NATS1530 F19 Space Flight and Exploration
Lesson 1 Study Guide: A History of Space Exploration

Lecture Review Questions

1. What is the Kármán line? Describe how it effects airflight vs spaceflight.

2. What was the first man-made object to breach the Kármán line, and in what decade did this occur? What was the object's original purpose? Who designed this object, and where did he end up working?

3. How were the 1st photographs of Earth taken from space?

4. What kinds of lifeforms were launched into space by the U.S. and the Soviet Union in the 1950s? Why were these animals chosen? How would you describe the success of these missions?

5. What was *Sputnik*? What was it capable of? Explain why it led to the creation of NASA.

6. What was the purpose of *Project Mercury*? Describe how the Mercury astronauts achieved spaceflight, and why these were not considered 'piloted' missions.

7. What was the name and nationality of the 1st human in space? Describe this mission.

8. What is an EVA? What was the name and nationality of the 1st cosmonaut to perform an EVA? Describe this mission.

9. Describe the following spacecraft terms and the purpose of each:
   - Orbiter/satellite
   - Impactor
   - Lander
   - Flyby
   - Hard- vs soft-landing
   - Rover

10. In what decade did the first lunar missions occur? Describe the achievements of the first 3 unmanned missions to the Moon. Which country was responsible for these missions?

11. Why can't we see the Moon's far side from Earth? Why is the far side more cratered than the near side? Explain the difference between the Moon's far side and its dark side.

12. Describe the first manned landing on the Moon. What were the names and nationalities of the astronauts who first stepped on the Moon?

13. In what decade did the first planetary missions occur? Were these missions manned or unmanned?

14. For each of the following 'milestone' planetary missions, state what each mission was the first to accomplish, and the country responsible for each mission:
   - *Mariner 2*
   - *Mariner 9*
   - *Pathfinder* and *Sojourner*
   - The *Venera* missions
   - *Vikings 1* and *2*

15. What is a 'space shuttle'? What was the purpose of NASA's Space Shuttle? Why was it shut down?

16. What is the International Space Station? What is its purpose?

17. Based on what you've learned in this lesson, what typically happens to the crafts that humans launch into space? Where do they end up?

<u>Reading Review Questions:</u> Assigned Reading - Chaikin (2007), p.1-55

1. State the general objectives of the *Apollo*, *Mercury* and *Gemini* missions. In what order did these missions take place? What was the difference between the *Gemini* and *Mercury* missions?

2. In Chapter 1, Chaikin tells us the story of the fire that claimed the lives of the astronauts of *Apollo 1*.
    a. Where did this incident occur, and during what event?
    b. How experienced was the manufacturer of the *Apollo 1* command module at building a manned spacecraft?
    c. What is suspected to have caused the fire, and why was this the fault of the manufacturer?
    d. According to Chaikin, there were 2 problems with the command module which caused the fire to spread quickly and prevented the astronauts from escaping in time. What were these two flaws, and why had they been implemented?
    e. Why did the *Apollo* astronauts later consider the tragedy a "hidden blessing"?

3. In Chapter 2, Chaikin introduces us to Deke Slayton, one of the key administrators of the Apollo missions. Why was he "grounded" from the Mercury missions, and what was his job during the Apollo missions? What was ironic about his responsibilities in this role?

4. Who did the "Original 7" and the "New Nine" refer to?

5. Why does Chaikin write "Soon it was clear that the competition embraced everything." What were the New Nine competing for?

6. Who was Chuck Yeager, and how would you describe the changing importance of academics in the career of a test pilot in Jim Anders' day compared to Chuck Yeager's generation? Why would Yeager not have qualified for Test Pilot School in 1959, and what is ironic about this? What are today's requirements to be an astronaut for NASA? (See, eg, www.nasa.gov/audience/forstudents/postsecondary/features/F_Astronaut_Requirements.html).

7. What made Anders "different from the other pilots", and why was he selected for the astronaut program despite this difference? How did this difference seem to affect his chances at getting a seat on a Gemini mission?

8. By 1966, how does Chaikin describe the progress of the American space program compared to the Soviet's? What had the Americans taken a "commanding lead" in?

9. Describe the incident that led Anders to become "a step closer to getting on a crew."

10. What incident led Chaikin to conclude Chapter 2 with the statement "…and for the first time in NASA's worst year, the moon came a little closer"?