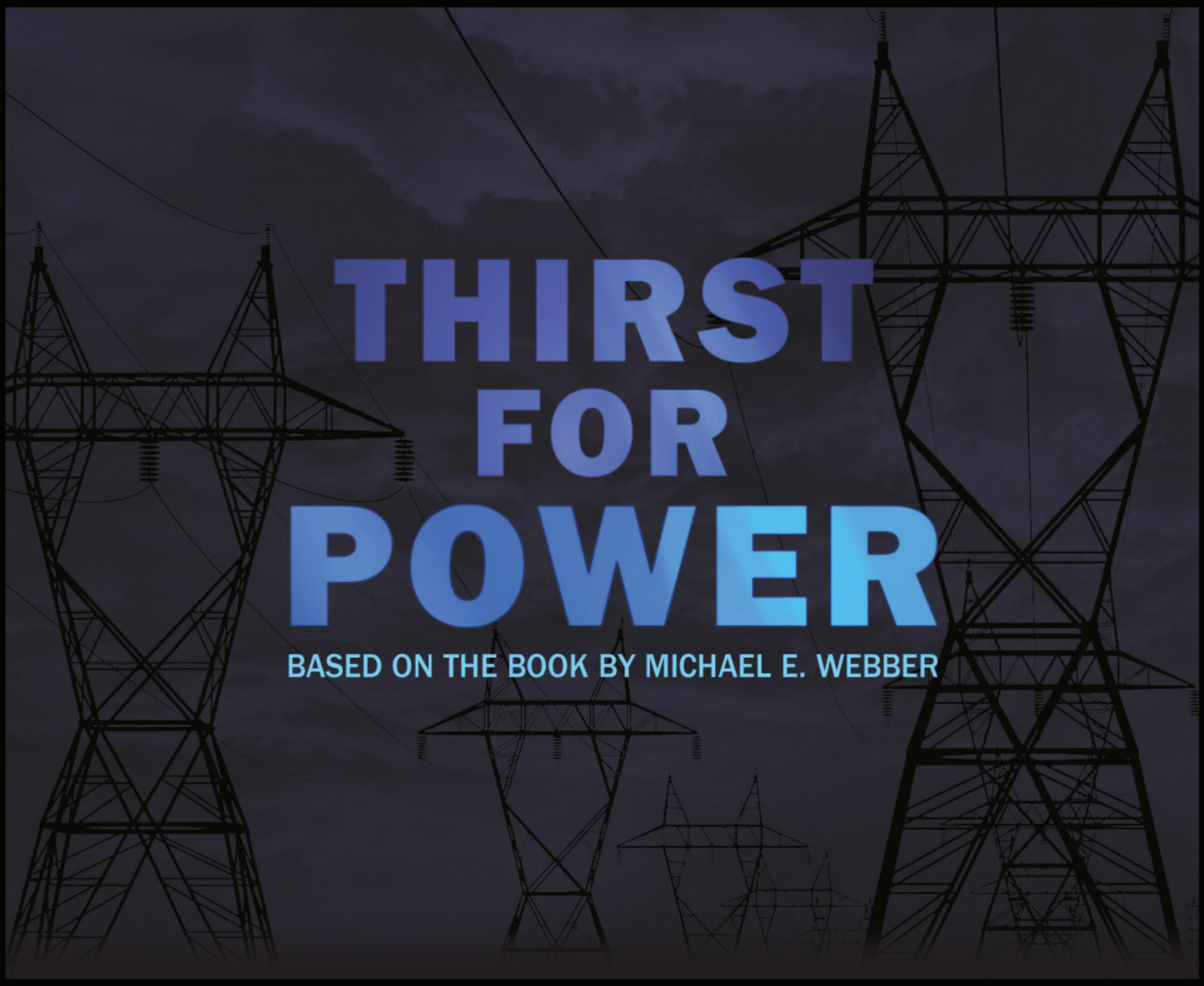

THIRST FOR POWER IS A PRODUCTION OF ALPHEUS MEDIA IN CONJUNCTION WITH THE UNIVERSITY OF TEXAS AT AUSTIN FEATURING DR. MICHAEL E. WEBBER

EXECUTIVE PRODUCER JUAN GARCIA EXECUTIVE PRODUCER BETH HAMES PRODUCED BY AUDREY LONG

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THE PARAMOUNT THEATRE

OCTOBER 8–9, 2019

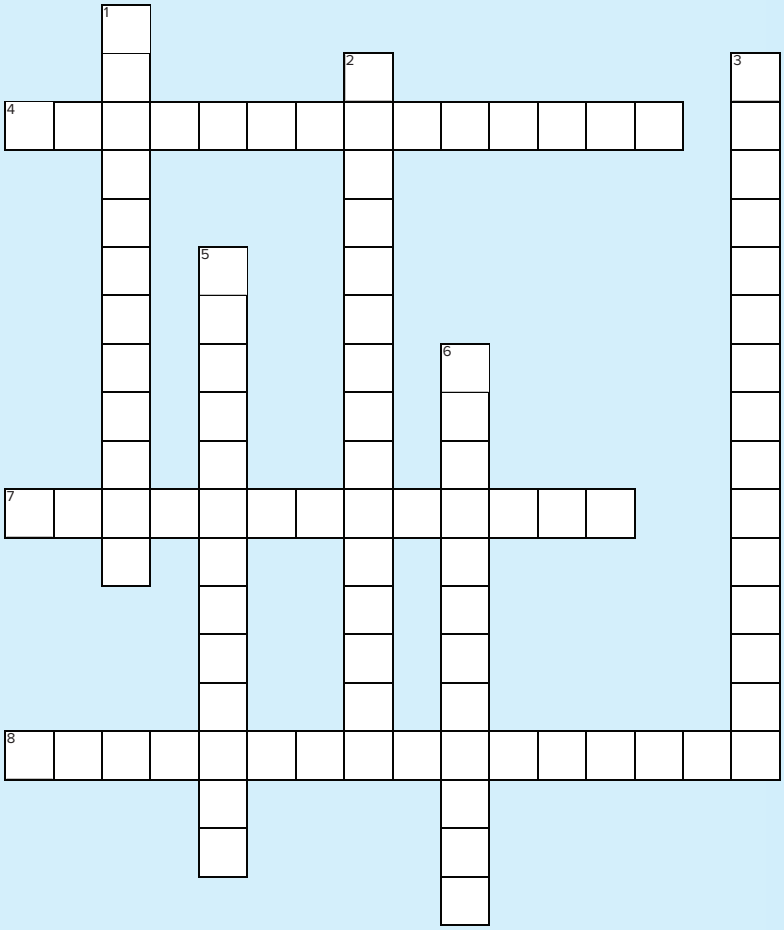
WHO IS DR. MICHAEL E. WEBBER?

Dr. Michel E. Webber is an internationally recognized professor, author, and energy expert. He trains the next generation of energy leaders at the University of Texas at Austin, where he is the Josey Centennial Professor in Energy Resources and a professor of Mechanical Engineering. He also serves as the Chief Science and Technology Officer at ENGIE, a global energy & infrastructure services company in France. In addition to *Thirst for Power: Energy, Water, and Human Survival*, he is the author of *Power Trip: The Story of Energy* which was published in 2019 and is being developed as a 6-part series for PBS.

BEHIND THE DOCUMENTARY, DIRECTOR MAT HAMES

Mat Hames is an Emmy winning director, writer and producer. In addition to the documentary, *Thirst for Power*, adapted from Dr. Webber's book, Mat is known for his two PBS Independent Lens documentaries *What Was Ours* (Amazon Prime Video, 2017) and *When I Rise* (2010). His films have screened at SXSW, HotDocs, and SundanceTV.

THIRST FOR POWER VOCABULARY CROSSWORD



DOWN

1. The process of using electricity to split water into hydrogen and oxygen.
2. Another name for the water cycling from the ocean to the atmosphere to the land.
3. Energy sources that replenish continually or annually.
5. A cause and effect chain.
6. The removal of salts and minerals from a substance.

ACROSS

4. The science of heat, temperature and energy.
7. Results in elevated ocean levels, more flooding, more droughts, and distorted snowmelt patterns.
8. Electricity made by generators that are pushed by movement of water.

WORD BANK

THERMODYNAMICS
HYDROELECTRICITY
ELECTROLYSIS
DESALINATION
RENEWABLE ENERGY
CLIMATE CHANGE
HYDROLOGIC CYCLE
FEEDBACK LOOPS

WATER IS LIFE

Ancient civilizations recognized that their survival was dependent on water. They built their cities where water was abundant. They learned to transport water using **aqueducts**. They knew that water was power, and controlling rivers meant ensuring their survival.

AQUEDUCT: *an artificial channel used to carry water from a source to a distribution point far away*

WATER AND CIVILIZATION GO HAND-IN-HAND

Just as many ancient civilizations thrived by using and controlling water, their collapse was often the result of water scarcity. Drought contributed to the collapse of the Roman Empire and several Chinese dynasties. Even the Maya Empire saw drastic population decreases as the result of climate change, drought, and the failure of a water transportation system.

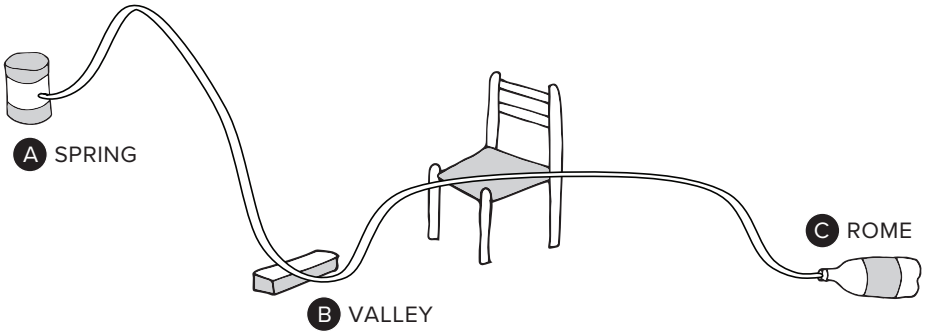
from Disco Learning Media's Resourcefulness Curriculum
http://smartenergyeducation.com

PONT DU GARD is an ancient Roman aqueduct in southern France that was built in the first century AD to carry water over 31 miles to the Roman colony now known as Nîmes, supplying the city with 8 million gallons of water daily. It crosses the Gardon River and is the highest of all Roman aqueduct bridges, and one of the best preserved. The water was carried on the top tier of the bridge, using an interior water conduit, or large pipe.

DESIGN YOUR OWN ROMAN AQUEDUCT

MATERIALS:

- empty 2-liter soda bottle and cap
- bucket
- clear vinyl 3/8" tubing
- 2–3 surfaces of varying levels (tables, chairs, blocks or books)
- 2 liters water
- electric drill or screwdriver



INSTRUCTIONS:

Water must flow through the plastic tubing from the bottle at point A (the "spring") through point B (the "valley") to point C ("Rome"). Water is precious, so any that escapes the system represents a costly mistake in engineering, construction, and/or operation.

How will you accomplish this task using the materials and diagram provided?

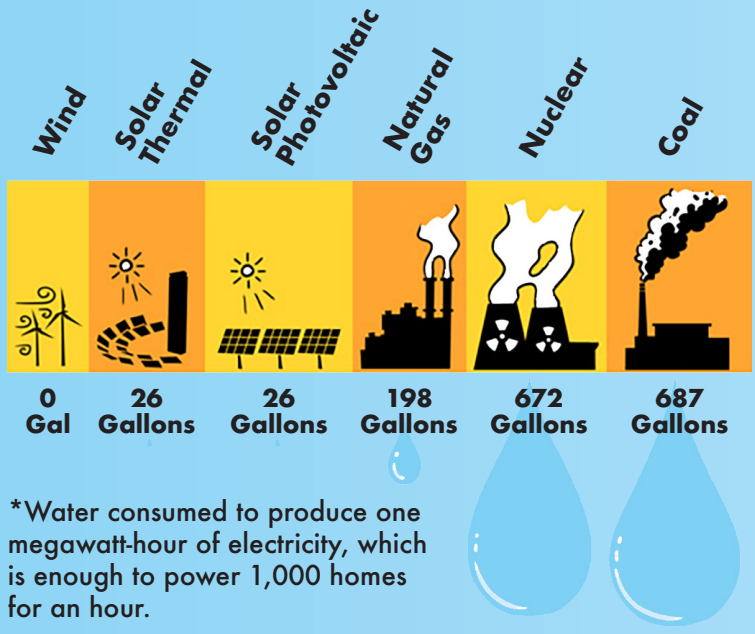
WATER IS POWER

Ancient and modern societies learned to harness water to create power. The first examples of water wheels dates back to 4000 B.C. By the 2nd century B.C. vertical watermills were used in Syria and Asia Minor, later spreading to ancient Greece and the Roman Empire. These watermills used hydropower. The water was used to drive a mechanical process such as grinding, rolling, or hammering.

WHERE WATER IS USED

Today we are just as dependent on water for energy as ever before. Nearly every type of power plant utilizes significant amounts of water.

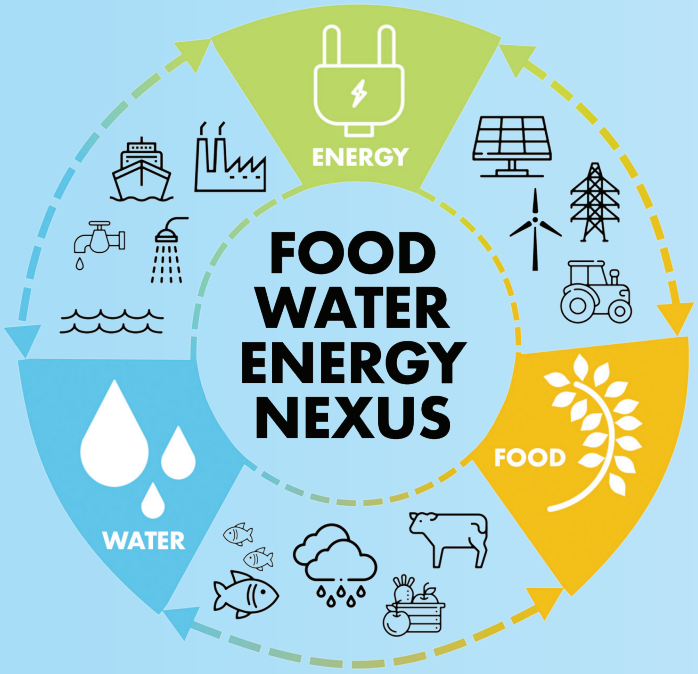
WATER USE BY POWER PLANT*



*Water consumed to produce one megawatt-hour of electricity, which is enough to power 1,000 homes for an hour.

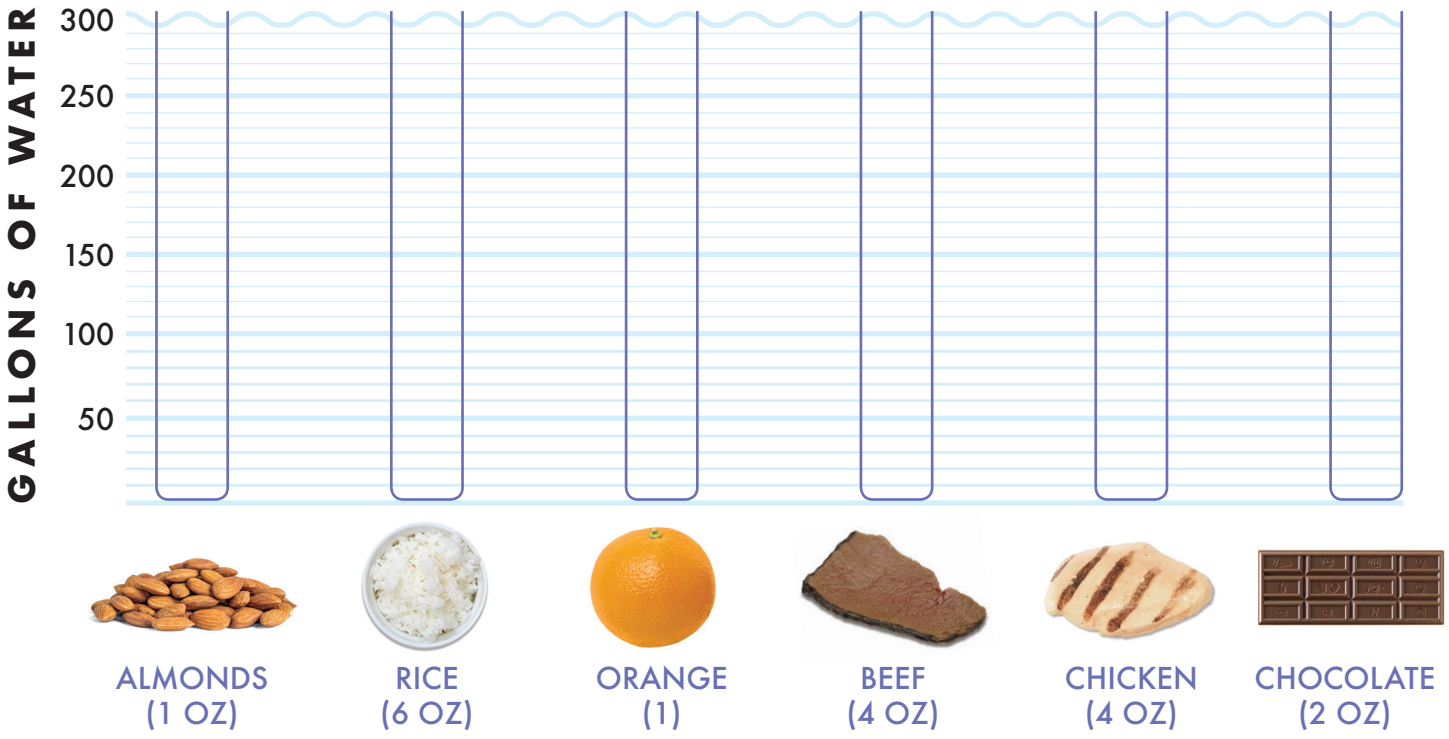
THE FOOD-WATER-ENERGY NEXUS

Food, water and **energy** are elements that are linked with each other. Impact on one will affect all three. To provide sustainable solutions on a global scale, all three have to be considered.



HOW BIG IS YOUR WATER FOOTPRINT?

How much water do you think it takes to produce only one serving of the foods you eat? Which food takes the least water and which one takes the most? **Fill in the containers below with your guesses.** See the answers according to the Water Footprint Network upside-down at the bottom of the page.



WATER FOOTPRINT ANSWER KEY:

Almonds (1 oz) = 120 gallons • Rice (6 oz) = 115 gallons • Orange = 23 gallons • Beef (4 oz) = 461 gallons • Chicken (4 oz) = 129 gallons • Chocolate (2 oz) = 257 gallons

CONSERVATION

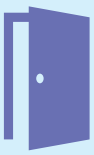
Understanding the relationship between water, energy, and food will also help you understand the need to make changes in your own life. Conservation is the first and most important tool we have in our tool kit. What can you do to reduce your use of power or water?

Turn off the faucet when brushing your teeth.

Take shorter showers. Make it a game!

Turn off the lights when you leave a room.

Use the sun to dry your wet clothes.



Don't leave the door open when your AC is on.

Replace incandescent light bulbs with LEDs

What are some more ideas on how you can conserve power/water?

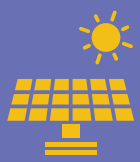
_____

_____

_____

_____

_____



SUSTAINABLE ENERGY

Spread knowledge! Advocate for forms of energy that don't require water consumption (wind and solar power). Learn more at: **http://smartenergyeducation.com**

WATER RECLAIMING

GREY WATER is the relatively clean wastewater from baths, sinks, washing machines, and other appliances. Using your water twice can make a big impact on your water footprint! Grey water can be used for mopping, flushing the toilet, watering landscapes, and more! It reduces the amount of household freshwater used, and reduces the amount of wastewater entering sewer or septic systems.

RAINWATER HARVESTING is the process of collecting rainwater and storing it for a future purpose. The easiest way to collect rain at your house is through a rain barrel (make your own from a large trash can or an old drum) linked to a pipe fitted to collect rainwater from the rooftop. The rainwater can then be used to water plants, wash cars, and more! It can also reduce flooding and stormwater pollution around your house.

Choose **grey water** or **rainwater harvesting** and draw a diagram below showing how it works.

DIAGRAM NAME: _____

THE PARAMOUNT THEATRE was built 104 years ago in 1915. Back then, Congress Avenue was a dirt road and the automobile was a new invention. As one of the first examples of early theatre architecture, the Paramount has been bringing Austin families together for generations. When you visit the theatre, you enter a place that feels exciting and welcoming. From your seat, you can almost reach out and touch the performers on stage! Many famous people have performed at the Paramount. From magician Harry Houdini to the premier of the original Batman movie, the Paramount and its audiences have seen it all over the past 100 years...here's to the next century!

DISCOVERY SERIES

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Make unforgettable memories at the Paramount Theatre with your whole family. Tickets and subscriptions are available now! Visit:

austintheatre.org/discovery

PARAMOUNT EDUCATION

We inspire the intellect and imagination of young people by providing opportunities to **experience**, **perform**, and **learn** through the arts. We can't wait to see you again at our theatre or in our school programs! Paramount Education programs are made possible through generous donations from our community. If you are interested in finding out more or want to make a contribution, please reach out to Natalie Seeboth at nseeboth@austintheatre.org or 512.233.0121. Thank you!

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