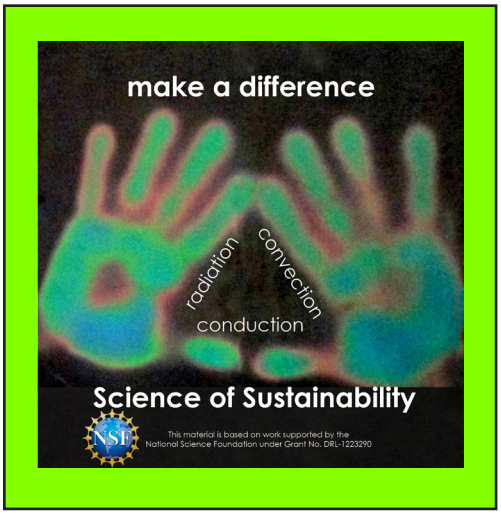
Project SOS | Science of Sustainability

"Project SOS: Making Connections Using the Science Of Sustainability," funded by the National Science Foundation (DRL-1223290) developed programs, exhibit prototypes, and hands-on team challenges for youth (ages 11-15) and their families, focusing on "the science behind heat transfer and sustainable building design." Participants learned basic concepts of physics and how to apply new skills and knowledge to save energy to make their homes more energy efficient.



Below is a description and visual overview of the project. All project components (slideshow, demonstrations, activities, lists of materials and supplies, and basic construction details of the exhibits) are described in the links on this website.

We invite you to explore the links and use these materials in your formal and/or informal science education programs. We are very interested in knowing whether you find them useful, and we welcome your feedback. For more information and to contact us, please write to Kathy Dawes, lead PI, at outreachpdsc@gmail.com.

Day 1 Exhibits and Activities at a community site:

Exploring Heat Energy. A one-hour introductory presentation of how three types of heat transfer (conduction, convection, and radiation) operate in everyday situations (e.g., keeping food cold/warm, staying warm outdoors) with demonstrations, animations, hands-on activities, and a team challenge to "Keep the Hot Cocoa Hot."

Interactive exhibits. Participants explored table-top interactive exhibits to learn how these three types of heat transfer affect heat loss in homes:

Conduction ... which materials in your home are good conductors or insulators?

Convection ... how does warm air move in your home?

Radiation ... how can you detect heat energy given off by objects?

Youth became experts in one type of heat transfer and then shared information and tools with their teams through cooperative learning in order to do the **Model House Challenge.**

palouse discovery science center

Palouse-Clearwater Environmental Institute

NSF

University of Idaho
A LEGACY OF LEADING

Washington State University

OMSI
Everyday Encounters with Science

AVISTA

Inland Power and Light Company

KootenaiElectric Cooperative
A Touchstone Energy® Cooperative

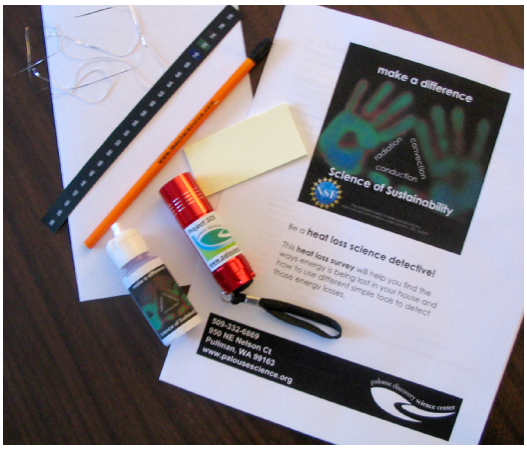
Clearwater Power Co.
"We Care"

This material is based on work supported by the National Science Foundation under Grant No. DRL-1223290
Any opinions, findings and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Project SOS | Science of Sustainability

Model House Challenge. Working in teams of six (two experts in each type of heat transfer), youth used materials and tools introduced in the table-top exhibits (e.g., insulation, energy-efficient windows, smoke pencils, and infrared imagers) to retrofit their Model Houses and then test their houses to see whether they hold heat more effectively.

HEAT Kits. Participants left the Day 1 program with the Heat Energy Audit Toolkit (HEAT) containing simple materials and guidelines for being a "Heat Science Detective" to find areas of heat loss in their own homes.



Day 2 Free family visit to the Palouse Discovery Science Center (PDSC)

One week later, youth and their families were transported to the science center where small-group discussions focused on what they discovered in their own homes and ways to improve energy efficiency using free weatherization materials provided by local power companies. Project staff (including scientists, engineers, and science educators) led a discussion of STEM careers and participants then had free time to explore PDSC.

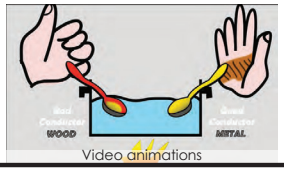
This material is based on work supported by the National Science Foundation under Grant No. DRL-1223290

Project SOS | Science of Sustainability

Project Components

An Introduction to Heat Energy


Demonstrations and hands-on activities

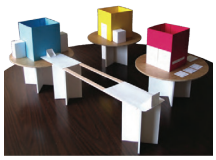


Video animations


Problem-solving challenge: "Keep the Hot Cocoa Hot"

Experiencing Exhibits

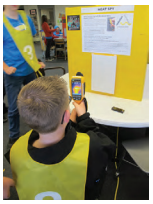
to become an expert in one type of heat transfer (Conduction, Convection, or Radiation) as it occurs in a house by doing four hands-on activities



conduction

convection

radiation



Sharing Expertise through Cooperative Learning

in which teammates share how to use specific tools to show how their type of heat transfer occurs in a house.

Before today, I never knew that…

"you could use smoke for finding gaps. What we did today reminded me that… doing science is way more important then I thought."
Youth participant

Before today, I never knew that…

"there could be so many places in a house that heat could escape from."

What we did today reminded me that…

"it's SUPER important to have some form of insulation in your house – it could save you lots of money on heating and cooling."
Youth participant

Model House Challenge

in which team members work together to use the tools and share their expertise to select and apply modifications to a model house to make it more energy efficient.

"I had a lot of fun. I learned the basics of heat "physics". I worked with a team to make a model house more efficient. I explored a real building to see where heat was coming in."
Youth participant

HEAT (Heat Energy Audit Toolkit)

training in which youth and their families use simple tools and an audit form to become a "Heat Science Detective" in their own home.

What we did today reminded me that...
"science is AWESOME!"
Youth participant

Youth and Family visit the Palouse Discovery Science Center


Sharing experiences of using HEAT audit and tools at home

"they talked a little bit about their careers, that gives me kind of an insight about what my options are, or what I could do."
Youth participant
STEM career awareness


Take home weatherization materials


Exploring the Palouse Discovery Science Center

One week later — Day one

Project SOS | the Science of Sustainability operates through the Palouse Discovery Science Center in Pullman, WA. Contact us for more information: outreachpdsc@gmail.com
This material is based on work supported by the National Science Foundation under Grant No. DRL-1223290