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Crash Course Physics #23: Thermodynamics

Name: _____ Date: _____

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1. The _____ law of thermodynamics states that the change in internal energy equals heat added minus work done.
2. In thermodynamics, work and _____ are the two main ways energy is transferred.
3. A _____ motion machine is impossible because it would violate the laws of thermodynamics.
4. A _____ system is one that does not exchange matter or energy with its surroundings.
5. The equation for the first law of thermodynamics is $\Delta U = Q -$ _____.
6. In an isovolumetric process, the _____ of the gas stays constant.
7. In an isobaric process, the _____ remains constant while volume can change.
8. The equation for work done in an _____ process is $W = P \times \Delta V$.
9. An _____ process occurs when temperature is held constant.
10. In an isothermal process, the change in internal energy is _____.
11. An _____ process is one in which no heat is exchanged with the surroundings.
12. In an adiabatic process, the internal energy change equals the _____ of the work done.
13. The second law of thermodynamics states that heat spontaneously flows from _____ to _____ objects.
14. _____ is the measure of disorder in a system and always increases overall in natural processes.
15. When two systems reach the same temperature, the overall _____ of the system has increased.

Crash Course Physics #23: Thermodynamics KEY

1. The **first** law of thermodynamics states that the change in internal energy equals heat added minus work done.
2. In thermodynamics, work and **heat** are the two main ways energy is transferred.
3. A **perpetual** motion machine is impossible because it would violate the laws of thermodynamics.
4. A **closed** system is one that does not exchange matter or energy with its surroundings.
5. The equation for the first law of thermodynamics is $\Delta U = Q - W$.
6. In an isovolumetric process, the **volume** of the gas stays constant.
7. In an isobaric process, the **pressure** remains constant while volume can change.
8. The equation for work done in an **isobaric** process is $W = P \times \Delta V$.
9. An **isothermal** process occurs when temperature is held constant.
10. In an isothermal process, the change in internal energy is **zero**.
11. An **adiabatic** process is one in which no heat is exchanged with the surroundings.
12. In an adiabatic process, the internal energy change equals the **negative** of the work done.
13. The second law of thermodynamics states that heat spontaneously flows from **hotter** to **colder** objects.
14. **Entropy** is the measure of disorder in a system and always increases overall in natural processes.
15. When two systems reach the same temperature, the overall **entropy** of the system has increased.

15 Questions

Answer Key Included

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