Rubric 1

Designing lunch-trash solar stills: Learning about the engineering design process through Earth science

Solar-still performance (This can be used for the first design, as well as for any improved designs.)

This rubric provides formative feedback for teacher/teams to evaluate solar-still performance and to compare the success of solar-still designs. Record the number of checkmarks earned for each objective and add those together.

Objective	**Extent to which objective was met**			**Number of ✓s earned**
	✓✓ Completely	✓ Somewhat	(no checks) Not at all	
Condensate is apparent in the still.	Many drops of condensate were at the top part of the still.	There were some drops of condensate or the drops of condensate were elsewhere in the still	No condensate was present	
Clean water is collected in the collection area.	1 mL or more of clean water was in the collection cup	Less than 1 mL (but at least one drop) of clean water was in the collection cup.	No clean water was in the collection cup or water collected was visibly dirty or had a basic pH.	
	Add another ✓ for each additional whole mL of clean water in the collection cup beyond 1 mL.			

Solar still performance score: _____✓s

Rubric 2

Lunch-trash solar stills: Learning about the engineering design process through Earth science

Engineering design process understanding and engagement and application of the water cycle: This rubric is for summative feedback for teacher/teams to evaluate each team and each student.

Rubric criteria: Apply the engineering design process rubric criteria (shaded) to each of the four steps of the engineering design process in rows 1 through 4of the scoring table and apply the application of water cycle criteria to row 5.

		3	2 or 1 (teacher judgment)	0
Team score	Engineering design process steps	Team clearly understands the intent of this step and demonstrates its engagement in it in detail.	Team is likely to understand the intent of this step, yet detail could be stronger (2) or much stronger (1); or team provides some detail but demonstrates lack of clarity with this step.	Team clearly does not understand the intent of this step.
	Application of water cycle	Team describes how the solar still works, specifically and correctly referencing the water cycle.	Team describes how the solar still works and references the water cycle either generally (i.e., not specifically) (2) or with some (2) or significant (1) errors or omissions.	Team fails to describe how the water cycle can explain how the solar still works.
Individual score	Engineering design process steps	Student demonstrates knowledge of and engagement in this step in detail in the engineering notebook.	Student does not fully detail engagement with this design step in the notebook. It is somewhat (2) or significantly (1) lacking in detail.	There is no evidence of student engagement in this step.
	Application of water cycle	Student describes (via a labeled drawing) how the team's solar still works, specifically and correctly referencing the water cycle.	Student describes (via a labeled drawing) how the solar still works, yet has some (2) or significant (1) errors or omissions.	Student fails to include a labeled drawing of how the water cycle can explain how the solar still works.

Scoring table: Engineering design process understanding and engagement and application of the water cycle
To complete, circle each grade earned for each criterion and add up the totals separately for individual and team scores.

	Individual score, based on engineering notebooks				Team score, based on quick poster and presentation			
Brainstorming	3	2	1	0	3	2	1	0
Planning (for first designed solution)	3	2	1	0	3	2	1	0
Testing results (for first and second design solutions)	3	2	1	0	3	2	1	0
Improvement step (i.e., planning for second designed solution with rationale regarding why that plan is different)	3	2	1	0	3	2	1	0
Application of water cycle	3	2	1	0	3	2	1	0

Individual engagement/understanding score: _____ / 15

Team engagement/understanding score: _____ / 15