Evaporation Experiment

You will need:

1. 2 plastic evaporation dishes
2. 2-bottles of water (8 oz)
3. Food coloring (optional for adding to water)
4. Digital scale
5. Air temperature sensor
6. Surface temperature sensor
7. Lego Braille Bricks

Part 1:

- You will measure the evaporation of water from a container by recording the change in weight of a dish filled with water.
- You will choose one experiment:
  - Evaporation in sun vs. shade
  - Evaporation inside vs. outside
- After collecting your data, you will work with other groups to determine average values and create a 3D model using Lego Braille Bricks.

Instructions:

1. If desired, add food coloring to the water bottle. (This may make water easier to see.)
2. Select two different locations for your dishes. Record this in your data log. *If you choose sun vs. shade, you may need to move the dishes as the sun moves during the day.
3. Gently pour water into 2 evaporation dishes until it reaches the textured line near the top of the dish.
4. Record the mass of the dish + water in your data log.
5. Place the dishes in two different locations with a "Do Not Disturb" card beside each one.
6. Use the air temperature sensor to measure the air temperature. Record this in your log.
7. Use the surface temperature sensor to measure the temperature of the water in each dish. Record this in your log.
8. Set a timer for 1 hour.
9. Repeat steps 5-8 every hour for 5 hours, recording your measurements in your data log each time.

Data Collection Log

Record the location of the evaporation dishes and any important details about the locations:

Sample 1	Sample 2

Make a prediction: Do you expect one sample to have higher or faster evaporation? Explain.

Instructions for data collection:
- Every hour, you will measure the mass of the dish + water in ounces (oz). Be sure the balance is set to the correct units!
- Record the mass in the (Mass Container + Water) column of your data log.
- Over time, the mass of the container does not change, so any changes in mass are due to loss of water.
- Calculate the mass of water evaporated by subtracting the mass measured from the starting mass (mass at time = 0 hr)

Sample 1.

Time (hr)	Air Temp (°F)	Surface Temp (°F)	Mass Container + Water (oz)	Mass of Water Evaporated (oz)
0				
1				
2				
3				
4				
5				

Calculations/Notes:

Sample 2.

Time (hr)	Air Temp (°F)	Surface Temp (°F)	Mass Container + Water (oz)	Mass of Water Evaporated (oz)
0				
1				
2				
3				
4				
5				

Calculations/Notes:

Part 2. Building a 3D Model

- You will work with other groups that chose the same variable (inside/outside or sun/shade).
- Find the average mass of water evaporated for each time interval. Record the values in the table below:

Time (hr)	Sample 1 Average Mass of Water Evaporated (oz)	Sample 2 Average Mass of Water Evaporated (oz)
0		
1		
2		
3		
4		
5		

1. Using Lego Braille Bricks, construct a 3D model of the average water evaporation over time.
2. Lego Braille Bricks have letters and numbers in both print and braille on each block. Add a title to your model using Braille Bricks or another type of label.
3. You will need to use a conversion factor to build your model. Each Lego Brick will represent some mass of water.
   a. Example: You measured an average evaporation of 0.05 oz.
   b. You could select the conversion factor: 1 brick = 0.01 oz.
   c. You would stack 5 bricks to represent 0.05 oz.
4. Work as a team to construct a 3D model of the average evaporation data from time = 0 hr to time = 5 hr.

Part 4. Data Analysis

1. What trends do you notice in the data?

2. How did your results compare with other teams' results?

3. How did your experimental data compare with your prediction about which sample would evaporate fastest?

4. How did location affect evaporation?

5. How did temperature affect evaporation?

6. Why is evaporation important?