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Crash Course Physics #42: Special Relativity

Name: _____ Date: _____

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1. Special relativity applies to situations involving _____ reference frames.
2. The first postulate of special relativity states that the laws of _____ are the same in all inertial reference frames.
3. The second postulate states that the speed of light in a _____ is the same for all observers.
4. The term for time appearing to pass slower in a moving frame of reference is _____.
5. The term for objects appearing shorter in the direction of motion is _____.
6. Time and length adjust because the _____ of light must remain constant.
7. The factor used in time dilation and length contraction calculations is called _____.
8. Gamma is always greater than 1, because the speed of any moving object is always less than _____.
9. The phenomenon where events appear to happen at different times in different reference frames is called lack of universal _____.
10. If light travels farther in one frame but still at speed c , the difference must be due to _____.
11. The mathematical expression for gamma involves the _____ of the moving object and the speed of light.
12. Length contraction only affects dimensions in the direction of an object's _____.
13. Time dilation and length contraction are consequences of the constancy of the speed of _____.
14. The fusion of space and time into a single four-dimensional framework is known as _____.
15. Special relativity only applies when the frames of reference are not _____.

Crash Course Physics #42: Special Relativity KEY

1. Special relativity applies to situations involving **inertial** reference frames.
2. The first postulate of special relativity states that the laws of **physics** are the same in all inertial reference frames.
3. The second postulate states that the speed of light in a **vacuum** is the same for all observers.
4. The term for time appearing to pass slower in a moving frame of reference is **time dilation**.
5. The term for objects appearing shorter in the direction of motion is **length contraction**.
6. Time and length adjust because the **speed** of light must remain constant.
7. The factor used in time dilation and length contraction calculations is called **gamma**.
8. Gamma is always greater than 1, because the **speed** of any moving object is always less than **c** .
9. The phenomenon where events appear to happen at different times in different reference frames is called lack of universal **simultaneity**.
10. If light travels farther in one frame but still at speed c , the difference must be due to **time dilation**.
11. The mathematical expression for gamma involves the **velocity** of the moving object and the speed of light.
12. Length contraction only affects dimensions in the direction of an object's **motion**.
13. Time dilation and length contraction are consequences of the constancy of the speed of **light**.
14. The fusion of space and time into a single four-dimensional framework is known as **spacetime**.
15. Special relativity only applies when the frames of reference are not **accelerating**.

15 Questions

Answer Key Included

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