

# 2019 BOEING 737 MAX



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## WARM UP

How much news/facts do you know about the Boeing 737 Max?

## BACKGROUND INFORMATION

Watch the video and answer the comprehension questions:

<https://www.vox.com/videos/2019/4/15/18306644/boeing-737-max-crash-video>

1. On March 10<sup>th</sup>, 2019, which airline crashed?
2. How many people died?
3. On October 29<sup>th</sup>, 2018, which plane crashed in Indonesia?
4. How many people died?
5. What plane model were these two airlines flying?
6. Who is Boeing's rivalry?
7. According to the pie chart what is the market share of Boeing? Is it more or less than its rivalry?
8. What's the difference between A320 and A320 neo?
9. Why did Boeing upgrade its 737 plane?
10. Why wasn't it easy to add a new engine for Boeing 737?
11. What was Boeing's solution to fit the bigger engine in?
12. Why did pilots only need minimal additional training to fly Boeing 737 Max?
13. Did Boeing 737 Max increase sales for the company?
14. What's the side effect of the new engine on Boeing 737 Max?
15. What was the work around to fix the problem?
16. What was the name of the system?
17. How much additional training did pilots get when entering the cockpit for the first time?
18. What's wrong with the training material?
19. In 2018, some American pilots complained to the federal government about that?
20. Why was the 737 Max plane being pushed down causing it do crash?
21. What is Boeing's response to fix this plane model?
22. In conclusion, is 737 and 737 Max the same plane?

## READ

### How the Boeing 737 Max safety system differs from others

<https://www.usatoday.com/story/news/2019/03/11/boeing-737-max-safety-system-differs/3129480002/>

George Petras, USA TODAY

Updated 7:01 p.m. ET March 14, 2019

Boeing's 737 Max 8 jet and its onboard anti-stall system will undergo renewed scrutiny in the wake of Sunday's Ethiopian Airline crash in which 157 people died. Ethiopian Air's Max 8 was identical to the one flown by Indonesia's Lion Air Flight 610, which crashed Oct. 29 killing 189 passengers and crew.

The Max 8 uses a system called MCAS — Maneuvering Characteristics Augmentation System — which is designed to stabilize the aircraft in flight. Boeing added MCAS after redesigning its 737 platform for the Max. The redesign changed the size and placement of the aircraft's engines, which altered how the jet handled in flight.

The Max tended to raise its nose in flight, a movement called pitch. If an aircraft pitches too high it risks stalling and crashing. MCAS is designed to automatically reduce the pitch in manual flight without pilot input. The system is constantly fed data from two synchronized wing-like devices called Angle of Attack sensors, located on the plane's nose. If the AOA sensors detect the plane is pitching too high, the MCAS automatically adjusts the tail's stabilizer — the horizontal part of the aircraft's tail — to level out the plane. However, if the AOA sensors feed faulty or contradictory data to the MCAS, the system can force the aircraft into a dive, according to a Boeing service bulletin issued Nov. 6.

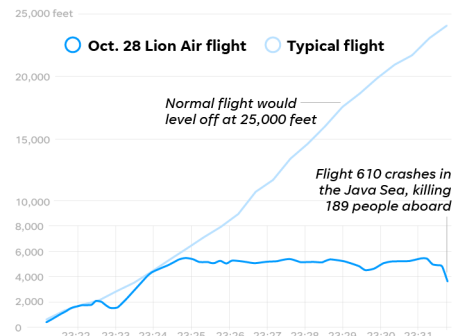
Pilots can cut off the system manually, but its sudden activation can confuse pilots. Flight data recovered from the Lion Air crash showed pilots repeatedly tried to get the nose up.

Boeing delivered its first Max 8 in May 2017. About 350 Max jets have been delivered, with more than 5,000 orders pending.

Some airlines have grounded their 737 Max jets pending investigation.

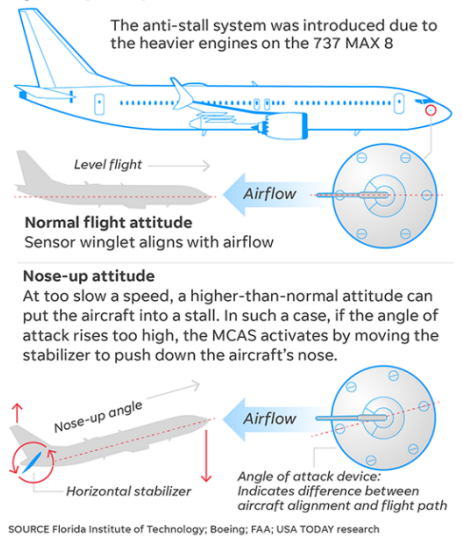
#### How Lion Air flight 610's takeoff compares with a typical flight

Altitudes in 10 minute period:



SOURCE flightradar24.com; flightaware.com

#### How Maneuvering Characteristics Augmentation System (MCAS) works



## COMPREHENSION QUESTIONS

23. What is pitch?
24. What is MCAS designed to do automatically even when in manual mode?
25. What are AOA sensors?
26. What would MCAS do if AOA sensors detected that the plane is pitching too high?
27. What is a tail stabilizer?
28. If the AOA sensors feed incorrect data, what happens to the plane?
29. Can the MCAS be disabled?
30. If the pilot can cut off the system manually, why would the plane still crash?

## EXPERIENCED PILOTS

### **Sullenberger's experience in a 737 MAX simulator made him see how pilots ran out of time**

By Devan Cole, CNN

Updated 2251 GMT (0651 HKT) June 19, 2019

**Since the crashes, what has happened? Watch the CNN report to see what has happened as of June 2019 and answer the following comprehension questions.**

<https://edition.cnn.com/2019/06/19/politics/chesley-sullenberger-boeing-737-max-scenario/index.html>

31. Who is Chesley "Sully" Sullenberger?
32. The following is a quote from Captain Sullenberger in the hearing with the House Transportation Committee? Fill in the blanks:

I recently experienced all these warnings in a 737 MAX flight \_\_\_\_\_ during \_\_\_\_\_ of the accident flights. Even knowing what was going to happen, I could see how crews could have \_\_\_\_\_ of time before they could have solved the problems. Prior to these accidents, I think it is \_\_\_\_\_ that any US airline pilots were confronted with this scenario in simulator training."

33. There's a lot of innuendo that these crashes had to do with "foreign" pilots lacking the experience. Does Captain Sully agree with that?
34. If the plane is to be ungrounded, perhaps what will be required instead of an iPad training?
35. Has Boeing or FAF made any decisions on the 737 Max?

### DISCUSSION

36. Would you take fly with Boeing 737 Max?
37. What is your personal opinion about this news?

### VOCABULARY

*Fill in 10 new vocabs that you learned. Look up not just the meaning but also the part of speech and pronunciation. If there are more unfamiliar vocabulary words, continue to learn by making your own chart!*

Word	Part of speech	Pronunciation	Meaning
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

### MAKE SENTENCES

Please make 6 sentences with all the 10 words above.

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

### REFLECT AND LEARN

*Either in outline format or paragraph format, reflect on what you learned from doing this worksheet? For example, how is it relevant to your life? What new information did you learn? How can you use the newly learned vocabularies in your life? Will you follow up on this news?*