

Features Analysis Chart—Water Cycle

Teacher Name: _____

Circle One: PRE POST

Describe the assessment item: Question 2a on the pre-post assessment for the Water Cycle unit:

Liquid water appears on the outside of a cold soda can when it sits on a table for a while. Imagine you could see the smallest parts of this water (the molecules) as it appears on the can.



Explain what is happening when liquid water appears on the can. In your explanation, you might also write about what happens to the molecules, and what the cold can has to do with what happens.

Describe the ideal response: The cold soda can has moisture on the outside because of condensation. There are individual water molecules in the air in the form of water vapor (gas). These molecules are moving quickly and spread out into the air. When some of these water-vapor molecules come close to the cold soda can, they lose heat energy, which causes them to slow down and move closer together. When the water molecules in the gaseous state cool and become attracted to each other, they form droplets of liquid water that can be seen as moisture on the outside of the can.

Features of a Complete, Accurate Response	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	34	36			
1. Indicates that there is water in the air.																																							
2. Indicates that water exists in the air as water vapor (or water in the gas state)																																							
3. Indicates that the cold soda can cools the water vapor (or water in the gas state).																																							
4. Indicates that when water vapor (or water in the gas state) is cooled, it turns into liquid-water droplets on the can.																																							
5. Indicates that water molecules in the gas state (water vapor) move rapidly.																																							
6. Indicates that water molecules in the gas state (water vapor) spread far apart from each other.																																							
7. Indicates that water molecules in the gas state (water-vapor molecules) cool as they get close to the cold soda can.																																							
8. Indicates that when water vapor cools (gets close to the cold soda can), the individual water molecules lose heat energy (cool).																																							
9. Indicates that when water vapor cools (gets close to the cold soda can), the individual water molecules slow down.																																							
10. Indicates that when water vapor cools, the individual water molecules are attracted to each other, forming liquid water on the soda can.																																							
11. Indicates that this process (either steps 2–4 or 7–10) is called <i>condensation</i> .																																							

Features Consistent with Student Misconceptions/Problems	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	34	36				
1. Moisture on the can came from inside the can.																																								
2. Moisture on the can came from water evaporating out of the can.																																								
3. The can sweats.																																								
4. Water sticks to cold things.																																								
5. Water is like a magnet that is attracted to cold things.																																								
6. Moisture on the can comes from the refrigerator (or freezer). When you take it out of the refrigerator, the ice (or frost) on the can turns to water.																																								
7. Something melted on the can.																																								
8. The cold can starts to get warmer.																																								
9. The water on the can is condensation. [Student doesn't see condensation as a process. This would be a response in an incomplete answer.]																																								
10. There is water on the can because of evaporation.																																								
11. Water vapor is individual water molecules. [This isn't accurate. One or many molecules may not be attracted to each other.]																																								