Galilean and special relativity

International Baccalaureate · IB Diploma · Physics · HL · Vocabulary in context

Word	Example
reference frame /ˈrefrəns freɪm/	A train is a **reference frame** for the people inside it.
• **event** /ɪˈvent/	A flash of light is an **event**.
inertial reference frame /ɪˈnɜːʃl ˈrefrəns freɪm/	A smooth-moving train is an **inertial reference frame**.
Galilean relativity	In **Galilean relativity**, speeds simply add.
special relativity	**Special relativity** says the speed of light is the same for everyone.
Lorentz transformation /ˈlɒrents trænsfɔːˈmeɪʃn/	The **Lorentz transformation** changes positions and times between frames.
Lorentz factor	At 0.8c, the **Lorentz factor** is 1.67. 0.8c 1.67
proper time interval	The **proper time interval** is measured by a clock that moves with the events.
time dilation /taɪm daɪˈleɪʃn/	**Time dilation** makes a moving clock run slow.
proper length /ˈprɒpə leŋθ/	The **proper length** of the rocket is 100 m. 100 m
length contraction	**Length contraction** makes a fast rocket look shorter.
space–time interval	Every observer agrees on the **space–time interval**.

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relativity of simultaneity	The **relativity of simultaneity** means two observers may disagree about “at the same time”. “at the same time”
space–time diagram	A **space–time diagram** has time on the vertical axis.
world line	A resting object has a vertical **world line**.
• **muon**	A **muon** is like a heavy electron.