A TEACHER GUIDE TO INTEGRATING STEM CAREERS INTO CLASSROOM CONTENT

LabTV

Introduction to using LabTV in your classroom:

- LabTV **[stem.wm.edu/labtv-by-ndep]** provides classroom connections between careers and academic content.
- The LabTV Webisode Guide will provide teachers a quick overview of STEM topics. For your convenience we have provided a guide to show you the connections between these videos and your classroom content.
- **BE CREATIVE** — expose students to the careers before or after you share academic content and explore how content can be connected to actual careers.
- Amazing research happens every day – bring that research into your classroom and answer the question, **Why do I need to know this stuff when I'm out in the world?**
- These five to seven minute clips will not only create excitement about your lessons, but will encourage students to consider awesome, innovative, and groundbreaking STEM careers.

LabTV was funded through the National Defense Education Program.
To locate the webisodes visit, **stem.wm.edu/labtv-by-ndep/**

For more resources and to read personal stories on how science and math has inspired NDEP Professionals, visit **www.ndep.us/**

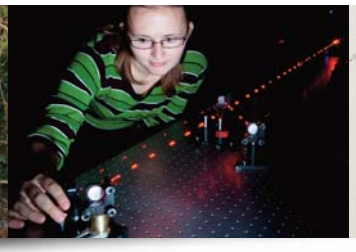
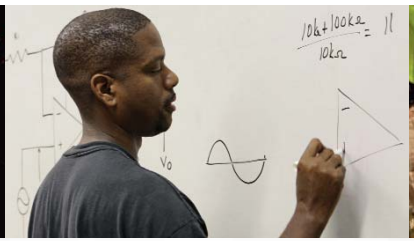
NDEP

STEM EDUCATION ALLIANCE
COLLEGE OF WILLIAM & MARY

CONTENT AREA FOR TEACHERS:

Electricity, Electronics

Special Features	Webisode Title (Season)	Concept Covered
	Beam Me Up (1)	Lasers, Light, Laser Waves Vs. Light Waves, Exciting Electrons, Fiber Optic Lasers
	Carbon Nanopearls (1)	Television Display Technologies, Nanotechnology
	Gimme Shelter (2)	Efficient Energy Use, Air Beams, Shelter Technologies
	Flock Of Robots (2)	Sensors, Computer Modeling, Robotics
	Just Add Water (2)	Materials Science, Alternative Energy, Fuel Sources, Aluminum, Chemical Equations, Endo/Exothermic Reactions, Measurements: Nanometer, Angstrom, Phase Changes, Nanotechnology
	Light Antennas (2)	Alternative Energy, Antennas, Carbon Nanotubes, Electromagnetic Spectrum, Infrared Light
	On My Wavelength (2)	Personal Electronic Devices, Scientific Process, Wavelength, Frequency
	Power Harvesting: Induction Magic (2)	Harnessing Electricity, Electromagnetic Induction, Inductive Coupling
	Power Harvesting: The Bat Hook (2)	Ac And Dc Electricity, Power Grid, Remote Auxiliary Power Systems (RAPS)
	Ship Shape (2)	Building To Scale, Resistance, Viscosity, Computer Aided Design
	Sink & Swim (2)	Electronic Circuits, Marine Engineering, Ship And Submarine Design
	Wafer Power: Building Circuits (2)	Semiconductor Wafers, Clean Rooms, MEMS (Microelectromechanical Systems)

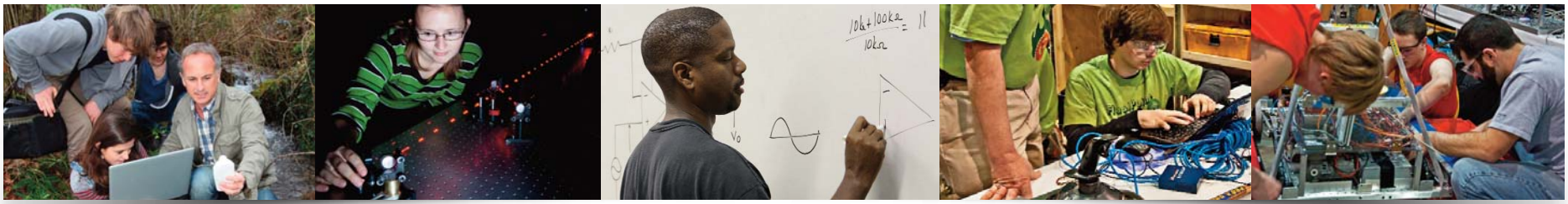


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CONTENT AREA FOR TEACHERS:

Computers, Programming

Special Features	Webisode Title (Season)	Concept Covered
	3-D Teleconference (2)	3-D Teleconferencing, High Speed Digital Imaging, Star Wars
	Computer Vision (1)	Pattern Recognition, Optical Character Recognition, Computers/Math
	First Person Thinker (2)	Video Games, Cultural Awareness
	Flock Of Robots (2)	Sensors, Computer Modeling, Robots
	Interior Design (2)	Engineering Process, Human Systems Integration, Human Factors, Virtual Product Testing
	Lego Champs (2)	Enprogramming, Robotics
	Light Stage (2)	Computer Graphics, Animation, Avatars
	Model Career (2)	Building To Scale, Computer Aided Design, Thrust, Torque
	On My Wavelength (2)	Personal Electronic Devices, Scientific Process, Wavelength, Frequency
	Plug-N-Play Satellites (2)	Smart Satellite Systems, Spacecraft Components
	Ship Shape (2)	Building To Scale, Resistance, Viscosity, Computer Aided Design
	Talk To The Hand (1)	Communications Technology, Engineering
	Virtual Human (1)	Interactive Digital Media, Virtual Human Technology, Natural Language Understanding, Speech Processing
	Wafer Power: Building Circuits (2)	Semiconductor Wafers, Clean Rooms, MEMS (Microelectromechanical Systems)
	Where In The World? (1)	GPS



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CONTENT AREA FOR TEACHERS: Engineering, Manufacturing, Design

Special Features	Webisode Title (Season)	Concept Covered
	Ceramics (2)	Ceramics, Sintering, Mohs Scale, Melting Points
♀	Color Writing (2)	Jet Fuel Development, Hydrocarbon Chains, Chromatography
	Foot Soldier (2)	Biomechanics, The Human Body, Footwear Engineering
♀	Gimme Shelter (2)	Efficient Energy Use, Air Beams, Shelter Technologies
♀	Interior Design (2)	Engineering Process, Human Systems Integration, Human Factors, Virtual Product Testing, Designing Military Vehicles, Simulations
♀	Lego Champs (2)	Enprogramming, Robotics
	Model Career (2)	Building To Scale, Computer Aided Design, Thrust, Torque
♀	Plug-N-Play Satellites (2)	Smart Satellite Systems, Spacecraft Components
	Printing New Skin (1)	Regenerative Medicine, Skin Burns
♀	Real World Design Challenge (2)	Engineering Design, Engineering Software, Aerodynamics, Span, Taper Ratio, Sweep, Lift, Weight, Drag Thrust
	Robot Birds (1)	Structure, Aerodynamics, Propulsion, Robotics
	Robot Birds Part 2 (1)	Aerodynamics, Propulsion, Robotics
♀	Ship Shape (2)	Building To Scale, Resistance, Viscosity, Computer Aided Design
	Sink & Swim (2)	Electronic Circuits, Marine Engineering, Ship And Submarine Design, Robotics, Buoyancy, Sea Perch
♀	Spinning Nanofibers (2)	Nanomaterials, Polymers, Nanotechnology
♀	Talk To The Hand (1)	Communications Technology, Engineering, Accelerometers
	Wafer Power: Building Circuits (2)	Semiconductor Wafers, Clean Rooms, MEMS (Microelectromechanical Systems)

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CONTENT AREA FOR TEACHERS:

Chemistry, Elements

Special Features	Webisode Title (Season)	Concept Covered
	Beam Me Up (1)	Lasers, Light, Laser Waves Vs. Light Waves, Exciting Electrons, Fiver Optic Lasers
	Breathe Easy (2)	Chemical Filtration, Hepa Filter, Activated Carbon, Adsorption, Mechanical Filtration
	Carbon Nanopearls (1)	Television Display Technologies, Nanotechnology, Material Sciences
	Ceramics (2)	Ceramics, Sintering, Mohs Scale
	Color Writing (2)	Jet Fuel Development, Hydrocarbon Chains, Chromatography
	Eat Up! (2)	Calorie Requirements, Food Energy, Mres Meal
	Fighting Malaria (1)	Artesunate, Drug Development, Malaria, Medicinal Chemistry, Mosquitoes, Transmission Of Disease
	Flame Proof (1)	Chemical Engineering, Composites, Material Engineering
	Flying Fuel Cells (2)	Fuel Cells, Hydrogen Energy
	It's A Small World (1)	Nanotechnology
	Just Add Water (2)	Materials Science, Alternative Energy, Fuel Sources, Aluminum, Chemical Equations, Endo/Exothermic Reactions, Measurements: Nanometer, Angstrom, Phase Changes, Nanotechnology
	Light Antennas (2)	Alternative Energy, Antennas, Carbon Nanotubes, Electromagnetic Spectrum, Infrared Light, Luna Moths
	Making Metal (2)	Alloys, Metal Matrix Composite, Metals, Conductivity
	Mission To Mars (2)	Elements, Manned Flight, Solar System, Space, Mars
	Spinning Nanofibers (2)	Nanomaterials, Polymers, Nanotechnology, Textiles
	Swab The Decks (2)	Cleaning And Decontamination, Surface Tension
	Wafer Power: Building Circuits (2)	Semiconductor Wafers, Clean Rooms, MEMS (Microelectromechanical Systems)

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CONTENT AREA FOR TEACHERS: Environmental Engineering

Special Features	Webisode Title (Season)	Concept Covered
	Breathe Easy (2)	Chemical Filtration, Hepa Filter, Activated Carbon, Adsorption
	Clean Chemistry (2)	Cleaning And Decontamination, Surface Tension, Surfactants
	Color Writing (2)	Jet Fuel Development, Hydrocarbon Chains, Chromatography
	Flying Fuel Cells (2)	Fuel Cells, Hydrogen Energy, Unmanned Aircraft
	Gimme Shelter (2)	Efficient Energy Use, Air Beams, Shelter Technologies
	Just Add Water (2)	Materials Science, Alternative Energy, Fuel Sources, Aluminum, Chemical Equations, Endo/Exothermic Reactions, Measurements: Nanometer, Angstrom, Phase Changes, Nanotechnology
	Save The Bay: Robotics Challenge (1)	Environmental Education, Robotics

CONTENT AREA FOR TEACHERS: Aerospace Engineering

Special Features	Webisode Title (Season)	Concept Covered
	Flying Fuel Cells (2)	Fuel Cells, Hydrogen Energy
	Mission To Mars (2)	Elements, Manned Flight, Solar System, Space
	Real World Design Challenge (2)	Engineering Design, Engineering Software, Aerodynamics, Span, Taper Ratio, Sweep, Lift, Weight, Drag Thrust
	Robot Birds (1)	Structure, Aerodynamics, Propulsion, Robotics
	Robot Birds Part 2 (1)	Aerodynamics, Propulsion, Robotics
	Space Hitchhikers (2)	Launch Vehicle, Payloads, Satellites, Ballast Weight, Buoyancy

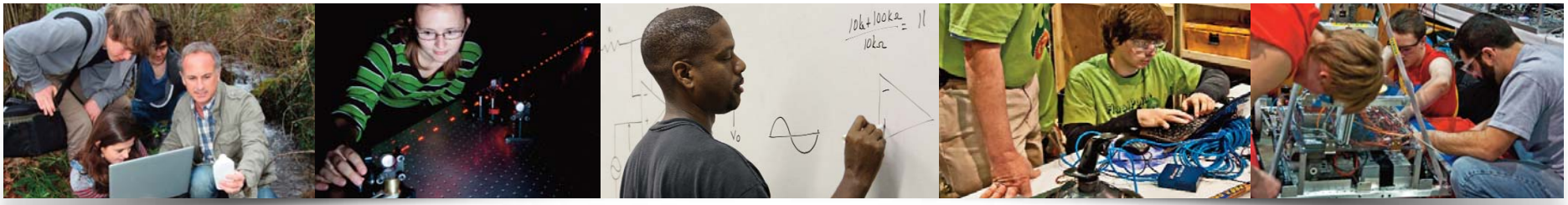
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CONTENT AREA FOR TEACHERS: Energy, Waves, Spectrum

Special Features	Webisode Title (Season)	Concept Covered
	Beam Me Up (1)	Lasers, Light, Laser Waves Vs. Light Waves, Exciting Electrons, Fiber Optic Lasers
	Bounce Back (2)	Radar, Radio Waves, Doppler Effect, Electromagnetic Spectrum
	Dolphin Lifesavers Part 1 (1)	Sonar, Echolocation, Mine Location
	Dolphin Lifesavers Part 2 (1)	Sonar, Echolocation
	Flying Fuel Cells (2)	Fuel Cells, Hydrogen Energy
	Laser Dazzlers (2)	Lasers, The Human Body
	Light Antennas (2)	Alternative Energy, Antennas, Carbon Nanotubes, Electromagnetic Spectrum, Infrared Light, Visible Light, Lasers
	On My Wavelength (2)	Wavelengths, Frequency

CONTENT AREA FOR TEACHERS: Language, Linguistics

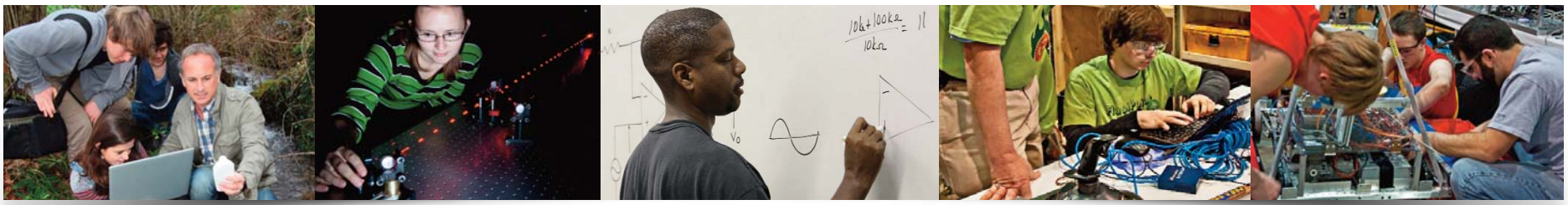
Special Features	Webisode Title (Season)	Concept Covered
	Talk To The Hand (1)	Communications Technology, Engineering, Sign Language,
	Virtual Human (1)	Interactive Digital Media, Virtual Human Technology, Natural Language Understanding, Speech Processing



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CONTENT AREA FOR TEACHERS: Biology, Anatomy, Viruses, Medicine

Special Features	Webisode Title (Season)	Concept Covered
	Biothreats (2)	PCR, Pathogens
	Brainwaves (1)	Nervous System, Psychology
	Building Body Parts (1)	Regenerative Medicine
	Cells In Space (1)	Regenerative Medicine, Orbits, Gravity
	Dolphin Lifesavers Part 1 (1)	Sonar, Echolocation, Mine Location
	Dolphin Lifesavers Part 2 (1)	Sonar, Echolocation
	Eat Up! (2)	Calorie Requirements, Food Energy, Mres
	Fighting Malaria (1)	Artesunate, Drug Development, Malaria, Medicinal Chemistry, Mosquitoes, Transmission Of Disease
	Foot Soldier (2)	Biomechanics, The Human Body, Footwear Engineering
	Laser Dazzlers (2)	Lasers, The Human Body
	Printing New Skin (1)	Regenerative Medicine, Skin Burns,
	Tracking The Flu (2)	H1N1, Influenza, Viruses, Vaccines



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CONTENT AREA FOR TEACHERS: Climate, Temperature, Atmosphere

Special Features	Webisode Title (Season)	Concept Covered
	Breathe Easy (2)	Mechanical/Chemical Filtration, Hepa Filter, Activated Carbon, Adsorption
	Don't Sweat It (2)	Human Temperature Regulation, Climate Chambers, Temperature Conversions, Temperature Scale, Scientific Method, Sweat
	How High? (1)	Atmospheric Pressure, Altitude Chambers

CONTENT AREA FOR TEACHERS: Investigation, Inquiry

Special Features	Webisode Title (Season)	Concept Covered
	Don't Sweat It (2)	Human Temperature Regulation, Climate Chambers, Temperature Conversions, Temperature Scale, Scientific Method, Sweat
	Interior Design (2)	Engineering Process Human Systems Integration, Human Factors, Virtual Product Testing, Military Vehicle, Simulations
	On My Wavelength (2)	Personal Electronic Devices, Scientific Process, Wavelength, Frequency, Using Math & Science For Things We Use Everyday

CONTENT AREA FOR TEACHERS: Physics, Gravity

Special Features	Webisode Title (Season)	Concept Covered
	Cells In Space (1)	Regenerative Medicine, Orbits, Gravity

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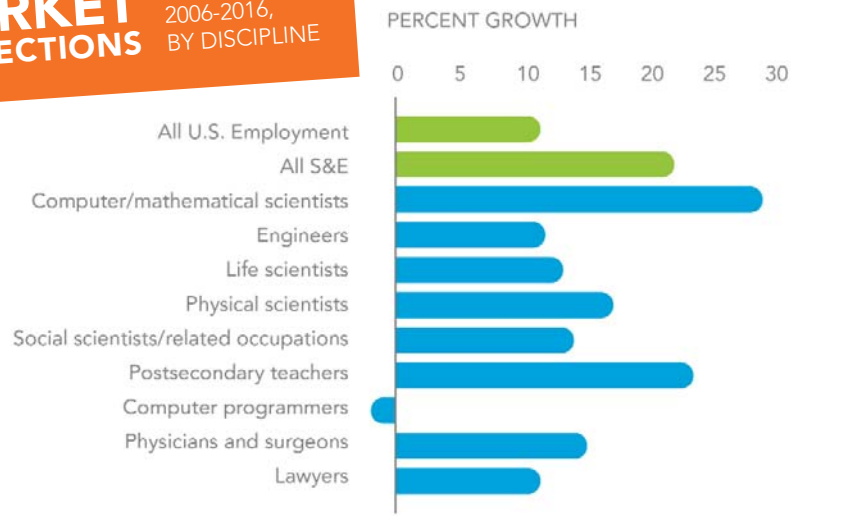
Check out our website at
stem.wm.edu

- Watch our *Talking with Scientists* videos, which feature a young diverse group of STEM professionals discussing why a career in STEM is so rewarding
- Read our *Explore* magazine online, under "STEM Career Resources"
- Order posters or magazines for your classroom, under "STEM Career Resources"
- Look for summer opportunities for your students, under "STEM Career Resources"
- Use our STEM Career Spotlights to discuss STEM careers in your classroom
- Explore the other stories, videos and resources
  we have to offer on our page

hot tip!

S&E JOB MARKET PROJECTIONS

FOR JOB GROWTH 2006-2016, BY DISCIPLINE



SOURCE: NATIONAL SCIENCE FOUNDATION

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