

A Look inside the Lab: Liquid Nitrogen Freezer

1. Convert the temperatures to complete the table. Show your calculations for each item.

Item	°F	°C	Calculation
Household refrigerator		4° C	
Household freezer		-18° C	
Boiling point of water	212°F		
Room temperature		24° C	
Moderate oven	350°F		
Typical body temperature	98.6F		
High fever	103°F		
Liquid nitrogen freezer		-190°C	
Pfizer-BioNTech COVID-19 vaccine		-70°C	
Moderna COVID-19 vaccine	-4°F		
Antarctica – Coldest recorded temperature		-89.6°C	
Sahara Desert – Hottest recorded temperature	136°F		

2. In the space below or on the back of this sheet, draw a thermometer scale that shows both Fahrenheit and Celsius and place the items from the chart onto the scale.

3. Answer these questions.

List at least two pros and two cons of having both Fahrenheit and Celsius temperature systems?

What do you think are the most important considerations for people working with liquid nitrogen freezers?

Why are “thermal stabilization” experiments important in vaccine development?