

DO NOT INCLUDE THE RED TEXT IN YOUR OUTLINE.

JM

Speech Outline

SPC1024- MTWR; 8:00am

Informative Speech

Zero-Gravity Body Waste Management

I. Introduction

- A. (Attention Getter) Space has always been full of mysteries to humankind. One of those mysteries is how astronauts handle their business in space. Are there toilets in space? How do things work without gravity?
- B. (Establishing Your Credibility) This is something that I've always wondered about.
- C. (Motivation Statement) *THIS EXAMPLE DOES NOT HAVE A MOTIVATION STATEMENT. MAKE SURE TO INCLUDE ONE IN YOURS. STUDENT WAS NOT ASKED TO GIVE A MOTIVATION STATEMENT.*
- D. (Preview of Topic) After having done research on this topic, I will be providing details on the history and modern practice of body waste management systems in space, as well as how accumulated body waste is handled.

II. Body

- A. (Main Point #1) To begin with, I will cover a brief history of some of the earlier systems that were used aboard manned space flights.
 - 1. There were no toilets in the early days of space flight.
 - 2. One of the earliest devices was known as the Urine Transfer System (UTS)
 - a. Urine was stored inside a collection bag.
 - b. The UTS required uncomfortable physical contact to be used.
 - 3. The Urine Receptacle Assembly (URA) was the next version of the device.
 - a. The URA was attached directly into the spacecraft.
 - b. The URA did not require physical contact to be used.

4. Plastic bags were used to collect fecal matter.
 - a. The fecal collection bags featured an adhesive lining, which would be attached to the posterior of the body.
 - b. Anything that didn't separate due to lack of gravity had to be done so by hand.
 - c. Paper waste would also be sealed inside of the bag.
 - d. Astronauts in space suits relied on the Fecal Containment System- an absorbent undergarment.

B. (Main Point #2) Now we will fast forward do today and examine how the system has changed.

1. Today there are toilets in space. The first toilet of the ISS cost over \$19 million to install
2. Astronauts use a vacuum hose rather than a toilet to urinate
3. There is also a vacuum in the toilet to help facilitate defecation
4. Astronauts make use of tethers and restraints to remain stationary while processing natural bodily functions.
5. A larger vacuum hose adjacent to the toilet is used for paper waste.
6. However, the toilet is a bit tricky to use.
 - a. The toilet has a hole with a diameter of only four inches
 - b. Astronauts are required to undergo "positional training"; using camera feedback.
7. Astronauts in space suits outside of the station wear Maximum Absorbency Garments (MAGs), which are sometimes referred to as diapers. One MAG can hold up to two liters.

C. (Main Point #3) Finally, I will explain how accumulated body waste in space is managed.

1. Early versions of waste management systems jettisoned urine directly into space.
2. Fecal collection bags were compressed and stored inside the spacecraft.
There was no way to safely eject solid waste.
3. Urine is accumulated aboard the modern-day ISS is processed into drinkable water. This water, in turn, can be processed into oxygen.
4. Today, fecal matter is stored inside plastic bags aboard the ISS and then later loaded into capsules along with other waste and then burned up in the atmosphere.

III. Conclusion

- A. **(Summary Statement)** Upon consideration of the past and present complexities of bodily restroom procedures endured by astronauts in space, we can appreciate how simple things are for us here on Earth.
- B. **(Concluding Remark)** I hope that the information I have provided today has enlightened you as it has enlightened me to one of the many mysteries of life in space.

Works Cited

- Gannon, Megan. "The Scoop on Space Poop: How Astronauts go Potty." *Space.com*. Purch, 29 Aug. 2013. Web. 6 June 2016.
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- Saucer, Richard L. and George K. Jorgensen. "Waste Management System." *SP-368 Biomedical Results of Apollo*. 1st Ed. N.p.: National Aeronautics and Space Administration, 1975. 469-84. *History.nasa.gov*. National Aeronautics and Space Administration, 6 Aug. 2004. Web. 6 June 2016.
- Teitel, Amy S. "The Trouble With Fecal Containment Systems." *Popular Science*. Bonnier Corporation, 26 Nov. 2013. Web. 6 June 2016.
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