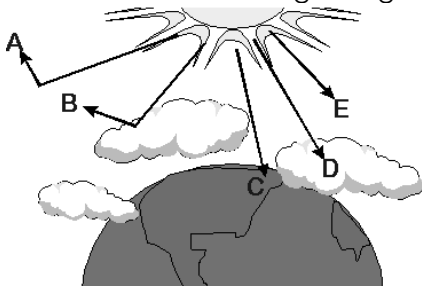
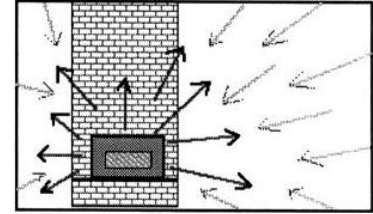
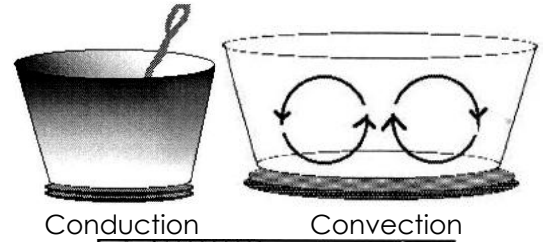


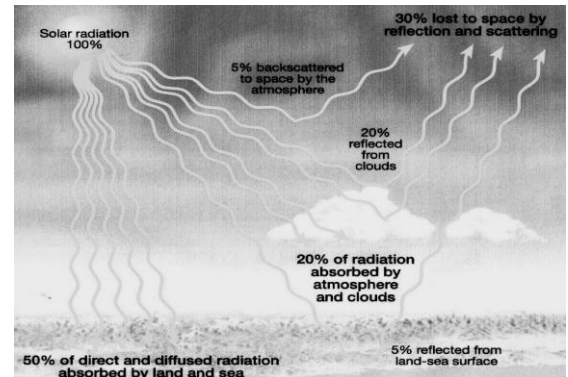
Heating of the Earth

- Energy Transfers
 - Conduction:** transfer of heat from one object to another through _____.
 - A spatula warms up after sitting in a hot pan.
 - _____ are the best _____ of heat, whereas _____ is the worst conductor of heat.
 - Convection:** transfer of heat from one place to another through _____.
 - In the ocean, warm currents move heat from the _____ to higher latitudes.
- Radiation:** radiant energy that is _____ by an object.
- The atmosphere is heated by _____.
- There are 4 laws regarding radiation.



- All objects, at any temperature, emit radiant _____.
- _____ objects radiate more total _____ per unit area than colder objects do.
- The _____ radiating bodies produce the _____ wavelengths with maximum radiation.
- Objects that are good _____ of radiation are also good _____.

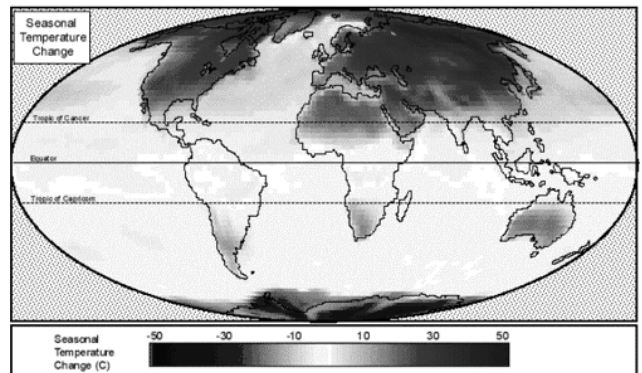
- Solar Radiation
 - There are 3 different results when radiation strikes an object.
 - Some energy is _____ by the object.
 - Substances such as water and air are _____ to certain wavelengths of radiation.
 - Some radiation may _____ off the object without being absorbed or transmitted.
 - Reflecting:** light bounces off an object in ___ direction.
 - Scattering:** light bounces off an object in _____ directions; the total amount of energy is _____ up into the various rays.
 - Absorption:** an object _____ the heat and energy received by radiation.



Temperature Differences

- Land and Water Differences
 - Land heats and cools more _____ than water.
 - The temperature range is _____ for land than water.
 - The land heats up to a _____ temperature than water can and will cool _____ than water can.
 - In the Northern Hemisphere, there is _____% land; whereas the Southern Hemisphere has _____% land.
 - What does this indicate? _____
 - _____
 - _____

Visualizations of Land mass distribution and seasonal temperature change



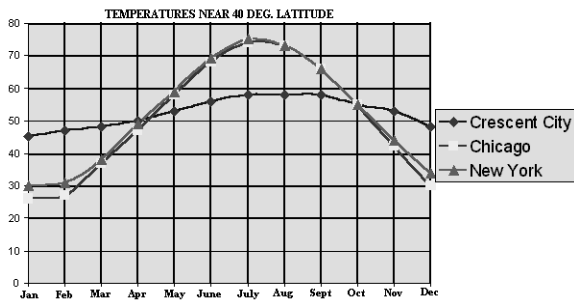


Figure 1

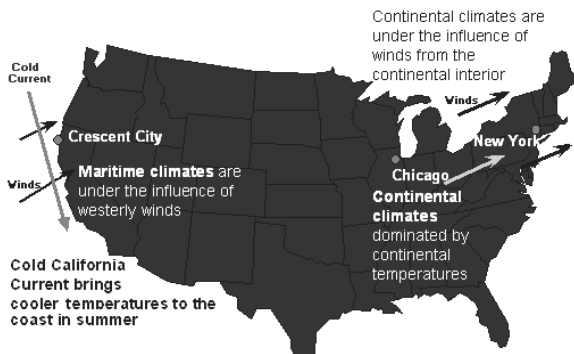


Figure 2

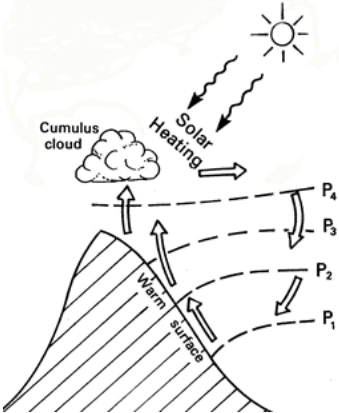


Figure 3

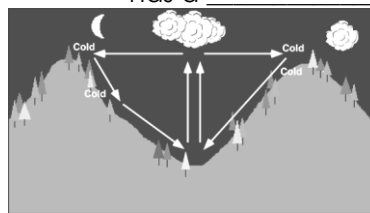


Figure 4

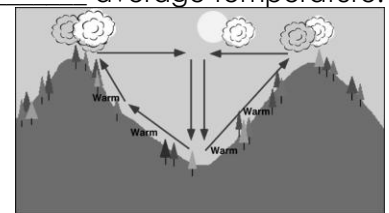


Figure 5

• Cloud Cover and Albedo

- _____ is the amount of radiation that is _____ back to space.
- Clouds have a _____ albedo, leading to _____ solar radiation reaching Earth, causing _____ temperatures during the day.



- At night, clouds _____ heat in the atmosphere and keep the temperature _____.

World Distribution of Temperature

- _____ are lines that show differences in _____ (similar to contour lines on a topographic map) on an isothermal map.
- The temperatures on these maps are taken at the same _____ in order to eliminate any differences in altitude.
- The higher latitudes have _____ average temperatures and have _____ temperature changes.



- Latitudes close to the _____ have _____ average temperatures and very _____ temperature changes.

Assignment: Answer the questions for the article "Why Green Is the New Red, White, and Blue?"

- Geographic Differences (figures 1 and 2)
 - In California, the wind blows mainly from the _____ to the land and the temperatures stay relatively _____.
 - In New York, the wind blows mainly from the _____ and the temperatures _____ frequently.
- Seattle, WA and Spokane, WA are a couple hundred miles away from each other, but because there is a _____ between them, they have different climates. (figure 3)
 - Seattle is on the _____ side of the mountains and receives winds from the _____ resulting in _____ temperature changes.
 - Spokane is on the _____ side of the mountains where there is _____ from the ocean has _____ temperature changes.
- Altitude Differences (figures 4 and 5)
 - Two cities in Ecuador, Quito and Guayaquil, are close to each other, but have different average temperatures.
 - Quito is _____ in the mountains and has a _____ average temperature.
 - Guayaquil is close to the _____ and has a _____ average temperature.

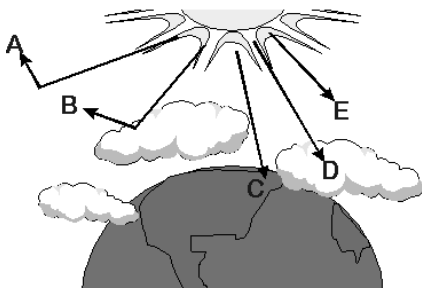
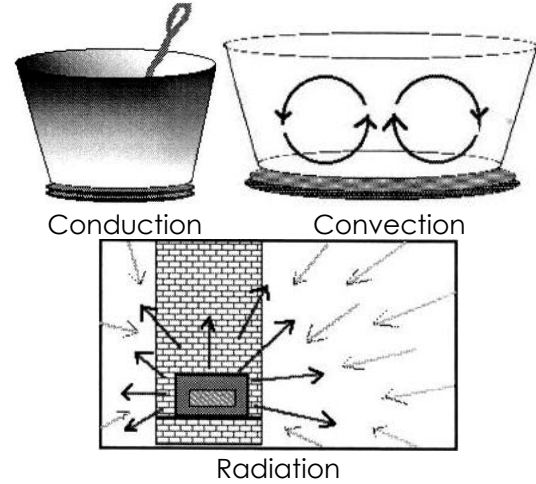
Heating of the Earth (Honors)

- Energy Transfers
 - What is conduction? _____

 - Example: _____
 - What type of materials conduct heat the best?
_____ Worst? _____
 - What is convection? _____

 - Example: _____
- What is radiation? _____

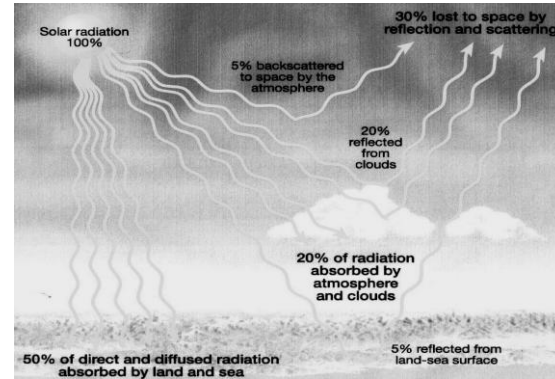
- Example _____
- There are 4 laws regarding radiation.



- _____
- _____
- _____
- _____

- Solar Radiation
 - There are 3 different results when radiation strikes an object.
 - _____
 - _____
 - _____
 - Reflecting: _____
 - Scattering: _____

 - Absorption: _____



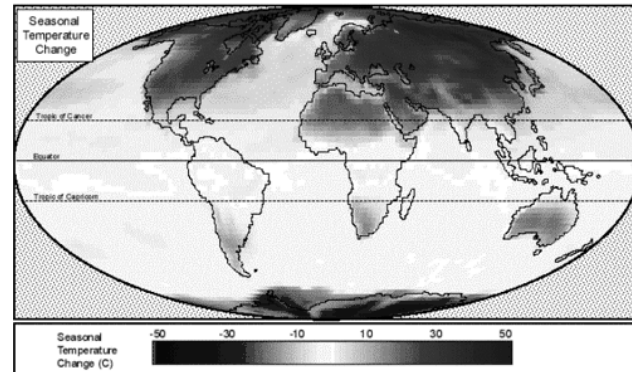
Temperature Differences

- Land and Water Differences
 - Which heats and cools more quickly (land or water)?

 - Which has a greater temperature range?

 - Why does the Northern Hemisphere have greater average temperatures than the Southern Hemisphere, according to the picture to the right?

Visualizations of Land mass distribution and seasonal temperature change



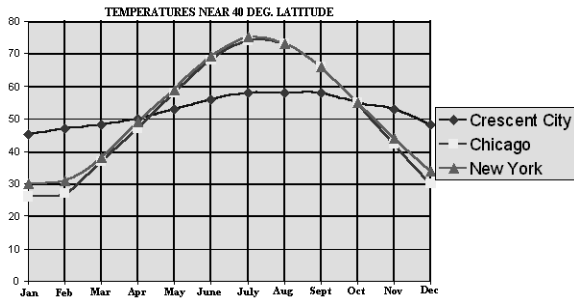


Figure 1

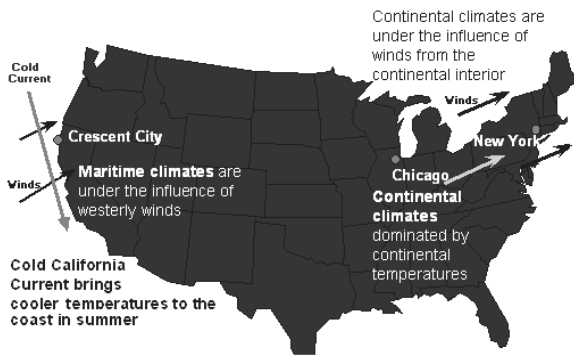


Figure 2

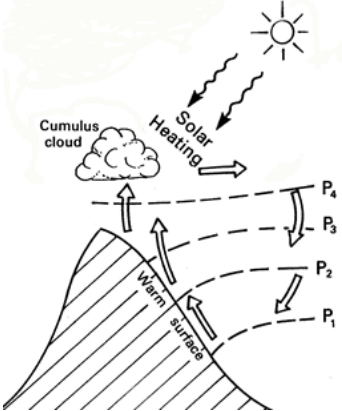


Figure 3

World Distribution of Temperature

- What are isotherms? _____
- What do these lines represent? _____
- How do temperatures change with altitude? _____



- Geographic Differences (figures 1 and 2)
 - Why does California have relatively constant and cool temperatures as opposed to New York? _____
- Why does Seattle have cooler average temperatures than Spokane does, even though they are only a short distance from each other? _____
- Altitude Differences (figures 4 and 5)
 - What causes the temperature difference between the cities Ecuador, Quito (lower temperatures) and Guayaquil (higher temperatures)? _____

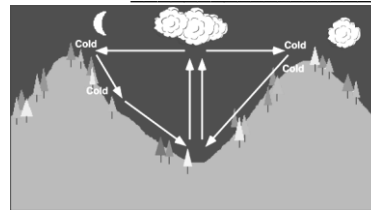


Figure 4

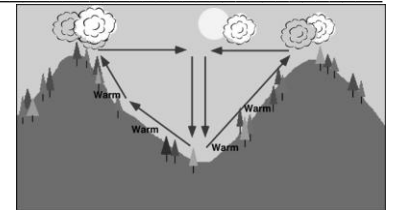
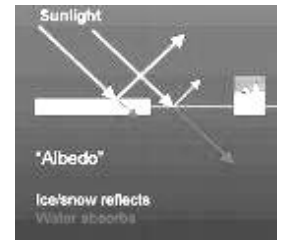


Figure 5

- Cloud Cover and Albedo
 - What is albedo? _____
 - Do clouds have high or low albedo? _____
 - How does this affect the temperature of the atmosphere during the day? _____
 - How does this affect the temperature of the atmosphere during the night? _____



- How do temperatures change with latitude? _____

Assignment: Answer the questions for the article "Why Green Is the New Red, White, and Blue?"