	LESSON PLAN: Rainmaker 45 minute class period
Standard	MS-ESS2-4 Earth's Systems: Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity.
Vocabulary	Evaporation Evaporation occurs when molecules in a liquid gain enough energy that they overcome attractions from other molecules and break away to become a gas. Condensation Condensation is the process in which molecules of a gas slow down, come together, and form a liquid. Precipitation Precipitation occurs when water falls from the sky as a solid or liquid Cycle A series of events that are regularly repeated in the same order. simulation imitation of a situation or process for the purpose of study. clouds A visible mass of condensed water vapor floating in the atmosphere, typically high above the ground.
Objective	Students will simulate the process by which water vapor condenses and turns into precipitation. Students will use the simulation to construct a hypothesis of how precipitation occurs.
Supplies	a pan of water, a burner, a large cookie sheet, ice cubes, 2 trash cans, lab sheet Attached is a Google doc for the lab sheet or a google form whichever you prefer. You will be forced to make a copy.
Bell Ringer	What happens when a mass of warm air containing water vapor is cooled? Video Clip Same video on You tube have students only watch until 1:35
Experiment	Question - What causes Precipitation Procedures - **(this is designed as a demonstration unless you are able to do multiple set-ups in your class if you are able to do multiple set-up you can modify the google doc and the google form to add the procedures)** 1. Place a pan of water onto the burner. 2. Place two trash cans on either side of the burner. 3. Next place the cookie sheet on the two trash cans so that it forms a "ceiling" over the pan of water. 4. Place the ice cubes on the top of the cookie sheet. 5. Heat the water and watch as the steam accumulates and hits the cool surface (cookie sheet) 6. Record your observations on the lab sheet. (Students should observe the water evaporating quickly as it is warmed - rising and condensing as it meets the cooler air above, creating a cloud. As the condensed water accumulates against the cool surface, they grow in size and fall back to the pan as rain (precipitation)). Analysis - Students will then compare the simulation to Earth's water cycle breaking down the simulation explaining which stage represents evaporation? (the water in the pan changing

	to a gas as it is heated) condensation? (the water vapor forming a cloud as it condenses in the cooler air) precipitation? (The steam turned into rain as the condensed water vapor accumulated and the water drops grew in size and fell back towards the pan.) Students will also discuss in their group what happened to cause the condensation to turn to precipitation. (The condensed water droplets in the cloud accumulated and increases in size eventually falling back to the surface as precipitation.)
Closing Question	Compare and contrast this simulation to the natural process. (The sun heats the earth's water causing it to evaporate. The warm air rises and expands. As the warm air rises, the water vapor in the air condenses in the cooler air above and forms a cloud. As the condensed water vapor accumulates, the water droplets grow in size and become too heavy to be contained in the cloud. The water droplets fall to earth as rain or precipitation.)
Notes	Attached is a Google doc for the lab sheet or a google form whichever you prefer. You will be forced to make a copy.

Adapted from
http://www-k12.atmos.washington.edu/k12/modules/nw_wx_watch/tchrpg_ex5.html