

# Green Chemistry and Living in the Desert

What are the goals for these materials?

- Reinforce Chemistry Concepts/Knowledge
- Promote Green Chemistry and Sustainability
- Make Chemistry More Interesting to High School Students
- Provide Some Materials for Classes

# Green Chemistry and Living in the Desert

- Make Chemistry More Interesting to High School Students
  - Same chemistry principles/ideas introduced in more relevant content with more interesting/familiar examples
  - Highlight the importance in life/society
  - Show what chemists do, not just what they know
  - More weight on concepts and the significance of ideas rather than just quickly jumping to math

# Green Chemistry and Living in the Desert

- Provide material for classes
- Modules and Experiments
- Rather than just extra material to add to courses, hopefully it provides alternative methods to introduce the same topics/ideas
- Clear connections to existing topics

# Green Chemistry and Living in the Desert

## Green Chemistry and Sustainability

- Chemical considerations for the things we need
  - Energy
  - Materials
  - Food and Medicine
- What is a chemical? What makes them good or bad?
- Fate of chemicals in the environment

# Green Chemistry and Living in the Desert

- The desert theme is a great way to introduce many chemistry and green chemistry concepts in a relevant, relatable way
- These materials are built around some major things we need to be concerned about when living in the desert:
  - Sun
  - Heat
  - Water

# Green Chemistry and Living in the Desert

## Sun

- What we do and don't want from it
- Energy from the sun (fossil fuels vs renewables)
- Light/matter interactions
- Infrared, heat, greenhouse effect
- Ultraviolet, sunburn, sunscreen, oxygen, ozone layer

# Green Chemistry and Living in the Desert

## Heat

- Avoiding it, removing it
- Light matter interactions IR and Heat
- Cooling drinks - ice inside, condensation outside
- Cooling me - Shade, Sweat, Humidity, Cooling breeze
- Cooling our space – Refrigeration and AC
- Refrigerant problems - Ozone layer, Greenhouse effect

# Green Chemistry and Living in the Desert

## Water

- Staying alive – drinking
- Clean water for drinking, what are the problems?
- How is water sterilized, chlorine, UV, ozone
- How is water purified? Distillation, reverse osmosis, deionization, charcoal.
- Drink containers - Recycling
- Cooling off – Swimming pool chemistry
- Chlorine, pH, buffers, water hardness
- Cleaning – detergents, dishwashing, laundry
- Biodegradation, algal blooms, eutrophication

Ideas of green chemistry and sustainability appear in many of the Sun, Heat, and Water topics