

# Project SOS

## the Science of Sustainability

operates through the  
**Palouse Discovery Science Center in Pullman, WA.**



The goals of the project are that youth gain a basic understanding of the physics of heat transfer, learn to work collaboratively on team challenges, bring their interest and information home to their families, and begin to think about the future and how their families can save energy.

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Through Project SOS, youth and their families have learned how to apply their new skills and knowledge to find ways to make their own homes more energy efficient.



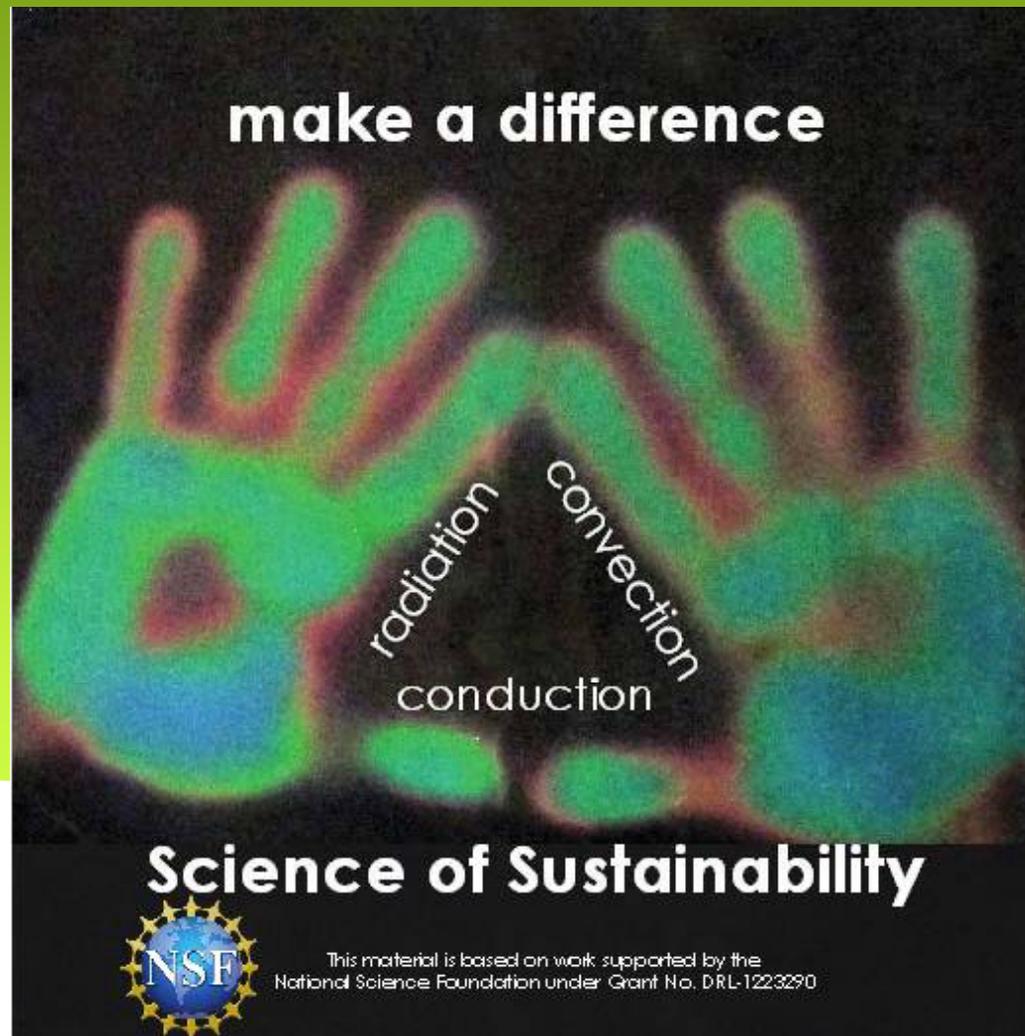
**For more information about Project SOS and future plans,  
contact Kathy Dawes at [outreachpdsc@gmail.com](mailto:outreachpdsc@gmail.com)  
or call 208-310-2922**

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See more at [www.palousescience.net/#!/sos-introduction/c1mws](http://www.palousescience.net/#!/sos-introduction/c1mws)

# Project SOS

## the Science of Sustainability



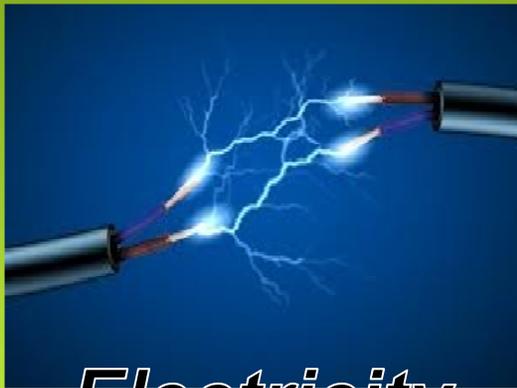
# Why are we doing Project SOS?

**SOS** – The **S**cience of **S**ustainability

What does sustainability  
mean?

to “aim for low or zero net energy use”  
is a goal for sustainable housing

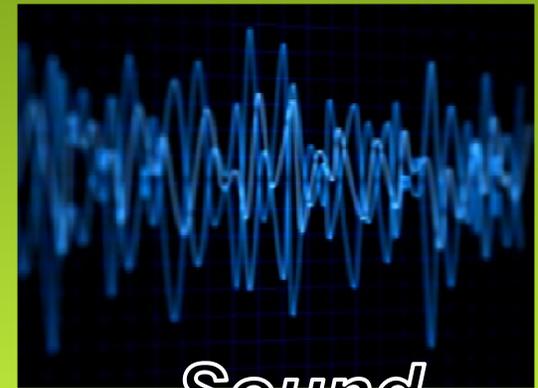
# Different forms of energy ...



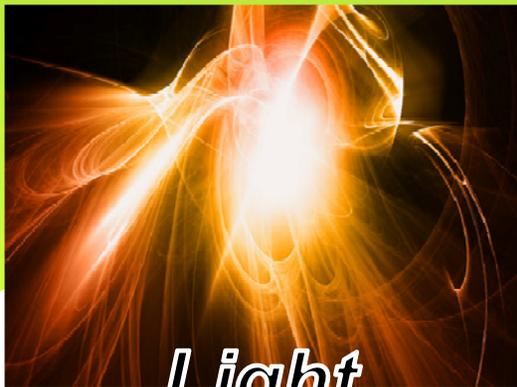
*Electricity*



*Magnetism*



*Sound*



*Light*



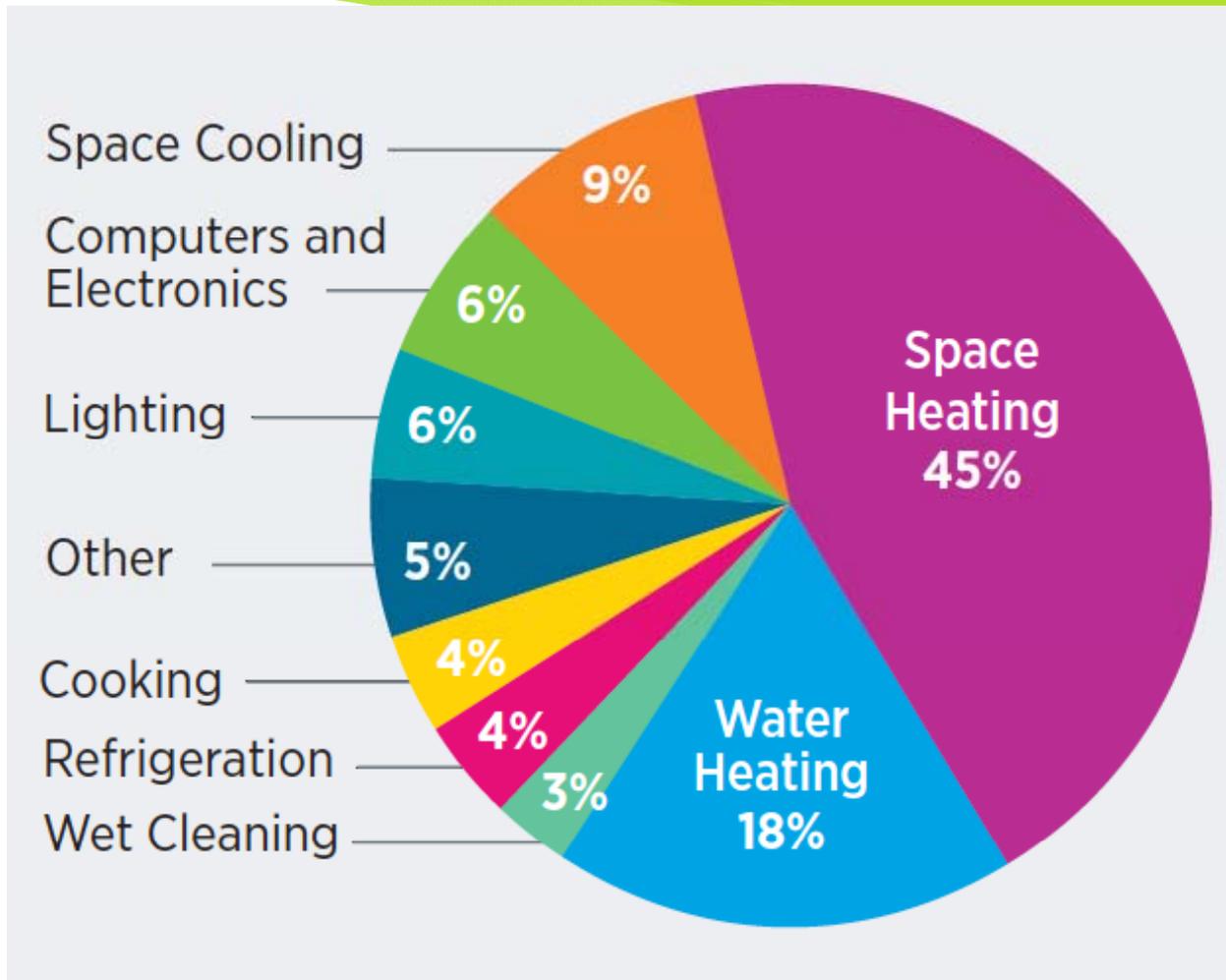
*Chemical*



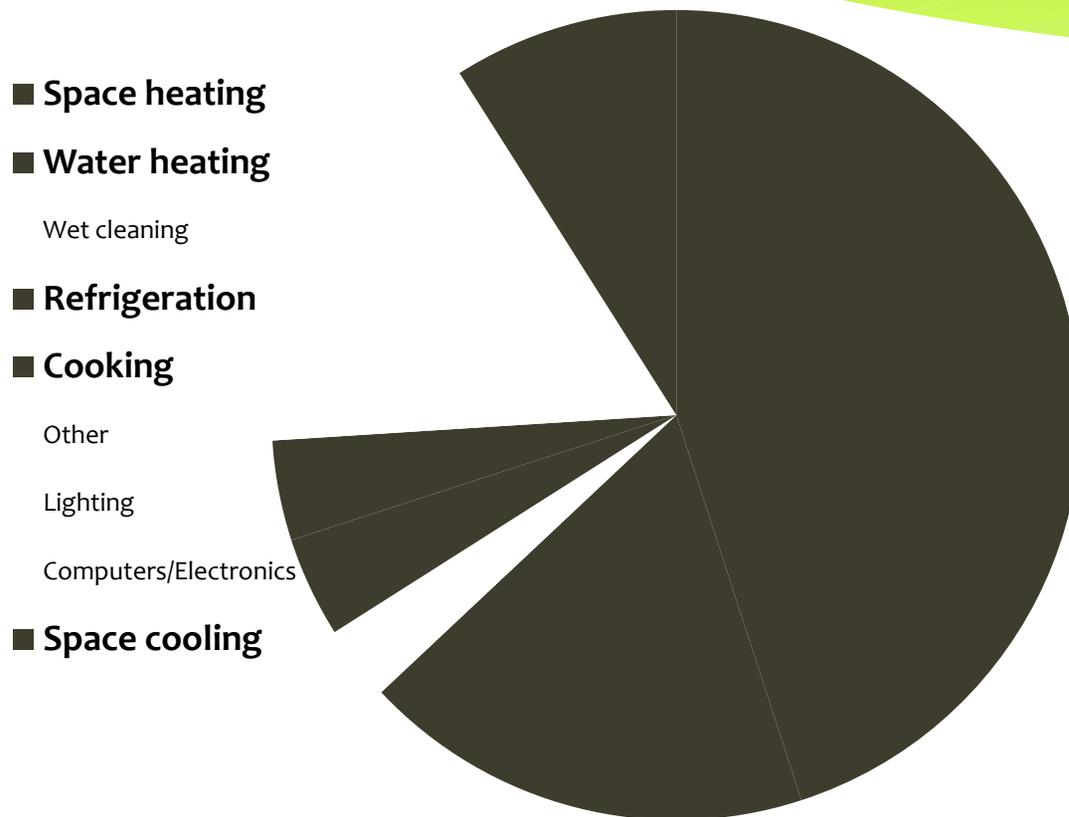
*Heat*

# Did you know???

## Home energy use



# Home energy use that's related to Heat =



**80%**



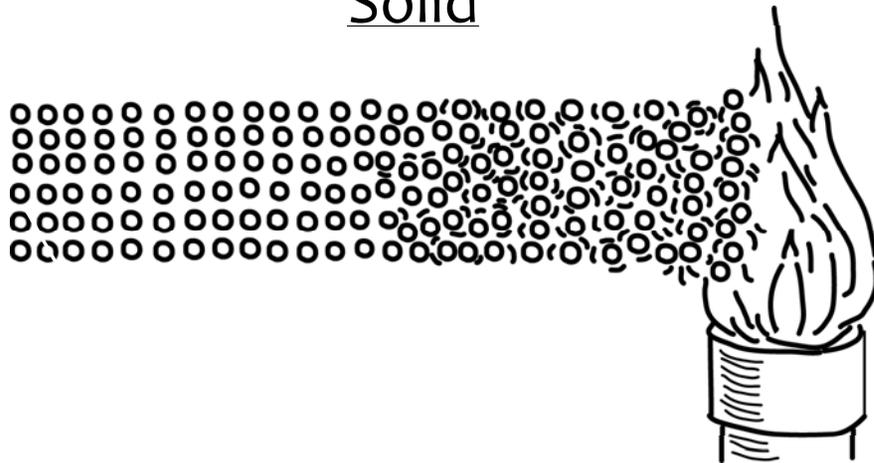
# That's why we're Exploring **Heat Energy**



# Temperature

The measure of the average motion of atoms in a substance

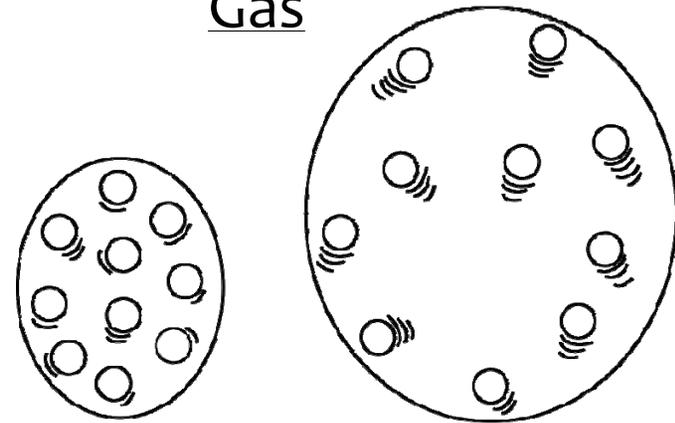
Solid



Cold

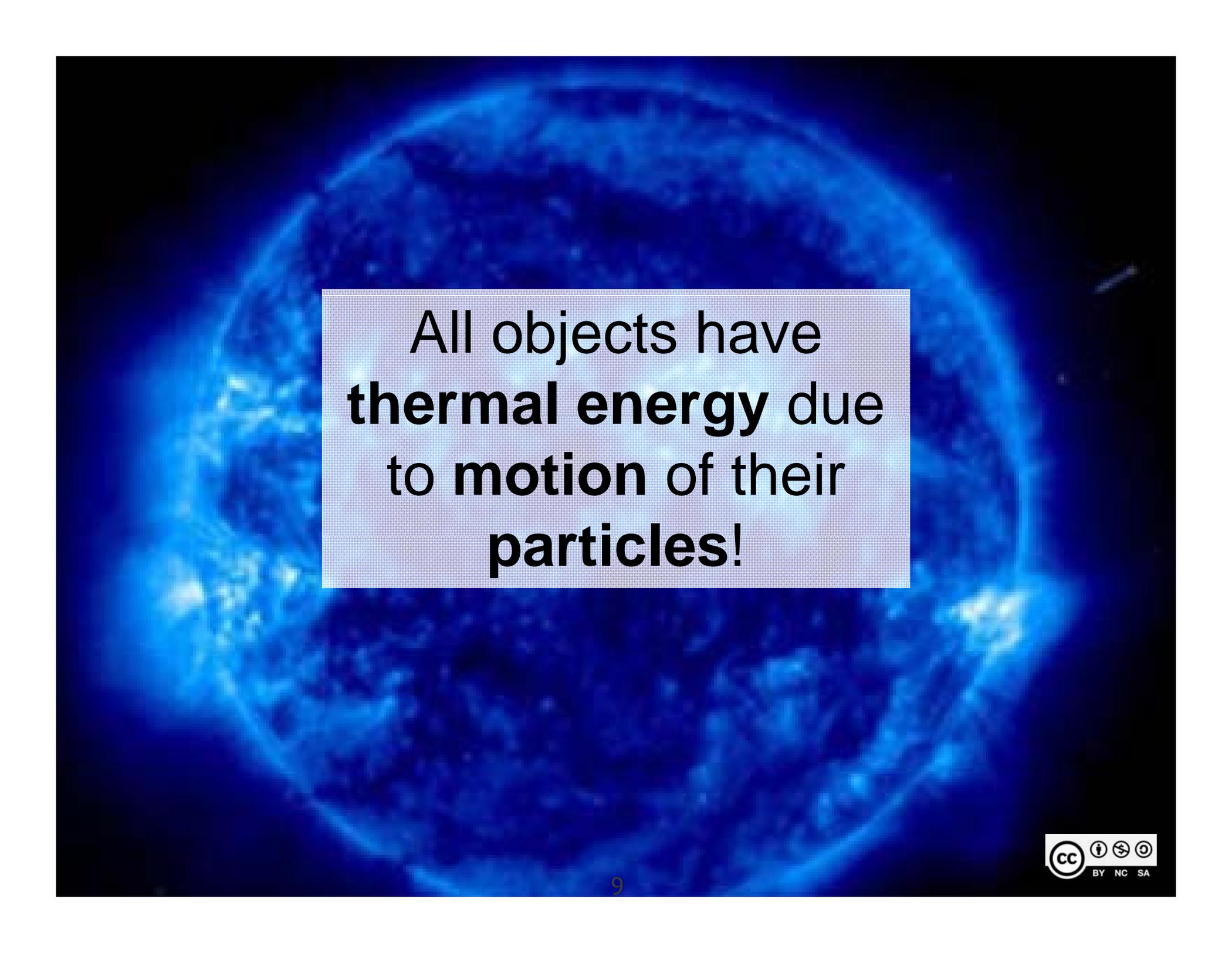
Hot

Gas



Cold

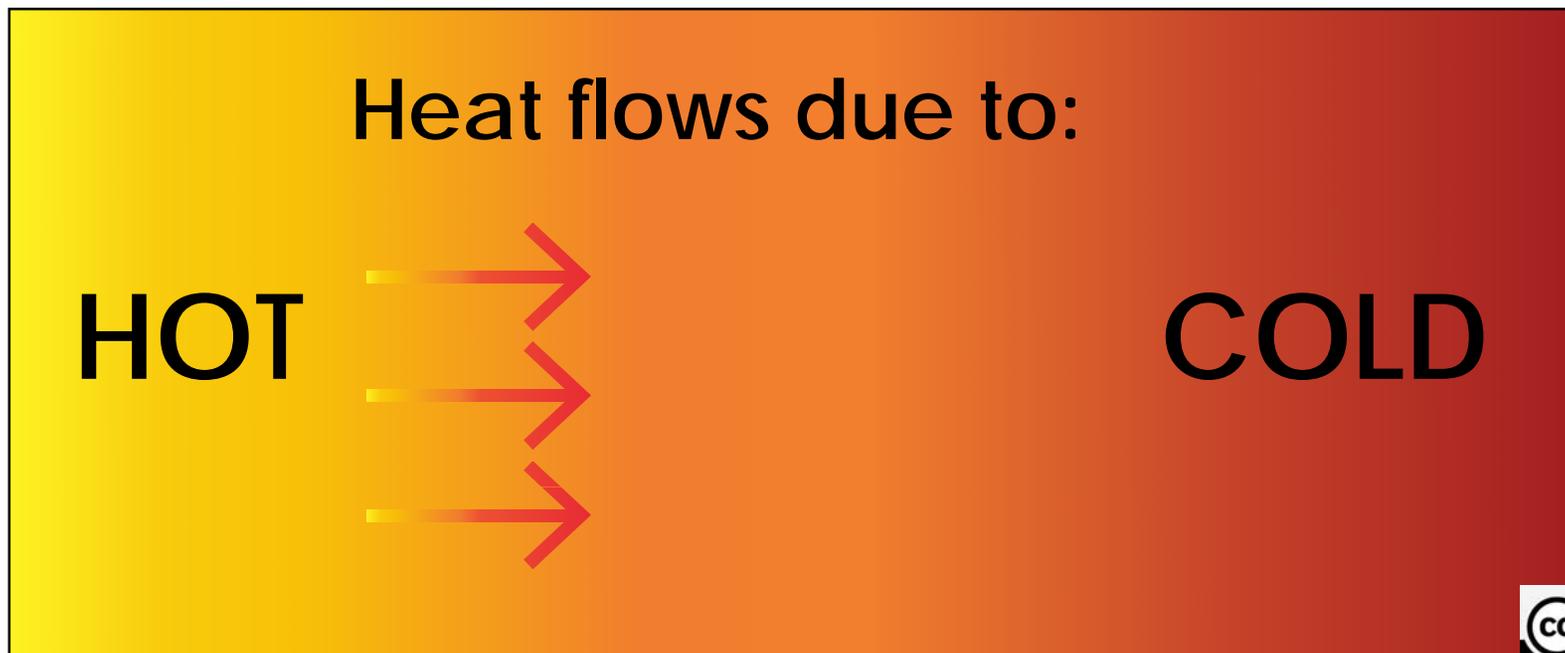
Hot



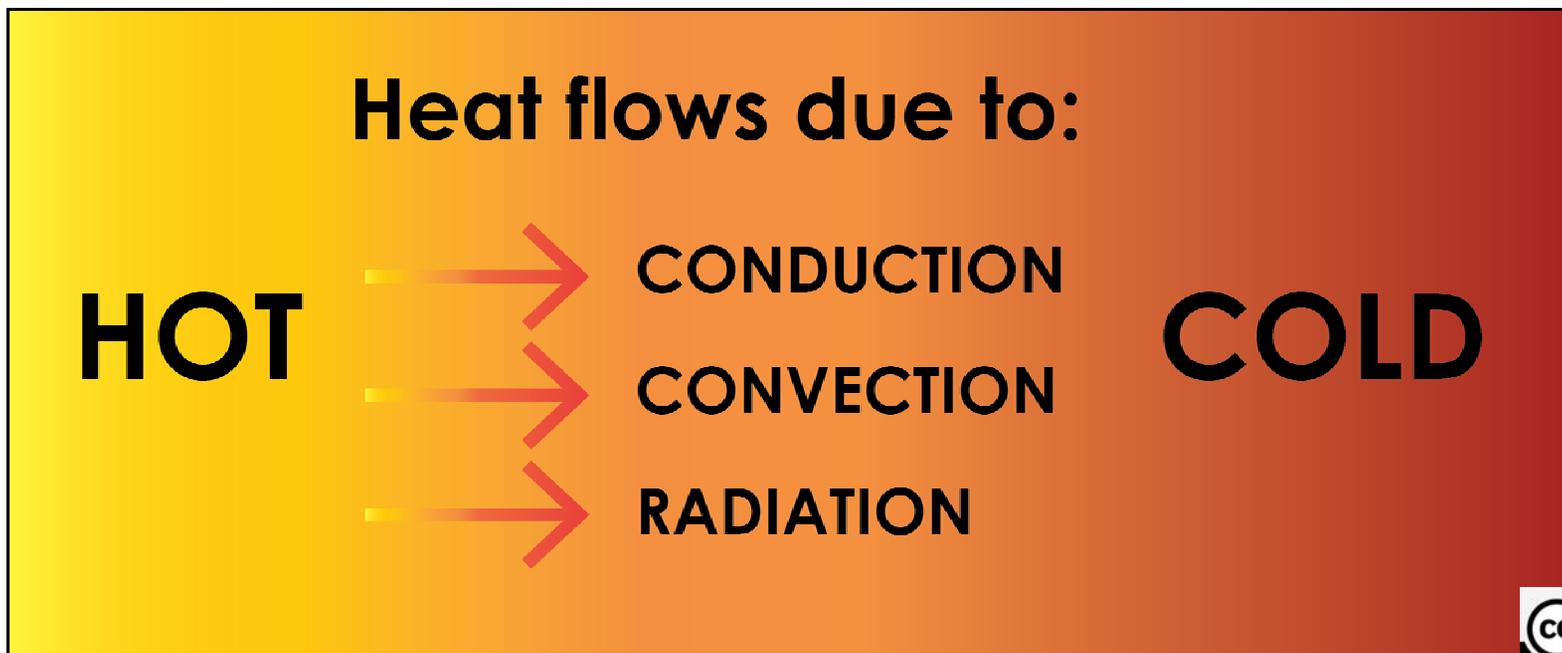
All objects have  
**thermal energy** due  
to **motion** of their  
**particles!**

# *Heat Energy*

**flows from hotter to colder areas**  
when there is a temperature difference  
across an object or between two objects



# Heat flows three ways:



# How and when does heat energy flow???

Only when there is a **temperature difference...**

Always from **hotter to colder ...**

The **greater the temperature difference,**  
the **faster it flows...**

And it **flows** until **everything reaches**  
**the same temperature!**





Let's do an  
experiment...



We “**feel cold**” when...

...our surroundings are colder than we are, so heat moves from our body to our surroundings!



We “**feel hot**” when...

...our surroundings are hotter than we are, so heat moves from our surroundings to us!

# Forms of Heat Transfer...

radiation



conduction



convection



# *Conduction*

When **heat moves between materials**  
that are **touching**



Animation Link:

[https://youtu.be/\\_6LlkgRciak](https://youtu.be/_6LlkgRciak)

# Convection

When **heat** moves as hot gases,  
or **liquids** rise

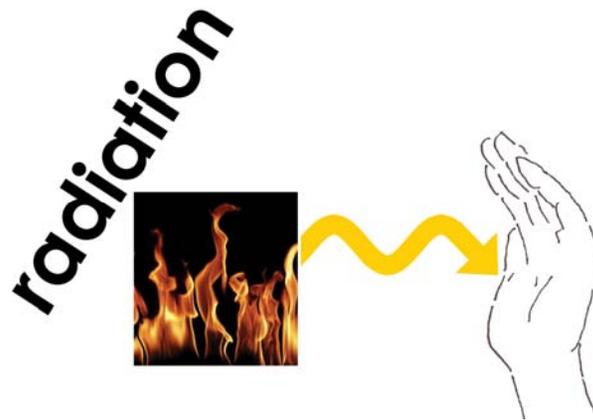


Full of Hot Air Demo link:  
<https://youtu.be/E4ViB2wCeCo>

Animation Link:  
[https://youtu.be/teEiou\\_sj-o](https://youtu.be/teEiou_sj-o)

# *Radiation*

When **heat moves in all directions**  
as invisible infrared light

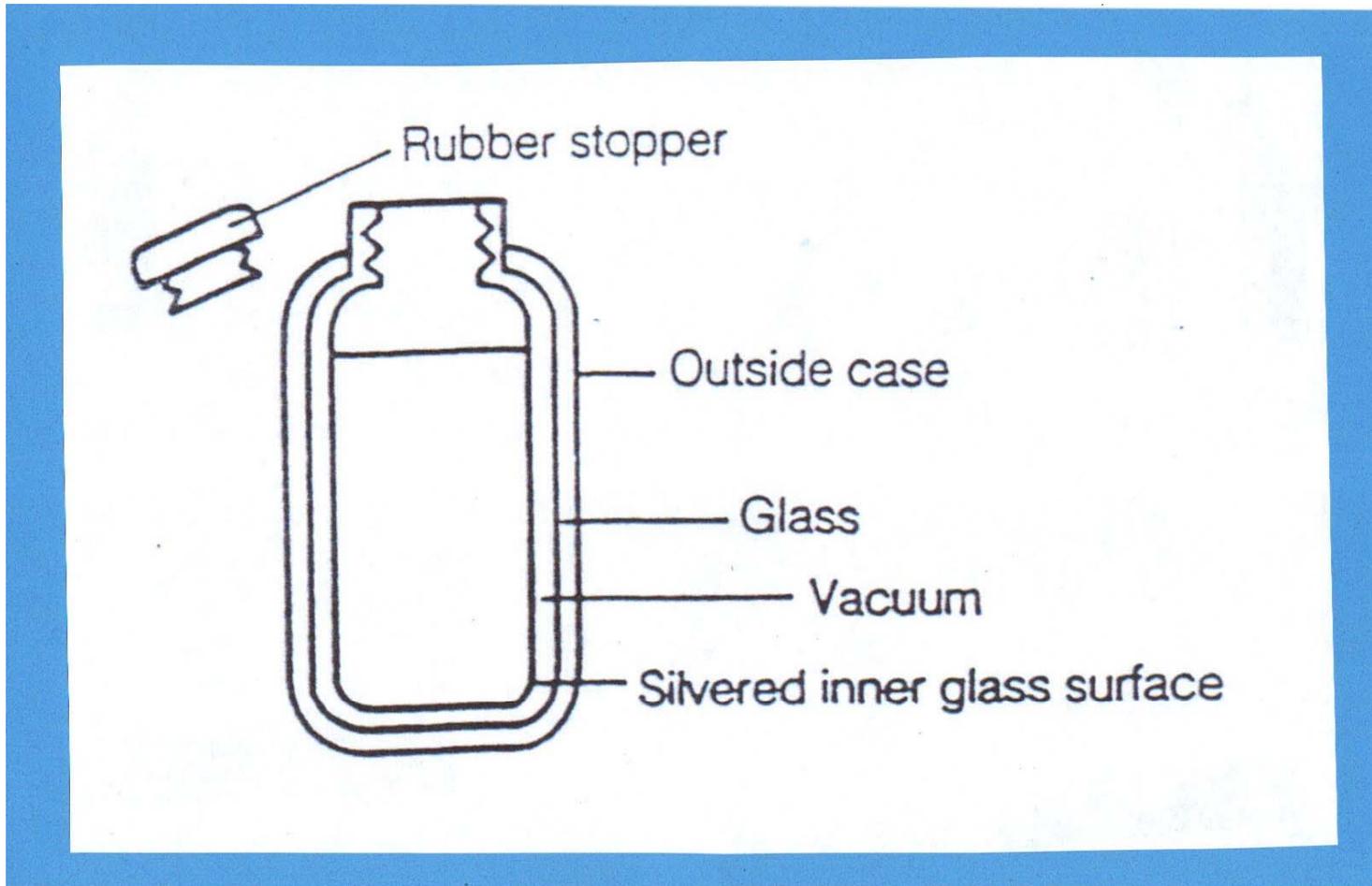


Animation Link:

<https://youtu.be/RtFqo7ORWP8>

What's the smartest invention ever made?

THE **THERMOS** BOTTLE!  
How does it 'know'???





Let's do another  
experiment...

Your team  
challenge: **Keep the  
hot cocoa HOT!**

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