Table 1. Investigation summary chart.
A summary of the five investigations in a unit on evaporative cooling. For both investigations 1 and 5, the investigation-level question is the same as the unit-level driving question as they served respectively as an introduction and conclusion to this unit. Within the Investigation-Level PE column, **Orange** text refers to disciplinary core ideas, **Blue** text refers to science and engineering practices, and **Green** text refers to crosscutting concepts.

Investigation	Investigation-Level Question	Investigation Summary	Investigation Activities	Investigation-Level PE
1	Why do I feel colder when I am wet than when I am dry?	Students will engage with evaporative cooling, ask questions about the phenomenon, and develop initial models.	Experience the sensation of evaporative cooling, develop a DQB, construct a model illustration, construct an initial computational model.	Make and use observations of the evaporation of liquids to **ask questions** and **develop initial models** related to **energy and matter transfer during evaporation** using the lens of **cause and effect**.
2	Why do some liquids "stick together" more than other liquids?	Students will explore the cohesive properties of liquids and learn about IMF and its relationship to evaporation.	Test "cohesiveness" of liquids, compare results to Inv. 1, explore IMF through virtual simulation, revise models.	**Carry out investigations** into the cohesive nature of various liquids to identify **patterns** between **intermolecular properties (IMF) and bulk scale behavior (cohesion and evaporation rate).**
3	Why does hot steam feel worse than a hot hair dryer?	Students will discover that when liquid water is at its boiling point, its kinetic energy stops increasing as additional energy is being used to overcome the	Create a "heating curve" for water by measuring temperature during boiling, explore the relationships between thermal, kinetic, and potential energy	**Collect and analyze data** that shows that as thermal **energy** is being added to a liquid, some of **the energy is being used to increase** temperature and **kinetic energy**,

		IMFs of the water molecules. This process transforms the liquid into a gas, increasing its potential energy.	via simulations, revise models.	while some of this **energy is being used to transform the liquid into a gas (increasing its potential energy)** through boiling.
4	How does the temperature of a liquid change during the evaporation process?	Students will conduct an experiment that demonstrates that in the initial stages of evaporation, the temperature of a liquid drops rapidly as high-energy particles leave. With fewer high-energy particles, the rate of evaporation decreases.	Plan and conduct an experiment to measure change in temperature during evaporation, interpret these results through small group discussions, revise models.	**Collect and analyze experimental data** on how the kinetic **energy** of a liquid changes during the process of evaporation as **the kinetic energy of the liquid is transferred into the potential energy of gas particles.**
5	Why do I feel colder when I am wet than when I am dry?	Students will explore additional features within SageModeler that allow them to better represent how energy is transferred from one form to another during evaporation. After revising their models, students will create an explanation of the phenomenon.	Introduction to advanced SageModeler features, revise models, use models to scaffold an explanation of the phenomenon that answers the driving question.	**Construct a model** using **systems thinking** that demonstrates how the process of evaporation results in **the transfer of thermal energy from human skin to the potential energy of gas** over time.