

Special Relativity Project Proficiency Rubric

Reference frames, paradoxes, and relativistic calculations

EMERGING

Beginning awareness of special relativity concepts

- Attempts basic calculations but makes significant algebraic or conceptual errors
- Identifies the scenario but cannot explain different perspectives convincingly
- Recognizes a paradox exists but cannot articulate why it appears contradictory
- Submits work more than 3 days late, uses incorrect file formats, leaves work incomplete

PROFICIENT

Solid understanding, applies concepts independently

- Performs calculations accurately, showing algebraic manipulation before plugging in values
- Explains both perspectives convincingly with supporting physics reasoning
- Clearly articulates paradox and resolves it using time dilation, length contraction, or simultaneity
- Submits on time with proper formatting and communicates about delays

DEVELOPING

Basic grasp of special relativity, needs guidance for complex applications

- Completes calculations with minor errors, sometimes plugging in numbers before showing algebra
- Presents both reference frames but explanations remain surface level
- States the paradox but struggles to fully explain the resolution
- Submits 1–2 days late or requests last-minute extensions

EXTENDING

Exceptional understanding with sophisticated connections

- Executes calculations with full algebraic derivations, checks limiting cases, explains physical meaning
- Synthesizes multiple relativity concepts showing consistent physical outcomes
- Connects paradox resolution to experimental evidence and explores implications beyond requirements
- Submits quality work ahead of deadlines with clear communication