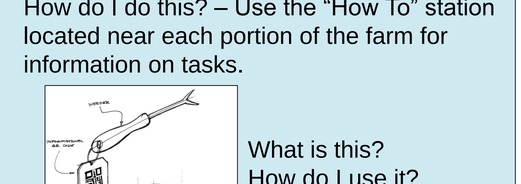
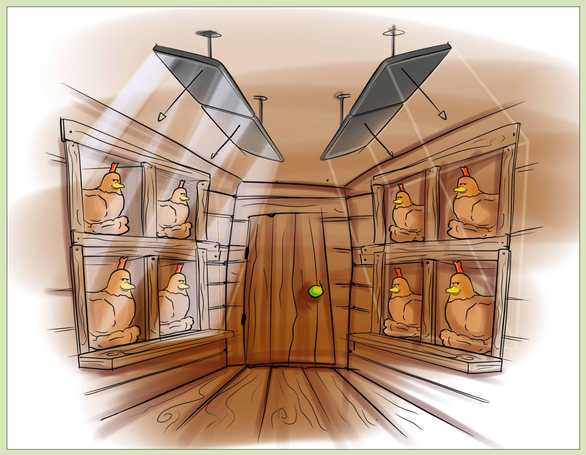
LCD Screen Lights:
Egg Production

For many years it has been known that the growth and reproduction of chickens is dependent upon the type and length of light to which the chickens are exposed. Chicken farmers, in particular the egg production industry, now could have an easy and inexpensive way to maintain constant egg production all year round. Instead of using regular light bulbs, the LCD screens of used laptops could be connected in a network and programmed with a single laptop to produce the correct lighting for a batch of chickens so that they will produce eggs during their natural off season (i.e., winter) and molt during the summer while another batch of chickens is on the schedule of producing eggs in the summer and molting in the winter (natural cycle). LCD screens are also more energy efficient than regular light bulbs.

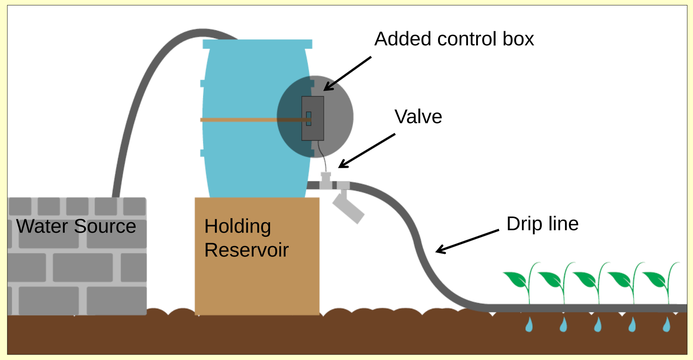


An example of linked monitors to provide lighting to the chickens.



An example of a chicken coop with half the chickens receiving artificial light and half on the normal daylight cycle.

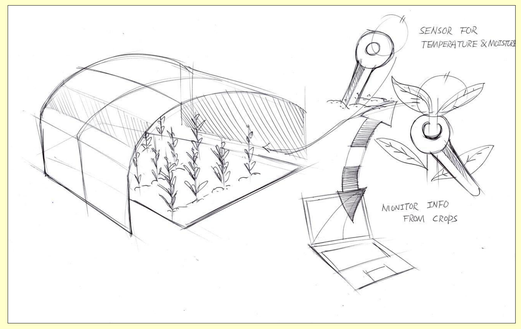
Auto Drip Irrigation & Sea of Sensors



Here the control box is easily strapped to the holding reservoir barrel with rope and connected to a valve.

Using parts from recycled laptops, a low-cost automated irrigation system could be designed that would be added to any simple drip irrigation system. The result would be that the farmer could save up to 10x the amount of water used in traditional continual drip irrigation.

A step up from the simple drip control box is a sea of temperature and moisture sensors which could be placed in the soil in a farmer's greenhouses or fields. The sensors would be modified from recycled computer sensors and controlled by a program on a recycled computer. The sensors would help conserve water and energy (especially in a greenhouse) while still maintaining an automated system.



An example of an automated moisture-sensing and sprinkler system in a greenhouse.

A New Life for Laptops

Is a laptop computer useless without a hard drive? A group of University of Illinois students decided to find out. With funding provided by Dell and a grant from the Sustainable Electronics Initiative (SEI) at the Illinois Sustainable Technology Center (ISTC), a division of the Prairie Research Institute on the University of Illinois – Urbana-Champaign (UIUC) campus, the students worked in conjunction with university researchers and explored reuse options for such devices destined for recycling.

Laptops used by government agencies and various industries typically have their hard drives removed or destroyed before recycling. This removal is done out of concern for data of a sensitive or personal nature falling into the wrong hands.

The goal of the class directed by William C. Bullock, Professor of Industrial Design, was to extend the useful life of these used laptops and their components prior to recycling. The project utilized cross-disciplinary teams of students (graduate and undergraduate) and research faculty from engineering, marketing, computer science, business, and industrial design at UIUC and staff from ISTC. (Project Advisors: Hong Yuan, Assistant Professor, Department of Business Administration; Brian Lilly, Adjunct Associate Professor, Engineering; and Cliff Shin, Associate Professor, Industrial Design; Joy Scrogum, ISTC; Nancy Holm, ISTC; Mike Watson, Dell; John Pflueger, Dell)

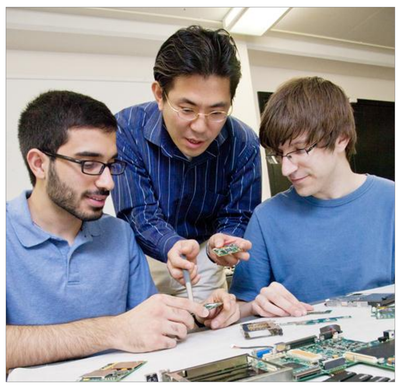
Vintage Tech Recyclers in Romeoville, Illinois, donated 20 recycled Dell laptops to the students for experimentation. Any unused computer parts were returned for recycling. Final class projects were presented in May 2012 and results are posted on the SEI website http://www.sustainelectronics.illinois.edu/.

The four ideas developed from this project include (as shown):

- LCD Screen Lights: Egg Production
- Auto Drip Irrigation & Sea of Sensors
- Laptop Express
- Education & Training

ILLINOIS SUSTAINABLE TECHNOLOGY CENTER
PRAIRIE RESEARCH INSTITUTE

sei Sustainable Electronics Initiative



DELL

Education & Training

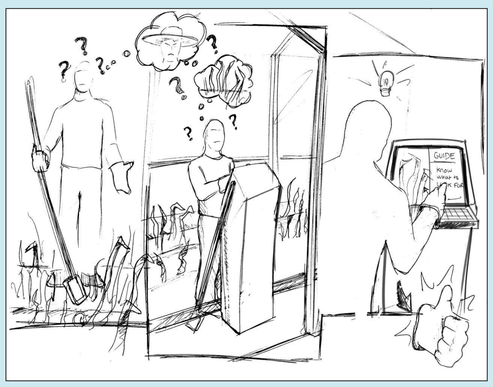
What is it?
The Farm Education Initiative is a one-stop education laptop with how-to videos and additional information.

Who's it for?

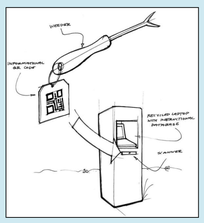
- Farm workers
- Agriculture groups
- School field trips

Where?

- Personal laptops for off-site learning
- Communal learning stations on the farm



How do I do this? – Use the "How To" station located near each portion of the farm for information on tasks.



What is this?
How do I use it?
Scan the QR code to learn how.

What is this plant? How do I take care of it? Scan the plant and read information online or in a database.

Laptop Express

Laptop Express would be a subscription service offering recycled laptops that can easily be replaced if broken or damaged. This service would give farmers the ability to use technology in the field where they need it, but not have to worry about ruining expensive equipment.

It's as easy as 1, 2, 3!

An example of tiered pricing strategy that students presented to Dell.