen science projects involve students in real research in their communities
- Online standards correlations, lesson plans, and customizable assessments help educators plan, differentiate instruction and assess student learning
Curriculum Delivery

Online & Print Curricula

Interactive Simulations and Games

Live Events

Videos

Inquiry-Based Hands on Labs
JASON recognizes that support from aligned leadership leadership – from superintendent to principal, to teacher – is key to affecting a shift in the educational paradigm. Following with JASON’s central belief that to teach science, you must first be inspired by science, this model was designed to help superintendents inspire their teachers and students.
U.N. Study Shows

Out of the world’s estimated 7 billion people, 6 billion have access to mobile phones. Only 4.5 billion have access to working toilets.

By Yue Wang | March 25, 2013 | 27 Comments

On the eve of World Water Day last week, the U.N. offered a sobering statistic: according to its recent study, more people on earth have access to cell phones than toilets.

Out of the world’s estimated 7 billion people, 6 billion have access to mobile phones. Far fewer — only 4.5 billion people — have access to working toilets. Of the 2.5 billion who don’t have proper sanitation, 1.1 billion defecate in the open, according to the study.
District Cultural Change

- Science Fairs
- Internal JASON Learning clubs
- Argonaut adventures
- Teacher learning activities
- Parent/Community events
  - Science exploration
  - JASON presentations
  - News Letters
Our Future
Evaluation

Triangulated measurement: student data, student/teacher surveys and anecdotal evidence

- Student achievement gains on STAAR
  - Grade 8 Science Test

- Student interest in science was increased in districts
- Teacher use is defined by success with the following:
  - English language learners
  - Instructional differentiation
  - Closing the achievement gap
  - Accelerating learning
A STEM Background is Essential

- All students need a STEM background
- All citizens need a STEM background
- Democracy is incumbent on STEM Knowledge
ENERGIZING QUALITY STEM EDUCATION:
JASON LEARNING IN THE GREATER HOUSTON AREA

Prof. Daniel L. Duke
University of Virginia
THE MISSION

Draw on the community commitment and resources of Chevron in Houston, the instructional materials and science curriculums of JASON Learning, and the educational leadership and teaching talent of Houston-area school systems to promote student interest and achievement in science, technology, engineering, and mathematics (STEM).
1. On-line and hard copy materials:
   Monster Storms
   Resilient Planet
   Infinite Potential
   Terminal Velocity
   Tectonic Fury
   (Materials include engaging graphics, stimulating problem-based activities, assessments, and guide-lines for teachers.)
2. Interactive website, including opportunities to communicate with scientists in the field in real time.
3. School visits by JASON scientists.
4. Opportunities to compete for spots on summer expeditions aboard the Nautilus.
STRATEGIC ACTION TO IMPROVE EDUCATION BY CHEVRON IN HOUSTON

1. Maximize impact by focusing on school districts instead of schools or teachers.

2. Channel resources selectively to districts poised to make a significant jump in student achievement.

3. Make a long-term commitment of resources in order to increase sustainability.
District leader commits to support JASON initiative

Responsibility for JASON implementation delegated to central office supervisors and school-based teacher leaders

Initial and ongoing training

Alignment of JASON content to district standards and pacing guides

Provisions for continuous feedback and collaboration on JASON implementation
CHANGE STRATEGIES USED BY CHEVRON OF HOUSTON

1. Multi-year funding to ensure effective implementation.

2. Layering – Chevron of Houston assists in the acquisition of additional funds to support and extend its implementation efforts.
Key Beliefs Supporting JASON Programs and Curriculums

Beliefs about science

1. Science is dynamic, not static.
2. Scientific discovery depends as much on guesswork and trial-and-error as formalized procedures.
3. Scientific inquiry is best regarded as an interdisciplinary endeavor.
Charting a Course to Effective Learning

Key Beliefs Supporting JASON Programs and Curriculums

Beliefs about learning

4. Learning depends to a great extent on motivation.
5. Learning cannot be understood apart from the context in which it occurs.
6. Learners vary in terms of their prior learning and interests.
7. Learning entails the application as well as the acquisition of knowledge.
Beliefs about science teaching

8. It is not essential for science teachers to know all the answers to questions posed by and for students.

9. Students can learn from peers as well as adults.
Differentiation: The adaptation of lessons and learning activities to meet the needs, ability levels, learning styles, and content knowledge of different students.

Customization: The adaptation of lessons and learning activities to reflect teaching styles, classroom conditions, and available resources.
OTHER IMPORTANT DESIGN PRINCIPLES

The JASON program must be adaptable to the needs, ability levels, learning styles, and content knowledge of different students.

The JASON program must accommodate differences in teaching styles, classroom conditions, and available resources.

The JASON program must expose students to real problems from the world around them.

The JASON program must provide students with opportunities to compete.

The JASON program must expose students to role models that they can relate to.
OTHER IMPORTANT DESIGN PRINCIPLES

The JASON program must include lessons and activities that students enjoy.

The JASON program must encourage experimentation and guesswork.

The JASON program must provide opportunities for hands on and technology-based activities.

The JASON program must be continually updated to address recent events of scientific significance.

The JASON program must be compelling to teachers and user friendly.
## Teacher Perceptions of JASON’s Instructional Benefits: Aldine & Alief

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Disagree</th>
<th>No Opinion</th>
<th>Response Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many JASON lessons align with the TEKS science standards.</td>
<td>82.9%</td>
<td>8.6%</td>
<td>8.6%</td>
<td>35</td>
</tr>
<tr>
<td>JASON lessons help me to differentiate instruction to meet the needs of different students.</td>
<td>80.0%</td>
<td>5.7%</td>
<td>14.3%</td>
<td>35</td>
</tr>
<tr>
<td>JASON lessons lead to interesting discussions and promote academic conversations.</td>
<td>82.9%</td>
<td>2.9%</td>
<td>14.3%</td>
<td>35</td>
</tr>
<tr>
<td>Formative assessments found in JASON’s “online teacher tools” are easy to use.</td>
<td>57.1%</td>
<td>5.7%</td>
<td>37.1%</td>
<td>35</td>
</tr>
<tr>
<td>JASON texts and online resources cover many science topics better than my current science textbook.</td>
<td>57.1%</td>
<td>11.4%</td>
<td>31.4%</td>
<td>35</td>
</tr>
<tr>
<td>JASON lessons expose students to many ways in which science is applied in the real world.</td>
<td>97.1%</td>
<td>0.0%</td>
<td>2.9%</td>
<td>35</td>
</tr>
<tr>
<td>JASON lessons keep students engaged while they are learning about science.</td>
<td>85.7%</td>
<td>0.0%</td>
<td>14.3%</td>
<td>35</td>
</tr>
</tbody>
</table>
Percentage of Students in 2 Middle Schools Responding “Yes” to Statements Regarding the Benefits of JASON Lessons

<table>
<thead>
<tr>
<th>Skill</th>
<th>AMS</th>
<th>KMS</th>
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</thead>
<tbody>
<tr>
<td>Reading Graphs</td>
<td>47%</td>
<td>68%</td>
</tr>
<tr>
<td>Reading Data</td>
<td>50%</td>
<td>74%</td>
</tr>
<tr>
<td>Analyzing Data</td>
<td>61%</td>
<td>70%</td>
</tr>
<tr>
<td>Using Scientific Terms</td>
<td>44%</td>
<td>59%</td>
</tr>
<tr>
<td>Reading Difficult Material</td>
<td>30%</td>
<td>43%</td>
</tr>
<tr>
<td>Following Procedures</td>
<td>65%</td>
<td>78%</td>
</tr>
<tr>
<td>Making Predictions</td>
<td>53%</td>
<td>72%</td>
</tr>
<tr>
<td>Designing Experiments</td>
<td>53%</td>
<td>67%</td>
</tr>
<tr>
<td>Solving Problems</td>
<td>53%</td>
<td>72%</td>
</tr>
<tr>
<td>Writing</td>
<td>32%</td>
<td>49%</td>
</tr>
<tr>
<td>Playing Computer Games</td>
<td>74%</td>
<td>51%</td>
</tr>
</tbody>
</table>
Through this partnership, AASA members will have the opportunity to access the entire JASON program. The package includes curriculum, videos, assessments, support materials and some of the best thinking about STEM today for just $6 per student.

“STEM education has become a critical component to our economic growth,” said Daniel A. Domenech, executive director, AASA. “By advancing the AASA-JASON Learning partnership, we will reach more school districts, more schools and most importantly, more students in our efforts to escalate STEM learning environments, especially in low-income areas. I encourage our members to take advantage of this cutting-edge initiative.”

“We are excited about this partnership because AASA is America’s premier voice for advocating on behalf of public schools and public school children by working directly with school district leaders. Our work will advance academic success for our students,” added Smalley.

The program will provide schools with lesson plans, assessments and comprehensive professional development programs. The program will also:

• Deliver professional development opportunities for superintendents in STEM curricula;
• Create opportunities for superintendents to become part of JASON Learning’s National Argonaut Program—an initiative that’s engaged hundreds of students and educators worldwide in hands-on, scientific field work.

For more information about the AASA-JASON Learning national STEM partnership and how AASA members can access the program, contact Mort Sherman, AASA superintendent-in-residence, at msherman@aasa.org or Eleanor Smalley, JASON Learning executive vice president and chief operating officer at esmalley@jason.org. In addition, please visit the website at http://www.aasa.org/jason.aspx.