# CLASSROOM TECHNOLOGY REVIEWS

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## EDUCATIONAL GAMES – THE NOBEL PRIZE IN MEDICINE

The Nobel Foundation offers free educational games at its official Web site (www.nobelprize.org) and the games for the Nobel Prize in Medicine (at http://nobelprize.org/educational_games/medicine/) are very applicable for high school biology. The games are geared toward young learners ranging in age from 14-18 years, although adults may also find the games informative and amusing. Not only does the Web site offer historical information about the Nobel Prize winning scientists and their work, it also provides students with an innovative way to grasp some abstract concepts by playing games and participating in simulations.

The game topics listed on the Web site include the following:

- Blood Typing
- The Cell and Its Organelles
- Control of the Cell Cycle
- DNA – The Double Helix
- The Ear Pages
- Electrocardiogram
- The Genetic Code
- The Immune System
- Malaria
- MRI
- Pavlov's Dog
- The Split Brain Experiments
- Tuberculosis
- Vitamin $B_1$

Although the Web site information suggests that no prior knowledge is necessary, some of the games would be much more enjoyable for students as a supplemental activity after learning about the topics in the classroom. The games that might require some previous experience are the Genetic Code Game, Control of the Cell Cycle, the Tuberculosis Game, and the Blood Typing Game. The Genetic Code Game is timed and even students familiar with the codons have difficulty finding the proper amino acids presented in the list format. In the Control of the Cell Cycle Game, students need to know the events for each phase in order to push the proper buttons at the factory console. If it's microbiology you're helping students learn, the Koch's lab simulation provides a somewhat slow-moving quest design but allows students to isolate the bacteria and infect the guinea pigs to identify the tuberculosis pathogen. Giving a suitable transfusion to an accident victim is required for the Blood Typing Game and students might find the tasks a little less daunting if they are already well-informed about the terms *antigen, antibody,* and *clumping* (agglutination). If students like a challenge and are able to explore well on their own, the games do provide links on "How to play," as well as information about the Nobel Prize winner and the work that is associated with the game in order to help students complete the activities.

Other games like those for the Cell and Its Organelles, DNA-The Double Helix, Vitamin $B_1$, and Pavlov's Dog would be somewhat easier with some background, but students can choose whether to view the helpful hints prior to beginning the games or just learn how to participate by first-hand experience. Students will enjoy the comic book introduction for the Incredible Megacell game before having to slingshot organelles back into the professor. Vitamin B1 deficiency (Beriberi) is presented in an animation that students can view to learn what foods are high in Vitamin B1 content. If not, they'll rapidly uncover what to feed their chickens in order to become Farmer of the Month in the Chicken Farm Game. Some students may have heard references to Pavlov's work and will be able to quickly make the dog salivate with a specific sound in the Pavlov's Dog Game. These games provide students with extra practice of biological terms and processes. Moreover, the games imply the fortitude required of the Nobel Prize winners in their pursuit of scientific understanding.

The remaining games on the list are fairly simple in their objectives and very entertaining for students. The Immune System Defender Game requires students to fight the bacterial infection by dragging and releasing granulocytes into the war zone before the level of bacteria becomes too high to handle. Fascinating graphics and fun sounds make the text-heavy portions of the Ear Pages more enjoyable. The Electrocardiogram and the MRI simulations are reasonably short and simple, allowing students to diagnose patient conditions. In the Mosquito Game for Malaria, students act as mosquitoes trying to draw blood from people before being killed by birds or insecticide. As the *Plasmodium falciparum* of Malaria, students need to reach the liver in order to multiply without being killed by antibodies and white blood cells. The Split Brain Experiments encourage students to experiment on Mr. Split Brainy with funny animations, although the simulation seems a little flat and lingering at times.

Overall, the Educational Games at the Nobel Prize in Medicine Web site would be a tremendous asset to a biology classroom. The activities and readings introduce students to scientists' biographies and clarify processes that are often confusing in biology textbooks. Related science disciplines could also benefit with games such as the Tetris-like Liquid Crystals-Crystallite Game on the Physics page, the PCR-Eye of the Donkey Game under Chemistry, and the Red Cross-Prisoners of War Game under the Peace Prize. As more teachers utilize the Web site and complete the Teachers' Questionnaire, the activities available at this Web site will only continue to improve.

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