IEEE REACH Educational Partnerships

Opportunities for districts, states, & independent schools

IEEE REACH

Raising Engineering Awareness through the Conduit of History

IEEE

About IEEE

Driving Transformation

Solving the world's most pressing global challenges requires a new generation of innovators ready to rise to the challenge.

As the world's largest technical professional organization with nearly 400,000 members, **IEEE is uniquely positioned to take action.**

IEEE is a 501(c)(3) charitable organization

About IEEE

IEEE is committed to using its influence to meet pressing national and global challenges by implementing programs that:

ILLUMINATE – the possibilities of technology by using it to address global challenges

EDUCATE – the next generation of innovators and engineers

ENGAGE – a wider audience in appreciating the value & importance of technology

ENERGIZE – innovation by celebrating technological excellence

The Educational Challenge

The importance of technological literacy

One of the 21st century skills students need to be responsible citizens is technological literacy. Every aspect of the world we live in today is impacted by technology.

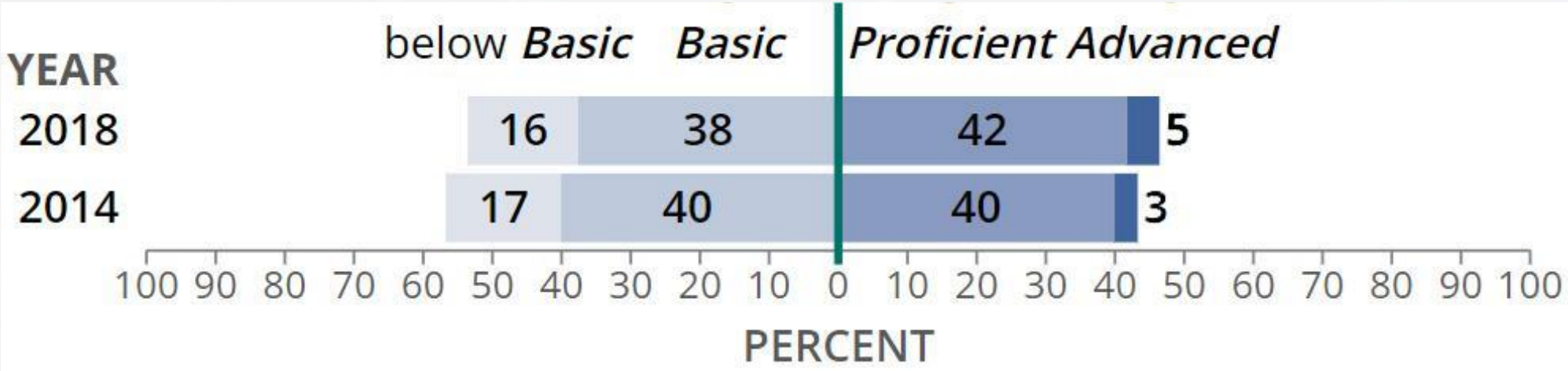
> *"In order to be a technologically literate citizen, a person should understand what technology is, how it works, how it shapes society and in turn how society shapes it."*
>
> *- International Technology and Engineering Educators Association (ITEEA)*

Yet many students fall below technological literacy proficiency levels.

The Educational Challenge

Technology Learning Gap – Hard Facts

54% of 8th grade students assessed in 2018 for technology and engineering literacy were *Not Proficient*.

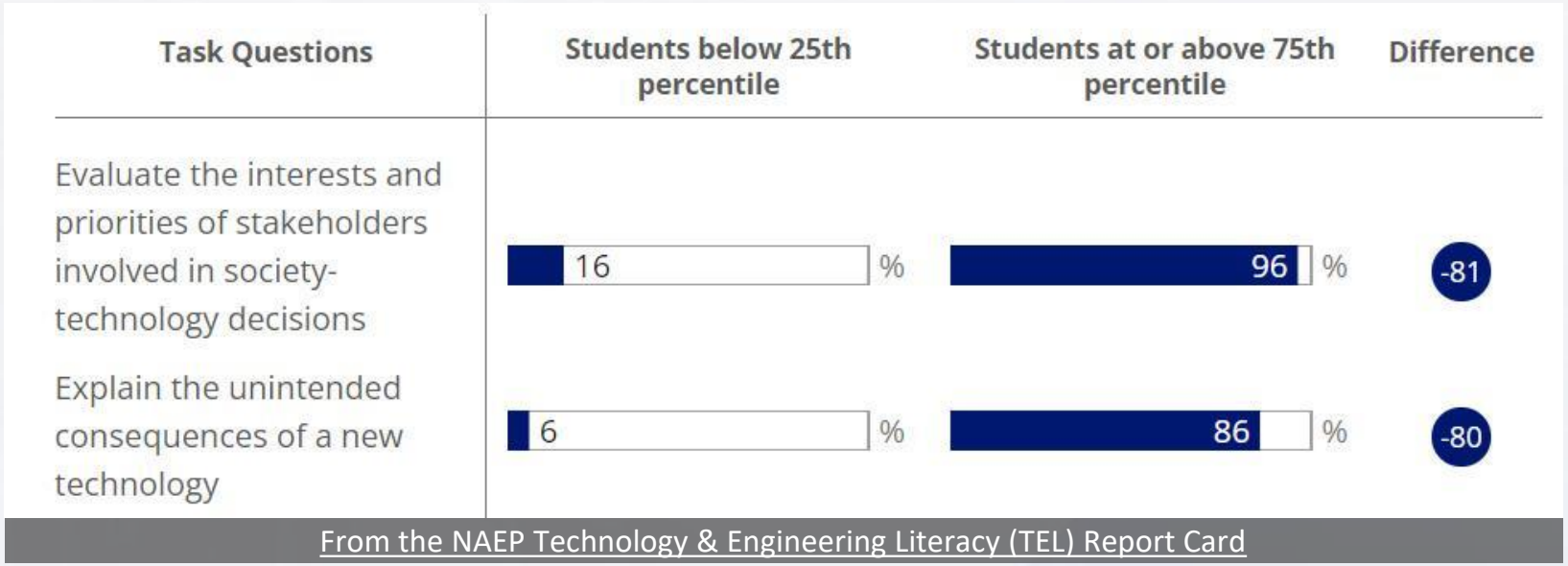


From the NAEP Technology & Engineering Literacy (TEL) Report Card

The Educational Challenge

Technology Learning Gap – Hard Facts

Students who are not proficient in technology literacy score significantly lower than their peers and are unable to explain basic concepts of technology's impact on society and stakeholders.



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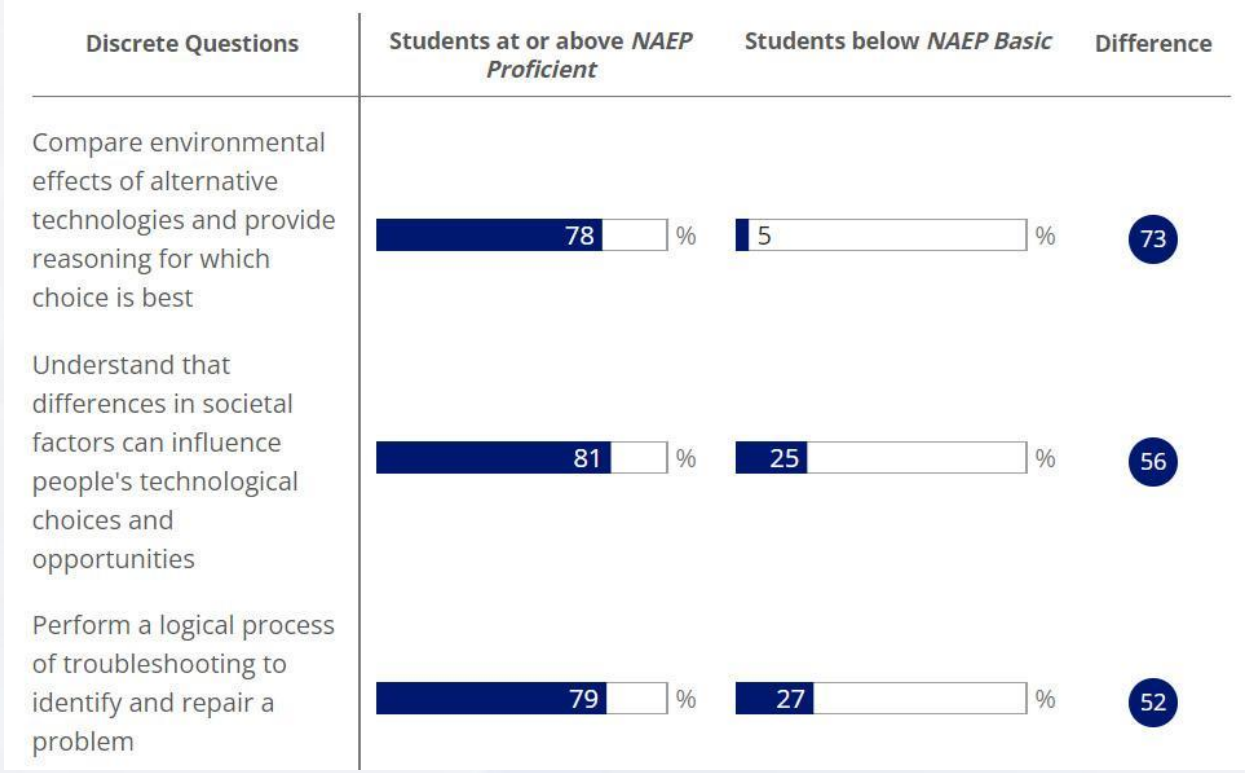


The Educational Challenge

Barriers expressed by teachers to integrated technology/society lessons

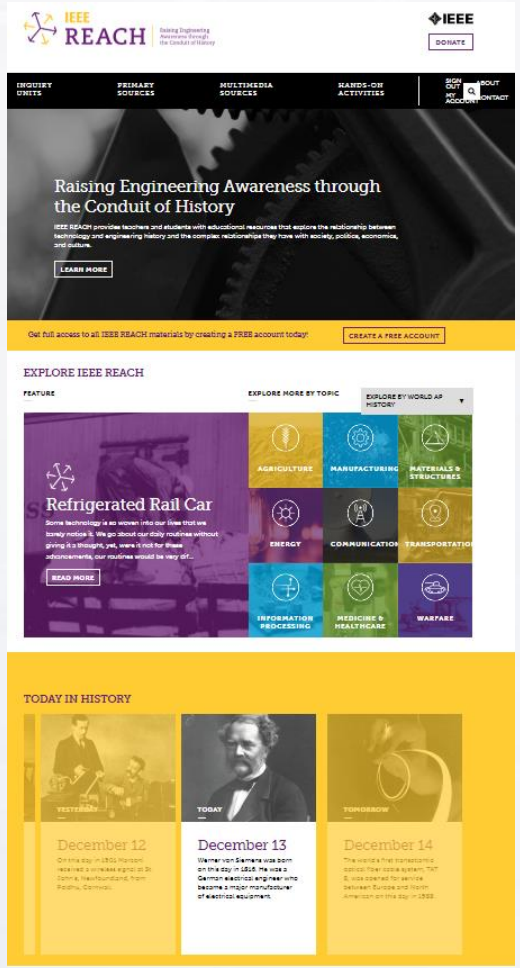
1. *Lack of curricular planning time*
2. *Lack of support networks in schools*
3. *Teacher preparation programs lacking relevant pedagogy*
4. *Anxiety regarding classroom implementation*

The science-technology-society framework for achieving scientific literacy: an overview of the existing literature – European Journal of Science and Mathematics Education

About IEEE REACH

IEEE REACH

Raising Engineering Awareness through the Conduit of History



Addressing the Technology Learning Gap

IEEE REACH provides 6th-12th grade teachers with free, multimedia curricular materials that explore the history of technology and address its social, political, economic, and cultural contexts. Students obtain a greater understanding of how technology and engineering are relevant to their lives and their future.

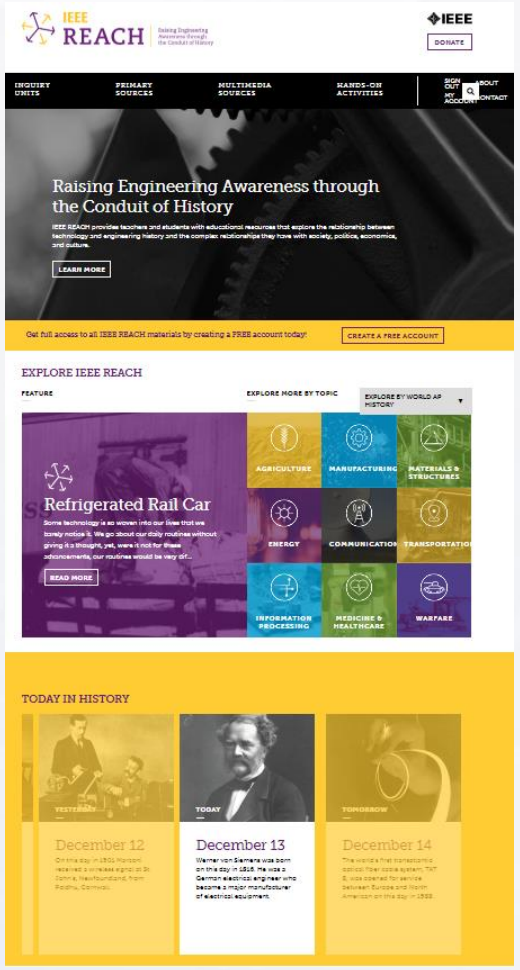
About IEEE REACH

REACH helps Educators Bridge the Gap

REACH uses the lens of history to engage students in technology narratives that allow for critical analysis about how technology has, and will continue to, impact their lives.

REACH is designed to assist both social studies and STEM teachers to make the crucial cross-cutting connections needed to bridge the technology literacy learning gap.

REACH was developed to correspond with the National Council of the Social Studies' C3 (College, Career, Civics) Standards; Common Core Standards; and World History Standards; the resources also meet the Next Generation Science Standards (specifically ETS2.B); and Standards for Technology and Engineering Literacy as defined by ITEEA

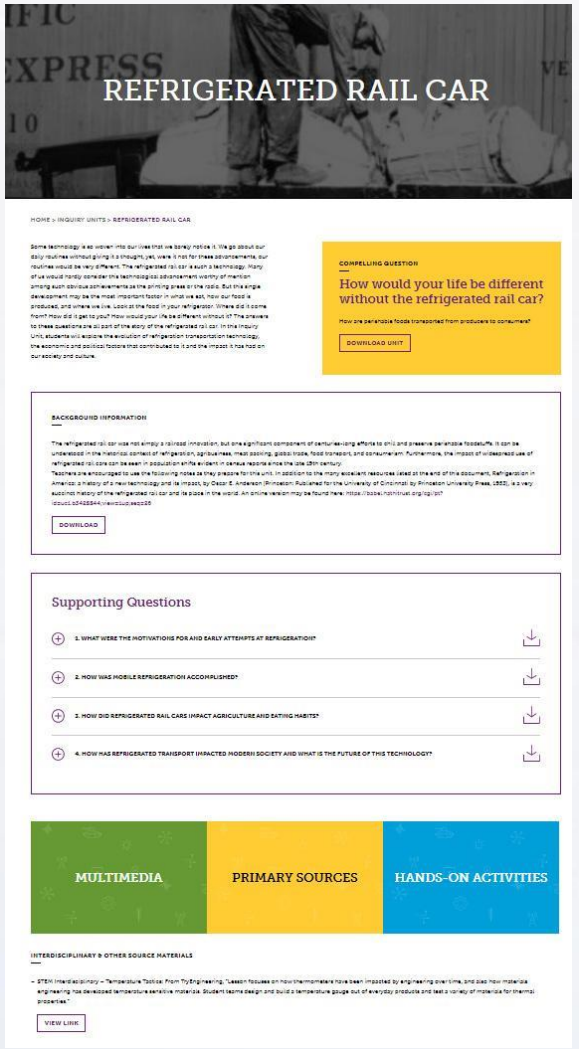


About IEEE REACH

REACH Provides a Complete Toolkit

Each REACH Inquiry Unit provides necessary tools for both teachers and their students:

1. Inquiry-designed, standards-aligned, **lesson plans** built around the history of a specific technology and its societal implications
2. Detailed **background information** for the teacher
3. Digitally accessed **Primary source** materials (original sources of evidence, such as an artifact, document or recording, created during the time of study) for students to analyze
4. **Multimedia** resources - proprietary REACH historical videos
5. Engaging **hands-on activities** for students, which bring the lesson plan to life

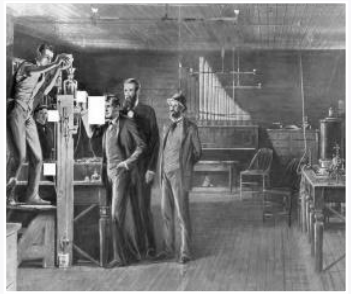


About IEEE REACH

REACH: Current Inquiry Units Span Time, Space, and Technology

UAV (Drones)

Early Maritime Navigation



Electric Lighting

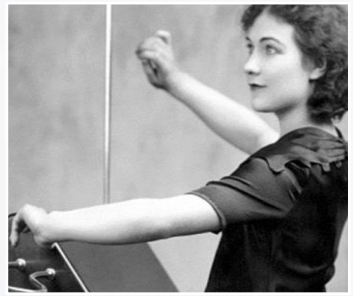
Printing Press

Radio

Refrigerated Railcar

Skyscrapers

Trireme



Electronic Music

ADD INFORMATION THEORY

About IEEE REACH

REACH: Primary and Secondary Sources

Original sources such as an artifact or document that was created at the time of study

Los Angeles Times

JANUARY 28, 1938.— FRIDAY MORNING.

AIRSHIP DESIGNED TO BE SHOT DOWN

Paul Whittier, co-builder of the radio-controlled model airplane to be tested Tuesday by Coast Artillerymen, the plane and his ground control equipment. Times photo

ARMY TO TEST MODEL ROBOT PLANE AS ARTILLERY TARGET

With elaborate range-finding equipment, a unit of the Sixty-third Coast Artillery under Lieut.-Col. Claude M. Thiele will go to Muroc Dry Lake next Tuesday to test its marksmanship against a radio-controlled model airplane.

If successful, trial flights of the miniature craft will pave the way for general use of such machines to train anti-aircraft and coast artillerymen.

RADIO CONTROLLED

Paul Whittier, veteran National Guard airman, and Reginald Denny, actor-model-maker, constructed the gasoline-powered plane, climaxing two years of intense experimentation before they were successful in building a delicate radio mechanism which permits control of the model aloft.

The craft's wing span is twelve feet. From tail to propellor, it measures eight and one-half feet.

IMPULSES CONTROLLED

Once the model's three-horse power engine pulls it skyward, the radio controls go into action. In the fuselage of the plane, the builders have installed a three-tube receiving set, which relays impulses to tiny electric motors. These operate the tail rudder and elevators.

Ground equipment consists of a short-wave sending set and a control box, with contact points which modulate the wave-lengths of the radio impulses. These send the model up, down, left or right.

DEVELOPMENT PLANNED

Eventually, said Whittier, who served as chief engineer of the project since its inception in 1935, they hope to gyrate the small craft in intricate loops, falling leaves, and spins.

Earlier flight tests have indicated that the Whittier-Denny model will travel sixty miles an hour. Its tiny engine will haul its forty-two pounds to an altitude of 9000 feet—far enough to put the plane out of sight of the naked eye.

COPPER CUP IDEA

Two years ago, over the coffee cups, Denny broached the idea of making such a ship for anti-aircraft artillery use. Practice procedure for the Army today demands the day-and-night service of an observation plane and a skilled pilot. This costs the government $300 an hour.

The model, proven successful, will permit coast artillerists to attain their range-finding for a very small sum.

RATIO PLANNED

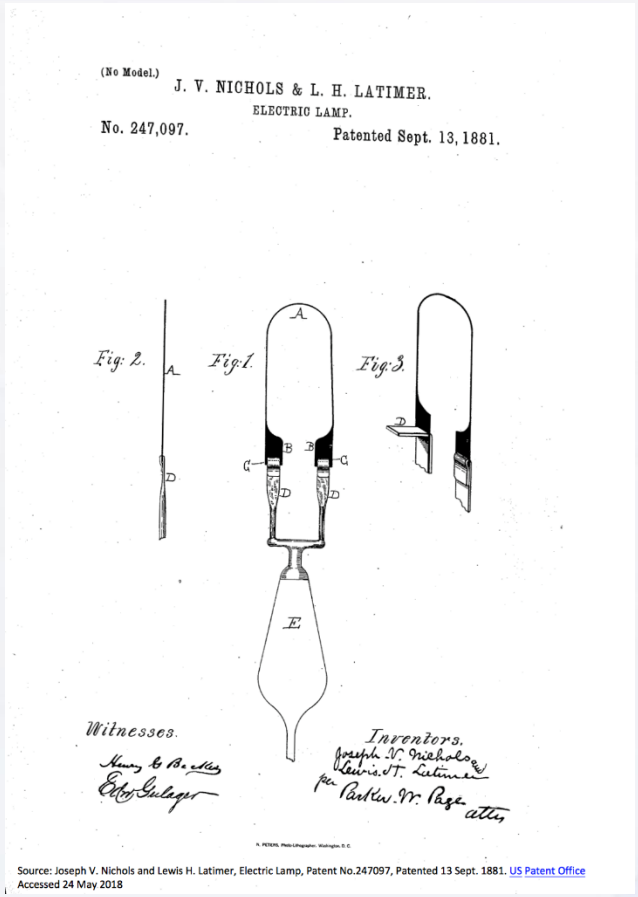
Its design aims at producing a miniature whose speed-size ratio corresponds exactly to full-sized ships. Thus, as the models become old, they will probably be used directly as flying targets for the artillerists.

On a production basis, Whittier said, the craft will fetch $600. This experimental model, however, represents a $2000 investment.

ALL-DAY TEST

Col. Thiele announced he will take height-finders, speed determiners and other equipment to Muroc Dry Lake for an all-day test Tuesday.

He admitted freely that perfection of such a model will provide the Army with something it has sought for years.



(No Model.)

J. V. NICHOLS & L. H. LATIMER.

ELECTRIC LAMP.

No. 247,097. Patented Sept. 13, 1881.

Fig. 2. Fig. 1. Fig. 3.

Witnesses. Inventors.

Source: Joseph V. Nichols and Lewis H. Latimer, Electric Lamp, Patent No.247097, Patented 13 Sept. 1881. US Patent Office Accessed 24 May 2018

About IEEE REACH

REACH: Multimedia

Short engaging videos for use in the classroom or in a flipped classroom environment

MULTIMEDIA

Drones from the Civil War to Today

UAV (Drones) Inquiry Unit

Historic insights into unmanned aerial vehicles (UAVs), from the Civil War through to today. See how aerial balloons were an integral part of early UAV, or drone, development, and follow the technol...

LEARN MORE

MULTIMEDIA

Longitude

Early Maritime Navigation Inquiry Unit

Solving the Longitude problem was necessary to navigating the worlds oceans and opening the door to global trade. Click here to download this video from the REACH Vimeo page....

LEARN MORE

MULTIMEDIA

A Pre-History of Radio (Part One)

Radio Inquiry Unit

Join historian Alex Magoun on a journey through the history of radio technology from James Clark Maxwell's theory of electromagnetism to Guglielmo Marconi's use of that theory in long-distance radio...

LEARN MORE

About IEEE REACH

REACH: Hands-on Activities

Captivates students and brings the lesson to life

HANDS-ON ACTIVITY

Testing Insulation for Refrigerated Rail Cars

Refrigerated Rail Car Inquiry Unit

Refrigerated Rail Car Inquiry Unit Download PDF Testing Insulation for Refrigerated Rail Cars Prompt for the students: Joel Tiffany has just hired your team to engineer his first Tiffany Refri...

LEARN MORE

HANDS-ON ACTIVITY

Original Radio Program

Radio Inquiry Unit

Radio Inquiry Unit (Featured Sources, Supporting Question 3) All of the information below is also available in the pdf linked below. ORIGINAL RADIO PLAY: Create an original radio program using the...

LEARN MORE

HANDS-ON ACTIVITY

Compass Hands-on Activity

Early Maritime Navigation Inquiry Unit

Early Maritime Navigation Inquiry Unit Compass Lesson Plan - Supporting Question 3 Task With a towel placed over their heads and the only visual being that of a magnetized needle, set on a plasti...

LEARN MORE

reach.ieee.org

About IEEE REACH

Growth of REACH

REACH was launched by IEEE in 2016 and is currently used by a highly diverse population of educators and students in schools across the US.

In 2022:

- **2,600+ downloads of Inquiry Units and supporting materials via REACH website**
- **1,700+ subscribers to educator's email monthly newsletter**
  - 85% of REACH Newsletter subscribers surveyed have used REACH in their classroom during the most recent school year. Of those, 41% used it 3 or more times.
  - While REACH is targeted towards secondary education classrooms, it is also heavily used by both primary and postgraduate educators.
- **300,000+ students served with REACH**
- **10,500+ site visitors**
- **REACH population of students is highly diverse**
  - 49% minority population of students in schools served by REACH
  - 52% of public schools served by REACH are Title 1

Educational Partnership Opportunities

Educational Partnership Opportunities

Special programs for state, district, & independent organizations

For state, district, and independent school organizations, REACH offers no-cost partnership opportunities that provide significant additional value to your teachers and students.

Partnerships include:

1. Teacher training webinars on how to implement the REACH lesson plans into your classroom instruction.
2. Opportunities for teacher learning sessions and Q&A with Michael Geselowitz, PhD, Senior Director of the IEEE History Center.
3. Bring the lessons to life for your students with an “engineer in the classroom”. With nearly 400,000 members, IEEE has engineers from a wide range of disciplines in almost every city and region who can come to your classrooms and engage with your students on the life of an engineer.

Educational Partnership Opportunities

Special programs for state, district, & independent organizations

We have a limited number of partnerships available for 2023/24. For more information or to discuss opportunities for your district, please contact us.

IEEE REACH

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