2.04 Thermal Energy and Chemical Change Lab Report

Instructions: In this engineering lab, you will build trains to reach the finish line without crashing. You will need to repeat tests of your device to make sure it does not need to be redesigned or improved. ***Complete all the areas shaded in purple.***

Note: If you cannot complete this lab as directed, please contact your instructor for assistance.

Student Name	
Instructor	
Date	

Part 1: Thermal Energy

Lab Objective:

The goal of the lab is to build steam engine trains that can carry cargo to the end of three different tracks.

Part 2: Energy Engineers

To create working trains, you will need to learn about the different parts that power the train. Take notes on each part.

	Is this an endothermic or exothermic process?
Evaporative cooler	
Wood Burning heater	
Steam engine	

Part 3: Runaway Train

You will need tools to design a train that can make it to the target station without crashing. **Select each tool in the virtual lab and describe how it could help your train design.**

Steam Engine	Train car	Spring	Helium balloon	Wood-burning heaters	Evaporative coolers

Design Ideas

Describe three design ideas you have for your train. But first, consider these design limitations.

- Each train needs at least one train car, one panda, one cargo box, and a steam engine.
- The train tracks will have two hills.
- One train track has some tracks missing.
- You can use additional tools in your train design to get to the finish line.

Train 1 on Track 1	Train 2 on Track 2	Train 3 on Track 3
	•	•

Data:

Record the results of each of the test run you make to the train station. Be sure to describe any changes you make to your train to improve your design between test runs.

	Train 1 on Track 1	Train 2 on Track 2	Train 3 on Track 3
Trial 1 Did your train make it to the station?			
Trial 2 Describe any new tools you added to your train. Did your train make it to the station?			
Trial 3 Describe any new tools you added to your train. Did your train make it to the station?			

Analyze Data and Conclusion:

This section will include an analysis of your test results and plans for redesigning your train. Please write in complete sentences.

1. Were any of your train designs able to get their cargo to the train station without crashing? If yes, describe the design of one successful train.
2. What are the benefits of using repeated trials and replication in a scientific investigation?
3. Which train track presented the most challenge to getting the train to the station?
4. How do endothermic reactions differ from exothermic reactions? Be specific.