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| IESS 8 Unit 1: Solar Energy and Fluid Circulation |
| REQUEST FOR PROPOSAL Home Location Altitude Latitude Land Features |
| SCIENCE CONCEPTS | LABS AND ACTIVITIES | CONNECTION TO R.F.P. |
| **Safety First*** I will be able to perform investigations and labs while modeling the MCPS Science Lab Safety Rules
 | * Science Safety Sign
* Science Safety Test (100%)
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| **Global Energy Budget*** *I will be able to describe how the sun’s energy is reflected and absorbed by the Earth.*
 | * ACTIVITY: Global Energy Budget
 | If the Earth absorbs more energy than it reflects, how might the climate in my assigned location change? How will that impact the design of my home? |
| **What’s in the Air?*** I will be able to describe the matter that makes up the atmosphere
 | * What’s in the air lab
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| **Density*** *I will explain the movement of particles and the change in density when temperatures change*
 | * DEMO: Is it Getting Hot in Here?
* INV: I’m Your Density
* INV: Mystery Liquids
* ASSESS: Density
 | What types of temperatures will you need to be concerned with in your location? |
| **Heat Transfer*** *I will be able to describe types of heat transfer: Conduction, Convection and Radiation*
* *I will describe the movement of a fluid based on its density*
* *I will describe how energy and matter transfer affect Earth’s systems Atmospheric circulation*
* *I will be able to apply and use the following terms: heat transfer systems conduction/convection/radiation, phase change, latent heat, pressure gradients, general global circulation, Coriolis effect*
 | * READING: Jittering Atoms
* LAB: Heat Transfer
* DEMO: Floating Bag in Space
* HW: Keep the Fires Burning
* READ: Green Roofs
* ASSESS: Heat Transfer
 | How many levels should your home have? Why?What materials will you need use to keep heat from transferring in or out? |
| **Atmosphere Vertical and Air Pressure*** *I will be able to compare the properties of high and low pressure systems*
 | * LAB: A Crushing Experience
* An Even Bigger Crushing Experience
* NOTES: Highs and Lows
* ACTIVITY: Reading Isobars
* ASSESS: Pressure Systems
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| **Atmosphere Surface*** *I will be able to describe the weather associated with high and low pressure systems*
* *I will be able to analyze isobars to determine the center of rotation of a high and low pressure system*
* *I will be able to describe the reasons for local and global winds*
 | * INV: Just a Bunch of Windbags
* NOTES: Local and Global Winds
* ASSESS: Local and Global Winds
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| **Latitudinal and Seasonal Patterns*** *I will be able to describe the reason for the seasons*

*I will be able to compare and explain the differences in climate at different latitudes on the planet (Equator, Tropics, Poles)* | * LAB: Around the World Temperature Patterns
 | How does the Latitude of your location effect the local climate?How does the latitude of your location effect the season’s you experience? How will this affect the design of your home? |
| **Hydrologic Cycle** * *I will be able to describe the reasons for monsoons, El Nino and La Nina patterns*
 | * READING: Monsoons
* DEMO: The Water Cycle
* LAB: Cloud Formation
* ASSESS: Hydrologic Cycle Cartoon
* READING: El Nino La Nina
* DEMO: El Nino in Bowl
* LAB: Comparing El Nino and La Nina
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| **Geologic Influence and Air Mass*** *I will be able to read a climatogram*
* *I will be able to describe the influence of major geographic features on local climate (examples of geographic features: Coastlines and oceans, prairies and plains, Mountain Chains, Islands and Peninsulas)*
 | * LAB: Climatograms
* NOTES: Air Masses and Fronts
* INV: Factors Influencing Climate
* RESEARCH: Geography Location
 | Explain the type of air masses that influence your location? Explain the geologic factors that influence your location? How will this affect the design of your home? |
| **Ocean Vertical and Ocean Surface*** I will determine the processes and patterns of the flow of water in the ocean basins. Students will explain how this flow exerts a fundamental influence on short and long-term climate
* I will explain what factors affect the density of ocean waters and the role that evaporation plays in the density of ocean waters.
* I will be able to describe and explain the role of density in deep ocean currents.
 | * DEMO: Salinity and Ocean Current
* LAB: Salinity Density
* LAB: Ocean Currents
* ASSESS: Ocean Currents
 | How does the distance your location is from the Ocean effect the local climate? How will this affect the design of your home? |
| **Storms*** *Students will describe and compare the formation and characteristics of a Tornado, a Hurricane, a Nor’Eastern, a Lake Effect Snow, a Thunderstorm*
 | * ACTIVITY: Storm Jigsaw
* WEBSITE: Forces of Nature
 | What are typical storms in your location? How will the impact the design of your home? |