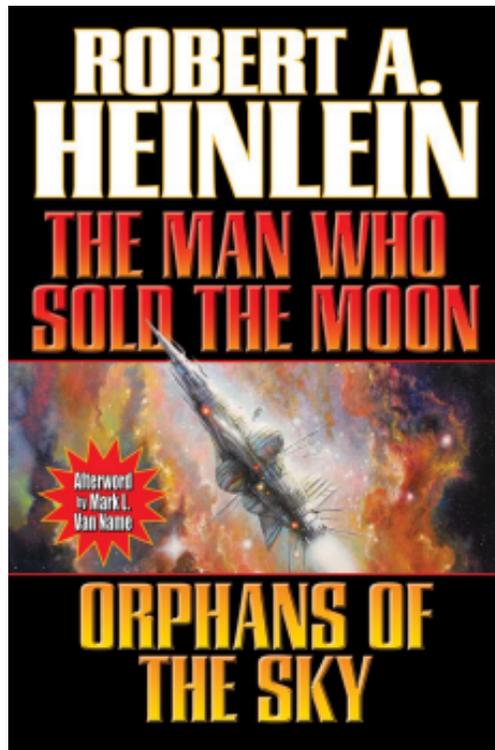


**TEACHER'S GUIDE TO *THE MAN WHO SOLD THE MOON* AND  
*ORPHANS OF THE SKY*  
BY ROBERT A. HEINLEIN**



Contents:

- recommended reading levels
- Heinlein biographical material and links
- background of the book and plot summary
- character sketches
- chapter guides include a more detailed plot summary and may also include some of the following:
  - Prepare to read...
    - vocabulary
    - focus questions or initiating activity
  - plot summary
  - quiz/reading comprehension questions—multiple choice/short answer questions to testing reading comprehension
  - reflection and discussion questions—may be used to initiate classroom discussion, as short writing assignments, or as test questions
  - suggested activities/inquiry-based exploration—suggestions for activities and projects

**Recommended reading levels:** Heinlein’s fiction appeals to readers of many ages, from early middle-school readers to adults, and much of his earlier work can also be read by young adults although they were originally marketed to older readers. For use in the classroom, *The Man Who Sold the Moon* and *Orphans of the Sky* are probably most appropriate for readers in grades 9-12.

### **Biographical information on Robert Heinlein:**

Robert Anson Heinlein is considered to be one of the best, if not the best, writers of science fiction of all time. He was a prolific, commercially and critically successful, and at times controversial, contributor to the genre. He was born in Butler, Missouri on July 7, 1907, and graduated from the United States Naval Academy in 1929. Heinlein served in the Navy until 1934, but was forced to retire because of tuberculosis. After a few failed business and political ventures, he decided to try writing and sold “Lifeline”, a short story, in 1939 to *Astounding Science Fiction*, which was a “pulp” magazine. These were periodicals published on cheap (pulp) paper that catered to popular tastes for genre fiction (mystery, romance, detective, adventure, horror and science fiction). He was a regular contributor to science fiction pulp magazines for the first several years of his career. He hit his stride as a novelist after World War II, publishing fourteen “juvenile” novels aimed at the young adult market as well as many novels for adults. Some of his most popular works are *Double Star* (1956), *The Door into Summer* (1957), *Stranger in a Strange Land* (1961), *The Moon is a Harsh Mistress* (1966), and *Time Enough for Love* (1973), and four of his novels won the Hugo Award, which is presented at the annual World Science Fiction Convention. Heinlein wrote original screenplays for two movies: *Destination Moon* (1950) and *Project Moonbase* (1953), and two of his novels have been adapted into films: *The Puppet Masters* (book, 1951; film, 1994) and *Starship Troopers* (book, 1959; film, 1997). His novel *Space Cadet* (1948) also inspired the television show *Tom Corbett, Space Cadet* (1950-1955). Heinlein died in Carmel, California on May 8, 1988. For more biographical details, see the following articles:

- The Robert Heinlein Society offers a biographical essay by William H. Patterson, Jr. (*The Heinlein Society*, <http://www.heinleinsociety.org/rah/biographies.html>) and further information about Heinlein’s life and work (*The Heinlein Society*, <http://www.heinleinsociety.org/rah/FAQrah.html>).
- Carlos Angelo, “Heinlein,” *Robert A. Heinlein: Dean of Science Fiction Writers*, <http://www.wegrokit.com/bio.htm>

**Suggested class activity:** Have your students read the information on Heinlein above before they begin the book.

### **For further information on Heinlein and his work:**

- The most current and extensive website dedicated to Heinlein is that of The Robert Heinlein Society (<http://www.heinleinsociety.org/>). In addition to the biographical information linked above, the Society website includes news, essays,

- forums and many other interesting areas to explore.
- Another useful website is *RAH: The Robert A. Heinlein homepage* by James Gifford (<http://www.nitrosyncretic.com/rah/>). Although this web site is not currently being updated, it contains useful FAQs, essays and links on Heinlein's life and work.
  - Another website that is not currently being updated, but which provides some interesting essays and biographical information is *Robert A. Heinlein, Dean of Science Fiction Writers* (<http://www.wegrokit.com/>).
  - There are several critical studies of Heinlein's work available in book form. The first and still one of the best is *Heinlein in Dimension* by Alexei Panshin (Chicago: Advent: Publishers, Inc., 1968). Panshin devotes about three paragraphs each to *The Man Who Sold the Moon* and *Orphans of the Sky* and refers to them elsewhere in the book. Another critical study that discusses *The Man Who Sold the Moon* and *Orphans of the Sky* is *Robert Heinlein* by Leon Stover (Boston: Twayne Publishers, 1987).

**Background:** Heinlein wrote *The Man Who Sold the Moon* around 1949-1950, and Shasta published it in 1950 as the title story in a six-story collection. It is a prequel to one of the other stories in the collection, "Requiem", first published in the January 1940 issue of *Astounding Science Fiction*. In 1967, it was included in the collection *The Past through Tomorrow*, published by Putnam. He wrote *Orphans of the Sky* around 1940-1941. Part one, "Universe" was originally published in the May 1941 issue of *Astounding*, and part two, "Common Sense", appeared in the October 1941 issue of the same magazine. Dell published "Universe" as a ten cent paperback in 1951, and in 1964, Putnam published both stories under the title *Orphans of the Sky*. In 1973, the Science Fiction Writers of America voted "Universe" to be on the list of the top ten science fiction novellas published prior to 1966, and it was reprinted in the *Science Fiction Hall of Fame* anthology in 1974. "Universe" and "Common Sense" were also included in the story collection *Off the Main Sequence* in 2005. All three stories are part of Heinlein's Future History series, which he began in 1939 and was still developing at the time of his death in 1988.

**Plot Summary for *The Man Who Sold the Moon*:** D.D. Harriman is a billionaire entrepreneur who decides that his next project should be a space flight to the moon. He persuades his partner, George Strong, and another businessman, Daniel Dixon, to join in. His wife Charlotte objects, however, when he announces that he is selling all their assets to invest in his new venture. Harriman recruits a former rocket scientist, Bob Coster, to be the chief engineer to build the space ship and the only world's only experienced space pilot, Leslie LeCroix, to pilot it. His original plan called for a three astronaut crew of Harriman, Coster, and LeCroix for the first trip to the moon, but in order to launch before they run out of money, he has to scale back the mission to a one astronaut crew of LeCroix alone. The first attempt is successful, so Harriman includes himself as a member of the crew for the second mission. This trip would carry seven people with the intention of leaving at least four to start a lunar colony. However, Dixon and Charlotte Harriman force Harriman to remain behind, because Harriman is too important to the whole endeavor to risk his life traveling in space.

### **Characters-*The Man Who Sold the Moon*:**

- **Delos David “D.D.” Harriman**, is a billionaire entrepreneur.
- **George Strong** is Harriman’s business partner.
- **Donald Dixon** is chairman of the board of the Hemisphere Power Corporation and invests in Harriman’s space program.
- **Charlotte Harriman** is Harriman’s wife.
- **Bob Coster** is the chief engineer of Harriman’s space program.
- **Leslie LeCroix** is the pilot of Harriman’s rocket to the moon.
- **Jack Entenza** is president of the Two-Continents Amusement Corporation and invests in Harriman’s space program.
- **Saul Kamens** is a lawyer working for Harriman and Strong.
- **Montgomery, aka “Monty”**, is head of publicity for Harriman and Strong.
- **Andrew Ferguson** is chief engineer for Harriman and Strong.
- **Mynheer van der Velde** is a diamond merchant.
- **Jock Berkeley** is a manager working in one of Harriman and Strong’s companies.

## **CHAPTER SUMMARIES-THE MAN WHO SOLD THE MOON**

### **Chapter 1—**

- prepare to read:
  - vocabulary
    - philistines
    - antipodes
    - uranium
    - pantograph
    - temperament
    - stylus
    - hemisphere
    - procession
  - Focus question/initiating activity: Harriman wants to go to the moon. Ask the students whether they also want to travel to the moon.
- Chapter summary: In this chapter, the reader is introduced to Delos D. Harriman, George Strong, his business partner, and Donald Dixon, another businessman and learn that they have been highly successful. Harriman has just talked Strong into joining him in a commercial space venture to travel to the moon. Then then travel via air taxi to the board meeting of Hemisphere Power, which provides atomic energy to the Western Hemisphere. They have just recovered from the destruction of their power satellite, which produced atomic fuel in orbit. Most of the meeting deals with business issues stemming from that unfortunate event. At

the end of the meeting, Harriman pitches his idea of a commercial venture to fly to the moon. Only two of the members invest in the venture: Chairman of the Board Dixon and Jack Entenza, head of a large media company.

- quiz/reading comprehension questions:
  1. What is material did Delos and George use to build houses?
    - (a) Wood
    - (b) Concrete
    - (c) Steel
    - (d) Plastic
  2. What idea does Delos have in this chapter?
    - (a) Microwave ovens
    - (b) Robotic tractors
    - (c) Automatic light switches
    - (d) Smart phones
  3. What happened to the power satellite?
    - (a) It blew up.
    - (b) It fell out of orbit.
    - (c) It escaped from the Earth's gravitational field and flew out of the solar system.
    - (d) It was closed, because it lost money.
  4. How did the power satellite generate power?
    - (a) It converted rays of the sun to electricity and microwaved it to the Earth.
    - (b) It generated a synthetic radioactive fuel for power plants on Earth.
    - (c) It generated electricity through nuclear power and an electrical line connected it to the Earth.

Answers: 1-d, 2-c, 3-a, 4-b

  - Suggestion for reflection and discussion: Delos's and George's company used plastic to build homes. Ask the students whether they think it would be feasible.
  - Suggested activities/inquiry-based exploration: Delos was named for an island in Greece. Have the students research the island's history.

## Chapter 2—

- prepare to read:

- vocabulary
  - decentralize
  - clapboard
  - bailiff
  - chalet
  - catacomb
  
- Focus questions or initiating activity: The Harriman house is designed to withstand anything short of a direct hit by a bomb or an attack by tanks. Ask the students how well their houses would survive a natural disaster or an attack by a hostile force.
  
- Chapter summary: Delos knows that his new venture will require all his cash. When he suggests selling the house, his wife Charlotte reacts negatively. Then when he reveals that he is planning a trip to the moon, she announces her opposition.
- Quiz/reading comprehension questions:
  1. How many children do the Harrimans have?
    - (a) None
    - (b) One
    - (c) Two
    - (d) Three
  
  2. Where did the Harrimans live when they were first married?
    - (a) In a beachside resort in Florida
    - (b) At a ski resort in the Himalayas
    - (c) In a cramped flat over a grocery store
    - (d) In a house in the suburbs
  
  3. Where would Charlotte prefer to live?
    - (a) A little chalet tucked away in the mountains
    - (b) Beverly Hills
    - (c) Manhattan
    - (d) Hawaii

Answers: 1-a, 2-c, 3-a

- Suggestion for reflection and discussion: Charlotte is against Delos's idea to go to the moon. Why is that and do any of the students agree with her?
- Suggested activities/inquiry-based exploration: The relationship between Delos and Charlotte resembles the one between billionaire Warren Buffett and his first wife Susan, who assumed Buffet would retire after amassing his first \$10 million.

Have the students research their relationship.

### Chapter 3—

- prepare to read:
  - vocabulary
    - terrestrial
    - nautical
    - almanac
    - latitude
    - tropical
    - homeopathic
    - catalyst
    - philatelic
  - Focus question/initiating activity: Delos is concerned that when (not if) he journeys to the moon, someone else will claim ownership. How can someone own the moon?
- Chapter summary: When George arrives at the office, he finds Delos is already there studying the globe and the Nautical Almanac. Delos and George discuss property rights in relationship to the moon. Delos asks George to buy the franchise rights to the moon in all countries over which the moon passes in case the issue ever arises. Then they meet with Saul Kamens, their legal counsel, to discuss the issue as well as incorporating the venture. Later, they bring in Montgomery, their publicity chief, to discuss those issues, the timing of the official announcement of their new venture, and financing. After a while, Dixon and Entenza arrive to confirm their intention to invest in the moon project, and they work out the arrangements. Finally, Delos meets with Andrew Ferguson, his chief engineer to discuss building a rocket to the moon. As it turns out, Ferguson has already hired a man with experience with rockets, Bob Coster, who is waiting outside the office. Coster agrees to head the project, providing he gets to go on the first trip.
- quiz/reading comprehension questions:
  1. What states does the moon pass over?
    - (a) Alaska.
    - (b) Florida, Texas, and the Hawaiian Islands.
    - (c) All of them.
  2. What country does the moon NOT pass over?
    - (a) Russia
    - (b) Brazil

- (c) Peru
- (d) Ecuador.

3. In the partnership among Harriman, Strong, Dixon, and Entenza, who has the deciding vote in case of a deadlock?
- (a) Strong
  - (b) Dixon
  - (c) Entenza
  - (d) Harriman

Answers: 1-b; 2-a; 3-d

- Suggestion for reflection and discussion: How could someone make money going to the moon?
- Suggested activities/inquiry-based exploration: There is a man named Dennis Hope who claims to own the moon. Have the students research Hope, the 1979 treaty regarding ownership of extraterrestrial property, and any else who claims ownership of the moon.

#### Chapter 4 ----

- prepare to read:
  - vocabulary
    - spectroscopy
    - metallurgy
    - vector
    - catapult
    - parasite
    - interplanetary
    - uranium
    - prospective
- Chapter summary: The chapter opens with a meeting between Harriman and Dixon to discuss the possibility that there is uranium on the moon. Then Heinlein cuts to a meeting between Harriman and Mynheer van der Velde, a diamond merchant to discuss the possibility that there are diamonds on the moon. From there, Harriman travels to where the moon rocket is under construction. Harriman is dissatisfied with the progress being made and arranges for Jock Berkeley, a manager who works in one of Harriman's other companies, to transfer to the moon project. When Berkeley arrives, he assumes Coster's administrative responsibilities. Harriman then discusses the moon rocket itself with Coster.
- quiz/reading comprehension questions:

1. Where does van der Velde live?

- (a) London
- (b) Rotterdam, Holland
- (c) Paris
- (d) New Delhi

2. Where is the moon rocket being built?

- (a) Colorado Springs, Colorado
- (b) Cape Canaveral, Florida
- (c) Huntsville, Alabama
- (d) Houston, Texas

3. Where is Coster living?

- (a) In an apartment in Denver
- (b) On a ranch
- (c) At a boarding house
- (d) In a dormitory

Answers: 1-b, 2-a, 3-c

- Suggestion for reflection and discussion: Harriman does not know if there is really uranium or diamond on the moon. Why is he talking about them?

## Chapter 5

Prepare to read:

- vocabulary
  - memorandum
  - composition
  - concession
  - pyrotechnic
  - celluloid
- Focus questions/initiating activity: Harriman discusses the possibility of using the face of the moon as an advertisement. Ask the students if they think it would be feasible.
- Chapter summary: Harriman discusses publicity ideas with Montgomery, such as reviving an old song. He then visits the executive of a soft drink company to

persuade him to buy an advertising concession. Finally, he meets with a conservative publisher to ask his support to reach the moon before the Russians get there.

- quiz/reading comprehension questions

1. Does Harriman want to deface the moon with an advertisement?

2. What is not a prize for a one hundred word essay on “Why I want to go to the moon”?

- a. One thousand acres on the moon
- b. A trip to the moon
- c. A six foot scale model of the moon rocket.
- d. A saddle-trained Shetland pony.

Answers: 1-No, but he is willing to be paid not to. 2-b.

- Suggestion for reflection and discussion: Ask the students for example of corporate sponsorships of events.
- Suggested activities/inquiry-based exploration: Heinlein predicts that the Soviet Union, the Communist government of Russia, would still exist at the time of the first moon landing. He was correct, and the Soviet Union did not fall until 1991, which was twenty-two years after the first moon landing. Have the students research the collapse of Russia’s Communist government

## Chapter 6--

- prepare to read:
  - vocabulary
    - satellite
    - quarto
    - cosmic
    - radiation
    - elucidate
    - subordinate
    - incorruptible
  - Initiating activity: Ask the students if any of them would like to become a pilot.
- Chapter summary: Harriman meets with and hires Leslie LeCroix, the only experienced space shuttle pilot in the world, to pilot the rocket to the moon. Harriman then meets with the chairman of the Atomic Energy Commission to buy a license to use nuclear fuel for the moon rocket. The chairman tries to persuade

Harriman to not use the fuel, because it is dangerous. However, it turns out that it does not matter, because there is no nuclear fuel available.

- quiz/reading comprehension questions:
  1. What is LeCroix's experience as a space shuttle pilot?
  2. What does Harriman learn about the cause of the explosion of the power satellite?

Answers: 1— LeCroix was the relief pilot for the shuttle that went to and from the power satellite. 2—It was actually the shuttle that exploded and destroyed the satellite.

- Suggestion for reflection and discussion: If Harriman was able to obtain nuclear fuel, he would have used it for the moon rocket. Would this have been a good idea?
- Suggested activities/inquiry-based exploration: Have the students research the history of nuclear accidents such as Three Mile Island and Chernobyl.

## Chapter 7—

- prepare to read:
  - vocabulary
    - prospecting
  - Focus question: Ask the students whether they have a television antenna, cable TV, or a satellite dish.
- Chapter summary: Harriman meets with a television executive to discuss the feasibility of broadcasting from the moon. Then he meets with Coster and LeCroix to discuss problems with the moon rocket. The original plan was for a three person crew: LeCroix, Coster, and Harriman. Unfortunately, the rocket would weigh too much. They decide that there can only be one person on the first moon rocket and, to Harriman's and Coster's disappointment, the best choice is LeCroix.
- quiz/reading comprehension questions:
  1. Where will parts of the moon rocket fall?

- (a) The Pacific Ocean
- (b) Eastern Colorado and Kansas
- (c) Lake Michigan

2. What name does Harriman want to give to the first moon colony?

- (a) Harrimanville
- (b) Moonburg
- (c) Luna City

Answers: 1-b, 2-c

- Suggestion for reflection and discussion: Was Harriman being irresponsible when he chose Colorado Springs as the rocket launch site?
- Suggested activity/inquiry-based exploration: NASA avoided the dangers of launching multi-stage rockets over populated areas by locating the Kennedy Space Center in Cape Canaveral, Florida. Have the students research why that particular site was chosen.

## Chapter 8--

Prepare to read:

- vocabulary
  - auditor
  - acrimonious
  - exploitation
  - messiah
- Focus question/initiating activity: Strong is very loyal to Harriman, although he worries that the moon rocket venture will bankrupt them both. Ask the students if they think Strong is right to be so loyal.
- Chapter summary: Dixon and Entenza pay a visit on the office of Harriman and Strong. Harriman is out, but Entenza gives Strong a check so that he can remain a full partner. Dixon offers to buy a portion of Strong's share, which would give him financial control of the moon rocket venture. However, Strong remains loyal to Harriman and refuses to sell. When Harriman arrives, Entenza complains that Harriman has sold the television rights, which Entenza feels belongs to him by virtue of the partnership. Then Harriman leaves for Colorado Springs
- quiz/reading comprehension questions

1. What was the original relationship between Harriman and Strong?

2. Which historian does Dixon cite when referring to Harriman?

Answers: 1- Harriman was originally an employee of Strong. 2—Dixon refers to Thomas Carlyle, a Scottish historian.

- Suggestion for reflection and discussion: Is Harriman promoting his moon rocket venture to make money, or does he have another motivation?
- Suggested activities/inquiry-based exploration: Have the students research the history of the Robber Barons, especially financier and railroad magnate Edward Henry Harriman.

## Chapter 9--

- prepare to read:
  - vocabulary
    - prairie
    - stimulant
    - blockhouse
    - periscope
    - ululation
    - acceleration
  - Focus question/initiating activity: Ask if any of the students have ever seen a rocket launch.
- Chapter summary: This is the day of the rocket launch. Harriman meets with LeCroix one last time. When LeCroix leaves for the rocket, Harriman joins Strong and the other VIPS in the balcony above the control room. Harriman is too nervous to watch from there, so he goes outside. After watching the launch, he returns to the balcony, where the control room team is tracking the rocket's progress. When the excitement is over, Harriman speaks to the press and everyone departs.
- quiz/reading comprehension questions
  1. What is the name of the moon rocket?
    - (a) Eagle
    - (b) Spirit of Colorado Springs
    - (c) Apollo

(d) Pioneer

2. Where does the first stage (step five) of the rocket land?

(a) On a cow fifteen miles southwest of Dodge City, Kansas.

(b) On a mall in Kansas City

(c) In the Mississippi River

Answers: 1-d, 2-a

- Suggestion for reflection and discussion: Harriman has very little to do on the actual launch day. Why is that?

## Chapter 10—

- Prepare to read:
  - vocabulary
    - ballistic
    - stratosphere
    - kinetic
    - khaki
    - peasant
    - tousle
    - disconcerted
    - billboard
    - velocity
- Chapter summary: Harriman is sleeping when Coster calls to inform him that LeCroix has successfully landed on the moon. To save weight, the *Pioneer* did not have radio, so LeCroix marked two acres with black powder. A few days later, LeCroix lands the *Pioneer*. Harriman flies to the site from Colorado Springs and is first to arrive. LeCroix is patiently awaiting him while relaxing in the shade. The plane carrying Coster, Dixon, and Strong are the second to arrive closely followed by Entenza with both television and radio crews plus photographers.
- quiz/reading comprehension questions
  1. Where does LeCroix land the *Pioneer*?
  2. What does LeCroix find on the moon?

3. Had LeCroix really taken a package of cancelled stamps to the moon?

Answers: 1—West of Chihuahua, Mexico. 2—Diamonds. 3—No, they weighed too much.

- Suggestion for reflection and discussion: Ask the students why diamonds are so valuable.
- Suggested activities/inquiry-based exploration: The Apollo spacecraft landed by parachuting into the ocean, the Soyuz spacecraft land by parachuting on to dry land, and the Space Shuttle landed like an airplane. Have the students research the pros and cons of these three methods.

## Chapter 11—

- Prepare to read:
  - vocabulary
    - stenographer
    - autonomous
    - shenanigans
    - commodity
    - monopoly
  - Focus questions/initiating activity: When Dixon presses Harriman for a plan to actually make money on space travel, Harriman confesses that he does not know when that will be. Ask the students if they would have invested money with Harriman.
- Chapter summary: Harriman has a telephone conversation with van der Velde about diamonds on the moon and then has an argument with Strong about the stamps that never left the Earth. Strong extracts a promise from Harriman that they will repay everyone who invested in those stamps. Dixon and Entenza arrive, and Dixon is so concerned about losing his investment in the venture that he forces Harriman to make him the beneficiary of all Harriman's life insurance policies.
  - quiz/reading comprehension questions:
    1. What is Harriman's plan for the next trip to the moon?
      - (a) Another single astronaut mission.
      - (b) A three person trip with LeCroix, Coster, and Harriman.
      - (c) A colonizing trip including engineers, miners, and other technical people to found Luna City.
      - (d) A mission to establish a military base.

Answers: 1—b

- Suggestions for reflection and discussion: Harriman does not trust anyone else to run the space program, especially someone like Dixon. Why does he feel that way?
- Suggested activities/inquiry-based exploration: Dixon mentions Carl Sandburg. Have the students research him.

## Chapter 12—

- Prepare to read:
  - vocabulary
    - consultant
    - succor
    - rendezvous
  - Focus questions/initiating activity: Harriman changes his plan from the previous chapter and decides that the second mission to the moon will establish a colony. Is this wise?
- Chapter summary: The *Pioneer* was been retired to the Smithsonian, where it joins the Wright Brothers Flyer, the Spirit of St. Louis, and the X-1. Two new spaceships are under construction, and another is in the design stage. Harriman is working hard. The multi-stage rocket is now obsolete. The next rockets will be single stage and assisted by a catapult. Fuel ships will be placed in orbit, and the new rockets will rendezvous with them before continuing to the moon
- quiz/reading comprehension questions:
  1. What are the names of the ships under construction?
  2. How many people will the second rocket carry?
  3. Will the fuel ships have pilots?
  4. How many people will remain when the *Mayflower* returns to Earth?

Answers: 1—*Mayflower* and *Colony*; 2—Seven: Coster, Harriman, LeCroix, and two married couples, all scientists; 3—No, they will be piloted by robots; 4—four, the two married couples.

- Suggestions for reflection and discussion: Ask the students if they would like to live on the moon.

- Suggested activities/inquiry-based exploration: One of the new ships is named the *Mayflower*. Have the students research the voyage of the original *Mayflower* and the founding of the Plymouth colony.

### Chapter 13—

- Prepare to read:
  - vocabulary
    - specialist
    - begrudge
    - liquidate
    - patent
    - tangible
    - intangible
    - solvent
    - experimental
    - aviation
    - quiver
  - Focus question/initiating activity: Dixon does not trust anyone, including himself, to run the space travel venture except for Harriman. Is he right?
- Chapter summary: Harriman and Strong are in their office discussing the next moon mission when Dixon arrives. Dixon now controls Entenza's share of the venture. Dixon tells him that he cannot go, because he is too valuable to the space program to risk his life traveling to the moon. They argue. Then Dixon reveals that he is allied with Harriman's wife Charlotte. She threatens to divorce Harriman and sue him for his share of the moon venture. Finally, Dixon cites Harriman's friendship with Strong, who will go bankrupt if Harriman dies in the moon mission. Finally, Harriman agrees to forego his trip to the moon.
- quiz/reading comprehension questions
  1. What does Strong want to discuss at the beginning of the chapter?
    - (a) His love life.
    - (b) The Superbowl
    - (c) The automatic light switch that Harriman suggested in chapter one.
  2. What does Harriman want to discuss?
    - (a) The successful rendezvous of the first two tankers.
    - (b) His marriage

- (c) The World Series
- (d) His golf game

3. What does Harriman hope will happen on the next mission?

- (a) That they discover uranium on the moon.
- (b) That they will discover water.
- (c) That they will discover oxygen.
- (d) That there will be enough extra supplies that he can stay on the moon.

Answers: 1-c; 2-a; 3-d

- Suggestions for reflection and discussion: Ask the students whether they have ever been disappointed about not making a trip that they had planned?
- Suggested activities/inquiry-based exploration: Although Harriman's insurance policies make Dixon the beneficiary in case of Harriman's death, they do not cover space travel. Have the students research the typical exceptions that life insurance does not cover.

## Chapter 14—

- Prepare to read:
  - vocabulary
    - thunderstorms
    - catapult
    - temporary
    - notable
    - construction
  - Initiating activity: Harriman hides his disappointment at not being allowed to travel to the moon. Ask the students how they would feel.
- Chapter summary: On the day the *Mayflower* is launched, Harriman is cheerful and jokes with the crew. Dixon and Strong watch him. Strong is sorry that Harriman can't go, but Dixon is less sympathetic. The launch is successful, and Strong compares Harriman with Moses.
- quiz/reading comprehension questions
  1. What mountain is close to Colorado Springs?
  2. Where is the catapult?
  3. When will Dixon allow Harriman to travel to the moon?

4. Does Harriman care about his place in history?

5. When do the Mayflower's rockets fire?

Answers: 1—Pikes Peak; 2—On Pikes Peak; 3—Harriman can go to the moon when space travel is so routing that ordinary men like Dixon and Strong can run the operation; 4—No, he only wants to go to the moon; 5—After it is launched from the catapult.

- Suggestions for reflection and discussion: Ask the students if any of them want to make history.
- Suggested activities/inquiry-based exploration: Strong compares Harriman to Moses from the Bible. Have the students research his story.

**Plot Summary for *Orphans of the Sky*:** Although he doesn't know it, Hugh Hoyland lives on a generation starship. If Einstein's Special Theory of Relativity is true, it is impossible to travel faster than the speed of light. One proposed method to travel to the stars is to build ships in which entire generations are born, live out a normal life span, and die without ever having stepped on a planet. Like everyone else in his society, Hugh believes the ship is the entire universe. At some point in the distant past, a mutiny took place on the ship. The inhabitants are divided into two groups: the crew, Hugh's people, and the Muties, which stands for both mutineers and mutants, and there is constant warfare between them. Hugh is recruited into the officer/scientist/priest class. While on patrol, he is captured by the muties, whose leader is Jim/Joe, a two headed mutant, and made a slave. Jim/Joe is a benevolent master, fortunately, and allows Hugh to read pre-mutiny books and to visit the Main Control Room and the Captain's Veranda. Hugh learns that there is a world outside the ship that contains bright lights called stars and that the ship is moving. Hugh persuades Jim/Joe to allow him to return to his people and inform them of the truth. When he does so, he is imprisoned for heresy and sentenced to death. Led by Jim/Joe, the muties rescue him and capture Bill Ertz, the ship's chief engineer. After taking Ertz to the Main Control Room and the Captain's Veranda, they convince him that there is more to the universe than the ship and that Hugh's supposed heresy was the truth. They decide to send Ertz back to his people as a spy. After his return, he persuades Phineas Narby, Executive Assistant to the Captain, to meet with Joe/Jim and Hugh in a neutral location and come alone. Like Ertz, they take him up to the Main Control Room and the Captain's Veranda to convince him that Hugh was telling the truth. Narby, Ertz, Hugh, and Joe/Jim negotiate an alliance to take over the ship. Ertz will remain chief engineer, Hugh will become the chief astrogator, Narby the captain, and Joe/Jim Vice-Captain and leader of the muties. At a meeting of the ship's officers some time later, Narby, Ertz, Hugh, Joe/Jim, and their followers overthrow the old captain, killing him and his supporters in the process. While the new regime consolidates its conquest, Hugh studies astrogation and takes two wives. He eventually discovers a compartment that he deduces is a shuttle craft designed to transport people to and from the surface of a planet. Suspicious of Narby, Hugh secretly provisions the shuttle craft.

He also realizes that the ship will be passing closely by a star. When he and Ertz ask permission from Narby to make the maneuvers necessary to put the Ship into an orbit, they learn that Narby never believed that the ship moved through space or that there was even an “outside”. Instead, he concluded that the Main Control Room and the Captain’s Veranda were tricks installed by the original ruling class to fool the lower ones. By coincidence, this happens at the same time that Narby tries to disarm Joe/Jim and his mutie followers. Hugh, Ertz, their friends, and their wives escape the ship in the shuttle craft. Unfortunately, Joe/Jim dies in the process. They quickly find a gas giant planet with a habitable moon on which they land and begin a life there. Meanwhile, the ship continues on its trip through the galaxy, presumably until the end of time.

### **Characters-*Orphans of the Sky*:**

- **Hugh Hoyland** is the son of a farmer, but is recruited into the officer/scientist/priest class of the crew of the starship *Vanguard*.
- **Alan Mahoney** is a childhood friend of Hugh who grows up to become a farmer.
- **Mort Tyler** is another childhood friend of Hugh, but they are rivals for the same girl. He also becomes an officer/scientist/priest and the prosecutor at Hugh’s trial.
- **Edard Hoyland** is Hugh’s uncle and a farmer.
- **Lieutenant Nelson** is Hugh’s teacher and mentor.
- **Joe-Jim** is a two-headed mutant who leads a gang of Muties.
- **Bobo** is a dwarf who follows Joe-Jim.
- **Bill Ertz** is the assistant chief engineer and later the chief engineer of the *Vanguard*.
- **Phineas Narby** is the executive assistant to the captain and later the captain of the *Vanguard*.
- **Huff** was a metal smith who in 2172 led a mutiny on board the *Vanguard*.
- **Theodor Mawson** was the last captain of the *Vanguard* who was born on Earth.

## **SECTION SUMMARIES-ORPHANS OF THE SKY**

Note: *Orphans of the Sky* does not have numbered chapters.

### **PART ONE: “UNIVERSE”**

#### **Section One—**

- prepare to read:
  - vocabulary
    - conjecture
    - fracture
    - bulkhead
    - passageway
    - expostulate
    - assailant
    - slither

pedestrian  
monosyllable

- Initiating activity: The prologue refers to Proxima Centauri. Have the students research the star.
- Section summary: Hugh Hoyland and his two best friends, Alan Mahoney and Mort Tyler, are exploring the upper decks of the world when the encounter “muties”. The “muties” almost kill Hugh, but he escapes. They descend to the lower decks, where they live, and go their separate ways. Hugh returns home, where he lives with his aunt and uncle, Edard Hoyland, who is a farmer. His uncle takes Hugh along when he visits the Witness. The Witness, as the name indicates, witnesses contracts and events by composing poems. The meter and rhymes help him remember. After the Witness settles a dispute, Edard leaves, but Hugh remains, wishing to ask the Witness a question. Hugh wishes to know what is on the highest deck, which he considers the top of the world. The Witness has his apprentice recite the story of the creation of the world, named the Ship. Hugh did not know how the story answered his question, but promised to think about it. The next day after breakfast, Hugh summoned by the village scientist, Lieutenant Nelson to discuss his future. Nelson then recruits Hugh to join the officer/scientist class and has Hugh move in with him for his training.
- quiz/reading comprehension questions
  1. According to the Witness’s apprentice, who created the world?
  2. According to the Witness’s apprentice, who introduced sin into the world?
  3. When Hugh meets with Lieutenant Nelson, what choices does Nelson give him?

Answers: 1—Jordan; 2—Huff; 3—Hugh can join the officer/scientist class, or he will be killed and his body recycled, i.e. “converted”. He is too smart to remain a farmer.
- Suggestions for reflection and discussion: Hugh’s choices are rather limited. Ask the students what kind of choices they have.
- Suggested activities/inquiry-based exploration: The Ship is what science fiction writers call “generation starships”, which have been proposed as a way to travel to the stars without going faster than the speed of light. Have the students research Einstein’s Special and General Theories of Relativity to see why it is impossible to travel faster than the speed of light.

## Section Two—

- Prepare to read:
  - vocabulary
    - compartment
    - allegorical
    - gravitation
    - propinquity
  - Initiating activity: Anyone volunteering to serve on a generation starship knows that they will live out the rest of their life on the ship. Depending on the planned length of the voyage, their children, grandchildren, and so on will be born, live, and die on the ship. Ask the students if they would be willing to serve on such a voyage.
- Section summary: Hugh studies the ancient texts, but they confuse him as much as they inform him. Nelson tells him that ancient books should be read as figurative writings rather than literal ones. They also discuss the “muties”. Nelson says that they are descended from true humans, but because of Huff’s original sin, they cannot be considered to be persons. Nelson also informs Hugh that “mutie” has two meanings. The first is “mutineer” from Huff’s rebellion. The second is “mutant”, which is one of their punishments for the rebellion. When Hugh is not studying, he is working. When he works on the Converter, he meets Bill Ertz, Assistant Chief Engineer. Another of his assignments is to patrol the upper levels. His team is ambushed by muties, and Hugh is wounded. His team retreats and leaves him for dead
- quiz/reading comprehension questions
  1. What specific book do Hugh and Nelson discuss?
    - (a) *Basic Modern Physics*
    - (b) *The Hunger Games*
    - (c) *Harry Potter*
    - (d) *Twilight*
  2. What does the Converter do?
    - (a) Converts lead into gold
    - (b) Converts molecules in the air to food
    - (c) Converts ugly people into beautiful ones
    - (d) It recycles organic matter

3. What kind of weapon does a Mutie use to wound Hugh?

- (a) A sword
- (b) A knife
- (c) A slingshot
- (d) A phaser

Answers: 1—a; 2—d; 3—c

- Suggestion for reflection and discussion: There are no females among in the scientist/officer class of the Ship. Should there be?
- Suggested activities/inquiry-based exploration: The people on the Ship take recycling very seriously. Have the students research the history of the recycling movement.

### Section Three—

- Prepare to read:
  - vocabulary
    - checkers
    - saliva
    - supine
    - umbilicus
    - pantomime
    - compartment
  - Initiating activity: Both Joe-Jim and Bobo are mutations. Ask the students what they know about the concept. Be prepared for a discussion of the comic book *X-Men*.
- Section summary: Joe-Jim Gregory are playing checkers when Bobo delivers Hugh, who is unconscious, to their compartment. Bobo, who knocked Hugh out with his slingshot, wants to eat Hugh. Fortunately for Hugh, Joe-Jim want to interrogate him. After they give Hugh water, he tells them about himself.
- quiz/reading comprehension questions
  1. What is Joe-Jim’s mutation?
    - (a) He has two heads.
    - (b) He has wings.
    - (c) He can read minds.
    - (d) He can control the weather.

2. What is Bobo's mutation?

- (a) He has x-ray vision.
- (b) He can run at supersonic speeds.
- (c) He is four feet tall, but extremely strong.
- (d) He is six inches tall.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: It only takes a drink of water to get Hugh to cooperate with Joe-Jim. Should he have resisted?
- Suggested activities/inquiry-based exploration: Bobo is a cannibal. Have the students research the history of cannibalism.

#### Section Four—

- Prepare to read:
  - vocabulary
    - *de facto*
    - economical
    - repugnant
    - condition
    - disturbance
    - organization
  - Initiating activity: Explain to the students the concept of slavery.
- Section summary: Joe-Jim make Hugh their slave. Hugh does not try to escape, because Bobo sleeps outside their compartment and Joe-Jim have promised him that if Hugh tries to escape, Bobo may eat him.
- quiz/reading comprehension questions
  1. What do Joe-Jim allow Hugh to practice?
    - (a) knife throwing
    - (b) shooting
    - (c) wrestling
    - (d) acrobatics
  2. Why do Joe-Jim not allow Bobo to eat Hugh?
    - (a) They consider cannibalism to be immoral.

- (b) They are punishing Bobo.
- (c) Hugh has become their servant
- (d) They feel they can learn from Hugh.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Hugh seems to accept the condition of slavery rather easily. Ask the students why?
- Suggested activities/inquiry-based exploration: Have the students research the history of slavery in the United States.

### Section Five—

- Prepare to read:
  - vocabulary
    - figurative
    - humiliate
    - ignoramus
    - intellectual
    - conceit
    - temperament
    - spiritual
  - Initiating activity: Ask the students if they ever believed in Santa Claus, the Easter Bunny, or some idea like that.
- Section summary: Hugh explains the differing opinions of the nature of the universe among his people, the “realistic” one of the younger scientists and the “religious” one of the older ones. Joe-Jim tells him that both are wrong. Instead, according to Joe-Jim, the universe is much larger than Hugh believes, and the Ship moves through it. Joe-Jim decide to take Hugh to the highest level in the Ship to prove it to him
- quiz/reading comprehension questions
  1. According to the “religious” beliefs of a majority of Hugh’s people, what is the Trip to Centaurus?
    - (a) The place you go when you die.
    - (b) A journey in space to another planet.
    - (c) A story to control the common people.
    - (d) A video game.
  2. According to the “realistic” beliefs of a minority of Hugh’s people, what is the Trip to Centaurus?

- (a) The place you go when you die.
- (b) A journey in space to another planet.
- (c) A story to keep control the common people.
- (d) A video game.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Ask the students if they believe in a Heaven and Hell.

### Section Six—

- Prepare to read:
  - vocabulary
    - coherent
    - stanchion
  - Initiating activity: Ask the students to explain the difference between fiction and non-fiction.
- Section summary: Joe-Jim, Bobo, and Hugh ascent to the highest levels of the Ship, where there is no gravity. Then the move along the Ship's axis until they come to a door, which has so much mass that only Bobo can open it. Joe-Jim announces that they have come to the Main Control Room.
- quiz/reading comprehension questions
  1. Who does Jim regard as the greatest man who ever lived?
    - (a) Allan Quartermain.
    - (b) John Henry.
    - (c) Rudyard Kipling.
    - (d) Rhysling.
  2. Who is Joe-Jim's favorite poet?
    - (a) Rhysling
    - (b) Tennyson
    - (c) Kipling
    - (d) Browning.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Joe-Jim’s knowledge of the world comes from books and what they observe. Ask the students how they learn about the world.
- Suggested activities/inquiry-based exploration: Have the students study the difference between mass and weight.

### Section Seven—

- Prepare to read:
  - vocabulary
    - scaffold
    - acceleration
    - latticework
  - Initiating activity: Hugh finds the Main Control Room to be intimidating. Ask the students whether they have ever been anywhere as intimidating.
- Section summary: Joe-Jim and Hugh enter the Main Control Room, although Hugh tries to hang back. Joe-Jim has Hugh take a seat and manipulate some instruments that control the lights.
- quiz/reading comprehension questions
  1. How big is the Main Control Room?
    - (a) About 200 feet across
    - (b) The size of a large car
    - (c) Bigger than a football field
    - (d) The size of a basketball court.

Answers: 1—a

- Suggestion for reflection and discussion: Ask the students what the largest indoor facility they have ever been in.

### Section Eight—

- Prepare to read:
  - vocabulary
    - simulacrum

- inchoate
  - veranda
- Initiating activity: Ask the students if anyone of them have ever been in a planetarium.
  - Section summary: Joe-Jim activates the star field, and Hugh is overwhelmed. Joe-Jim informs him that the stars are outside the Ship. They are not looking directly at the stars, but rather a representation. Joe-Jim announces that he is hungry, so they and Bobo return to the apartment.
  - quiz/reading comprehension questions

1. How far away does Joe-Jim think the stars are from the Ship?

- (a) Thousands of miles
- (b) Millions of Years
- (c) Light years
- (d) Parsecs

2. What is the place where you can look directly at the stars?

- (a) The observation nose
- (b) The conning tower
- (c) The Captain's Veranda
- (d) The bridge

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Why should Joe-Jim and Hugh believe the stars are real? Why can't they be an illusion?
- Suggested activities/inquiry-based exploration: Have the students research the distances from the Earth to the stars.

### Section Nine—

- prepare to read:
  - vocabulary
    - midriff
    - earshot
    - gravitation
    - glimmer
    - ballistics

centrifugal  
manipulation  
auxiliary  
transformer

- Section summary: Having seen the Main Control Room, Hugh studies Joe-Jim's books with a passion. When he returns to the Main Control Room, Hugh tries to push the Acceleration button, but receives an error message saying "Main Engines—Not Manned". Joe-Jim tells him that they have been to the engine room, but there they get an error message saying "Control Room Not Manned".
- quiz/reading comprehension questions

1. How long was the Trip supposed to take?
2. How long had it taken to build the Ship?
3. Where was the Ship built?

Answers: 1—Sixty years; 2—Fifteen years; 3—In an orbit beyond the Moon.

- Suggestions for reflection and discussion: Ask the students to speculate what might happen if Hugh pressed the Acceleration button in the Main Control Room at the same time that Joe-Jim tries to activate the engines.

## Section Ten—

- Prepare to read:
  - vocabulary
    - serene
    - backspin
    - simultaneous
    - tractable
  - Initiating activity: Hugh wants to re-start the Ship's engine. Is this a good idea?
- Section summary: Hugh and Joe-Jim are sitting in the Captain's Veranda watching the stars when Hugh suggests re-starting the Ship's engine. Joe-Jim

disagrees at first, but is eventually persuaded. They conclude that they will have to recruit some people to make up a crew. Joe-Jim gives Hugh permission to go back to his people and persuade them that the Ship really moves.

- quiz/reading comprehension questions

1. Where is Joe-Jim sitting?

- (a) In the captain's chair
- (b) On a sofa
- (c) In a folding chair
- (d) On a futon

2. Who does Hugh think will believe him?

- (a) His family
- (b) His friends
- (c) The peasants
- (d) The scientists

3. What number do Hugh and Joe-Jim conclude is the minimum number to form a crew?

- (a) Four hundred
- (b) Three
- (c) Twelve
- (d) One hundred

Answers: 1—a; 2—d; 3—c

- Suggestion for reflection and discussion: Hugh thinks he will be able to persuade people that the Ship moves. Is he being naïve?

### **Section Eleven—**

- Prepare to read:
  - vocabulary
    - inadvertent
    - seniority
    - precedent
    - paramount
    - territory
    - impassive

- heresy
- Chapter summary: Bobo escorts Hugh to neutral territory, and Hugh proceeds alone from there. When he meets people, no one recognizes him and he finds his way to the office of Bill Ertz, now chief engineer of the Ship. He tell his story to Bill, who then takes him to a compartment where he can sleep. When Hugh awakes, he finds that he is a prisoner. When Bill arrives, he informs Hugh that he will stand trial for heresy.
- quiz/reading comprehension questions

1. Who has Hugh's old job?

- (a) Mort Tyler
- (b) Lieutenant Nelson
- (c) Phineas Narby.
- (d) Edard Hoyland.

2. Who is going to preside over Hugh's trial?

- (a) An elected judge.
- (b) The council of scientists.
- (c) The captain.
- (d) Lieutenant Nelson.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Why does Bill think Hugh is a heretic?
- Suggested activities/inquiry-based exploration: Have the students research the life of Giordano Bruno, who was burned at the stake for heresy.

### Section Twelve—

- Prepare to read:
  - vocabulary
    - belligerency
    - prerogative
    - affirmation
    - gist
    - deviation
    - contention

- Chapter summary: The captain presides at Hugh’s trial, and Mort Tyler, Hugh’s childhood friend, is the prosecutor. Tyler argues that Hugh’s imprisonment by the muties have driven him insane, which is why he has lapsed into heresy. Hugh is sentenced to death
- quiz/reading comprehension questions

1. What aspect of Hugh’s birth is mentioned to show a tendency toward heresy?

- (a) His head was larger than normal at birth
- (b) He was underweight
- (c) He was overweight
- (d) He was born prematurely

2. What is Hugh’s final word?

- (a) “I am an innocent man.”
- (b) “Have mercy!”
- (c) “It *still* moves.”
- (d) “I curse you all.”

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Ask whether the students feel Hugh received a fair trial.
- Suggested activities/inquiry-based exploration: Have the students research the trial of Galileo.

### Section Thirteen—

- Prepare to read:
  - vocabulary
    - radiation
    - recrimination
    - vicarious
    - aberration
    - hydrogen
    - acquaint
    - benefactor
  - Initiating activity: Ask the students to imagine what it would be like to be on “death row”.

- Section summary: Hugh is in his cell awaiting execution when his old teacher Lieutenant Nelson visits. Unfortunately, Nelson believes that Hugh is truly insane and is advocating heresy. Nonetheless, Nelson promises to ask his childhood friend Alan Mahoney to visit him. Alan later comes to visit and informs Hugh that his trial and sentence have been kept secret. Alan suggests that he and some other friends try to break Hugh out of his prison. Hugh gives Alan directions on how to find Bobo.
- quiz/reading comprehension questions
  1. What item does Nelson promise to send Hugh?
    - (a) Chewing tobacco
    - (b) Pizza
    - (c) A book
    - (d) A video game.
  2. What was one reason for Tyler’s animosity toward Hugh?
    - (a) Hugh once beat Tyler up.
    - (b) Hugh and Tyler were once lovers, but Hugh dumped him for Alan.
    - (c) They both liked the same girl, and Tyler married her after Hugh’s capture.
    - (d) Tyler wanted to eliminate Hugh as a rival for promotion.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Ask the students whether they think Hugh has any chance to escape.
- Suggested activities/inquiry-based exploration: Have the students check the story of Socrates from Plato’s dialogue *Crito*.

#### **Section Fourteen—**

- Prepare to read:
  - vocabulary
    - foolhardy
    - peril
    -
- Initiating activity: Note that Joe-Jim reads physical books. Explain to the students that Heinlein was writing before anyone was predicting e-books.
- Section summary: Alan climbs higher than he ever climbed before. Bobo hits him in the stomach with his slingshot, captures him, and takes him to Joe-Jim. Alan

- persuades Joe-Jim to form a party to rescue Hugh.
- quiz/reading comprehension questions

1. What is Joe-Jim reading when Alan arrives?

- (a) Robert Browning's *Collected Poems*
- (b) *War and Peace*
- (c) *A Tale of Two Cities*
- (d) *The Three Musketeers*

2. How many people are going to be in the rescue party?

- (a) a hundred
- (b) three
- (c) Six (Seven if you count Joe-Jim as two people)
- (d) twenty

Answers: 1—a; 2—c

### Section Fifteen—

- Prepare to read:
  - vocabulary
    - commotion
    - methodical
    - intersection
- Chapter summary: Hugh is sitting in his cell when he hears noises. Then the door opens and Alan enters. They quickly exit and find themselves in the middle of a knife fight. Alan kills Tyler as the rescue party escapes. Then they run into a group led by Bill Ertz, whom they capture in the melee. They take Bill up to the Captain's Veranda to show him the stars.
- quiz/reading comprehension questions

1. While everyone else is using knives, what weapon does Bobo use?

- (a) Slingshot
- (b) Short sword
- (c) Axe
- (d) Saber

Answers: 1—a

- Suggestion for reflection and discussion: Ask the students what Hugh should do next.

## **PART TWO: “COMMON SENSE:**

### **Section One—**

- Prepare to read:
  - vocabulary
    - tranquil
    - probation
    - bloodthirsty
    - exterminate
- Chapter summary: After taking Bill Ertz to the Captain’s Veranda and showing him the stars, Hugh and Joe-Jim decide to kidnap other scientists and repeat the process.
- quiz/reading comprehension questions
  1. Why can’t Joe-Jim be happy with the status quo?
    - (a) The ship’s officers are planning to exterminate the muties.
    - (b) The ship is about to crash.
    - (c) The ship is near its destination.
    - (d) They are running out of food.
  2. What assumption(s) does Hugh make?
    - (a) That the engines can be restarted.
    - (b) That the ship’s navigation system still works.
    - (c) That seeing the stars immediately convinces someone that the ship moves.
    - (d) All of the above.

Answers: 1—a; 2—d

- Suggestion for reflection and discussion: How plausible is Hugh’s plan?

### Section Two—

- Prepare to read:
  - vocabulary
    - befuddle
    - rationalism
    - embarrassment
    - belligerent
- Initiating activity: Ask the students if they know any dwarfs or midgets.
- Section summary: Joe-Jim asks Bill to confirm that the scientists plan to exterminate the muties. Bill does confirm the plan but adds that any muties who surrender and can be put to work will be spared. Under Joe-Jim’s further questioning, Bill admits that this would apply only to muties without any obvious physical differences. Muties like two-headed Joe-Jim and dwarfish Bobo would be put to death even if they surrendered peacefully.
- quiz/reading comprehension questions
  1. What do the muties eat?
    - (a) pigs and children
    - (b) Food from the replicator
    - (c) Food from the pantry and refrigerator
    - (d) They don’t. They don’t need food.
  2. What is Bill’s new status?
    - (a) Leader of the muties
    - (b) Captain of the ship
    - (c) Probationary officer
    - (d) Prisoner of war

Answers: 1—a; 2—d

### Section Three—

- Prepare to read:

- vocabulary
  - peasant
  - formulate
  - wholehearted
  - apostate
  - moron
  - culture
  
- Initiating activity: Ask the students if they have ever heard the term “blood brothers”
  
- Chapter summary: Joe-Jim asks Alan if he knows about the plan to exterminate the muties. He did not, but he did confirm that a new junior officer had been assigned to his village and that there were more military drills and weapons training than before. Bill agrees to join Hugh and Joe-Jim in their plan. They confirm their agreement by engaging in some sort of blood exchange ceremony.
- quiz/reading comprehension questions

1. Assuming they can bring any officers to the Captain’s Veranda and the Main Control Room, what will happen to the officers who are still not convinced that the Ship moves?

- (a) They will be put to death.
- (b) They will be demoted.
- (c) They will be put into protective custody.
- (d) None of them will fail to be convinced.

2. Where does Joe-Jim cut himself?

- (a) On his thumb.
- (b) On his wrists.
- (c) In the upper part of his left arm.
- (d) On his neck.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: The female crewmembers do not get weapons training. Is this fair?

#### **Section Four—**

- Prepare to read:

- vocabulary
  - historian
  - musketeer
  - illustration
  - sanguinary
  - infinite
  - research
- Initiating activity: Ask the students whether they have read or seen a movie based on *The Three Musketeers*.
- Section summary: It is decided that Alan will return to the lower levels as a spy. Bill reads *The Three Musketeers*. Discussing the book with Joe-Jim leads Joe-Jim to research their other books for ideas for weapons besides knives and slingshots. Then they meet with more muties.
- quiz/reading comprehension questions
  1. What does Alan tell Hugh about the old Witness from the beginning of the book?
    - (a) He is dead
    - (b) He is still the village historian.
    - (c) He has been promoted to be historian of the whole ship.
    - (d) He is alive but retired.
  2. According to Hugh, what is a house?
    - (a) A riding animal
    - (b) A brokerage firm
    - (c) A kind of compartment
    - (d) A physician

Answers: 1—a; 2—c
- Suggestion for reflection and discussion: No one on the ship has ever seen a horse or a picture of one. Ask the students how well Hugh does in describing one to Bill.
- Suggested activities/inquiry-based exploration: Have the students research the history of knives.

**Section Five—**

- Section summary: Joe-Jim introduces Hugh, Alan, and Bill to the muties who have not met them and says that they all have the right of safe passage and protection. Furthermore, they have the authority to give orders in his absence. When a mutie questions the orders, Joe-Jim has Bobo kill the mutie with his slingshot and allows the other muties to divide up the body for food. After they are finished, he orders three of them to accompany Bobo, Alan, and Bill to the lower decks. At one point, they leave the muties to continue to the inhabited levels, ordering that at least one stay there at all times and wait for their return
- quiz/reading comprehension questions
  1. Who is the mutie who questions Joe-Jim's order?
    - (a) Jack-of-the-Nose
    - (b) Long Arm
    - (c) Forty-one
    - (d) The Ax
  2. How far down does the group go before they leave the muties behind?
    - (a) A mile
    - (b) One hundred yards
    - (c) Forty decks
    - (d) They never leave the muties

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Ask the students whether they think Joe-Jim overreacted to the challenge to his authority.

## Section Six—

- Prepare to read:
  - vocabulary
    - rummage
    - irrational
    - indispensable
- Chapter summary: Assuming the Bill is dead, Phineas Narby is going through Bill's desk, where he finds books. Narby considered Bill a rival to succeed the captain, whom he is contemplating assassinating. Narby wants to become Captain himself.

- quiz/reading comprehension questions
  1. What is Narby's title?
    - (a) Executive Assistant to the Captain
    - (b) Astrogator
    - (c) Senior Watch Officer of the Converter
    - (d) Chief Engineer
  2. Where do Narby's talents lie?
    - (a) Tending the converter
    - (b) Servicing the power lines
    - (c) Administration and personnel
    - (d) Military affairs

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Explain to the students to concept of “the power behind the throne”.

### **Section Seven—**

- Prepare to read:
  - vocabulary
    - afterthought
    - requisition
    - imagination
  - Initiating activity: Ask the students whether they get angry if someone goes through their desk or other personal space.
- Chapter summary: Bill interrupts Narby as he is going through Bill's desk. Narby assumes that Bill escaped. They get into an argument about the disposal of Tyler's body and some of the books in Bill's desk. Bill agrees to lend them to Narby.
- quiz/reading comprehension questions
  1. What happened to Mort Tyler's body?
    - (a) It was fed to the converter.
    - (b) It was cut up for food.
    - (c) It is being kept on ice pending an autopsy.

(d) It is at a funeral home to be viewed by friends and relatives.

Answers: 1—a

- Suggestion for reflection and discussion: Narby assumes that Bill escaped from the muties. Ask the students why he would do this.

### Section Eight—

- Prepare to read:
  - vocabulary
    - receipt
    - handicap
    - fanatic
- Chapter summary: Bill talks to Narby and discusses the possibility of contacting Hugh, now in the Mutie-controlled parts of the Ship. Bill tricks Narby into tentatively approving an attempt. Bill works at his regular job and sends for Alan. They agree to meet later on a higher deck.
- quiz/reading comprehension questions
  1. Why does Narby think Bill wants to contact Hugh?
    - (a) To gather intelligence about the muties.
    - (b) Narby thinks they are lovers.
    - (c) Narby thinks Bill has gone over to the mutie side.
    - (d)
  2. What is Alan's social and economic status?
    - (a) He is a married farmer with a big family.
    - (b) He is a scientist with a wife but no children.
    - (c) He is unmarried, has no children, and owns no property.
    - (d) He is a Witness without a family.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Neither Bill nor Narby are honest with

each other. Who has the upper hand at this time?

### Section Nine—

- prepare to read:
  - vocabulary
    - rendezvous
    - precaution
    - identification
    - artisan
    - taboo
    - adjacent
    - neutral
    - territory
    - thermodynamic
    - tithe
    - shrill
- Initiating activity: Ask the students whether any of them have ever seen a demonstration of knife making.
  
- Section summary: Bill and Alan climb the decks until they reach the spot where the muties are waiting. Forty-One is on duty, and Bill dispatches him to find Hugh and bring him there. Bill only finds Bobo at Joe-Jim's apartment, and Bobo directs him to the knife maker. He finds Joe-Jim in an argument with the knife maker, aka the Mother of Blades. He wants her to make swords, but she only wants to make throwing knives. He eventually wins
- quiz/reading comprehension questions
  1. What is the name of the knife maker's shop?
  2. What is her mutation?
  3. The knife maker gets paid when and how?

Answers: 1—Thermodynamic laboratory; 2—She has four arms; 3—She gets paid in food and a percentage of the meat every time the knife kills something.
- Suggestions for reflection and discussion: The knife maker is one of few female characters in *Orphans of the Sky*. Discuss the status of women in this story.
- Suggested activities/inquiry-based exploration: Have the students research the history of swords.

## Section Ten—

- Prepare to read:
  - vocabulary
    - picayune
    - caliber
    - emulate
    - deceit
- Section summary: Forty-One informs Joe-Jim that Ertz has requested a meeting with Hugh. Joe-Jim climbs to the Main Control Room and finds him.
- quiz/reading comprehension questions
  1. What is the slogan of *The Three Musketeers*?
    - (a) All for one and one for all.
    - (b) Onward Christian soldiers
    - (c) Remember the Alamo
    - (d) Give me liberty or give me death.
  2. What is Hugh's favorite place in the whole ship?
    - (a) The Captain's Veranda
    - (b) Joe-Jim's apartment
    - (c) The engine room
    - (d) The Main Control Room
  3. Who is guarding Hugh?
    - (a) Jack-of-the-Nose
    - (b) Long Arm
    - (c) Squatty and Pig
    - (d) The Ax

Answers: 1—a; 2—d; 3—c

- Suggestion for reflection and discussion: Hugh wants to be a spaceship pilot. Ask if any of the students harbor similar ambitions.
- Suggested activities/inquiry-based exploration: Have the students

research the life of Archimedes.

### Section Eleven—

- Prepare to read:
  - vocabulary
    - orb
    - stellarium
    - astrogator
    - manipulate
- Chapter summary: Joe-Jim enters the Main Control Room, where they find Hugh studying the stars and inform him that Bill has requested a meeting. Before they leave, he shows them a star that is getting progressively larger and therefore closer. Joe-Jim reply that they had noticed the star, too. However, they had not realized that this may mean that the ship is near *the End of the Trip*.
- quiz/reading comprehension questions

1. Where is Hugh sitting?

- (a) In the chair of the chief astrogator
- (b) In the captain's chair
- (c) In the science officer's chair
- (d) In the communications officer's chair

2. Is the star that is getting closer Far Centaurus?

- (a) Yes
- (b) No
- (c) Maybe
- (d) It is not a star. It is a giant space station.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: If the Ship is getting close to a star, then how urgent is it for Hugh and the others to get control of it?

### Section Twelve—

- Prepare to read:

- vocabulary
  - savvy
  - provocative
- Chapter summary: Bill informs Hugh and Joe-Jim about his meeting with Narby and his plan to lure him to the upper decks. They agree and dispatch Alan to escort him.
- quiz/reading comprehension questions
  1. Why do they send Alan rather than Bill?
    - (a) Narby will not expect Alan to know anything.
    - (b) Narby has been trying to seduce Alan.
    - (c) Narby trusts Alan.
    - (d) Bill wants to spend more time on the upper decks.
  2. Why don't they kill Narby, as Joe-Jim wants?
    - (a) They like him.
    - (b) They want to make him their servant.
    - (c) If they can persuade Narby that the Ship moves, they might not have to fight any more.
    - (d) Narby is unimportant.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Ask whether the students whether they think Bill's plan will work.

### **Section Thirteen—**

- Prepare to read:
  - vocabulary
    - precipitous
    - cuff
    - exasperation
    - recalcitrant
    - churl
    - preposterous
    - shrewd
    - pique
    - composure

- Section summary: After passing through several intermediaries, Alan delivers the message. Narby accompanies Alan to the meeting place, where Bill, Hugh, Joe-Jim, and Bobo are waiting. Narby draws his knife and attempts to run away. However, Bobo catches and disarms him. When everyone calms down, Joe-Jim orders Bobo to return Narby's knife.
- quiz/reading comprehension questions
  1. Why does Narby not take at least one guard to the meeting?
    - (a) The guard would be a witness.
    - (b) He is not afraid of Bill
    - (c) He is an expert knife fighter.
    - (d) The meeting is in a safe place.
  2. Why does Bobo not kill Narby?
    - (a) He likes him.
    - (b) Narby is too strong for him.
    - (c) Joe-Jim takes away his knife and slingshot.
    - (d) Bobo does not believe in violence.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Are Hugh and Bill making a mistake by letting Narby live?

#### **Section Fourteen—**

- Prepare to read:
  - vocabulary
    - preposterous
    - mendacious
    - absurd
    - contradiction
    - transverse
    - buoyant
    - taciturn
    - stratagem
    - unprecedented
    - predecessor

- Section summary: Now that Narby no longer resists, they can have their meeting. Bill tells him that he now believes Hugh's claim that the Ship really moves. They take Narby first to the Captain's Veranda and then to the Main Control Room. Narby is impressed. They continue the meeting in Joe-Jim's apartment. Narby agrees to help them bring the Ship under their control, and they make a plan.
- quiz/reading comprehension questions

1. Is Joe-Jim the leader of all the muties?

- (a) No, but he is the leader of the largest and strongest gang of muties
- (b) Yes.
- (c) No, because he is not a leader.
- (d) No, but he is the leader of all the dangerous ones.

2. Since Narby still has his knife, why doesn't he just leave?

- (a) He is curious
- (b) He is not afraid
- (c) He is surrounded by muties.
- (d) He enjoys their company.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Has Narby actually said that he is convinced that the Ship moves?

### Section Fifteen—

- Prepare to read:
  - vocabulary
    - *coup d'état*
    - pertinent
    - wistful
- Section summary: The meeting continues. Narby convinces Bill and Hugh that there will need to be a new captain. They decide that Narby will be the new captain, Joe-Jim vice-captain in charge of the muties, and Hugh will become chief astrogator. Bill will remain in his old job of chief engineer, but will also be responsible for re-starting the ship's main engine
- quiz/reading comprehension questions

1. What will happen to the old captain?

- (a) It is not discussed in this section.
- (b) He will retire.
- (c) He will be demoted.
- (d) He will be executed

Answers: 1—a

- Suggestion for reflection and discussion: Ask the students what they think will happen to the captain and the officers who side with him if the plan succeeds.

### Section Sixteen—

- Prepare to read:
  - vocabulary
    - countenance
    - agenda
    - hydroponic
    - parchment
    - insolence
    - depredation
    - ordain
- Chapter summary: At a meeting of all but a few of the ship's officer and the captain, Narby announces that he has made a truce with the muties. The captain orders Narby's arrest.
- quiz/reading comprehension questions
  1. What was the original purpose of the assembly hall?
    - (a) It was a gymnasium.
    - (b) It was a shuttle hangar.
    - (c) It was a convention center.
    - (d) It was a theater.
  2. What is written on the piece of parchment delivered to Narby during the meeting?
    - (a) "Abort"

- (b) “Delay”
- (c) “Wait 15 minutes”
- (d) “Ready”

Answers: 1—a; 2—d

### Section Seventeen—

- Prepare to read:
  - vocabulary
    - dissident
    - bloc
    - *en masse*
  - Section summary: Bill, Hugh, Joe-Jim, Bobo and a contingent of more muties enter the assembly hall and surround the officers. They are armored and carry either a knife or a sword. Bobo kills the captain with his knife. An elderly officer objects, and Bobo kills him too. Narby then asks the rest of the officers to swear allegiance to him as the new captain. Bill is the first. Only a handful of officers refuse, and the muties with swords slaughter them
  - quiz/reading comprehension questions
    1. Who asks that Narby spare the officers who refuse to swear allegiance to him?
      - (a) Bill
      - (b) Hugh
      - (c) Alan
      - (d) Lieutenant Nelson
    2. Who is among the officers killed?
      - (a) Bill
      - (b) Hugh
      - (c) Alan
      - (d) Lieutenant Nelson, Hugh’s old teacher, mentor, and friend

Answers: 1—a; 2—d

- Suggestion for reflection and discussion: Ask the students what how they think Hugh must feel when he sees his old friend Lieutenant Nelson killed.

## Section Eighteen—

- Prepare to read:
  - vocabulary
    - conquest
    - consolidation
    - amplify
    - individual
    - allegiance
    - ballistics
    - topology
    - neurology
    - catalyst
    - hiatus
    - sophisticated
    - metrical
    - parallax
    - parsec
    - magnitude
    - futility
    - flexure
  - Initiating activity: Ask the students if they are good in math and science.
- Chapter summary: Joe-Jim's gang, supported by Narby's forces, kill or force the surrender of most of the rest of the muties. Hugh studies the remaining scientific textbooks in an effort to teach himself physics and astronomy. It is not easy for him. At the same time, he selects two wives, a widow and a younger, prettier, never married, woman.
- quiz/reading comprehension questions
  1. What concepts give Hugh the most trouble?
    - (a) Measured time and deep space.
    - (b) Ballistics and topology.
    - (c) Engineering and cooking
    - (d) Neurology and chemistry.
  2. What does Hugh find in the Main Control Room that helps him?

- (a) Cheat sheets.
- (b) An iPad.
- (c) Time pieces
- (d) A television

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Hugh slaps the young woman after she bites him. Is this physical abuse?

### Section Nineteen—

- Prepare to read:
  - vocabulary
    - superficial
    - dilettante
    - pacification
    - contemptuous
    - administrator
    - authority
  - Initiating activity: Remind the students about Narby’s reaction to the Captain’s Veranda and the Main Control Room. Did he ever say whether he believed the Ship moved?
- Section summary: Hugh seeks out Joe-Jim to ask him a question. He finds them just as a meeting between him and Narby is ending. Narby reports that he has made the Main Control Room and the Engine Room off limits to everyone who has not visited it previously, including officers. When Hugh points out that the original plan was to bring people up there to show them that the Ship really moved, Narby replies that this would create a disturbance.
- quiz/reading comprehension questions
  1. How many muties does Joe-Jim believe are still left to subdue?
    - (a) A few dozen
    - (b) None
    - (c) About a hundred
    - (d) About a thousand
  2. How many assistants will Hugh need to pilot the Ship?
    - (a) Two

- (b) One
- (c) None
- (d) Ten

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Narby lets Hugh think that the prohibition against visiting the Control Room or the Engine Room is temporary. Is it really?

### **Section Twenty—**

- Section summary: It occurred to Hugh that there must be a way to exit the ship, but no one knew of one. Joe-Jim remembers that there are seven locked doors near the Main Control Room. He leads Hugh and Bobo to them, and they manage to open one.
- quiz/reading comprehension questions

1. Why doesn't Hugh like Narby's policy on access to the Main Control Room and the Main Engine Room?

- (a) Hugh feels that the truth should be free.
- (b) He is lonely when he is in the Main Control Room.
- (c) He is worried that Narby is not going to allow him to pilot the Ship.
- (d) He feels that any order Narby gives is to his detriment.

2. Why must there be an exit from the Ship?

- (a) There needs to be an emergency egress.
- (b) The original crew might have wanted to take space walks.
- (c) The whole point of the voyage was to arrive at another planet and colonize it. To do so the inhabitants have to leave the Ship at some point.
- (d) There needs to be a way to re-supply the ship.

Answers: 1—a; 2—c

### **Section Twenty-One—**

- Prepare to read:
  - vocabulary

- vacuum
  - vestibule
  - ajar
- Chapter summary: Joe-Jim, Hugh, and Bobo pass through the door and two others until they find a group of compartments. Joe-Jim also finds a small converter.
  - quiz/reading comprehension questions
    1. What is so unusual about the converter?
      - (a) An apartment that size does not need a converter.
      - (b) It converts water into alcohol.
      - (c) It converts lead into gold.
      - (d) It converts inorganic material into organic.
    2. Why is it fortunate that none of the doors lead directly to the outside?
      - (a) They had no food.
      - (b) They had no water.
      - (c) None of them were wearing space suits
      - (d) None of them were wearing sunglasses.

Answers: 1—a; 2—c

### Section Twenty-Two—

- Prepare to read:
  - vocabulary
    - experiment
    - acceleration
    - corresponding
- Chapter summary: Hugh has found a small compartment with one wall made of glass, two acceleration chairs, and controls like those in the Main Control Room. After a discussion of what they have found, Hugh speculates that this is a small Ship inside the big Ship
- quiz/reading comprehension questions
  1. What do the accidentally open?

- (a) An air lock.
- (b) A vault.
- (c) A box.
- (d) An oxygen tank

Answers: 1—a

- Suggestion for reflection and discussion: Is this a possible way off the ship?

### Section Twenty-Three—

- Prepare to read:
  - vocabulary
    - simultaneous
    - metal smith
    - spartan
  - Chapter summary: Hugh and Joe-Jim discover the ship's log. After some routine entries, the officer of the watch describes the original mutiny. It began on June 6, 2172, and it was led by a man called Huff, a metal smith. Then there is a gap in the entries until October 1 of the same year. The new captain, Theodor Mawson, formerly a storekeeper, describes the condition of the ship. The mutiny has been suppressed, but all officers and about 90% of the people on board before the mutiny are dead. The main engine and the anti-radiation shield are no longer operating, and about one out of every twenty newborns has observable birth defects.
  - quiz/reading comprehension questions
    1. When the mutiny began, the officer of the watch dispatched three crewmembers to find the captain. What happened to them?
      - (a) Two were killed by the mutineers, and the third was sent back to the Main Control Room to relay an order to surrender.
      - (b) They rescued the captain.
      - (c) They escaped from the Ship.
      - (d) They helped suppress the mutiny.
    2. What policy does the new captain start regarding babies with birth defects?

- (a) They are put into hospice care.
- (b) They are cared for by their parents.
- (c) They are put to death.
- (d) They are evacuated from the Ship.

Answers: 1—a; 2—c

- Suggested activities/inquiry-based exploration: Have the students contrast and compare the story of the mutiny in the ship's log to the one recited by the Witness early in the book.

### Section Twenty-Four—

- prepare to read:
  - vocabulary
    - feeble
    - orientation
    - comprehend
    - embark
    - encyclopedia
- Initiating activity: Ask the students if any of them have ever tried to write a blog and compare that to the ship's log.
- Section summary: In the last entry of the ship's log, Mawson writes that he is the last member of the crew who was born on Earth and that his shipmates have a hard time imagining life on a planet. He also writes that not all crewmembers are being taught to read. Mawson is hiding the log in the one remaining shuttle craft for safekeeping.
- quiz/reading comprehension questions
  1. How old was Mawson when the Ship's voyage began?
  2. What books did someone almost feet to the Converter?
  3. What happened to the other shuttle crafts?

Answers: 1—Five; 2—Encyclopedia Terrestriana; 3—Some of the mutineers escaped in them.
- Suggestions for reflection and discussion: Ask the students to imagine what it

would be like to grow up without ever seeing the sky.

### Section Twenty-Five—

- Prepare to read:
  - vocabulary
    - casualty
    - hyperbola
    - trajectory
    - preposterous
    - ellipse
    - eccentric
- Section summary: Hugh provisions the shuttle. He also studies the star the ship is heading toward.
- quiz/reading comprehension questions
  1. What happens to the bodies of people killed in the war with the Muties?
    - (a) They are processed by the Converter.
    - (b) They are buried with military honors.
    - (c) They are cremated.
    - (d) They are left where they died.
  2. Who never really understood the difference between a planet and a star?
    - (a) Hugh
    - (b) Joe-Jim
    - (c) Bill
    - (d) Alan
  3. What does Hugh want to do regarding the Ship and the Star?
    - (a) Land on the star
    - (b) Pass by it
    - (c) Go into orbit around the star

Answers: 1—a; 2—d; 3—c

- Suggestion for reflection and discussion: Hugh does not inform Narby that he is provisioning the shuttle. Why would he do that?
- Suggested activities/inquiry-based exploration: Have the students study the differences between circles, ellipses, parabolas, and hyperbolas.

### Section Twenty-Six—

- Prepare to read:
  - vocabulary
    - breechcloth
    - pamper
- Section summary: Hugh and Bill decide to inform Narby that it is time to start the main engine and make maneuvers to go into orbit around the star. Together with Alan, the head toward Narby's office.
- quiz/reading comprehension questions

1. Why do Hugh and Bill have to get Narby's permission before starting to maneuver into orbit?

- (a) Narby is the captain.
- (b) Only Narby knows how .
- (c) Only Narby has the computer passwords.
- (d) They are not sure whether it is a good idea.

2. Where is Joe-Jim?

- (a) Reading
- (b) Fighting
- (c) Meeting with Narby
- (d) Eating.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Hugh and Bill follow the chain of command by asking Narby's permission before re-starting the main engine. Why would they do that?

### Section Twenty-Seven—

- Prepare to read:

- vocabulary
  - crestfallen
  - ubiquitous
  - *sotto voce*
- Section summary: Bill, Hugh, and Alan approach Narby’s office, but have to turn over their weapons to a guard before entering. They find that Narby and Joe-Jim are arguing over Narby’s order that muties loyal to Joe-Jim turn over their weapons. Hugh then informs Narby that it is time to start the main engine and move the Ship.
- quiz/reading comprehension questions

1. Who else is present during the meeting?

- (a) Bobo.
- (b) Narby’s wife.
- (c) Squatty.
- (d) Hugh’s uncle.

2. Why does Narby require that people be disarmed before entering his office?

- (a) Narby doesn’t like weapons.
- (b) Weapons interfere with the electronics in his office.
- (c) The previous captain had been assassinated, and Narby does not want the same thing to happen to him.
- (d) Narby is allergic to knives.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: Why does Narby want Joe-Jim’s followers disarmed?

### **Section Twenty-Eight—**

- Prepare to read:
  - vocabulary
    - hoax
    - superstitious
    - immutable
    - disconcerted

- postpone
- Section summary: Narby denies permission for Hugh and Bill to start the main engine and begin orbital maneuvers. Narby reveals that he never believed that the Ship moves. Instead, he believes that the Main Control Room and the Captain's Veranda are devices created by ancient engineers to persuade superstitious and gullible ordinary people that the Ship moves. He also believes that Hugh and Bill are delusional.
- quiz/reading comprehension questions
  1. Why does Narby not believe that the Ship moves?
    - (a) It is contrary to common sense.
    - (b) His parents told him that the Ship does not move.
    - (c) He has proven it scientifically.
    - (d) He has had a revelation.
  2. What is Narby's response to Bill's request to let them try to move the Ship?
    - (a) Narby says no.
    - (b) Narby says yes.
    - (c) Narby says that he will consider it.

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: According to Narby, common sense dictates that the Ship cannot move. Ask the students why they believe the Earth moves.

### **Section Twenty-Nine---**

- Prepare to read:
  - vocabulary
    - judicious
    - superfluous
- Section summary: The conversation returns to the subject of disarming Joe-Jim's followers, and Bill sides with Joe-Jim. Narby reveals that the purpose of the meeting was really to trap for Joe-Jim, and several armed guards enter the room. When Narby orders Joe-Jim and Bobo arrested, they resist.

- quiz/reading comprehension questions

1. What happens to Bobo?

- (a) He is stabbed in the ribs, but still alive.
- (b) He is unharmed.
- (c) He is killed.
- (d) He escapes.

2. What happens to Narby?

- (a) He is stabbed in the ribs, but still alive.
- (b) He is unharmed.
- (c) He is killed.
- (d) He escapes.

Answers: 1—a; 2—d

- Suggestion for reflection and discussion: Did Narby ever intend to let Joe-Jim and his followers live?
- Suggested activities/inquiry-based exploration: Narby says that the only good mutie is a dead mutie. Have the students google the phrase “The Only Good Indian is a Dead Indian”.

### Section Thirty—

- Prepare to read:
  - vocabulary
    - jugular
    - vein
    - extract
    - windpipe
- Section summary: Joe-Jim, Bobo, Bill, Hugh, and Alan escape to the higher decks, but they have to carry Bobo. They decide that they need to escape from the Ship. Bill, Hugh, and Alan go to retrieve their wives while Joe-Jim stays with Bobo. Joe-Jim removes the knife sticking into Bobo and concludes that Bobo is going to die. Joe-Jim then takes out one of his own knives and kills Bobo.

- quiz/reading comprehension questions

1. Where does Joe-Jim cut Bobo?

- (a) In the jugular vein.
- (b) In the carotid artery.
- (c) On the wrists.
- (d) On his ears.

Answers: 1—a

- Suggestion for reflection and discussion: Is Joe-Jim right to euthanize Bobo?

### Section Thirty-One—

- Prepare to read:

- vocabulary

- docile
- bewilderment

- Chapter summary: Hugh, Alan, and Bill return with their wives, and they make their way to the door to the shuttle. Just as they are entering the shuttle, Narby's guards arrive. Joe-Jim stays behind to fight them and is killed. With Hugh as the pilot and Bill as the engineer, they are able to launch the shuttle.
- quiz/reading comprehension questions

1. Hugh reports that at least one of Joe-Jim's followers is dead. Which one?

- (a) Jack-of-the-Nose
- (b) Long Arm
- (c) Squatty
- (d) The Ax

2. What is the name of Hugh's older wife?

- (a) Catherine
- (b) Joan
- (c) Chloe
- (d) Mary

Answers: 1—c; 2—c

- Suggestion for reflection and discussion: When Joe is killed, Jim stays behind. Why does he do that?

### Section Thirty-Two—

- Prepare to read:
  - vocabulary
    - auxiliary
    - pioneer
    - projectile
    - geocentric
    - anthropomorphic
    - stereoscopic
    - terrestrial
- Chapter summary: Hugh pilots to shuttle to a gas giant planet that has a moon suitable for human life.
- quiz/reading comprehension questions
  1. Why does Hugh decide to land on the moon rather than the planet?
    - (a) They had insufficient fuel to land on the planet.
    - (b) Hugh knew that they could not breathe the planet's atmosphere.
    - (c) Hugh knew that they could live on the moon.
    - (d) Hugh did not decide. The autopilot decided.
  2. The gas giant planet they discover is larger than \_\_\_\_\_.
    - (a) Canopus
    - (b) Alpha Centauri
    - (c) Jupiter
    - (d) Antares

Answers: 1—a; 2—c

- Suggestion for reflection and discussion: How improbable is the shuttle's voyage?
- Suggested activities/inquiry-based exploration: Heinlein mentions the stars Canopus and Antares. Have the students research them.

### Section Thirty-Three—

- Prepare to read:
  - vocabulary
    - stratosphere
    - autopilots
    - contour
  
- Section summary: The autopilot actually lands the shuttle. They open the door and exit the ship.
- quiz/reading comprehension questions
  1. The temperature of the moon is how much colder than the Ship?
    - (a) Five degrees
    - (b) Twenty-five degrees
    - (c) Fifty degrees
    - (d) One hundred degrees
  
  2. Who is the first one to actually step on the moon?
    - (a) Bill
    - (b) Alan
    - (c) Hugh
    - (d) Chloe

Answers: 1—a; 2—c
  
- Suggestion for reflection and discussion: Ask the students if they would have been so eager to live the shuttle.

### **Section Thirty-Four---**

- Prepare to read:
  - vocabulary
    - sortie
    - vertigo
    - agoraphobia
  
- Section summary: Alan, Hugh, and Bill are walking a short distance from the

shuttle when they all have attacks of agoraphobia and vertigo. After a few minutes, they recover.

- quiz/reading comprehension questions
  1. How far do they get before the attacks begin?
    - (a) Fifty feet
    - (b) One hundred yards
    - (c) A kilometer
    - (d) A mile
  3. Who is the first to recover?
    - (a) Alan
    - (b) Bill
    - (c) Chloe
    - (d) Hugh

Answers: 1—a; 2—d

- Suggestion for reflection and discussion: Ask the students if any of them have ever had attacks of vertigo and/or agoraphobia?

### **Section Thirty-Five—**

- Prepare to read:
  - vocabulary
    - expedient
- Section summary: All the men and women exit from the shuttle. Alan recovers to the point where he can walk as far as fifty yards away. He sees a small animal which he kills for food.
- quiz/reading comprehension questions
  1. What does Alan use to kill the animal?
    - (a) A knife

- (b) A bow and arrow
- (c) A firearm
- (d) A phaser

Answers: 1—a

- Suggestion for reflection and discussion: Ask the students if they would like to colonize a new world.
- Suggested activities/inquiry-based exploration: Three men and four women constitute a small colony. Have the students research the science of recessive genes and discuss whether this would endanger the long-term viability of the colony.

**Suggestions for more extended papers/projects, which allow students to reflect on major themes in the book as a whole:**

- Have the students contrast and compare the first voyage to the moon as imagined by Heinlein in *The Man Who Sold the Moon* and how it actually happened in the 1960s. Avoid saying that Heinlein was trying to “predict” the future, because he wrote two other versions of the first voyage to the moon around the same time: “Destination Moon” (both screenplay and short story) in 1950 and *Rocket Ship Galileo* in 1947.
- Have the students research the Copernican Revolution in science.

