



U.S. DEPARTMENT OF
ENERGY

Biggest Energy Loser Challenge

Energy Efficient Building
Technology Curriculum
Development

Final Report

Presented by:

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Curriculum Audience

- Middle School Teachers and Students
 - Mr. Gentry Hirohata of Punahou Middle School, Honolulu, Hawaii
 - Ms. Rika Heshiki of University of the Ryukyus Junior High, Okinawa, Japan
 - Ms. Tara Hollins of Southern University Laboratory School, Baton Rouge, Louisiana

Curriculum Design

- 2- virtual sessions
- Activities
 - Web scavenger hunt
 - Home energy audit
 - Cross-cultural communication via Edmodo.com
- Final Project
 - Biggest Energy Loser Challenge
 - Google Sketch-up (Solid Modeling)

Home Energy Audit

| Household Appliance | Appliance wattage (kW) | x | Hours used per day | x | Days used per week | x | Average rate per kWh* | = | Average cost per week | x 4 | Average cost per month |
|---|------------------------|---|--------------------|---|--------------------|---|-----------------------|-----|------------------------|-----|------------------------|
| Clothes washer | 0.43 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Clothes dryer | 3.40 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Dishwasher | 2.00 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Window Fan | 0.20 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Microwave oven | 0.93 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Personal Computer CPU | 0.12 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Monitor | 0.15 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Laptop | 0.05 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Television | 0.11 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Flat Screen | 0.12 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| DVD | 0.02 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Games Console (PS3, Xbox, Nintendo) | 0.01 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| Refrigerator | 0.24 | x | | x | | x | \$ 0.099 | = | \$ - | x 4 | \$ - |
| | | | | | | | | | | | |
| Household Items | Average Cost per Hour* | x | Hours Per Week | x | Number of Bulbs | = | Average cost per week | x 4 | Average cost per month | | |
| 100 watt Incandescent Light Bulb | \$ 0.2376 | | | | | = | \$ - | x 4 | \$ - | | |
| 15 watt Compact Fluorescent Lightbulb (CFL) | \$ 0.0356 | | | | | | \$ - | x 4 | \$ - | | |
| 5 watt LED Light Bulb | \$ 0.0119 | | | | | | \$ - | x 4 | \$ - | | |
| | | | | | | | | | | | |
| TOTAL COST | | | | | | | | = | \$ - | x 4 | \$ - |

*Based on average kWh in Louisiana with Entergy.



Edmodo.com

<http://www.edmodo.com/home>

Google Sketch-Up

Southern University Laboratory School

Pictures



Sketchup Models



Google-Sketch Up

Punahou School

Pictures



Sketchup Models



Google Sketch-Up

University of the Ryukyus Junior High School

Pictures



Sketchup Models



Student Model of the House

Biggest Energy Loser Challenge Live Session



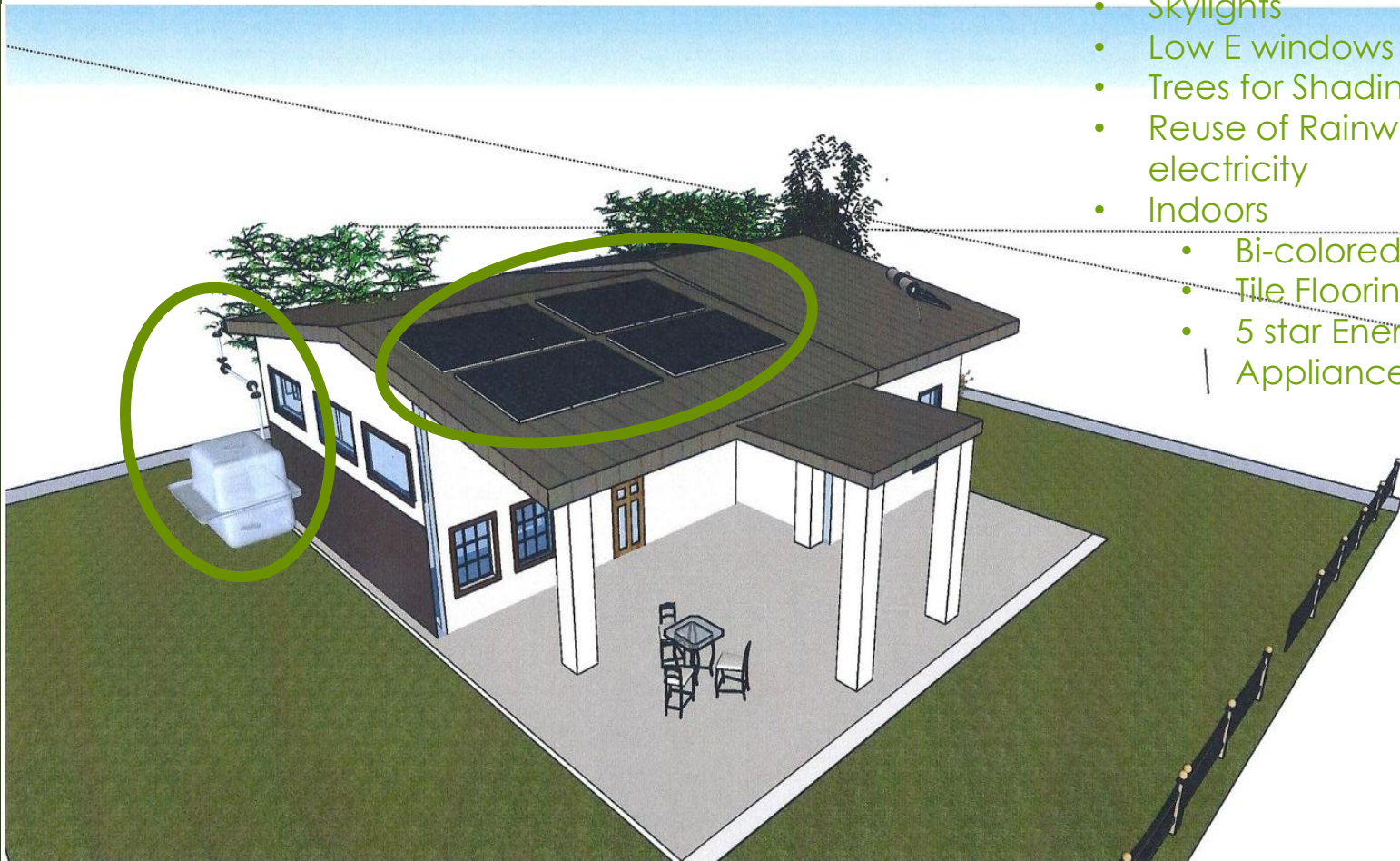
Tiny Giants of SU Laboratory School



- CFL Bulbs
- Solar Panels
- Large trees for Shading
- Energy Efficient Windows and Appliances

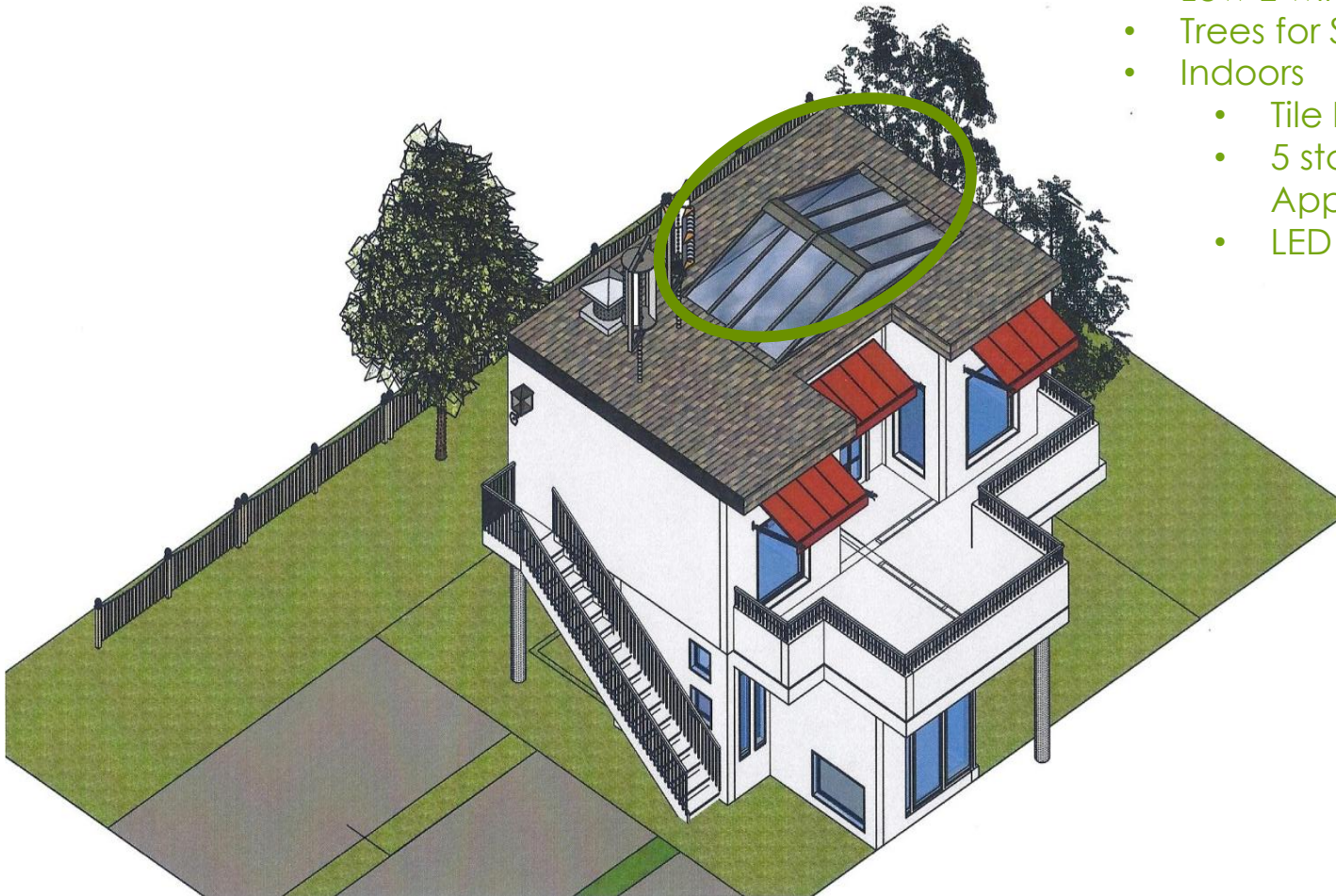
Group 5 of Punahou School

- South Facing
- Protective Metal Coating for Roof
- Skylights
- Low E windows
- Trees for Shading
- Reuse of Rainwater for electricity
- Indoors
 - Bi-colored walls
 - Tile Flooring
 - 5 star Energy Saver Appliances



Red Bull of University of the Ryukyus Junior High

- South Facing
- Skylights
- Low E windows
- Trees for Shading
- Indoors
 - Tile Flooring
 - 5 star Energy Saver Appliances
 - LED Lighting



Exit Survey Results and Recommendations

- Aligned with standards
- Presented new knowledge to students
 - Transferred knowledge
 - Real-world applications
- More interactive
 - Sessions
 - Assessments
- Publications