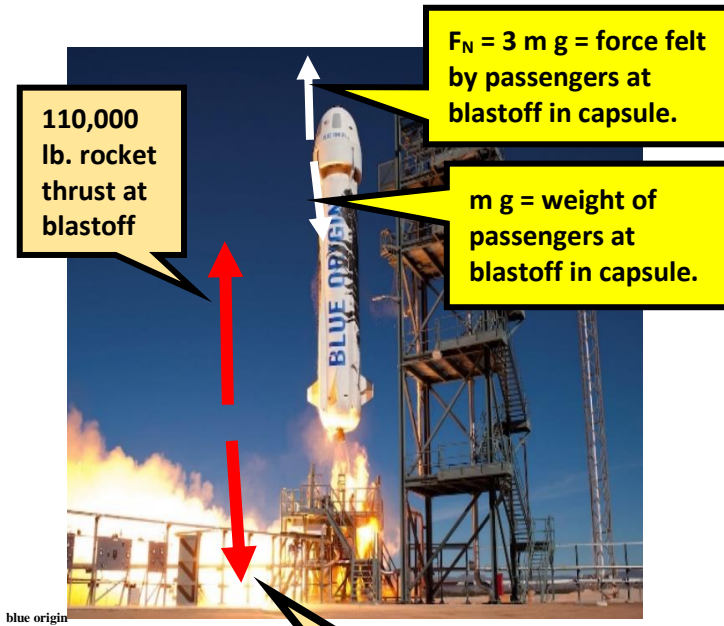


NEWTON'S 2ND LAW

Unit 6 & 7 Dr. John P. Cise, Professor of Physics, Austin Com.

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Jeff Bezos Says He Is Selling \$1 Billion a Year in Amazon Stock to Finance Race to Space



INTRODUCTION: Two goals of this application are: 1. Finding acceleration at blastoff, 2. Finding weight (Mg) of Blue Origin(New Shepard): Rocket, fuel, capsule at blastoff.

QUESTIONS: (a) Using Newton's second law ($F_{NET} = m a$) applied to forces on passenger in capsule at top of New Shepard rocket find acceleration(a) of rocket at blastoff?
(b) Knowing acceleration found in part(a), find Weight (Mg) of entire rocket at blastoff(rocket, fuel, & Capsule on top)?

HINTS: $F_{NET} = m a$

ANSWERS: (a) $a = 2 g$, (b) $M g = 36,666.67 \text{ lb.}$



Weight of :
rocket, fuel,
capsule at
blastoff = $M g$.

COLORADO SPRINGS —Mr. Bezos, the billionaire founder of Amazon, showed off the reusable rocket booster and the mock-up of the capsule that will take people up for panoramic views back down at earth, during a symposium here.

Mr. Bezos, who hopes to build Blue Origin into a commercial and tourist venture, also disclosed that it would cost about \$2.5 billion to develop an even bigger rocket, New Glenn, capable of lifting satellites and, eventually, people into orbit.

New Glenn is expected to fly by 2020, he said, but humans will not be passengers on the heavy-lift rocket until many years after that. "It's a mistake to race to a deadline when you're talking about a flying vehicle, especially one that you're going to put people on," he said. "I still think we can do commercial paying passengers in 2018."

New Shepard is a modest start for Mr. Bezos's ambitions to tap into the nascent space tourism market. It is a single-stage booster with a **capsule on top that is designed to carry six passengers at a time on trips of about 10 to 11 minutes.**

The (((engine that powers the booster produces up to about 110,000 pounds of thrust.))) On ascent, (((passengers will experience forces of about 3 Gs, about three times the normal force of gravity that humans experience on earth))).

When the booster reaches a certain altitude, the capsule will detach and coast above the Karman line, which is 62 miles above sea level, officially entering into space.