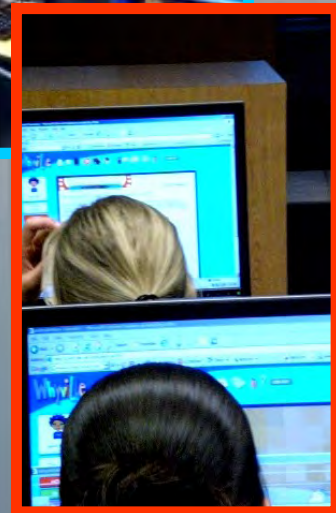


WhyPower™

Integrated STEM & Career Education for Middle Schools



DaVinci
Minds



What is WhyPower?

WhyPower is a program and supplemental curriculum for teaching math and science to middle schoolers. WhyPower also teaches middle schoolers about careers in energy fields, and about careers in other STEM* fields. Students learn math and science commonly found in 7th and 8th core academic standards.



WhyPower is different from other curriculum in an important way. It is based on *Whyville*, the learning-based virtual world for teens and tweens, as the platform for instruction.

What is Whyville?

Whyville is the learning-based virtual world for teens and tweens. Founded in 1999, Whyville has its own newspaper, economy, and government and has served over 7 million users with activities in math, science, art, government, economics, journalism, finance, life science, manufacturing, and more. All of our lesson plans are based on activities in Whyville, and especially on the activities in *WhyPower*, Whyville's power plant. Access to Whyville is free!

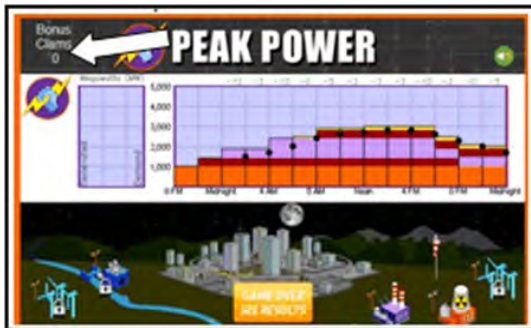


What Can I Teach with WhyPower?

You can use WhyPower to teach numerous math, science and career education lessons, many of which connect to core academic standards. There are fourteen class periods worth of lessons organized around these activities:

Peak Power

Don't brown out the city! Don't waste energy!



Green Build

Build a house, and stay in budget.



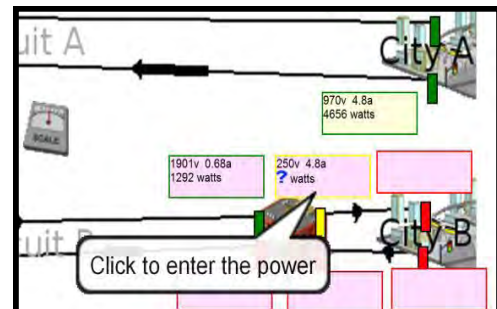
Electric Farm

Make a profit as you place collectors around Whyville.



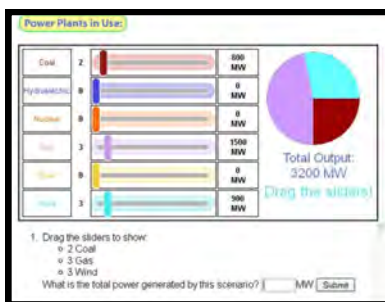
Power Line

Honor Ohm's Law while running power lines



Power Planner

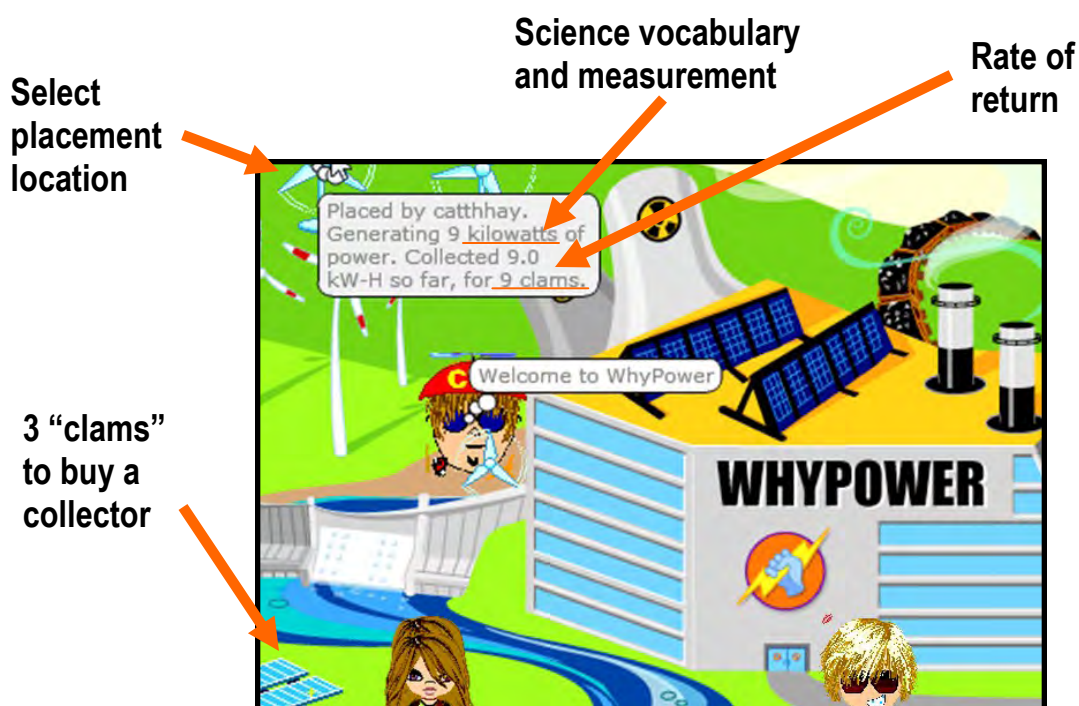
Help City Hall decide how much total power Whyville needs and what type of power to generate



How is the Content “Integrated?”

We believe students learn best when content is both challenging and relevant. We also believe, based on the research we follow, that students learn more, retain more and apply knowledge better when they “think” and “do” in the classroom.

In the Electric Farm lesson plan, students buy a wind turbine (economics), place it in the best spot (science, critical thinking), track progress (science, science vocabulary, measurement), calculate ultimate rate of return (math), and earn a career badge for accomplishment (career education).



What Math is Covered?

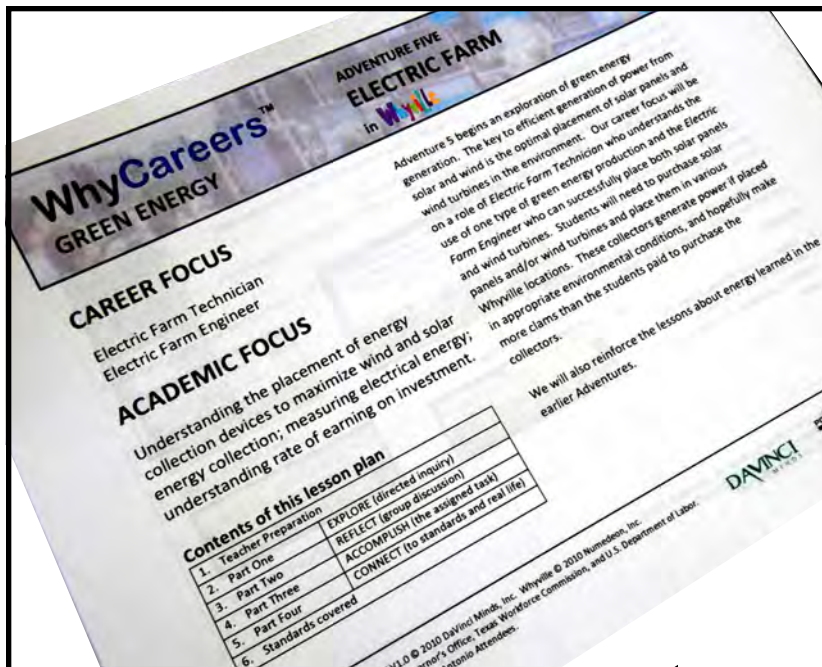
WhyPower teaches math that middle schoolers find the most challenging, that in turn is found on most middle school standardized tests:

1. Fractions
2. Ratios and proportions
3. Unit conversions
4. Graph reading and data interpretation
5. Measurement
6. Mental math
7. Rate of return
8. Problem solving



Heads Up! Important notes!

- We used to call our product **WhyCareers**. You'll still see that name from time to time.
- Our lesson plans are cross-matched to Texas standards. We can help you match them to your state's standards.



What Science is Covered?

WhyPower teaches the science (and math) of the energy industry. Students learn about:

1. **Kilowatts**
2. **Kilowatt-hours** (and how they relate to #1)
3. **R values** (measurement of insulation)
4. **Energy Star ratings**; appliance and housing material selection
5. **Sources of power**: Coal, natural gas, nuclear, hydroelectric, solar and wind

Appliance	Item	Power/Month	Cost/Month
Heater	Heat Pump (69 degrees)	162.29 kW-H	\$ 21.10
Air Conditioner	Heat Pump (76 degrees)	206.56 kW-H	\$ 26.85
Water Heater	Electric Energy Star (hot)	353.85 kW-H	\$ 46.00
Refrigerator	Energy Star	63.62 kW-H	\$ 8.27
Oven/Stove	Gas	393 kBTU	\$ 4.00
Clothes Washer	Energy Star	60.92 kW-H	\$ 7.92
Clothes Dryer	Gas Dryer	667 kBTU	\$ 8.00
Lighting	Compact Fluorescent	13.85 kW-H	\$ 1.80
Total energy used per month:		861.08 kW-H 999 kBTU	
Total energy cost per month:			\$ 123.94

GREEN BUILD
House Specification

Below are the choices you made for this house: [BACK TO GAME MENU](#)

Materials:

- Roof: Asphalt Shingles
- Roof Insulation: R-30
- Walls: Adobe
- Wall Insulation: Vacuum Insulated Panels
- Windows: Small, 2 Pane

Appliances:

- Heater: Heat Pump (69 degrees)
- Air Conditioner: Heat Pump (76 degrees)
- Water Heater: Electric Energy Star (hot)
- Refrigerator: Energy Star
- Oven/Stove: Gas
- Clothes Washer: Energy Star
- Clothes Dryer: Gas Dryer
- Lighting: Compact Fluorescent

[See Monthly Energy Profile for this house.](#)

6. **Issues in power generation**: Cost, brown outs, emissions, land use
7. **Ohm's law**: $v=ir$

What About Careers?

Students in WhyPower are in effect doing virtual jobs. In each lesson, students earn career badges for the jobs they accomplish! Students earn “Whyville clams” for completing jobs, and build up a “clam salary” tied to their demonstrated knowledge and accomplishment.

In addition to general information, WhyPower can integrate information about local education and career pathways. Imagine

your students seeing the math and science classes they need to complete in high school, and seeing the details of the college programs they can then enter. These pathways are built using *SooperMinds* ...

WHYPOWER

WhyPower Jobs

In real life, there are lots of exciting careers in the field of Energy and Power Generation. Some jobs require vocational training, and some require a college or graduate degree.

In Whyville, you can earn technical level and professional level badges by playing WhyPower games.

ELECTRIC FARM

<input checked="" type="checkbox"/>		Electric Farm Technician	6 clams of salary	Place one type of green power source around Whyville for clams.
<input checked="" type="checkbox"/>		Electric Farm Engineer	6 clams of salary	Place both types of green power sources around Whyville for clams.

[PLAY Electric Farm!](#)
[See your Electric Farm History](#)

POWER LINE

<input type="checkbox"/>		Powerline Technician	6 clams of salary	Measure the voltage and current at each point in the grid, and compute the power.
<input type="checkbox"/>		Powerline Engineer	6 clams of salary	Answer the questions about the grid measurements you made.

[PLAY Powerline!](#)

PEAK POWER

<input type="checkbox"/>		Power Plant Operator	6 clams of salary	Discover the basic parameters of power plants and win the first
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SooperMinds and Career Pathways

SooperMinds is a free Web 2.0 tool for defining local career pathways and building social networks around those pathways. WhyPower integrates these pathways.

When students earn WhyPower career badges, they are offered the chance to earn more clams by exploring educational and career pathways local to where they live. WhyPower can help middle school students explore and plan their high school program.



Whyville + Curriculum



MIDDLE SCHOOL
8th Grade Careers
& Other Classrooms



HIGH SCHOOL

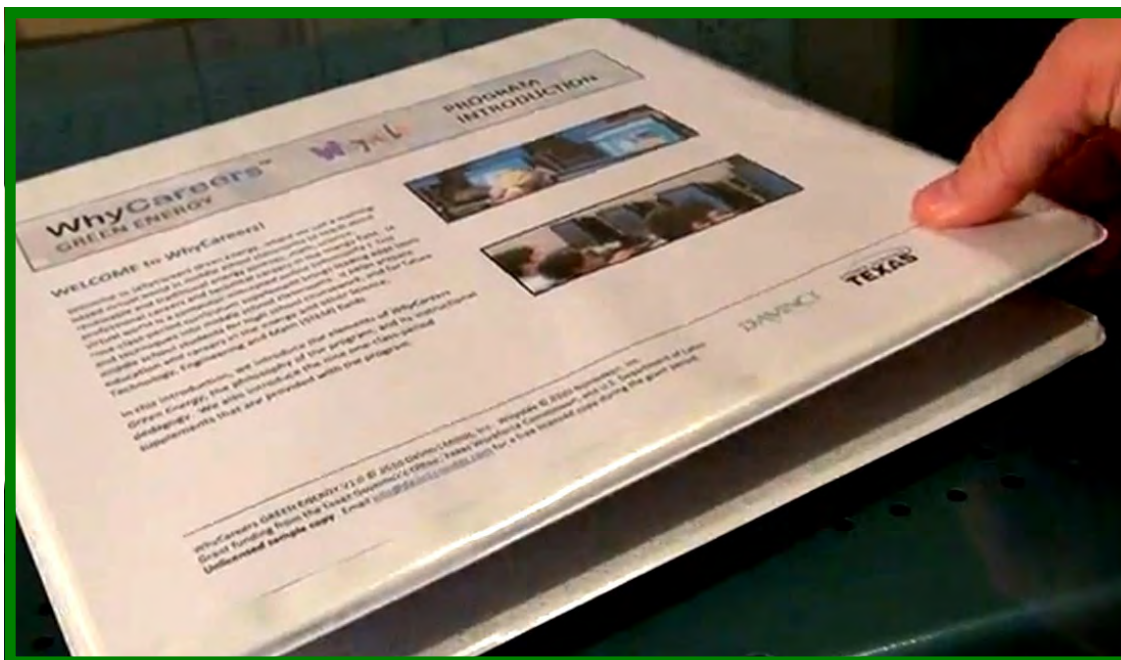


COLLEGE

Getting Prepared for WhyPower

How do you prepare to use WhyPower in your classroom? Here are some things you can do to explore Whyville and become familiar with the WhyPower program.

1. Explore Whyville with a Guest account
 - *click Login on the home screen and follow the instructions*
2. Get an account at www.whyville.net.
3. Make sure Whyville is accessible in your classroom.
4. Try a lesson plan — contact us!
5. Call us with questions.



More Things You Can Do Now

1. Watch our sample videos:

- *Electric Farm Lesson — Refresher Video:*
<http://www.youtube.com/watch?v=QxxB2ITDv0E>
- *Teacher Works Budget on Electric Farm home:*
<http://www.youtube.com/watch?v=OkyBcBbxCA>

2. Download our sample Electric Farm lesson plan at <http://www.davinci-minds.com/K12-WhyPower-ViewCurriculum.html>

The screenshot shows the Whyville website interface. At the top left is the 'Whyville' logo. To the right is a login section with a 'Members log in here. [Forgot your password?](#)' link, a 'Username' field, a 'Password' field, and a 'LOG IN' button. Below the login section is a 'New to Whyville? Start Here!' banner. It says 'Welcome to Whyville!' and 'As a citizen of Whyville, you can:' followed by a list of activities: 'Design your own look', 'Chat and play games', 'Hang out with friends', and 'Much more!'. There is a 'Click on a head to make your face.' instruction and a grid of six avatars. To the right of the avatars is a 'Make My Face' button. Below the banner is a 'What's Up in Whyville:' section with a calendar. The calendar shows events for 'JAN' (Jan 3 - Want to meet the makers of Whyville? Chat with City Workers in the Club Why Chat Room!), 'TODAY' (01:00 PM - Be the first to find the hidden words in a game of Letter Squash at the Greek Theater!), 'JAN' (Speedy at simple math? Prove it during Math Expressions in the Greek Theater!), and 'JAN' (HAPPY NEW YEAR!!!). Below the calendar is a 'Our Sponsors:' section with logos for Toyota Financial Services and Toyota Financial Services. The main content area shows a restaurant scene with a server and a menu. The menu has 'Enchilada' and 'Today's Specials' (cheeseburger, Garden Salad, Chicken Taco, Ham Sandwich). There are also speech bubbles from avatars: 'This is better than food at school lol' and 'now I'm hungry!'. At the bottom of the page is a navigation bar with links: 'About Whyville | [Privacy Policy](#) | [Contact Us](#) | [What Kids Say](#) | [In the News](#) | [Teachers](#) | [Parents](#)'. The 'WhyPower' logo is in the bottom right corner.

Who's Behind WhyPower?

WhyPower has been developed by these organizations.



DaVinci Minds operates at the intersection of technology, education and workforce development, developing products and services for middle schools, high schools, community colleges and universities. DaVinci Minds led development of the WhyPower program, curriculum and professional development offering, and is the lead organization promoting WhyPower to schools.



Power Across Texas is dedicated to raising awareness and understanding of energy issues and policies in Texas. As a non-partisan learning center, Power Across Texas draws from academic, political and private sector resources to provide balanced, reliable information, news analysis, and interactive resources that bring clarity and understanding to critical and complex energy issues in Texas.



numedeon, inc.

Founded in 1999, **Whyville** was created as part of the CalTech Pre-College Science Initiative by Dr. James Bower, CEO of **Numedeon, Inc.** Whyville has served 7 million users with games and simulations in math, science, art, economics, journalism, finance, biotechnology, manufacturing, entrepreneurship, finance, and more. Whyville has been the subject of multiple studies by the National Science Foundation.



The mission of **The Alamo Colleges** is empowering its diverse community for success. The Alamo Colleges serve the Bexar County community through programs and services that help students succeed in acquiring the knowledge and skills needed in today's world. Alamo Colleges has led evaluation efforts for Texas-based program development efforts.

WhyPower Funders and Supporters

WhyPower development has been funded and supported by these organizations.



Waco Independent School District
North East Independent School District (San Antonio)
Beaumont Independent School District

WhyPower curriculum and training is available at no cost to Texas schools through support from the Texas Workforce Commission. Email info@davinci-minds.com for information.

For More Information

To learn more about the WhyPower program and curriculum, contact DaVinci Minds at:

info@davinci-minds.com

210-399-1314

www.davinci-minds.com

www.whypower.net

