



Article Guide: Feel the G-force, Luke: How would it feel to fly an X-wing?
Part 2

<http://scienceovereverything.com/2016/01/14/feel-the-g-force-luke-how-would-it-feel-to-fly-an-x-wing-part-2/>

As you read each paragraph:

- Vocabulary – Box vocabulary words or words that you have not seen before
- Focus Questions – Underline in the text where these questions are as you read

How much force can you take?

1. What happens when the human body experiences a force that is more than ten times the Earth's gravity (10 G-forces)?

Speeding up

2. What two assumptions are made before making these calculations?

3. When would an X-wing pilot experience a force on their body while in space? When would they feel weightless?

Turn, Turn, Turn

4. What is inertia?

5. What is centripetal force? When do you experience centripetal force in everyday life?

Doesn't this make flying an X-wing, well, lame?

6. How long would it take you to reach top speed in an X-wing safely? How long would it take for you to make one complete circle in an X-wing?

7. How long would it take for you to get to Saturn in an X-wing? How long would it take for you to get to the closest star to Earth?

Application

A Y-wing is another starfighter from the Star Wars Universe. Its top speed is 80 MGLT, which is about 23,983.2 meters/sec. Say Luke Skywalker has a mass of 80 kg. Calculate how long it would take for him to accelerate to attack speed without experiencing more than 10 G-forces.

- a. Forces to blackout (in Newtons):

- b. Acceleration to blackout (meters/sec/sec):

- c. Shortest time to top speed without blacking out (seconds):

Bonus: Calculate the tightest turn Luke can make with out blacking out (circumference and how fast he can make it (seconds)

Discussion

Give the vast distances between planets and stars, how realistic is the possibility of you traveling to another planet within your lifetime? Could you get to Mars? What about the Outer Planets such as Saturn or Neptune?

Vocabulary Guide

Force	
Acceleration	
Velocity	
Speed	
Gravity	
Weight	
G-Force	
Newton	
Meters/sec	
Meters/sec/sec	
Medium	
Centrifugal force	
Radius	
Circumference	
Inertia	