



Energy Game Design Project - LESSON PLAN

The first step to true learning is engagement. What better way to engage students these days than video games. That's right... we said video games. This Lesson plan will easily guide you through the process of how you can use meaningful online video game design to enhance students understanding of energy science, (as well as enhance students' science, math, language, technology, and career skills along the way).

You will start out learning how to make sure your school environment is prepared technology wise (easier than you think). Then you will discuss energy science concepts (how energy is produced, how to conserve energy, etc). After that you will be introduced to an easy to use online video game design website called Gamestar Mechanic. Do not be intimidated, this site is built for teachers and students with no game design or even game playing experience. After that you will learn how to publish students' games on the Green Ribbon Schools website, for the entire world to see. All of this can actually occur in less than 4-6 weeks (depending on your schedule).

So let's get started! (See Next Page)

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Section 2: Discuss Energy Science and Energy Conservation with Students

Step 1:	Review the Resources provided in this Lesson Plan or collaborate with Science teachers at your school (1 hour)
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Section 3: Develop the Games

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Step 4:	Students are put into groups to Plan their Game (1-2 hours)
Step 5:	Games are created and Published on the GM website (2-3 hours)

Section 4: Publish on the Green Ribbon Schools website - let the world see it!

Step 1:	<i>If not completed in Section 1</i> - Teacher Registers on GRS and Starts Energy Game Design Project (10 minutes)
Step 2:	Students register on the GRS website and join the Energy Game Design Project started by the teacher (0-1 hour)
Step 3:	Students Create Results pages on GRS and Submit to Teacher (1-2 hours)
Step 4:	Teacher Reviews and Publishes Results pages (1 hour)

YOU ARE DONE! (once you Publish the Results page(s) the lesson plan is complete).

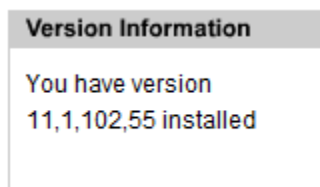


Section 1: Prepare the Environment and Get the “Energy Game Design” project Started on GRS!

Step 1: Technology Requirements: Computers, Browsers and Electricity (easier than you think) - 1 hour

- *Computers* - You will need about one computer for every 1-3 students. One computer per student is preferred so they can all complete the tutorials in SECTION 3: Step 3 at the same time. However, if you have a limited number of computers go ahead and group the students into a group of 3 or more and have them complete the tutorials as a group.
- *Adobe Flash* - All computers will need Adobe Flash (**Version 10 or higher**):

1. Check your version here <http://www.adobe.com/software/flash/about/> and look for the below box on the right side of the page:



2. If your version is lower than 10.0 update your Flash here for Free: <http://get.adobe.com/flashplayer/> (we recommend update to Version 11 or higher)

- *Internet* - All computers will need internet access.
- *Web Browsers* - Be sure that your computers have an internet browser (Internet Explorer or Firefox). Be sure that the browser is updated on all computers. For best results use Firefox 8 or higher (a free browser that can be downloaded here: <http://www.mozilla.org/en-US/firefox/new/>).

Step 2: Teacher Registers on GRS if not already registered (5 minutes)

Visit www.greenribbonschools.org and click on the REGISTER button.

Step 3: Teacher Must Start the "Energy Game Design" Project on GRS (5 minutes)

To “Start” the Energy Game Design project on the Green Ribbon Schools website:

- Once logged in, click on the big red **Start a New Project** button



Start a New Project

- Complete the "Start New Project" page. On this page, it is important that:
 - In the **Project Name** blank, you must enter the words “Energy Patrol”. (You may also include other words in the Project Name as long as “Energy Patrol” is included.)
 - From the **Cornerstone - Category** pulldown, choose "Eco Campus – Energy”.
 - From the **Subcategory** pulldown, choose "Energy Patrol Game Design”

Section 2: Discuss Energy Science and Energy Conservation with Students

Step 1: Review the Resources provided in this Lesson Plan or collaborate with Science teachers at your school (1 hour)

SUGGESTED RESOURCES:

Spend at least 2 hours discussing and teaching students about energy science and energy conservation. Here you are laying the foundation for the concepts they will put into their games. (i.e., Renewable resources vs. non-renewable and how can we prevent use of non-renewable resources, Energy conservation techniques)

- <http://energy.gov/eere/education/k-12-lesson-plans-activities>
- <http://www.newenergynexus.com/40609/wind-energy-lessons-plans>
- <http://www.energizeschools.org/curriculum-resources.html>
- <http://www1.eere.energy.gov/education/lessonplans/>
- <http://www.seco.cpa.state.tx.us/schools/infinitepower/lesson-plans.php>
- <http://www.cpsenergy.com/Services/Education/>

Section 3: Develop the Video Games

Step 1: Teacher Registration on Gamestar Mechanic website (5-30 minutes)

Visit this link (http://gamestarmechanic.com/teachers/get_started) and follow the below steps:

- On this page, you will locate and click on the “Use the Free Edition” button in the **Use the Free Edition** box (see image below):

Use the Free Edition

Sign your students up to use the Free Edition of Gamestar Mechanic and they'll have access to the same free learning experiences and content available to all Gamestar Mechanic users. Premium Educational features not included.

[Use the Free Edition](#)

(Note: If you wish, you can choose the *Exclusive Educational Package* offered on this page for a small fee per student.)

1. Complete the “*Create a Teacher Account*” and “*Tell us about Your School*” sections and click the “*Validate User and Create Your Class*” button.
2. Complete the “*Create Your Class*” section and click the “*Validate and Create Class*” button.
3. Upon completion of these steps, you will see a page like the below, letting you know you have successfully registered and completed setting up your class on the Gamestar Mechanic website :

Success!

Congratulations! Your class is now set up so your students can join and start using Gamestar as part of your class.

You have successfully setup the class **Green Ribbon Schools Team!**

Information about your class

NAME: *Green Ribbon Schools Team* SHORTNAME: *GRSteamwill*

Free Student Activations

REMAINING STUDENT ACTIVATIONS: *Unlimited*

Get your students signed up
Tell your students to visit this url to register with Gamestar Mechanic with your permission. If your students already have Gamestar accounts, they can use them to join your class. If they don't, they'll be able to create new ones. They will not receive premium benefits, but they will be attached to your class should you choose to upgrade later.

<http://gamestarmechanic.com/join/GRSteamwill/free>

[Manage your class from your Workshop](#)

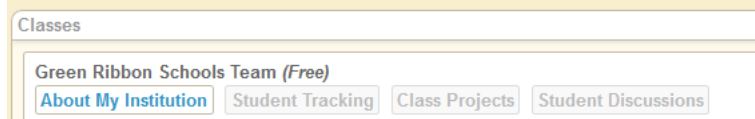
[Teaching Resources](#)

Step 2: Student Registration (30 min-1 hour)

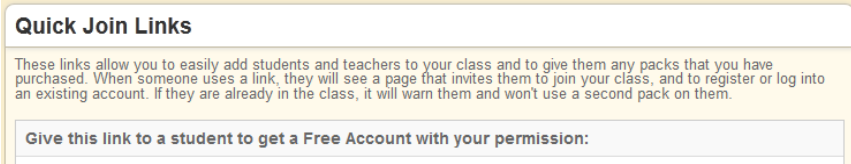
- Now that you have set up your “Class” you will receive an email from Gamestar Mechanic with a ***Student Invite Link***. Share this link with your students. They will follow that link and complete registration, connecting them to you and the Class you set up.
- If you lose your email from Gamestar Mechanic or it does not arrive, you can locate the ***Student Invite LINK*** by logging into your Gamestar account and clicking on WORKSHOP in the top navigation bar:



Then locate the “Classes” section on this page and click the “About My Institution” button:



Then locate the “Quick Join Links” section of this page and you will see the *STUDENT INVITE LINK*:



- Once your students have visited the *STUDENT INVITE LINK* you gave them and finished registration, they will click into the QUEST area of their account on Gamestar Mechanic. This will begin the Quest Tutorials on how to Design Games.

Step 3: Students Complete the Gamestar Mechanic Quest Tutorials (5 hours)



(This is the QUEST button students will see after logging into the Gamestar Mechanic site)

Once logged into the Gamestar Mechanic website, students will click on the **QUEST** button to enter the QUEST area of their account. Through the completion of the Quest, students will learn how to create video games and earn sprites/characters to use in their games. **The Quest Tutorials are set up so that students can complete them at their own speed, and they require no instruction from the teacher to complete.** They are:

- Lesson 1: Terms and Concepts - 1 hour
- Lesson 2: Core Design Elements - 1 hour
- Lesson 3: Balance - 1 hour
- Lesson 4: Design - 1 hour
- Lesson 5: Playtest and Iterate - 1 hour

Step 4: Students are put into groups to Plan their Game (1-2 hours)

Put students into teams of 3 or less. Students may also work individually if you prefer. Have the students plan what their game is going to be about and how they are going to put it together. Questions that should be answered during this pre game design planning phase are:

- Who is the audience: Other students and kids? Adults?, etc.
- What energy conservation lesson do you want to teach in your game?
- What is the story or narrative behind your game that explains who the characters are, what setting the game is in and what the mission of those characters are?
- What is the objective of your game: Eliminate all of the energy consumers and reach the end of the level. Collect all of the energy sprites to beat a level. And the like.

Step 5: Games are created and Published on the GM website (2-3 hours)

Each team of students will implement their plans from Step 4 by designing an actual game. Once the game is finished they will publish it on the Gamestar Mechanic website.

Section 4: Green Ribbon Schools – publish submission and let the world see it!

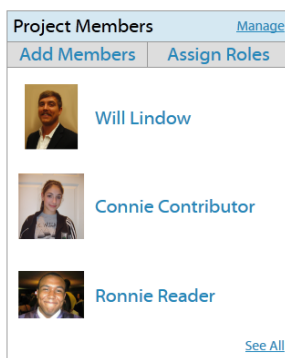
Step 1: If not completed in Section 1 of this Lesson Plan -Teacher Must Register on GRS and Start the Energy Patrol Project (5-10 minutes)

If the teacher has not yet registered on the Green Ribbon Schools website or Started the Energy Patrol Project on GRS, you must visit **Section 1: Step 2 and Step 3** before continuing to Section 4: Step 2.

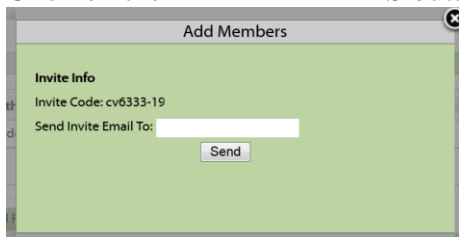
Step 2: Students will now register on the GRS website and join the Energy Patrol Project started by the teacher (0-1 hour)

This is a private project and no one can see it unless you invite him or her in. **To invite students into the project:**

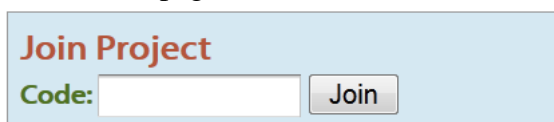
1. Login to the GRS site and click on the name of your Energy Patrol project on your **My Projects** page
2. Once inside the Energy Patrol Project you started, locate the “PROJECT MEMBERS” widget on the right side of the page:



3. Click on the ADD MEMBERS button in this widget and the ADD MEMBERS pop up will appear:



4. Email, text, IM, or write the INVITE CODE for this project on the board for the students. Students will login to the GRS website and enter that Invite Code into the JOIN PROJECT box on their MY PROJECTS page:



Step 3: Students Create Results pages on GRS and Submit to Teacher (1-2 hours)

THIS IS THE BIG FINISH: At this step students will build their "presentation page" or RESULTS PAGE to show off what they learned and to display/Embed their game (see this as an example: <http://greenribbonschools.org/activity-detail.php?id=863>).

Here is the process they should follow:

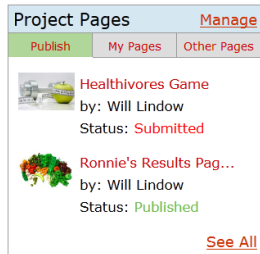
- Have students download or create/take images and video that represent the energy conservation lessons they want to teach with their games (right now they are just saving these to their computers and will insert these images/videos into their results page in a couple steps.
- Have students Log In to the www.greenribbonschools.org website and click on the Energy Patrol project listed on their My Projects page.
- Once inside the project on the Project's Dashboard page, you and the students will see a big open blank with a toolbar labeled "RESULTS PAGE BUILDER". This is where the presentation or RESULTS PAGE is created. Have them enter a fun and creative title for their Energy Patrol Results Page and then have them click into the big blank.
- Have students **EMBED** their game into their Results page using the **INSERT GAME** button. Here is how:
 1. Students will go to the Gamestar Mechanic website and locate their published game in the GAME ALLEY. Next to their game you will see the *SHARE THIS GAME* section. Click on the **EMBED** button and copy the entire code (the EMBED code is extremely long so be sure to copy the entire thing).
 2. Go back to the Green Ribbon Schools website and click into the big Results Builder blank. Then click on the **INSERT GAME** button. In the pop up, Paste the Embed code you just copied from Gamestar into the blank and click the "SAVE and RETURN TO BUILDER" button.
 3. You will see a big grey box appear where the game has been inserted. DO NOT resize or move this box now that it has been inserted.
- Have students enter all required text including:
 1. **The story or narrative behind the game:** (example: Super Energy Man wants to eliminate all of the energy wasters in the environments.)
 2. **The objective or goal of the game** (examples: stay alive for x amount of time, get to the end goal by avoiding the bad guys, collect all of the energy in the level)
 3. **The energy conservation lesson being taught with the game**
 4. **The intended audience for the game** (examples: other students, parents, everyone, etc.)
 5. **Team Members:** List the First Names of all Team Members who worked on this Game and GRS Results Page.
- Then have students insert their pictures and/or videos by clicking on the INSERT IMAGE and INSERT VIDEO buttons in the toolbar.
- Have the student review for spelling errors and final looks and then have them click the **PUBLISH PAGE** button.

Step 4: Teacher Reviews and Publishes Results pages (1 hour)

Students have now “submitted” their pages to you (the teacher) and you must now **PUBLISH** them to make them a completed submission and to send them to the PUBLISHED PROJECTS area of the GRS website for everyone in the world to see.

Here is how to PUBLISH:

- Login and click on the Energy Patrol Project you started.
- Locate the **PROJECT PAGES** widget on the page and click the Green Publish button This will show you the most Recently Submitted and Published Pages from your project(*see image below*):



- Click the [See All](#) link in the widget to bring up the PROJECT PAGES pop up, where you can see all of the pages currently submitted and or published for this project (see image below):



- Click on the name of any “Submitted” page to Preview it and to make sure the student has completed all requirements.
- Click the **PUBLISH** button in the ACTIONS column for each page you want to Publish. The entire line will turn Green and that page is now PUBLISHED (making it a completed contest submission).

YOU ARE DONE!

You can now locate your published work on the PARTICIPATING SCHOOLS page of the GRS site by visiting: <http://greenribbonschools.org/schools.php> , clicking on your school’s name in the list and then the name of your Energy Patrol project. You can also search for it using the PUBLISHED PROJECTS area of the site: <http://greenribbonschools.org/publishedprojects.php>.

Need help? Visit the [GRS Help Page](#).

Acknowledgements: Special thanks to the following for their efforts in developing this Lesson Plan: [Rackspace](#) and [Cyberways and Waterways](#), a 501c3 nonprofit, developing Green Ribbon SchoolsSM.