Step by Step: From the Headlines to the GED® Science Classroom

A Workshop by GED Testing Service®

Session Objectives

- Explore science headlines in the news
- Connect real-world science to GED® science themes
- Identify strategies and activities to build scientific inquiry skills
- Share resources

What has science done for you lately?

Scientific knowledge helps us make decisions that affect our lives every day.

3 GEDtestingservice.com • GED.com

Ever think about . . .

- What causes gravity?
- How tectonic plates move around on Earth's surface?
- How does the human brain store memories?
- How do water molecules interact with each other?

4 GEDtestingservice.com • GED.com

Find it in the Headlines!

HURRICANE HARVEY

Gas Prices Spike Nationwide After Hurricane Harvey

Scientists See Climate Change in California's Wildfires

Strong winds and months of record-high temperatures have fueled the destructive fires

Puerto Rico investigates post-hurricane disease outbreak

By MICHAEL MELIA, ASSOCIATED PRESS ·
SAN JUAN, Puerto Rico — Oct 11, 2017, 2:21 PM ET

Share Tweet

5 GEDtestingservice.com • GED.com

Find it in the Headlines!

Flu season is breaking records, CDC says

by Maggie Fox / Feb.12.2018 / 7:58 AM ET

Your Selection All

Get Used to Nor'easters — Arctic Warming May Mean More Severe Winters in the Northeast

March 13, 2018 | Article

Temperature spikes in the Arctic coincide with severe winter weather in the northeastern U.S.

Read More »

15 new planets discovered, including potentially habitable 'super-Earth'

Fiza Pirani - The Atlanta Journal-Constitution
1:01 p.m Tuesday, March 13, 2018 Filed in Atlanta News

6 GEDtestingservice.com • GED.com

What does this have to do with the GED® Science Test?

- Content topics describe key concepts widely taught in high school courses
- Content is relevant to lives of students
- Topics are generally familiar to students
- Content pulled from areas of interest drawn from the headlines

7 GEDtestingservice.com • GED.com

Taking the Headlines and Creating an Inquiry-Based Lesson

8 GEDtestingservice.com • GED.com

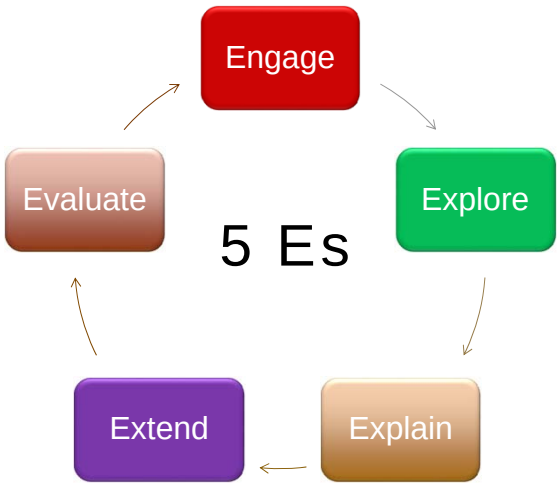
How Do We Begin?

- Look at focusing themes
- Find a headline of interest
- Think about how to engage students through inquiry
- Identify resources and create your lesson!

Focusing Themes

		Science Content Topics		
		Life Science (40%)	Physical Science (40%)	Earth & Space Science (20%)
Focusing Themes	Human Health and Living Systems	• Human body and health • Organization of life • Molecular basis for heredity • Evolution	• Chemical properties and reactions related to human systems	• Interactions between Earth's systems and living things
	Energy and Related Systems	• Relationships between life functions and energy intake • Energy flows in ecologic networks (ecosystems)	• Conservation, transformation, and flow of energy • Work, motion, and forces	• Earth and its system components • Structure and organization of the cosmos

Teaching Through Inquiry – 5Es



11 GEDtestingservice.com • GED.com

Five Features of Science Inquiry

We want our learners to:

- Engage in discourse through use of scientifically-oriented **Questions**
- Use **Evidence** in responding to questions
- Formulate **Explanations** from **Evidence**
- Connect **Explanations** to **Scientific Knowledge** and **Real-World Events**
- Communicate and justify **Explanations**

12 GEDtestingservice.com • GED.com

From the Headlines to the Classroom

It's a bird;

it's a plane;

No—it's Superbug!

13 GEDtestingservice.com • GED.com

Setting the Stage

- Have you ever taken an antibiotic?
- How and when should antibiotics be used?
- Who was Alexander Fleming?
- What are bacteria?
- What have you heard about super-bugs?

14 GEDtestingservice.com • GED.com

Engage with a Video

Superbugs

Are

Here!

- In the USA, over 2 million people each year become infected with bacteria that are resistant to antibiotics
- Last year, over 23,000 people died as a direct result of antibiotic-resistant infections
- By 2050, it is projected that antibiotic resistant infections will cause more deaths annually than cancer – over 10 million people worldwide or one person every three seconds.

GEDtestingservice.com • GED.com

Explore – What's the difference?

http://ed.ted.com/on/q41jt6vp#finally

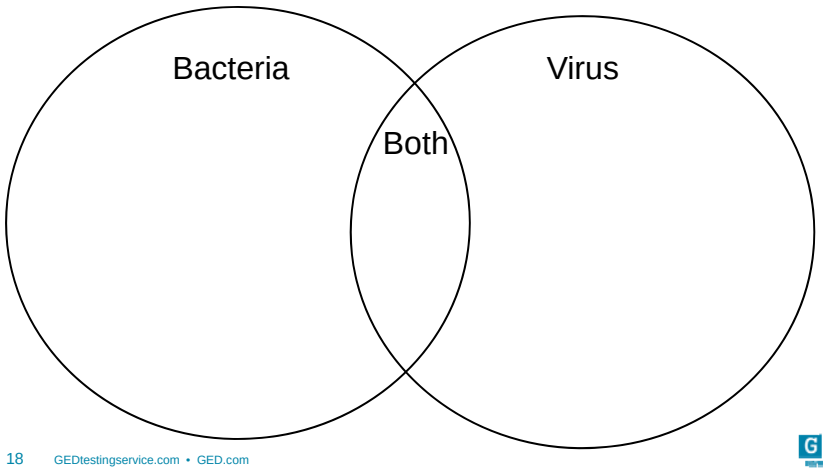
16 GEDtestingservice.com • GED.com

Explore - Bacteria/Virus – What's the Difference?

- What are bacteria?
- What are viruses? Is there a difference?
- What can we do to fight bacteria?
- How come sometimes medicine we take for infections don't work?
- What is a superbug?

17 GEDtestingservice.com • GED.com

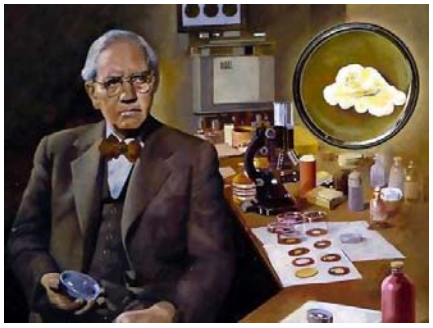
Explore – Use a Venn Diagram



18 GEDtestingservice.com • GED.com

Explain - Who was Alexander Fleming?

Penicillin – Wonder drug or not?



A Short Bio

http://www.nobelprize.org/nobel_prizes/medicine/laureates/1945/fleming-bio.html

http://www.bbc.co.uk/history/historic_figures/fleming_alexander.shtml

19 GEDtestingservice.com • GED.com

Feeling Sick?

Do you ever wonder what is causing your illness?

It could be a virus or a bacteria... and the differences are important.

Virus vs. Bacteria

Virus	Bacteria
Viruses are particles that invade your body's cells. Viruses contain genetic material (DNA or RNA) and a protein coat. Viruses take many shapes and are much smaller than bacteria.	**Bacteria** are one-celled organisms that take several shapes - spheres, rods, spirals. They are found everywhere - in food, dirt, and on our bodies. Bacteria can live outside our body's cells. Most bacteria are good -such as those that help with digestion, but some can cause infections.
Viruses cause diseases such as the common cold, many sinus infections, acute bronchitis and most sore throats. The body fights against viral infections by producing a fever or inflammation.	**Bacteria** cause infections such as strep throat by invading the body's cells. The body fights against bacteria by producing a fever or inflammation. Symptoms of bacterial infections are similar to those caused by viral infections.
Antibiotics cannot kill viruses. Antibiotics will not help a viral infection or stop the spread of a viral infection to others. Taking antibiotics for viral infections can increase the chance of an antibiotic-resistant infection later. · Rest, drink fluids · Relieve symptoms with over the counter medications · Call your doctor if your symptoms worsen	**Bacterial** infections usually need to be treated with an antibiotic - medications that kill bacteria. If you are prescibed an antibiotic, follow instructions closely: · take all the medication as directed even if you feel better · do not share antibiotics or save them for the next time you are sick

When antibiotics are misused, bacteria can develop resistance to the antibiotics over time. Antibiotic resistance affects everyone. YOU can help keep antibiotics working!

www.MinnesotaARC.org

Integrate Reading and Writing

Science News for Students

Superbugs: A Silent Health Emergency

https://www.sciencenewsforstudents.org/article/superbugs-silent-health-emergency

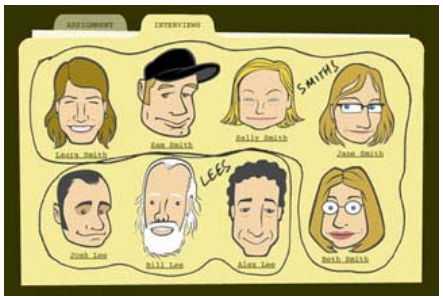
The War on Superbugs

https://www.sciencenewsforstudents.org/article/war-superbugs

GEDtestingservice.com • GED.com

Interact with Diseases!

http://sciencenetlinks.com/interactives/antibiotic.html



http://www.pbs.org/wgbh/nova/body/disease-detective.html

GEDtestingservice.com • GED.com

Extend – Earth Science

http://www.pbs.org/wgbh/rxforsurvival/index.html

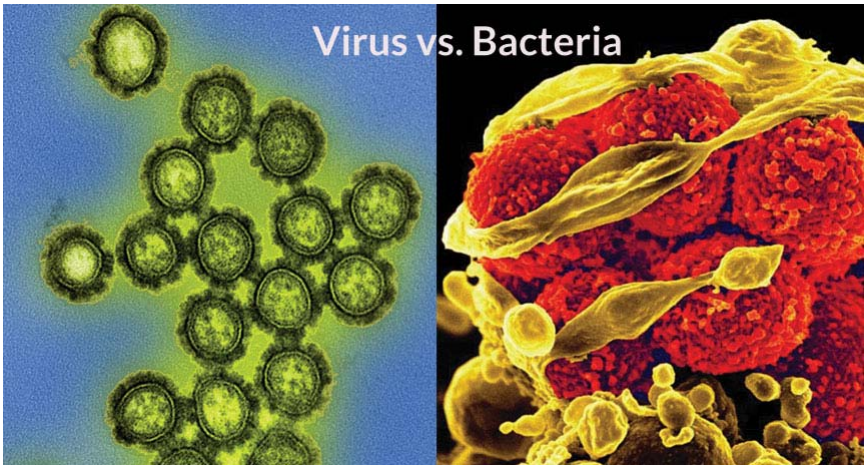
http://www.pbs.org/wgbh/rxforsurvival/series/teachers/index.html

Extend – Earth Science

Windows to the Universe - Changing Planet: Infectious Diseases
http://www.windows2universe.org/earth/changing_planet/infectious_disease.html

Disease	How is it spread?	Where is it found?	What are the symptoms?	How is it prevented?

Extend – It's Chemistry Too!



Integrate Graphics and Games

https://longitudeprize.org/superbugs

Evaluate with Questions

- What are the differences between viruses and bacteria?
- Are all bacteria harmful? Explain.
- How does the overuse of antibiotics lead to resistant strains of bacteria?
- When you get a cold, should you take an antibiotic to help you get better? Why?
- What can you do in your life to reduce antibiotic resistance?

Evaluate with Research

Research five solutions to antibiotic resistance. These can be ways to avoid developing and spreading resistance or possible alternatives to antibiotics. Cite your sources for each piece of information you find. Make sure to use reputable sources based on scientific facts.

Example: Overuse of antibiotics increases the chance of bacteria developing antibiotic resistance.

Source: http://emerald.tufts.edu/med/apua/about_issue/about_antibioticres.shtml

Take the First Step

How would you engage students?

29 GEDtestingservice.com • GED.com

How would you engage students?

Scientists See Climate Change in California's Wildfires

Strong winds and months of record-high temperatures have fueled the destructive fires

By Debra Kahn, Anne C. Mulkern, E&E News on October 12, 2017

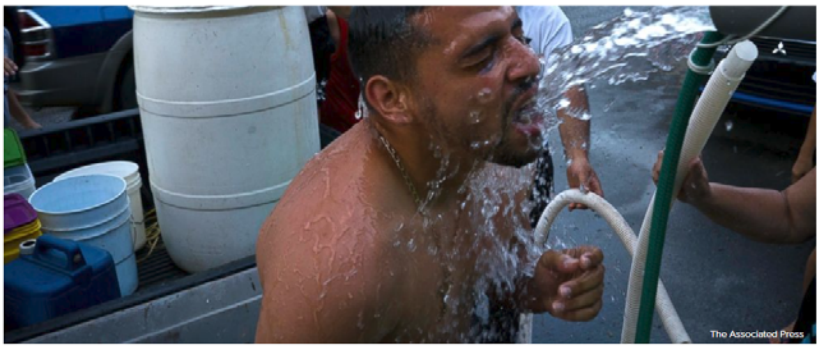
The Tubbs Fire burned through Santa Rosa, Calif., early Monday morning. A mobile home park was one of the casualties. *Credit: Justin Sullivan Getty Images*

30 GEDtestingservice.com • GED.com

How would you engage students?

Puerto Rico investigates post-hurricane disease outbreak

By MICHAEL MELIA, ASSOCIATED PRESS ·
SAN JUAN, Puerto Rico — Oct 11, 2017, 2:21 PM ET



FILE - In this Sept. 28, 2017 file photo, people affected by Hurricane Maria bathe in water piped in from a mountain creek, in Naranjito, Puerto Rico. Four deaths in Hurricane Maria's aftermath are being investigated as possible cases of a disease spread by animals' urine, Puerto Rico's governor said Wednesday, Oct. 11, 2017, amid concerns about islanders' exposure to contaminated water. On a U.S. territory where a third of customers remain without running water three weeks after the hurricane, some became ill after turning to local streams to relieve their thirst. (AP Photo/Ramon Espinosa, File)

http://abcnews.go.com/Health/wireStory/puerto-rico-investigates-post-hurricane-disease-outbreak-50413424

How would you engage students?

CNNMoney Reports

Panic draws long lines at gas stations

When Dallas residents heard Harvey had disrupted gas production, they came out in droves to refill their tanks. CNN's Alison Kosik reports.

How would you engage students?

Jeff Bezos christened Amazon's largest wind farm while 300 feet in the air

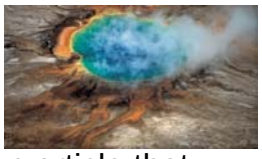
The new Amazon Wind Farm Texas is its largest farm, and one of the company's 18 clean-energy projects.

What other thematic topics can you think of for your science classroom?

Building A Lesson Plan From the Headlines: The Yellowstone Volcano

41 GEDtestingservice.com • GED.com

Explore



- Recent research findings (ASU) versus an article that takes the opposing position (Boise State) (https://news.nationalgeographic.com/2017/10/yellowstone-supervolcano-erupt-faster-thought-science/ vs www.idahostatesman.com/news/state/idaho/article179123806.html
- Compare the two sides. Construct an argument for or against whether an eruption may happen sooner rather than later.

42 GEDtestingservice.com • GED.com

Explain

- Identify and summarize the major ideas in a narrative
- Define vocabulary terms such as tectonic plates, caldera volcano, seismic activity, volcanic winter
- Identify the cause and effect of volcanic eruptions

Elaborate (Extend)

Imagine what the impact would be of the estimated ejection of ash (estimated at *250,000 times* that of the Mount St Helens eruption. What do you think the pros and cons are of the NASA solution? (www.nbcnews.com/mach/science/scientists-hatch-bold-plan-save-planet-supervolcano-ncna799166)

Engage

Show this news clip about the Yellowstone volcano

- Ask for real-life experiences
- State the who, what, when, where, and why of the video www.cbsnews.com/news/yellowstone-national-park-supervolcano-caldera/

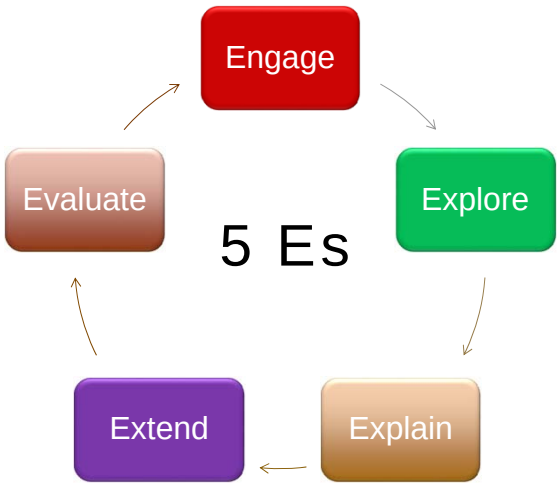
45 GEDtestingservice.com • GED.com

Evaluate

- Plot timelines for the five most active volcanos in the world on a graph
- Plot timelines for the most active volcanos in the Western Hemisphere
- What patterns do you see?

46 GEDtestingservice.com • GED.com

Teaching Through Inquiry – 5Es



47 GEDtestingservice.com • GED.com

Resources for Science

Getting Started

48 GEDtestingservice.com • GED.com

Resources

National Science Teachers Association – Freebies for Science Teachers

http://www.nsta.org/publications/freebies.aspx

Mythbusters

http://www.discovery.com/tv-shows/mythbusters/

Study Jams

http://studyjams.scholastic.com/studyjams/jams/science/index.htm

Science News

http://www.sciencenews.org

More Resources

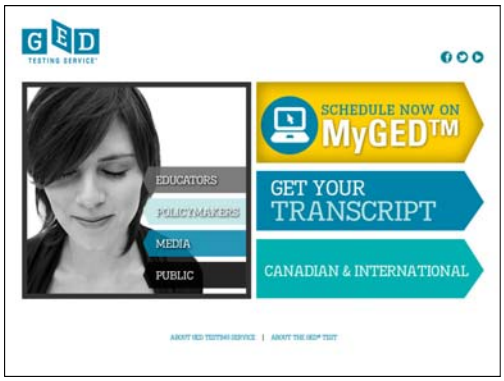
How Science Works

https://itunes.apple.com/us/course/how-science-works/id689052881

Virtual Microscope

http://www1.udel.edu/biology/ketcham/microscope/scope.html

Resources for the Classroom



http://www.gedtestingservice.com/

51 GEDtestingservice.com • GED.com

Summing It Up

What takeaways from this workshop will be important to know now? Three years from now?

Why?

52 GEDtestingservice.com • GED.com

Questions

Thank you!

Communicate with GEDTS

communications@GEDTestingService.com