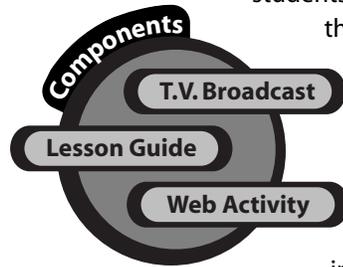


2001-2002 Series Overview

INTRODUCTION TO THE NASA CONNECT SERIES

What is NASA CONNECT?

NASA CONNECT is an annual series of FREE integrated mathematics, science, and technology instructional distance learning programs for students in grades 5-8. Each program has three components: (1) a 30-minute television broadcast, which can be viewed live or taped for later use (see right); (2) an interactive web activity which provides educators an opportunity to use technology in the classroom setting; and (3) a lesson guide describing a hands-on activity. These three components — television broadcast, web activity, and lesson guide — are designed as an integrated instructional package.



NASA CONNECT is FREE to educators. Register on our web site, <http://connect.larc.nasa.gov>. Registered educators will receive, via E-mail, the date of upcoming shows, a show summary, and a PDF version of the lesson guide. NASA CONNECT is a U.S. Government product and is not subject to copyright. There are no fees or licensing agreements. Broadcast and off air rights are unlimited and granted in perpetuity.



Endorsed by the National Council of Teachers of Mathematics (NCTM), NASA CONNECT supports national mathematics, science, and technology standards. The 2001-2002 series uses proportional reasoning as the "integrative thread" that "connects" mathematics topics in each program. NASA CONNECT seeks to establish a "connection" between the mathematics, science, and technology concepts taught in the classroom and the mathematics, science, and technology used everyday by NASA researchers. By demonstrating the processes of creativity, critical thinking, and problem solving skills, NASA CONNECT enhances and enriches mathematics, science, and technology education.

How can I get the television broadcast?

- The shows are broadcast on Ku- and C-band satellite and can be downlinked using the satellite coordinates listed on the NASA CONNECT web site, <http://connect.larc.nasa.gov>.
- NASA CONNECT shows are carried by over 130 PBS stations, Channel One, and on many Cable Access Channels. Check our web site for viewing in your locality.
- Shows are available on the web through NASA's Learning Technologies Channel, <http://quest.arc.nasa.gov/ltc/special/connect/index.html>.
- Video copies of the broadcast can be obtained from the NASA Educator Resource Center in your state, <http://education.nasa.gov/ercn> (p. 8), or from the NASA Central Operation of Resources for Educators, <http://core.nasa.gov> (p. 7).

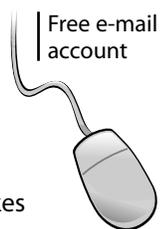
Educator Services

The American Institute of Aeronautics and Astronautics (AIAA) provides classroom mentors to assist educators with the hands-on activities. Every effort will be made to match an educator with an AIAA member who will assist the educators either in person or by E-mail. To request a mentor, e-mail nasaconnect@aiaa.org or call Lisa Bacon at (703) 264-7527 at least four weeks prior to conducting the hands-on activity.



Get a classroom mentor.

If you do not currently have an e-mail account, free accounts are available for educators at ePALS Classroom Exchange. Simply visit www.epals.com and click on "Step 1: Join our online community" to register. Registration takes only two minutes and allows you to access E-mail tools and to create a searchable profile for your class. Include the term "NASA CONNECT" or "AIAA Mentor" in your profile description and you will be able to find and communicate with colleagues also using the NASA CONNECT program.





NASA CONNECT 2001-2002 Theme

The 2001-2002 NASA CONNECT series uses the five Strategic Enterprises as its organizing theme: Aerospace Technology, Earth Science, Human Exploration and Development of Space, Space

Science, and Biological and Physical Research. For more information on these Enterprises visit <http://www.nasa.gov/enterprises.html>. This theme forms the creative basis for the series of nine programs; four new programs and five repeat programs from the 2000-2001 NASA CONNECT series.

2001-2002 NASA CONNECT PROGRAMS

MEASUREMENT, RATIOS, AND GRAPHING:

Safety First

Starts airing: Thursday, September 27, 2001, 11 am ET
 NASA engineers and researchers use measurement, ratios, and graphing to maintain high levels of aviation safety and to develop new technologies to meet the growing demands — keeping you safe in tomorrow’s skies.

Mathematics: measurement, ratios, graphing

Science: unifying concepts and processes, science as inquiry, science and technology, science in personal and social perspectives

NASA Research: Aviation Safety, Virtual Flight Tower

MEASUREMENT, RATIOS, AND GRAPHING:

3, 2, 1.... Crash! (R)*

Starts airing: Thursday, October 25, 2001, 11 am ET
 Crashing planes, skidding tires, and blasting water, NASA engineers work to improve airplane performance and safety.

Mathematics: measurement, ratios, graphing

Science: science and technology, science as inquiry, physical science

NASA Research: Aircraft Landing Dynamics Facility, Impact Dynamics Research Facility

GEOMETRY AND ALGEBRA: The Future Flight Equation

Starts airing: Thursday, November 29, 2001, 11 am ET
 NASA engineers and researchers use geometry and algebra to design, develop, and test tomorrow’s aircraft.

Mathematics: geometry, algebra

Science: science as inquiry, unifying concepts and processes, science and technology

NASA Research: Advanced Vehicle Concepts, Hyper X

GEOMETRY AND ALGEBRA: Glow with the Flow (R)*

Starts airing: Thursday, December 13, 2001, 11 am ET
 NASA aerospace engineers use scale models to see how air flows and why materials glow under wind tunnel conditions.

Mathematics: geometry and algebra

Science: physical science, science and technology, science in personal and social perspectives, science as inquiry

NASA Research: Flow Visualization, Blended Wing Body

DATA ANALYSIS AND MEASUREMENT: Ahead, Above the Clouds (R)*

Starts airing: Thursday, January 31, 2002, 11am ET
 Predicting severe weather, tracking clouds, and monitoring pollutants in the air, NASA engineers and scientists are developing technologies to collect data that will help them better understand Earth’s climate.

Mathematics: data analysis and measurement

Science: Earth and space science, physical science, science as inquiry, science and technology, science in personal and social perspectives

NASA Research: Geostationary Imaging Fourier Transform Spectrometer (GIFTS)

PATTERNS, FUNCTIONS AND ALGEBRA: Wired for Space (R)*

Starts airing: Thursday, February 28, 2002, 11am ET
 NASA researchers develop new ways to propel a spacecraft already in orbit without the aid of fuel.

Mathematics: patterns, functions, algebra

Science: physical science, Earth and space science, science as inquiry

NASA Research: Propulsive Small Expendable Deployer System (ProSEDS)

*(R) indicates a repeat show from the 2000-2001 series



DATA ANALYSIS AND MEASUREMENT: Having a Solar Blast

Starts airing: Thursday, March 28, 2002, 11 am ET
 NASA engineers and researchers use data analysis and measurement to predict solar storms, anticipate how they will affect the Earth, and improve our understanding of the Sun-Earth system.

Mathematics: data analysis, measurement

Science: science as inquiry, unifying concepts and processes, physical science, Earth and space science, science and technology, science in personal and social perspectives

NASA Research: SOLar Heliospheric Observatory (SOHO), Imager for Magnetopause-to-Aurora Global Exploration (IMAGE)

FUNCTIONS AND STATISTICS: International Space Station: Up to Us (R)*

Starts airing: Thursday, April 25, 2002, 11 am ET
 Ground research + space research = true science as international researchers anticipate working

together onboard the International Space Station.

Mathematics: functions, statistics

Science: science and technology, Earth and space science, physical science, science as inquiry

NASA Research: International Space Station Program, Virtual International Space Station

FUNCTIONS AND STATISTICS: Dressed for Space

Starts airing: Thursday, May 9, 2002, 11 am ET
 Building on past space suit technologies, NASA engineers and researchers use functions and statistics to create the next generation of space suits for the International Space Station and beyond.

Mathematics: functions, statistics

Science: science as inquiry, Earth and space science, physical science, life science, science and technology, science in personal and social perspectives, history and nature of science

NASA Research: Advanced Suit Development, Radiation Analysis

***(R) indicates a repeat show from the 2000-2001 series**

NASA CONNECT INSTRUCTIONAL DESIGN

Each program in the 2001-2002 NASA CONNECT series is designed to enhance and enrich the teaching of specific mathematics, science, and technology concepts. The NASA CONNECT series can be easily integrated into an existing curriculum or used to introduce or reinforce a curriculum topic, objective, or skill. These instructional programs demonstrate the "how to" and the "real world" application and integration of mathematics, science, and technology. NASA CONNECT has two objectives:

1. Students will be able to make connections between the mathematics, science, and technology taught in their classrooms and the real world applications by observing NASA researchers.
2. Students will be able to increase their understanding of mathematics, science, and

technology concepts through interactive activities.

Each NASA CONNECT program models an instructional lesson design which includes an anticipatory set, explanation, questioning strategy, and interactive activities. The accompanying lesson guide provides a program summary and objectives, background information, relevant national mathematics, science, and technology standards,

step-by-step instructions for conducting the activities, print and on-line resources, and suggestions for extending the activities.



Jackie Chan introduces GEOMETRY AND ALGEBRA: Glow with the Flow.

Anticipatory Set

Hosts and celebrity guests focus student attention, connect the program to past,

present, or future learning, and visually and verbally present the learning objectives.

Explanation

NASA engineers, scientists, and other expert guests illustrate the application and relevance of mathematics, science, and technology to the workplace. The connection is further established by introducing students to the tools and methods used by NASA researchers and other experts. Their contributions form the basis for the learning objectives.

process the mathematics, science, and technology concepts presented. Students record their answers on Cue Cards that are provided in the lesson guide.

Interactive Activities

The hands-on and web activities are based on national mathematics, science, and technology standards. These two interactive activities provide students the opportunity to connect the mathematics, science, and technology concepts learned in the classroom to the research presented by NASA researchers, engineers, and scientists.

Program 3 in the 2001-2002 NASA CONNECT Series

Student Cue Cards

Name: _____
Class: _____

Carter Voss's Work-Creation and Program Outreach Card, NASA Johnson Space Center

1. What are the tasks that you will do in the ISS?
2. How do you see the International Space Station with the Earth's orbit?
3. Describe the function of the solar panels, thermal blankets, and other systems.

Dr. John Bartel Burton, ISS Program Research Manager, NASA Johnson Space Center

1. What's your research project about in the ISS?
2. How does your research affect the health of the body?
3. Describe the technology that you use in your research.

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NASA
Education and Outreach International Space Station 10-10-01

Questioning strategy

Throughout the program, questions are posed to check for understanding and to give students time to

Students record answers on Cue Cards.

NASA CONNECT Teaching Strategy

INTRO TO NASA CONNECT TEACHING STRATEGY

The model proposed to educators through the NASA CONNECT series introduces students to inquiry and the process of searching for patterns and relationships. The six-step teaching strategy is designed to encourage the development of higher order cognitive skills and a more active mental engagement with the television broadcast. Following this strategy enables students to make stronger connections between the television broadcast, the activities, and appropriate

mathematics, science, and technology concepts.

The six-step strategy includes reflective discussion, student involvement, dialogue notes, the hands-on activity, journal writing, and the web activity. The strategy, consistent with constructivist theory, promotes rich discourse among students. The proposed format is flexible and effective in enhancing students' understanding of complex mathematics, science, and technology concepts.

STEPS IN NASA CONNECT TEACHING STRATEGY

Step 1: Reflective Discussion

Prior to viewing the NASA CONNECT television broadcast or videotaped copy, list and discuss questions and preconceptions that students have about the program topic. Keep these questions on the board during the show. In addition to helping students prepare for the program, these questions can also serve as a pretest for assessment purposes. The following is a sample of teacher-directed questions:

1. What role does mathematics play in science?
2. What kinds of mathematics, science, and technology do NASA experts use in their research?
3. What other skills are necessary to conduct research?
4. Of what value are collaborations and partnerships in conducting research?

Step 2: Student Involvement

NASA CONNECT is not designed for passive viewing and actively engages students throughout the program. The following suggestions are provided to help educators focus student attention on the major concepts presented in the show.

1 Describe the relationship between time in space and bone loss.

Cue Cards help students stay focused.

Cue Cards have selected questions that focus on the critical elements in each show segment. Educators should copy the Cue

Cards from the lesson guide and distribute them prior to viewing the show. Students are encouraged to take notes during the show and answer the questions on the cards.

When viewing a videotaped version of NASA CONNECT, educators have the option to use Norbert's Pause, which gives students an opportunity to reflect, answer, and discuss the Cue Card questions. Norbert, the animated cohost of NASA CONNECT, appears with a remote to indicate an appropriate time to pause the videotape.



Norbert's Pause

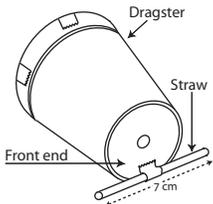
Step 3: Dialogue Notes

Immediately following the show, students should spend five to ten minutes reviewing the questions in "Step 1: Reflective Discussion Section." Educators should ask students to give examples from the show that support their responses to each question.

Review the Cue Cards with students. Educators should ask students to share what they recorded and learned from each guest and NASA researcher. Students should also discuss what they believe are the important mathematics, science, and technology concepts these individuals use in their work.

Step 4: Hands-On Activity

Students learn from direct teaching, engaging in classroom discussion, conducting research, and taking notes. The teacher-tested, hands-on activity is designed to enhance mathematics, science, and technology concepts. Students are assigned to cooperative groups and use everyday objects to complete the activity.



Hands-on activities with step-by-step instructions and diagrams are in every lesson guide.

When using the NASA CONNECT hands-on activity, refer to the lesson guide. Introduce students to the vocabulary, guide students toward connections, explore possible misconceptions associated with the topic, conduct the activity, and conclude by analyzing the data. Finally, have students relate the results of the activity to the NASA research presented in the show.

Step 5: Journal Writing

Journal writing supports students' reflective thinking processes. Students should reflect on what they learned from the show and from their own experimentation. Educators can ask students questions that relate to the application of mathematics, science, and technology concepts presented in the show to real-life situations. Educators might use journal questions to assess student understanding of the concepts presented in the lesson guide.

Step 6: Web Activity

Dan's Domain, located on the NASA CONNECT web site, features an interactive web activity for each program that supports and enhances the mathematics, science, and technology content presented in each show. Dan's Domain also provides links to other relevant NASA sites and a Career Corner that features program guests sharing information about their jobs at NASA. Teachers are encouraged to visit the Lab Manager section of Dan's Domain to receive guidance in using the web activities as part of the total NASA CONNECT learning experience (television broadcast/lesson guide/web activity). In the Lab Manager, there is a special link to additional mathematics activities produced by Riverdeep Interactive Learning, a new NASA CONNECT program partner.



Dan Geroe, NASA
CONNECT co-host

The NASA CONNECT web site, <http://connect.larc.nasa.gov>, includes information about the current season and past seasons of NASA CONNECT, broadcast dates and times, and additional student activities. The web site also establishes a connection between the classroom and the family. Educators may send home the NASA CONNECT web address to encourage parents to explore the web activities with their children.

NASA Resources for Educators

NASA's Education Home Page (<http://education.nasa.gov>) serves as the cyber-gateway to information regarding educational programs and services offered by NASA for educators and students across the United States and provides specific details and points of contact for all of NASA's educational efforts and Field Center Offices. Those using the site will have access to a comprehensive overview of NASA's educational programs and services, as well as home pages offered by NASA's four areas of research and development.

NASA Langley Research Center, Office of Education (<http://edu.larc.nasa.gov>) offers a wide variety of opportunities for educators at all levels of instruction. The Office of Education seeks to enhance the teaching of mathematics, science, and technology through its distance learning programs, all of which are described on the web site. Educators can also search NASA educational resources for the classroom, including activities, curriculum enhancing projects, and equipment. From this site, you can link to our NASA CONNECT web site.

NASA Spacelink (<http://spacelink.nasa.gov>) is one of NASA's electronic resources that is specifically developed for use by the education community. This comprehensive electronic library offers teacher guides, wall sheets, listings of videos, computer software, and other materials that have been developed to meet national education standards. Educators can search specific curriculum materials by grade level and subject matter. Current and historical information related to NASA's aeronautic and space research can be found on Spacelink. Links to NASA Educator Resource Centers (ERCs), the Central Operations of Resources for Educators (CORE), news releases, current state reports on agency projects and events, and television broadcast schedules for NASA Television are also provided.

Quest (<http://quest.nasa.gov>) is the home of NASA's K-12 internet initiative. This electronic resource specializes in providing programs, materials, and opportunities for teachers and

students to use NASA resources as learning tools to explore the Internet. One of its unique projects is Sharing NASA, a series about on-line, interactive units where students can communicate with NASA scientists and researchers to experience the excitement of real science in real time.

The Learning Technologies Channel (LTC) (<http://quest.nasa.gov/ltc/>) is a NASA location on the Internet that allows you to participate in on-line courses and to remotely attend some NASA workshops and seminars. A primary focus of the LTC is to broaden the uses of the Internet to include in-service teacher training and to bring new internet experiences into the classroom.

NASAexplores (<http://NASAexplores.com/>) provides science, mathematics, and technology lessons that are published weekly. NASAexplores gives teachers timely educational content based on current research, development, and related events. The web site provides an e-mail subscriber list service to notify subscribers of weekly content. Teachers sign up to receive e-mail notices linking them directly to the web site where the lessons, along with related resources and materials, are posted. Teachers without e-mail can also access the lessons by visiting the NASAexplores web site.

NASA CORE, Central Operation of Resources for Educators (<http://core.nasa.gov>) is a worldwide distribution center for NASA multimedia educational materials. Educational materials include videotape programs, slide sets, and computer software. For a minimal fee, NASA CORE will provide educators with materials through its mail order service. A free NASA CORE catalog is available.

NASA CORE
15181 State Route 58 South, Oberlin, OH 44074,
phone: (440) 775-1400, fax: (440) 775-1460,
E-mail: nasaco@leeca.org

EDUCATOR RESOURCE CENTER NETWORK

The NASA Educator Resource Center Network (ERCN) is composed of Educator Resource Centers (ERCs) located on or near all NASA field centers, colleges, museums, or other nonprofit organizations. These centers provide educators with inservice and preservice training, demonstrations, and access to NASA instructional products.

For a list of ERCs in your state, visit the NASA Educator Resource Center Network, <http://education.nasa.gov/ercn>. Educators may also contact one of the ERCs at the following NASA Centers.

AK, Northern CA (southern-most counties of Inyo, Kings, Monterey, Tulare), HI, ID, MT, NV, OR, UT, WA, WY

NASA Ames Educator Resource Center

Mail Stop 253-2

Moffett Field, CA 94035-1000

(650) 604-3574

<http://amesnews.arc.nasa.gov/erc/erchome.html>

AZ, Southern CA (northern-most counties of Kern, San Bernadino, San Luis Obispo)

NASA Dryden Educator Resource Center

45108 North Third Street East

Lancaster, CA 93535

(661) 948-7347

<http://www.dfrc.nasa.gov/trc/ERC>

CA

NASA JPL Educator Resource Center

Village at Indian Hills Mall

1460 East Holt Blvd., Suite 20

Pomona, CA 91767

(909) 397-4420

<http://eis.jpl.nasa.gov/eao/>

CT, DE, DC, ME, MD, MA, NH, NJ, NY, PA, RI, VT

NASA Goddard Educator Resource Center

Mail Code 130.3

Greenbelt, MD 20771

(301) 286-8570

<http://pao.gsfc.nasa.gov/gsfcc/educ/trl/welcome.html>

VA's and MD's Eastern Shore

NASA Wallops Educator Resource Center

Education Complex - Visitor Center

Building J-17

Wallops Island, VA 23337

(757) 824-2298

<http://www.wff.nasa.gov/pages/visitor.html>

FL, GA, Puerto Rico, Virgin Islands

NASA Kennedy Educator Resource Center

Mail Code ERC

J.F. Kennedy Space Center, FL 32899

(321) 867-4090

<http://www-pao.ksc.nasa.gov/kscpao/educate/edu.htm>

CO, KS, NE, NM, ND, OK, SD, TX

Johnson Space Center

1601 NASA Road One

Houston, TX 77058

(281) 244-2129

http://www.spacecenter.org/educator_resource.html

KY, NC, SC, VA, WV

NASA Langley Educator Resource Center

Virginia Air and Space Center

600 Settlers Landing Road

Hampton, VA 23669

(757) 727-0900, ext. 757

<http://www.vasc.org/erc>

IL, IN, MI, MN, OH, WI

NASA Glenn Educator Resource Center

21000 Brookpark Road, MS 8-1

Cleveland, OH 44135

(216) 433-2017

<http://www.grc.nasa.gov/WWW/PAO/html/edteachr.htm>

AL, AR, IA, LA, MO, TN

NASA Marshall Educator Resource Center

U.S. Space and Rocket Center

One Tranquility Base

Huntsville, AL 35807

(256) 544-5812

<http://erc.msfc.nasa.gov>

MS

NASA Stennis Educator Resource Center

Building 1200

Stennis Space Center, MS 39529

(228) 688-3338

<http://education.ssc.nasa.gov/htmls/trc/trc.htm>

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