

Archived Information

What is needed?

- Teacher preparation and professional education
 - Targets content in benchmarks and standards
 - Incorporates elements of good instruction
 - In context of curriculum materials
- Coherent curriculum K-12 (Good Curriculum Materials)
 - Targets benchmarks and standards
 - Incorporates elements of good instruction
 - Tells a story K-12
- Solid published research on student learning of specific ideas

Things You Want to Hear

- Informal education can address topics that are great motivators like space or forensic science-- teachers and kids love this stuff
- Informal education can target specific audiences like young science enthusiasts and provide opportunities for learning beyond school
- Informal education can be a resource for schools to achieve their NCLB mission

Things You Don't Want to Hear

- Most current science teaching K-14 is ineffective
- Most students are learning very little science K-14
 - TIMSS, NAEP, ask a college professor
- Learning and teaching science is hard
 - Science does not have a mechanical component like reading and mathematics
- Most curriculum materials don't have potential for helping teachers teach or students learn
 - Almost no materials produced by the major publishers or the informal education community have been researched
- There isn't room in the school curriculum for most of the stuff that informal education organizations would like to push

How much time is available for learning science in school?

- Space Science example:
 - ~ 50 hours per year for all science K-5
 - ~100 hours per year for all science 6-12
 - 1000 hours total K-12, Maybe 300 for “Earth Science”
 - Maybe 150 hours total K-12 for Astronomy and Space Science
 - ~12 hours per year!
- Our expectations for what most students can learn about astronomy and space science K-12 are probably way too high
- What would NASA like to do? Is it realistic?

Space Science Missions

With E/PO Supplementary Curriculum Components

Magellan Yohkoh XMM Wind Voyager Ulysses TRACE SWAS
Stardust SOHO SNOESAMPEX RXTE Polar Nozomi NEAR Mars
Global Surv IMP-8 IMAGE Hubble (HST) HETE-2 HALCA/VLBI
Geotail Galileo FUSE FAST Deep Space 1 Cluster II Chandra Cassini
ACE ACCESS AIM CINDI CNSR Constellation-X Dawn Deep
Impact Europa Orbiter Europa Lander FAME FIRST GEC GLAST
HNX INSIDE Jupiter Ionosph. Mappers JMEX JOULE Kepler LISA
Mag Const Mag Multiscale Mars 2003+ MESSENGER NetLander
NGST Planck Pluto/Kuiper PRIME Rad Belt Mappers SDO Sentinels
SIM Solar-B Solar Probe Space Tech 3 Space Tech 5 SPEAR SPIDR
STEP Swift STEREO Titan Explorer TPF AMS ASPERA-3 CATSAT
CHIPS CONTOUR GALEX Genesis Gravity Probe-B HESSI
INTEGRAL MAP '01 Mars Odyssey Rosetta SIRTf SOFIA TIMED
TWINS Mars Pathfinder Lunar Prospector

What can informal education do to bridge to schools?

Approach education as you do science

- Read the science education and learning literature
- Study the benchmarks and standards
- Learn from teachers—spend time in classrooms
- Do experiments--set learning goals, gather data, publish the results

Focus on your strengths and niches