

Darfur Stoves Supplemental Guide

A resource for learning about the Darfur Stoves Project using QUEST video

QUEST SUBJECTS

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| Life Science | Biology
Health
Environment |
| Earth Science | Geology
Weather
Astronomy |
| Physical Science | Physics
Chemistry
Engineering |

CORRELATIONS TO THE SCIENCE CLASSROOM

The segments described in this guide provide information on

- Physics
- Chemistry
- Engineering
- Global conflicts

QUEST MEDIA FOR TEACHING ABOUT DARFUR STOVES

Watch **Darfur Stoves Project** <http://www.kqed.org/quest/television/view/923>

- Every day, women living in the refugee camps of Darfur, Sudan, must walk for up to seven hours outside the safety of the camps to collect firewood for cooking, putting them at risk for violent attacks. Now researchers at Lawrence Berkeley National Laboratory have engineered a more efficient wood-burning stove, greatly reducing both the women's need for firewood and the threats against them.

INTRO QUESTIONS

- Have you ever helped light a fire at a picnic or on a camping trip? How easy or difficult was it? What were some of the problems you noticed?
- What are the different kinds of heat sources used to cook food? Can you think of some unusual ones?
- Take a few minutes to locate Darfur on a world map. Make a list of the things you know about the place.
- What do you think are some of the most valuable scientific innovations of modern times? What makes them valuable?

FOCUS QUESTIONS

- Why did the U.S. Office of Foreign Assistance approach Dr. Gadgil and his team?
- What problems did Dr. Gadgil's team identify in the traditional three-stone fire method of cooking used by the refugees?
- What variables does Dr. Gadgil list as determinants of a stove's efficiency? What other factors did the team take into consideration when designing the stove?
- In what ways does the Darfur Stoves Project improve the lives of the refugees in the refugee camps?
- Why are the Darfur Stoves Project stoves sold and not given away for free?
- Do you agree with Dr. Gadgil's conclusion that modern science can be the solution to the problems of people at the bottom of the economic scale? Can you think of other examples where scientific innovations have saved or significantly improved lives?

For all media see:

Segment Summary Student Sheet

http://www.kqed.org/quest/downloads/QUEST_SegSum_StudentSheet.pdf

Personal Response Student Sheet

http://www.kqed.org/quest/downloads/QUEST_PersResp_StudentSheet.pdf

VOCABULARY

Darfur

region in western Sudan in Africa, and the site of a long and brutal conflict and genocide by government-backed militias

Janjaweed

armed militias in Darfur, western Sudan and Eastern Chad, responsible for the killing, rape and mass displacement of civilians

Genocide

the deliberate and systematic destruction, in whole or in part, of an ethnic, racial, religious or national group

Refugee camp

temporary camp set up to house refugees, or persons fleeing persecution

Combustion

chemical reaction between a fuel and an oxidant, usually accompanied by the production of heat or heat and light

Prototype

original type, form or instance of something serving as a typical example, basis or standard for other things of the same category

Flat packs

ready to assemble articles that can be purchased in multiple pieces and put together at the destination

LESSON PLANS and RESOURCES from PBS, TEACHERS DOMAIN and NPR

NOTE: Resources from the Teachers' Domain collection require a fast and free registration.

Simple Solutions Teachers Domain

<http://www.teachersdomain.org/resource/eng06.sci.engin.design.amysmith/>

In this video produced for Teachers' Domain, mechanical engineer Amy Smith explains the design process for an innovation that enables poor people in isolated villages to determine if their water supplies are free of dangerous bacteria.

Heat Transfer Teachers Domain

<http://www.teachersdomain.org/resource/lsp07.sci.phys.energy.heattransfer/>

In this activity, learn about methods of heat transfer and classify examples of conduction, convection and radiation in everyday life.

On Fire PBS Teachers

<http://www.pbs.org/teachers/connect/resources/4191/preview/>

This interactive from **NOVA** lets you explore the basics of combustion, including how a fire ignites, how a molecule's atoms rearrange themselves during combustion and what a flame is made of.

Saved by the Sun PBS Teachers

<http://www.pbs.org/teachers/connect/resources/4933/preview/>

In this classroom activity from **NOVA**, students follow a seven-step invention process to design, build and test a solar cooker that will pasteurize water. At the end of the activity, students are able to describe how transmission, absorption and reflection are used to heat water, and evaluate what variables contribute to a successful cooker.

Kitchen Magician PBS Teachers

<http://www.pbs.org/teachers/connect/resources/6611/preview/>

Find out how cooking causes irreversible change in food items with this interactive game for younger learners. Decide what items have been changed through cooking and learn some funny food-related riddles.

ADDITIONAL RESOURCES and ACTIVITIES

On Our Watch PBS Teachers

<http://www.pbs.org/teachers/connect/resources/5937/preview/>

Watch as **Frontline** investigates genocide in the Darfur region of the Sudan, where at least 200,000 have been killed and 2.5 million driven from their homes in a brutal, government-supported campaign against civilians.

Build a US Strategy for Responding to the Crisis in Sudan PBS Teachers

<http://www.pbs.org/teachers/connect/resources/1774/preview/>

This activity plan from **Frontline** uses a "jigsaw" strategy to help students explore aspects of the crisis in Sudan in "expert" groups and then return to their "home" groups to develop recommendations for an appropriate U.S. response to the situation.

Studying Genocide PBS Teachers

<http://www.pbs.org/teachers/connect/resources/6927/preview/>

This comprehensive activity pack is a resource for teaching about the Holocaust and other past and current worldwide genocides, including Darfur, Bosnia and Cambodia.

Crisis in Sudan: Responding to Medical Emergencies PBS Teachers

<http://www.pbs.org/teachers/connect/resources/4497/> This lesson plan addresses the medical nature of the humanitarian crisis in the Darfur region, with resources including interviews with Doctors Without Borders.

VISIT OUR PARTNERS

The Bay Institute
www.bay.org

California Academy of Sciences
www.calacademy.org

Chabot Space and Science Center
www.chabotspace.org

East Bay Regional Park District
www.ebparks.org

Exploratorium
www.exploratorium.edu

Girl Scouts of Northern California
www.girlscoutsnorcal.org

Golden Gate National Parks Conservancy
www.parksconservancy.org

The J. David Gladstone Institutes
www.gladstone.ucsf.edu

Lawrence Berkeley National Laboratory
www.lbl.gov

Lawrence Hall of Science
www.lawrencehallofscience.org

Monterey Bay Aquarium
www.mbayaq.org

Monterey Bay Aquarium Research Institute
www.mbari.org

Oakland Zoo
www.oaklandzoo.org

The Tech Museum of Innovation
www.thetech.org

UC Berkeley Natural History Museums
<http://bnhm.berkeley.edu/>

U.S. Geological Survey
www.usgs.gov

MORE EDUCATIONAL RESOURCES FOR USING QUEST MULTIMEDIA TO ENHANCE 21ST CENTURY SKILLS IN TEACHING AND LEARNING

Why Use Multimedia in Science Education?

<http://www.kqed.org/quest/downloads/QUESTWhyMedia.pdf>

- Read about the importance of using multimedia in the 21st century science classroom.

How to Use Science Media for Teaching and Learning

<http://www.kqed.org/quest/downloads/QUESTMediaTips.pdf>

- A collection of tips, activities and handouts to actively engage students with multimedia.

Science Multimedia Analysis

<http://www.kqed.org/quest/downloads/QUESTMediaAnalysis.pdf>

- Give your students the tools to recognize the purposes and messages of science multimedia.

Create Online Science Hikes with Google Maps

http://www.kqed.org/quest/files/download/52/QUEST_ExplorationCreation.pdf

- Do you like the science hike Explorations on the QUEST site? Use this place-based educational guide to create similar science-based maps with youth.

OTHER WAYS TO PARTICIPATE IN QUEST



LOG ON

www.kqed.org/quest



LISTEN

**KQED 88.5 FM San Francisco &
89.3 FM Sacramento
Mondays at 6:30am and 8:30am**



WATCH

**KQED Channel 9
Tuesdays at 7:30pm**

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