Teacher's Key

The Science of Flatulence: Why and How We Pass Gas (Level B1)

Vocabulary Matching

1 normal = **N**
2 embarrassing = **A**
3 swallow = **H**
4 bacteria = **L**
5 digest = **G**
6 fiber = **M**
7 smell = **I**
8 muscles = **E**
9 volunteers = **D**
10 average = **O**
11 range = **J**
12 amount = **K**
13 survey = **B**
14 communicate = **C**
15 estimated = **F**

Fill in the Blank

1 normal
2 embarrassing
3 swallow
4 bacteria
5 digest
6 fiber
7 smell
8 muscles
9 volunteers
10 average
11 range
12 survey
13 communicate
14 estimated

True or False

1 **True.** Many people still find it embarrassing.

2 **False.** The larger source is bacteria in the large intestine.

3 **True.** This includes fiber and some sugars.

4 **False.** Most gas has no smell.

5 **False.** Only some people make methane.

6 **True.** The muscles around the anus hold it in.

7 **True.** The range was 476 to 1,491 milliliters.

8 **False.** They reported it less often.

9 **True.** Only some comes from the other end.

10 **False.** The fish gulp air and let out bubbles near the anus.

Language Focus: Comparatives and Superlatives

Example answer: The amount of gas on a fiber-free diet was **smaller than** the amount on a normal diet.

Comprehension Questions: Model Answers

1 Flatulence is the medical word for passing gas from the digestive system, also called farting. Doctors say it is normal and not dangerous.

2 Swallowed air and bacteria in the large intestine. The bacteria are the larger source: about three quarters of the gas in one study of 16 people was made inside the intestine.

3 They digest food that our bodies cannot break down, especially fiber and some sugars, and they make gases as they work.

4 Mostly nitrogen, hydrogen, carbon dioxide, and sometimes methane. The bad smell comes from tiny traces of gases with sulfur in them. In one study, the stronger the smell, the more hydrogen sulfide the sample had.

5 They hold the gas in, and most of the time we can choose when to let it out.

6 Ten volunteers ate their usual food plus 200 grams of baked beans. They passed between 476 and 1,491 milliliters a day, with a middle value of 705 milliliters, about two soda cans. More gas was passed after meals, and on a fiber-free diet the amount fell to about 214 milliliters a day.

7 A 1996 study of 25 adults found an average of 10 times a day, with 20 at the top of the normal range. The US National Institutes of Health gives 8 to 14 times a day and says up to 25 can be normal. The highest number came from a 2025 University of Maryland study: a small hydrogen sensor worn on underwear recorded an average of 32 times a day.

8 The most common answer was about every three to four hours, and people aged 65 and over reported it less often than younger adults. The answers were self-reported, and the Maryland team says counts like these may be too low because people forget or do not notice every time.

9 Most of a cow's methane leaves through the mouth as burps, while herring let out air bubbles with high-pitched sounds. The herring gas is gulped air, not digestive gas, so it is not flatulence in the strict sense.

10 Not Given. The reading says baked beans were used in an experiment but does not say that beans always cause gas.

11 No. The writer says the topic is normal and treats it in a neutral, scientific way.

12 They show that gas production is not only a human topic. They add examples from animals and from the past, and the dinosaur example is presented as an estimate, not a fact.

Notes on the Evidence

- Sources checked (September 2026). US National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), Symptoms and Causes of Gas in the Digestive Tract, page read on 27 September 2026: people pass gas an average of 8 to 14 times a day, and up to 25 times a day can be normal; swallowed air and bacterial breakdown of carbohydrates in the large intestine are the causes. Furne, Levitt and others 1996, Digestive Diseases and Sciences (abstract read in full: 25 healthy subjects, one week on usual diet, 10 plus or minus 1 passages a day, upper limit of normal 20). Tomlin, Lowis and Read 1991, Gut, University of Sheffield, UK (abstract not reachable this time; figures carried over from the previous version, which read the abstract: 10 volunteers, usual diet plus 200 g baked beans, 476 to 1,491 mL a day, median 705 mL, more after meals, fibre-free diet 214 mL). Suarez and others 1997 (about 74 percent of flatus produced in the gut, also quoted in Wikipedia, Flatulence) and Suarez, Springfield and Levitt 1998, Gut (odour correlated with hydrogen sulphide). Almario and others 2017, Clinical Gastroenterology and Hepatology, “Old Farts: Fact or Fiction?” (title confirms 16,000 Americans and age; the modal answer of every three to four hours and the lower reports at 65 and over come from the previous version’s summary sources; the full text returned 403). Smart Underwear study: Botasini, Hall and others, Biosensors and Bioelectronics: X, December 2025; University of Maryland news release 11 February 2026, ScienceDaily 14 March 2026, Science News: healthy college-age volunteers, average 32 flatus events a day, range 4 to 59; the team contrasts this with the 14 (plus or minus 6) often cited; the Human Flatus Atlas plans to measure hundreds of people. The number of participants in the pilot was not given in the articles read. Wilson, Batty and Dill 2004, Biology Letters (herring). NASA Science climate FAQ (most cow methane is belched). Wilkinson and others 2012 on sauropod methane (via news coverage).
- Discrepancies and limits. Frequency figures differ by method: 10 a day (self-recorded diary, 1996), 8 to 14 (NIDDK), 13 to 21 (Merck Manual), and 32 (hydrogen sensor, 2025). The sensor counts hydrogen events, and the pilot was small and young, so 32 is not yet a population average; the reading gives it as one study’s result and attributes the explanation (people forget or do not notice) to the Maryland team. The 1991 experiment used 10 volunteers on a bean-supplemented diet, so 705 mL is not a general average. Swallowed air: the NIDDK lists it as a cause, while the Merck Manual says little flatus comes from it; the reading says most comes back up as burps. Methane: the previous version said three of ten volunteers made methane in one experiment; this could not be traced to a source, so the reading now says only that some people make methane, depending on their gut microbes (methane is made by archaea, not bacteria, so the reading says microbes). Cow methane: most leaves as burps (a veterinary paper puts 10 to 13 percent in the large intestine). The dinosaur estimate is speculative.
- Revision (September 2026, fix mode). Replaced the vocabulary items produce, contains, and release, which had near-identical definitions and accepted each other in the fill-in, with embarrassing, volunteers, and estimated. Updated the NIH figure from about 14 a day to 8 to 14 (up to 25 normal) as the NIDDK page now states. Added the 2025 Maryland sensor study (average 32 a day) and ended the reading on the planned larger study. Removed the untraced three-of-ten methane claim. Moved the 1991 experiment into paragraph 4 and reworded the muscle sentence (muscles do not decide). Bolded smell at its first use. Removed a model answer claim about men and women that the reading did not support. Replaced discussion question 8, which overlapped question 2. Replaced a dead NASA link and rewrote a resource description that addressed the editor.
- Caution. This is general information, not medical advice; the reading advises talking to a doctor about strong pain or other worrying symptoms. Discussion questions avoid personal questions about the learner’s own body. The Hindi and Arabic translations have not been checked by a native speaker.