

11A – EVAPORATIVE COOLING

Part 1 Analysis – Cooling

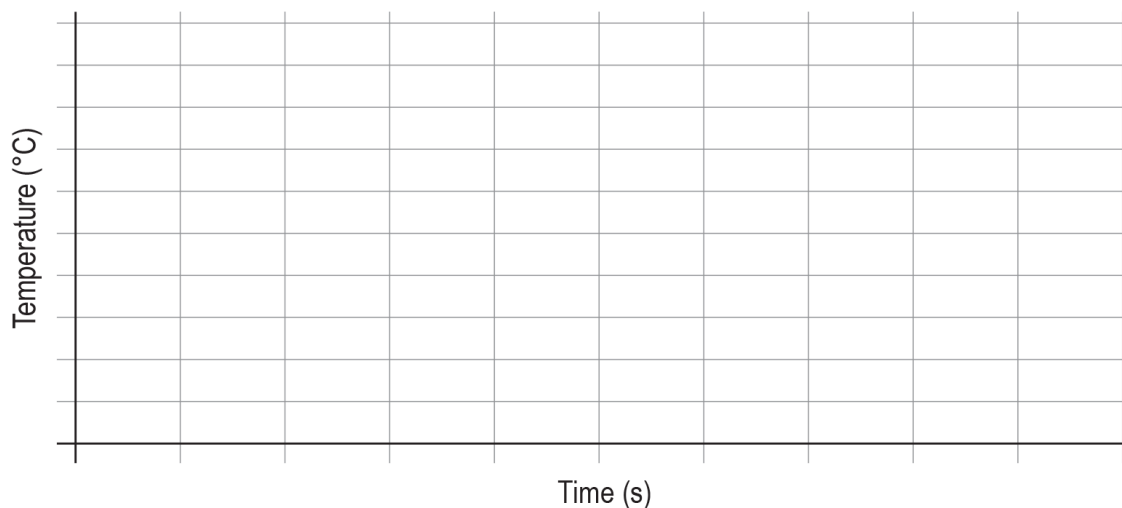
Table 1 – Qualitative cooling data

	Observations
Water	
Rubbing alcohol	

Table 2 – Quantitative cooling data

	Maximum temperature (°C)	Minimum temperature (°C)	Change in temperature (°C)	Cooling time (sec)	Cooling rate (°C/sec)
Water					
Rubbing alcohol					
Nail polish remover					

Graph 1 – Cooling rates



Part 2 Analysis – Modeling**Table 3 – Modeling**

Substance	Chemical Formula	Structural Formula	Observations
Water			
Isopropyl Alcohol			
Acetone			

Questions

1. Refer to your drawings and models of the 3 substances. What is different about the structures of the three liquids?
2. In terms of their structure, explain why you think there are differences in evaporative cooling rates?

- ❓ 3. What differences did you notice when you placed water on the inside of your elbow compared to the rubbing alcohol? Does your feeling match the data?

- ❓ 4. If you could see water and alcohol particles moving in the liquid phase, what would you see? How would particle evaporation of water compared to alcohol look different in terms of particle motion?

- ❓ 5. What is happening as the liquid evaporates? What accounts for the differences between them? Use your data to justify your explanation.

- ❓ 6. Why is perspiration vital to mammals maintaining homeostasis?

- ❓ 7. How has our knowledge of evaporative cooling shaped our modern world? Which technologies do we depend on daily that rely on the effects of evaporative cooling?