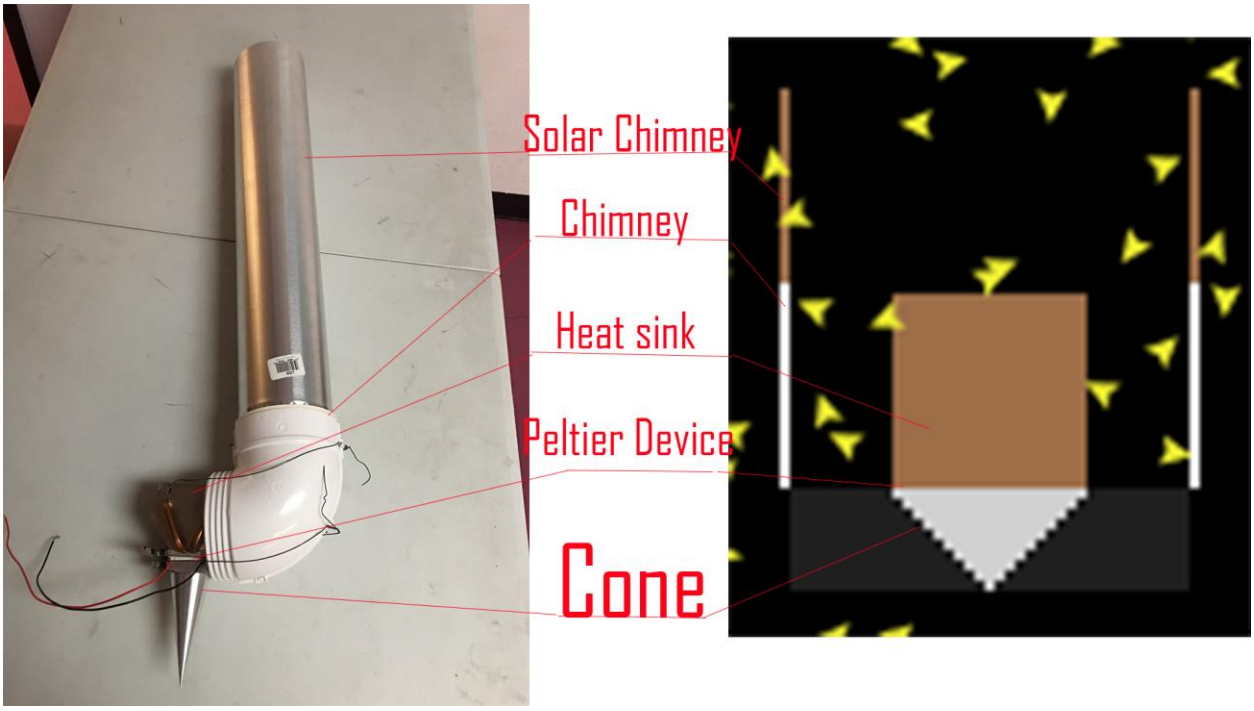
Schools Name: Media Arts Collaborative Charter School
Area of Science: Humans and Environment
Project Title: The Avian Oasis, creating water for endangered birds.

Problem Definition:

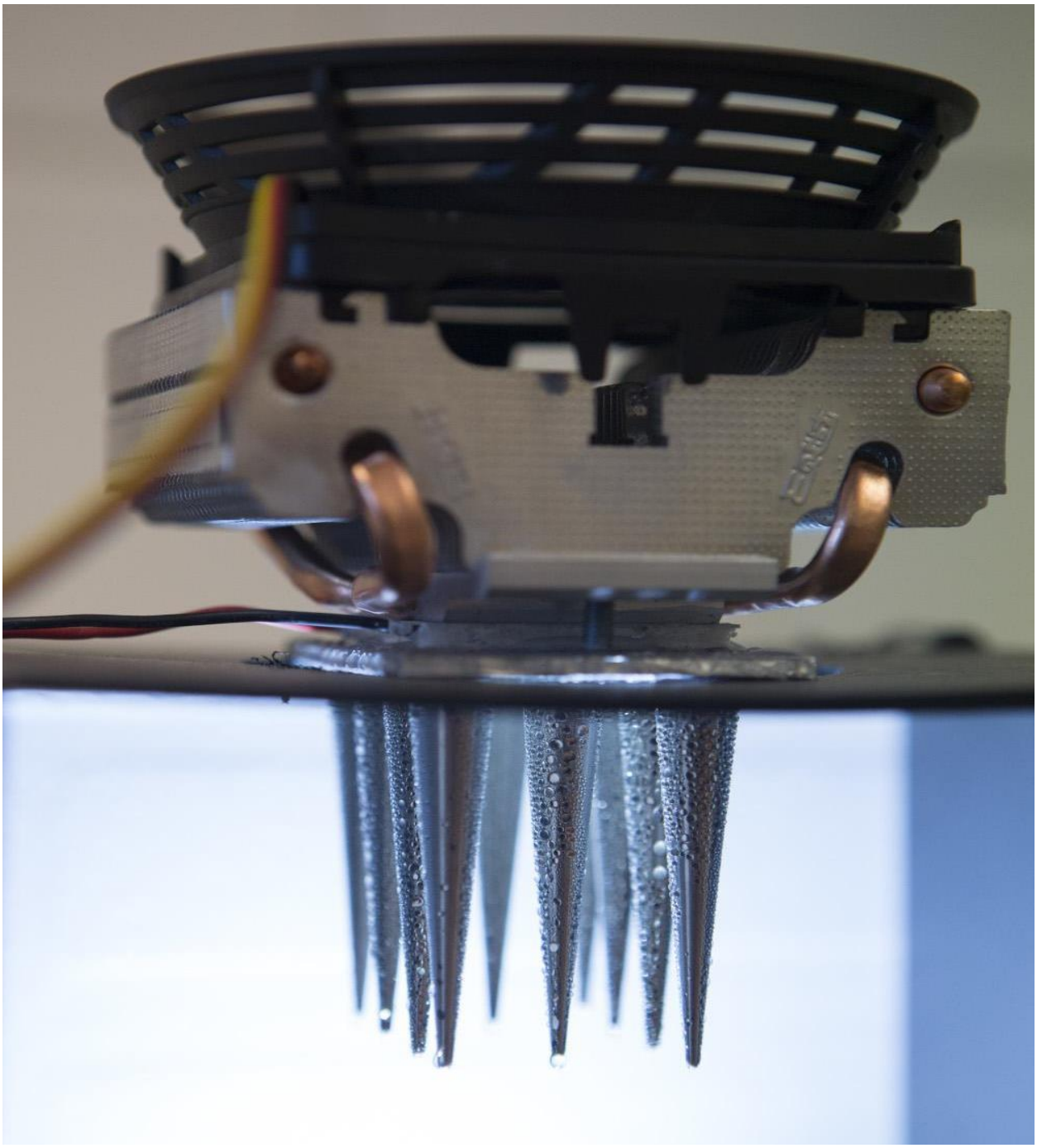
Birds are becoming endangered because of lack of water. There is a device called the SunGlacier that makes water. The problem with the SunGlacier is that it takes a long time to make water and it only produces very little.

Problem Solution:

The SunGlacier also is known as the Avian Oasis, is a machine that creates water by condensing cold air. The components include a heatsink, a cone, and a Peltier device in this machine. The Peltier device is constructed of 1 large sheet. The device creates heat on one side of the sheet and it's cold on the other side. It is sandwiched between the heatsink and the cone, the hot side is facing the heatsink and the cold side is facing the cone. This makes the cone very cold and the heatsink will take the heat and force it out as hot air. Heatsinks are usually found in computers and other electronic devices. Heatsinks take the heat from electronics and turn it into hot air so the electronic component doesn't overheat. The cone is where the water can form. It is super cold so when air molecules touch the cone condensation occurs and water forms on the cone. An added part is the solar chimney, it forces all the hot air to push the cold air up so when it falls out it will reach the cone and hopefully start condensation faster.



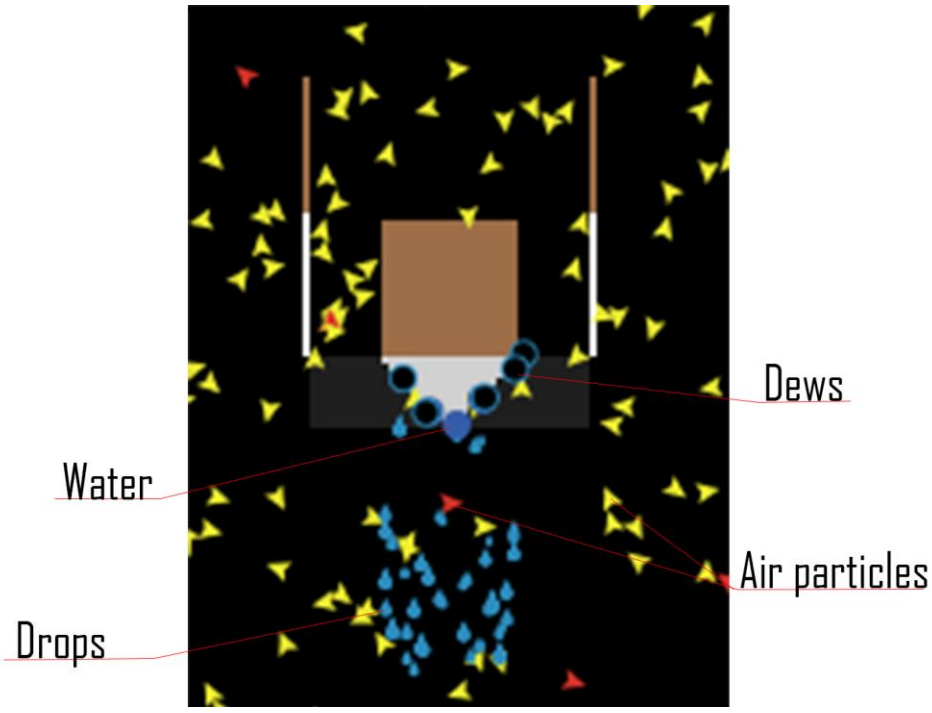
Set we used projects from the sunglacier program as inspiration here is one of their creations:



https://sunglacier.nl/wp-content/uploads/2016/03/R_W9163.jpg

Progress to date:

The simulation is set up we have the machine with a chimney. A solar chimney hooked up to the device and all the air particles are represented with the yellow and red arrows. In the center, is the machine. There is also a slide control to control the humidity. When running the program it will start to make these blue outline circles called dew, and when two of those combine it makes a blue circle called water. Dew is only very small units of water and it can only move when it becomes the blue circle. The water needs to combine to make a drop which results in water falling. The red air particles are hot air and hot air rises. The yellow air particles are average temperatures or cold. If the model is accurate, the solar chimney is more efficient than without the solar chimney.



No solar chimney and No chimney						
Humidity	Average of count dews	Average of count waters	Average of count drops	Average of red turtles	Average of air temp	
0	4.4	2	113.5	34.8	33.95684	
10	4	2	157.1	33.9	34.19388	
20	4.4	3.3	309.1	36	34.23259	
30	4.8	2.3	472.6	34.5	34.34078	
Grand Total	4.4	2.4	263.075	34.8	34.18102	

Chimney but not solar chimney						
Humidity	Average of count dews	Average of count waters	Average of count drops	Average of red turtles	Average of air temp	
0	4.7	2.5	110.1	50.5	38.54264	
10	4.2	2.8	212.6	56.2	38.80655	
20	4.2	2.6	448.6	51.9	38.63847	
30	4.8	3.4	717.4	53.3	38.43516	
Grand Total	4.475	2.825	372.175	52.975	38.6057	

chimney, with solar chimney						
Humidity	Average of count dews	Average of count waters	Average of count drops	Average of red turtles	Average of air temp	
0	4.5	2.8	1299.7	168.9	39.22550856	
10	4.9	5	1903.4	168.3	39.23235766	
20	4.2	6.7	2706.2	168.4	39.01651298	
30	4.9	8.2	3637	165.4	39.41432028	
Grand Total	4.625	5.675	2386.575	167.75	39.22217487	

Final Results:

The final result of the simulation shows that the chimney and solar chimney will give the most water. If I could do this again I would focus more on how it will react in different situations and less on the birds.

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