NEWTON'D 2ND LAW

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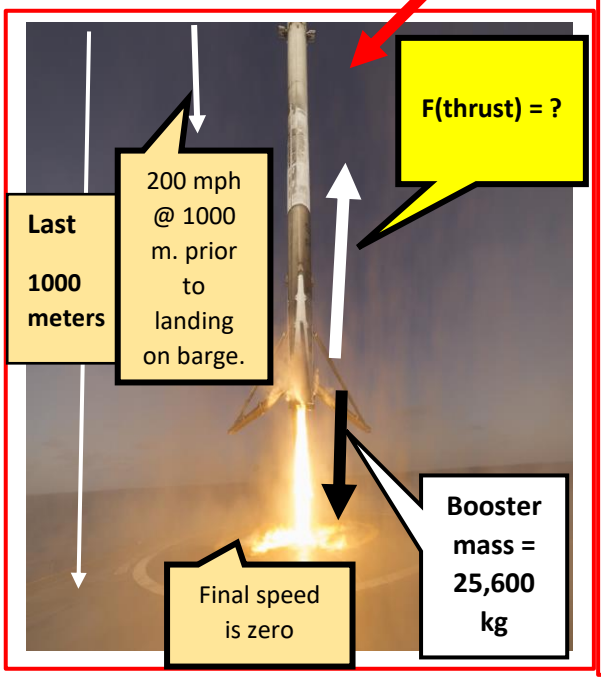
The Latest: SpaceX Rocket Booster Lands on Floating Platform

By THE ASSOCIATED PRESS APRIL 18, 2018, 7:13 P.M. E.D.T.

CAPE CANAVERAL, Fla. — The Latest on the launch of the planet-hunter satellite Tess (all times local):

7:00 p.m. Just minutes after launching NASA's planet-hunting spacecraft, **the SpaceX rocket booster is back on Earth. The first-stage booster landed Wednesday evening on a floating platform in the Atlantic**, just off the Florida coast.



INTRODUCTION: The goal in this application is to find the booster's rate of deceleration in going the last 1000 meters (starting at 200 mph) prior to landing at zero mph. Then, finding the thrust UP causing the booster(mass of booster = 25,600 kg.) to slow down and stop on the barge upright in the ocean.

QUESTIONS: (a)Convert 200 mph to m./s.?, (b) Find rate of deceleration (a) of booster while landing in last 1000 m. to floating platform barge? NOTE: y = -1000 meters since (0,0) of coordinate system starts at top of graphic at left. Also, the initial velocity of 200 mph is negative since heading down which is in negative direction. (c) Apply Newton's 2nd law to this slowing down booster to find the rocket thrust UP …….F(thrust)? Find all solutions in the metric system.

HINTS: 0.447 m./s. = 1 mph , $v^2 = v_o^2 + 2\,a\,y$, F(net) = m a, g = 9.8 m/s^2 NOTE: Booster has two forces while landing: weight down, thrust up, Weight = m g

ANSWERS: (a) v_o = - 89.4 m,/s. , (b) a = ~ 4 $m./s.^2$, (c) F(thrust) = ~ +35.34 X 10^4 N,

The Tess satellite, meanwhile, kept heading toward orbit with help from the Falcon rocket's second stage. It will take two months for Tess to reach its final scientific orbit, which will stretch all the way to the moon. Tess, or the Transiting Exoplanet Survey Satellite, will peer at hundreds of thousands of bright neighboring stars, seeking planets that could support life. Scientists expect Tess to identify thousands of planets in our cosmic backyard. SpaceX plans to use the recovered booster for NASA's next grocery run to the International Space Station. It is the 24th booster landing for SpaceX, which aims to reduce launch costs by reusing rocket parts.

6:51 p.m.NASA's Tess spacecraft has embarked on a quest to find new worlds around nearby stars that could support life. Tess soared from Cape Canaveral, Florida, aboard a SpaceX rocket Wednesday evening. Once in orbit, the Transiting Exoplanet Survey Satellite, or Tess, will peer at hundreds of thousands of bright neighboring stars, seeking planets. Scientists expect Tess to identify thousands of planets in our cosmic backyard, adding to the bounty provided over the past decade by NASA's Kepler Space Telescope. The planets discovered by Kepler are too distant and too faint for practical study. But those found by Tess should be close enough for mega telescopes in the future to detect any atmospheric signs of life. SpaceX halted Monday's countdown to make extra rocket checks.

1:15 p.m. NASA's newest planet-hunting spacecraft is back on the pad for another shot at launch. A SpaceX Falcon rocket is set to blast off with the Tess satellite Wednesday evening from Cape Canaveral, Florida. SpaceX halted Monday's countdown for extra rocket checks. Once in orbit, the Transiting Exoplanet Survey Satellite, or Tess , will peer at hundreds of thousands of bright neighboring stars, seeking planets that might support life. Scientists expect Tess to identify thousands of planets in our cosmic backyard, adding to the bounty provided over the past decade by NASA's Kepler Space Telescope. The planets discovered by Kepler are too distant and too faint for practical study. But those found by Tess should be close enough for mega telescopes in the future to detect any atmospheric signs of life.