



GALAXY

A simulation of a space society on the brink of civil war

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PURPOSE

GALAXY combines the exciting science of space exploration with the social studies concepts of a society facing civil war. As cadets at an Intergalactic Space Academy, students study spacecraft design, the mathematics of large numbers, astronomy, map reading and navigation, and complete research projects. When intergalactic war begins, students form alliances and compete by applying the knowledge they learned as cadets to determine which faction will win the civil war.

During GALAXY your students will experience the following:

Knowledge

- History and design of spacecraft
- Types of spacecraft needed for future human exploration of space
- Scientific theories about the formation of the universe, our galaxy, our solar system and our planet
- History of a mythical society
- Vastness and complexity of the universe

Attitudes

- Appreciation of the vastness of our galaxy and the universe
- Respect for humanity's attempts to reach out into space
- Distaste for mankind's tendency to overpopulate and pollute the Earth
- Displeasure with the human tendency to form factions and fight wars

Skills

- Reading and computing large numbers
- Reading maps and plotting navigation courses on a map
- Writing diary entries
- Making a time line
- Evaluating facts to form alliances
- Strategic thinking

SETUP DIRECTIONS

TEACHING TIP

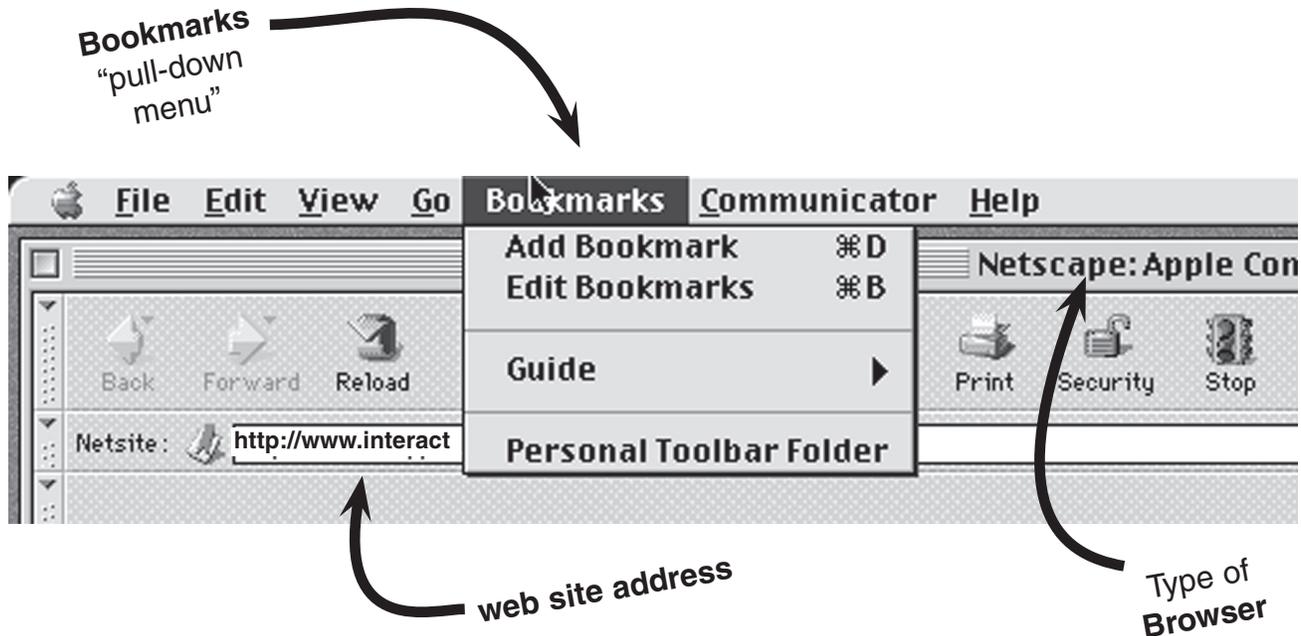
*Throughout the Daily Directions you will find **Read or Tell** text. Much of this text is repeated verbatim from the Student Guide. The **Read or Tell** text enables you closely monitor the understanding of your students. It includes introductory information, Intergalactic Space Academy Lesson assignments, Diary Entry instructions and civil war procedures.*

1. **Before You Begin** Prior to beginning GALAXY, carefully read this Teacher Guide and the Student Guide. Become familiar with all forms, handouts and procedures in the simulation.
Notes: You can order extra Student Guides and handout materials from Interact at any time.
2. **Classroom Displays** Enlist an artistic student to assist in setting up classroom displays several days before beginning GALAXY. Student involvement in room preparation increases motivation and enthusiasm.
 - Display the enclosed map of Gemini Galaxy in a prominent place in your classroom. Laminate the map so that it will last longer and to facilitate tracking the progress of the squadrons during the civil war portion of the simulation.
 - Consider setting up other displays and bulletin boards featuring astronomy and space travel.
3. **Resource Materials** Consider the use of audio-visual materials and guest speakers to enhance this unit. Possibly a parent involved in space technology, engineering or astronomy could speak to the class or arrange a field trip. Gather resource materials to supplement the essays presented as Intergalactic Space Academy Lessons and for the projects students complete for IGSA Lesson #6.
4. **Internet Resources** If you have access to the Internet, your students may benefit from the wealth of information available through that resource. Before using the Internet, become familiar with your school's Acceptable Use Policy. Always preview any web sites you make available to your students. Following are three suggestions for making web sites available for your class:
 - A. **Interact's Resource List** Several recommended web site addresses are listed on a Resources page available through the Interact home page.

To find the GALAXY Resources Page, follow these steps:

- a. Connect to the Internet.
- b. Go to Interact's home page at:
www.interact-simulations.com.
- c. Click the "Resources" button.
- d. Click the "Galaxy" button.
- e. Click any available resource web site button.
- f. Click the "Back" button to return to Interact's home page.

SETUP DIRECTIONS



- B. **Bookmarks/Favorites** You can use any browser to mark specific web site addresses for your students to use. Depending on your browser, these saved web addresses will be called “Bookmarks” or “Favorites.”

To create a “Bookmark”:

- Go to a selected web site.
 - Click on the Bookmarks “pull down menu” and choose “Add Bookmark.” Different search engines may have different terminologies and/or processes for marking or saving web addresses.
 - The name of the web site will automatically enter on your menu as a bookmark or favorite.
 - Search out several appropriate web sites and place the sites in a folder entitled “Galaxy” on your browser. When you have completed your search, save the entire folder on the desktop or to a disk. You can then insert the folder into the browser on each available computer in the classroom or computer lab.
- C. **Off-line browsing** If Internet access is limited for your students, you may want to save selected web sites to your hard drive in your classroom or in the computer lab. Downloading web sites requires significant hard drive space; you may want to put only a few downloaded files on each computer and have students rotate time at the computers.

SETUP DIRECTIONS

7. **Duplication** Duplicate the following HANDOUTS in the quantity indicated in italics:
- ACADEMY RECORD—*one*
 - COMBAT FORM—*one per squadron*
 - CONFIDENTIAL IDENTITY INFORMATION—*class set*
(*Cut these handout pages along the dotted lines and place them in separate folders. You can label each folder to match the identification of a cadet, or you can place the folders aside and distribute them to the appropriate students on Day 2.*)
 - FLIGHT PLAN—*one per squadron*
 - GALAXY TIMES—*class set*
 - GEMINI GALAXY MAP (lamine)—*one per squadron + teacher copy* (*If laminating the maps for the squadrons is not an option, copy up to five per squadron for students to use during the civil war. Copy one map for your own use.*)
 - IGSA DIPLOMA—*class set*
 - NAME TAG TEMPLATES—*class set*
 - SPACE FLEETS ROSTER—*one*
 - SQUADRON LEDGER—*one per squadron*
8. **Planning the IGSA Graduation** The graduation ceremony can be as elaborate and as stimulating as you want. Design a graduation ceremony that fits you and your students. Some options for graduation ceremonies are:
- Simply distribute the IGSA DIPLOMAS and congratulate the new officers.
 - Compute a class ranking as U.S. military academies do. Graduate the new officers according to their class ranking based on total points earned to date on simulation assignments and activities. Honor only the top graduates to avoid embarrassing others.
 - Design wings, spacecraft or other insignia to pin on the graduates.
 - Invite other classes, parents and other school staff to attend.
 - Plan a graduation party.
 - Use your imagination to come up with something uniquely your own.

SETUP DIRECTIONS

TEACHING TIP

This Civil War Alignment information is included in the Daily Directions for Day 15, the day on which hostilities are announced.

9. **Organizing for the Civil War** Whether a solar system (and hence the student representing that solar system) supports the Federation or the Rebels in the civil war is pre-determined, based upon the General and Confidential Identity Information. On Day 15, the Academy portion of GALAXY ends and the civil war begins.

- A. Determine how you will identify the Federation (blue) and Rebel (red) solar systems at the beginning of the civil war.
- **Option 1:** Cut out blue and red squares of construction paper to tack or tape on the classroom Gemini Galaxy map.
 - **Option 2:** Use erasable markers of blue and red, changing colors as solar systems change alliances during the civil war.
 - **Option 3:** Use red and blue thumbtacks to identify the allegiance of solar systems on the classroom Gemini Galaxy map.

TEACHING TIP

If your class is not divisible by three, add the extra students to one or two crews so that some squadrons have four members.

- B. Determine how to organize squadrons. On Day 16, students join with other cadets to establish squadron crews of three officers.
- **Option 1:** You may assign students to squadrons.
 - **Option 2:** Students may draw for squadron assignments.
 - **Option 3:** Students may simply agree among themselves to form squadrons.
- C. Prior to Round 1 of the civil war, each navigator makes a red or blue spacecraft marker with which to plot the squadron's position on the classroom map.
- D. The battle strength of the squadron is determined by combining the scores earned for all IGSA work by the squadron crew members
- E. As each squadron completes its organizational work, assign a number to each squadron to facilitate your record keeping and the application of Fates.
- F. Some students may be philosophically or morally opposed to participating in a war simulation. GALAXY includes a Peace strand which allows students to participate in the simulation without engaging in hostilities. The Daily Directions for Days 16 and 17 include specific directions for incorporating the Peace strand.

SETUP DIRECTIONS



TEACHING TIP

To reinforce information you think is significant, you may create additional Fates of your own. Simply number them 34, 35, etc.

10. **Fates** This Teacher Guide includes 33 Fates that will randomly affect the fortunes of the combatants during the civil war.
 - A. It is not necessary to copy or cut apart these Fates.
 - Step 1** Cut paper into 33 similarly-sized slips, and number from 1 to 33. Place these 33 slips into an envelope labeled **Fates**.
 - Step 2** Label a second envelope **Squadrons**. Into it place a numbered slip of paper for each numbered squadron you have in the civil war—one squadron for every three students. Thus, if you have 27 students, you will place nine slips, numbered 1 to 9, in this envelope.
 - Step 3** Obtain a pair of dice to calculate the consequences of certain Fates.
 - B. During each battle round, use the following procedure to introduce the Fates. Simply read the selected Fate directly from the Teacher Guide.
 - Step 1** Randomly draw three numbered slips from the **Squadrons** envelope.
 - Step 2** Read these numbers aloud, then replace them in the envelope. The science/engineering officers of the squadrons whose numbers you have read come forward and randomly draw a numbered slip from the **Fates** envelope.
 - Step 3** In turn, read the Fates that correspond to the numbers drawn and provide any explanation necessary for each officer.
 - Step 4** The science/engineering officer completes any action dictated by the Fate—either in front of the class or at his or her desk.

SETUP DIRECTIONS

11. **Conducting Battles** Detailed instructions about the conduct and scoring of battles are given in the Daily Directions for Day 18 and on the **Summary of Rules and Regulations** reference sheet in both the Student Guide and Teacher Guide. Be sure that you understand the procedures before beginning the battle rounds, and be sure that students understand the procedures and their responsibilities.

The Battle Questions are grouped by point value (*One Point, Two Points, Three Points or Four Points*). The harder the question, the more points squadrons can earn. The questions follow the Daily Directions for Day 18. Answers are given with each question.

12. **Scoring GALAXY** includes several forms to assist in scoring. These forms follow the Daily Directions for the day on which use is first required.
 - Keep all IGSA Lesson scores earned by students on the ACADEMY RECORD (by Day 2). Student points earned by completing Diary Entries, IGSA Lessons and their Senior Projects determine how powerful their squadron will be as they begin the civil war Battle Rounds.
 - Track the performance of the various squadron crews during the civil war on the SPACE FLEETS ROSTER (by Day 16).
 - Students complete COMBAT FORMS and file FLIGHT PLANS for every battle round. Collect these papers daily and check their accuracy.

SETUP DIRECTIONS

13. **Options** GALAXY, like all other Interact materials, is meant to be a flexible teaching and learning experience. As a creative and aware teacher, adapt these materials to meet the needs and interests of your students. The Unit Time Chart and Daily Directions provide only one procedure. Different classes will undoubtedly have different needs, interests and resources. Listed below are several ways this simulation can be modified to meet these needs and to take advantage of your resources. You may think of other changes as you read the Daily Directions.
- **Option 1:** Shorten the simulation by stopping at the end of the Academy Lessons. As a culminating activity students write either an essay or a series of newspaper articles concerning the outcome of the civil war.
 - **Option 2:** Shorten the simulation by eliminating the days spent on a) the IGSA Lesson #6 Senior Projects and b) the graduation ceremony.
 - **Option 3:** Lengthen the amount of time that the students spend working on the lessons such as spacecraft design and astronomy to allow students to go into more depth on these subjects.
 - **Option 4:** Lengthen the unit by participating in field trips to planetariums and museums or by bringing outside materials to the classroom (films, guest speakers, spacecraft models, etc.)
 - **Option 5:** During the Academy portion of the simulation, have students create requirements concerning dress and behavior. This further simulates the atmosphere and life of a military academy. *Example:* Cadets may develop IGSA insignia, armbands or hats, and may invent greetings or protocols to observe. This can be continued during the civil war portion of the simulation with the creation of squadron insignia, code words, etc.
 - **Option 6:** Add your own Diary Entries to focus student thinking on concepts you wish to emphasize.
 - **Option 7:** Add your own editions of *The Galaxy Times* with articles covering specific events you want to emphasize.
 - **Option 8:** Write additional Fates and Battle Questions to emphasize materials that you have covered in class.

SETUP DIRECTIONS

TEACHING TIP

Some significant court decisions pertain to the scientific vs. creation science debate. Edwards v. Aguillard (1987) invalidated Louisiana's "Creationism Act" which had prohibited the teaching of the theory of evolution in public school unless accompanied by instruction in creation science. See also Epperson v. Arkansas (1968). Seagroves v. State of California (1981) has similar significance.

14. **Scientific Theory and Creationism** Possibly you have in your classes students whose religious beliefs do not accept any scientific explanation of human origins or the origin of the universe. Many school boards struggle with parents and groups who insist that the Biblical story of creation should be taught in the public schools. However, recent U.S. and state supreme court decisions support teaching the scientific theories of creation and reject challenges by creationists to teach their beliefs in the public schools. As a result of these court decisions, most states prohibit mention of "creation science" in public school classrooms. GALAXY presents the "Big Bang" theory of creation as the most commonly accepted scientific theory at this time.

Make it clear to all students that GALAXY introduces an accepted scientific explanation of the formation of the universe and is not controversial in scientific circles. "Creation science," after having been examined thoroughly by leading scientific societies, has been rejected. This being the case, your refusal to allow any discussion of "creationism" as an equal to the Big Bang theory should not presuppose that you or any other educated person doesn't believe in the Bible or God. Hopefully, your approach to all this will result in a minimal defense strategy, but be prepared to deal with this possibility in using GALAXY.

RESOURCES

Videodisk

- *Astronomy*, Macmillan/McGraw-Hill School Publishing Company, 1993. (This is an excellent resource if you have access to a laser disk player.)

Encyclopedias

- *Rand McNally Astronomy Encyclopedia*, Rand McNally.
- *Encyclopedia Americana*, Grolier Inc., Danbury, CT 06816.
- *The New Encyclopedia Britannica*, Encyclopedia Britannica Inc. Chicago.

Trade Books

- *Astronomy Made Simple*, Michael Hamburg, Doubleday, 1993.
- *Space Vehicles*, Kent Alexander, Gallery Books, 1989.
- *Spaceflight: A Smithsonian Guide*, Valerie Neal, Macmillan USA, New York, 1995.
- *Space Travel*, Jeanne Bendick, Watts, New York, 1982.
- *Where are We Going in Space?*, David J. Darling, Dillon Press, Minneapolis.
- *Our Milky Way and Other Galaxies*, Isaac Asimov, Gareth Stevens, 1988.
- *Columbia and Beyond*, Franklyn M. Branley, Collins, 1979.
- *The New Astronauts*, David J. Darling, Dillon Press, Minneapolis.
- *Far Out: How to Create Your Own Star World*, Robin West, Carolrhoda, 1987.

DAILY DIRECTIONS

DAY 1

Materials

- Student Guides—*class set*
- Construction paper for name tags—*class set*
- NAME TAG TEMPLATES—*class set*
- Safety pins for name tags—*class set*
- Markers or crayons—*class set*

TEACHING TIP

If your students need help, you may read the Introduction to them, discussing the scenario outlined in the essay as you read.

Procedure

1. Distribute the Student Guides and have students read the **Introduction**.
2. As a class, discuss the following:
 - What is a simulation?
 - What will the class be doing for the next several weeks?
 - What is this simulation really about?
 - What are students' first impressions of life in the Gemini galaxy?Keep the discussion brief and to the point. Answer general questions, explaining that many of the more specific questions students have will be answered as the simulation progresses.
3. Assign students their identities as citizens from one of the 36 inhabited solar systems that make up the Gemini galaxy. You may allow students to choose their roles randomly. See Setup Directions—**Assigning Identities**. Allow students time to carefully read the **General Identities** information for their own character and for the other students.
4. Encourage students to begin matching fellow students with their GALAXY identities. Knowing who belongs to which identity and which solar system will become increasingly important as the simulation progresses. Each student can write other students' names next to their identities in his or her Student Guide.
5. Distribute construction paper, markers and pins and allow students time to complete their name tags. Collect the name tags at the end of the day and laminate them so that they will last. Students wear their name tags every day during the Academy phase of the simulation.

TEACHING TIP

You may encourage your students to create special costumes to enhance the simulation. Your non-human cadets may invent truly stunning physical characteristics (an extra eye or two, strange ears, horns or extra limbs, etc.).

NAME TAG TEMPLATES



Name: _____

Home Solar System: _____



Name: _____

Home Solar System: _____

DAILY DIRECTIONS

DAY 2

Materials

- GEMINI GALAXY MAP (laminated)—*one for teacher*
- Student Guides—*class set*
- Folders—*class set*
- CONFIDENTIAL IDENTITY INFORMATION—*class set*

Procedure

1. Have the students open their Student Guides to the **Gemini Galaxy** map. As they examine their maps, point out the legend and general map layout. During this initial examination of the map, emphasize the tremendous distances involved. Also, point out that the map shows only a small fraction of the solar systems and only the most important features of Gemini Galaxy.
2. Distribute to each cadet the folder containing his or her CONFIDENTIAL IDENTITY INFORMATION. Suggest that the students read the information very carefully and caution them about the importance of keeping this information to themselves. Instruct students to keep their Student Guides, any handouts and all work completed during GALAXY in their folders.

DAILY DIRECTIONS

3. As soon as students finish reading their CONFIDENTIAL IDENTITY INFORMATION, assign the **Intergalactic Space Academy** essay in their Student Guides. Again, depending upon the needs of your class, you may choose to read this with the class.
4. As a class, discuss the **Intergalactic Space Academy** essay. During the discussion, explore these concepts:
 - What is the purpose of a military academy?
 - Who goes to a military academy?
 - What is life like at such a school?
5. As the discussion draws to a close, review with the students the responsibilities of the three officer positions that the IGSA cadets will fill. Advise students to prepare to be either a commander, navigation officer or science/engineering officer upon graduation. If students ask what their role will be, inform them that at this time it is not possible to predict what role any one student may fill. See Setup Directions— **Organizing for the Civil War** for more information.
6. Have students read **Diary Entry #1: The Academy**. Explain that during the course of the simulation students will complete periodic diary entries on their own paper. Encourage students to be creative in their entries.



Diary Entry #1:

The Academy

Situation This is your second day back at the IGSA after the leave granted all cadets before the final year of training. Although it was good to be home, you heard and saw some things that disturbed you. Rumors of war still bother you. Throughout the galaxy problems with food shortages, pollution, energy shortages, overpopulation, and loss of freedom are causing great discontent. You were excited to go home, but seeing and hearing about so many problems made you even more excited to return to the IGSA.

DAILY DIRECTIONS

READ OR TELL

Entry Begin by describing your family and your home solar system, and how it felt to return home after three years at the IGSA. Explain the problems the galaxy is facing as you see and understand them. Do you have any ideas for possible solutions? What do you think lies ahead for the Federation?

7. Go over the situation and the directions for writing the first diary entry. Stress to your students that high scores on their preliminary work will make them more powerful during later stages of the simulation.

READ OR TELL

“The grades you earn on these IGSA assignments are important because they determine the size of the force you will command after graduation from the Academy.”

8. Allow students time to complete their diary entries in class, or assign the work as homework to be handed in at the beginning of the next class.
9. All papers, assignments or projects completed during the simulation should be scored as indicated, then recorded on the ACADEMY RECORD. For further information on record keeping, see Setup Directions—**Scoring**. So that students can track their own progress, return all papers to the students in a timely manner.

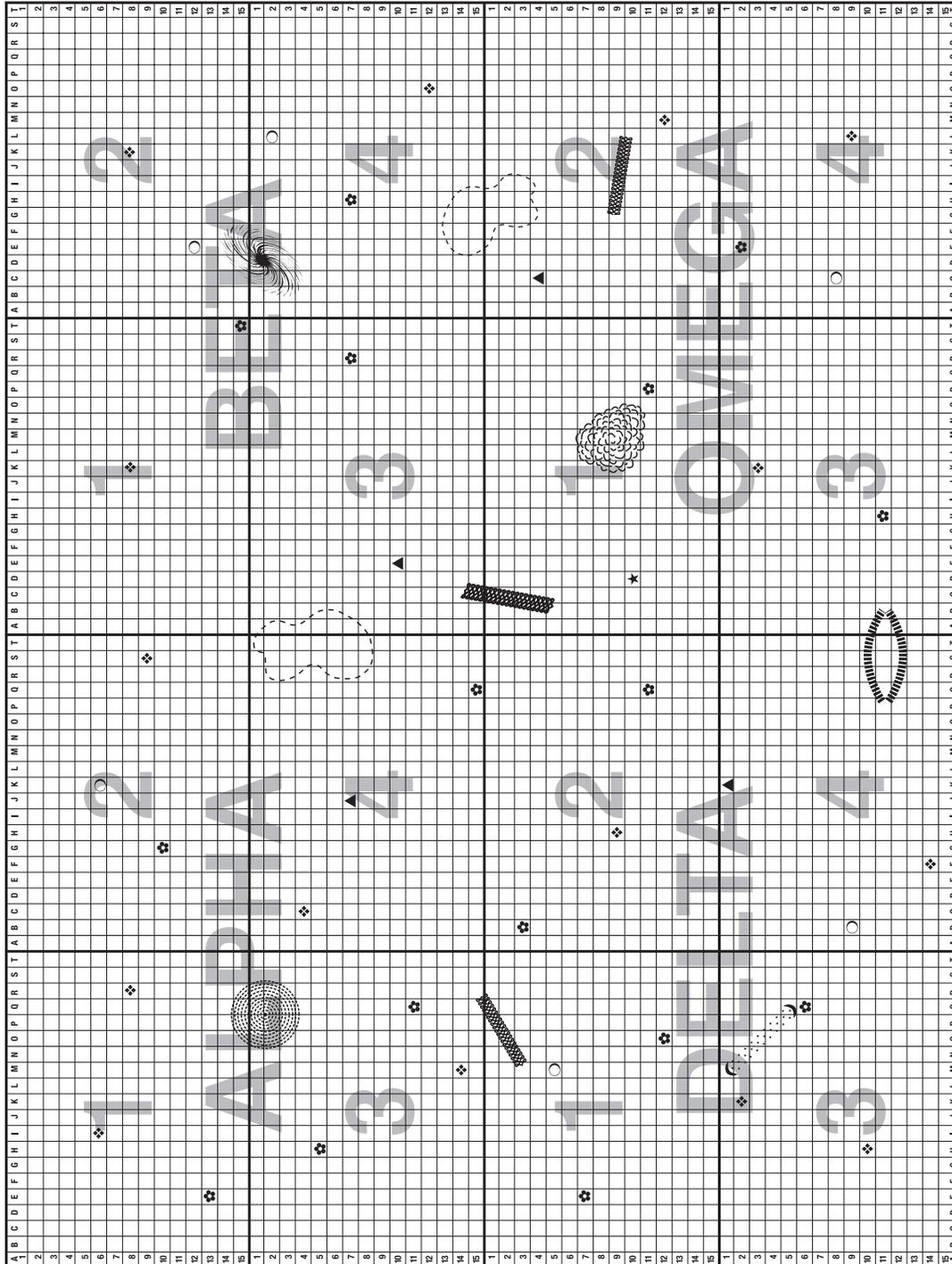
GALAXY MAP

Gemini Galaxy Key To Graph

- 100 light years
- ★ Federation Capital
- ▲ Quadrant Capital
- ✱ Federation State
- ◆ Federation Colony
- Renegade Solar System
-  Black Hole
-  Magnetic Asteroid Field
-  Intense Magnetic Field
-  Radiation Field
-  Spore Contamination
-  Poisonous Gas Cloud
-  Volatile Gas Cloud

GALAXY MAP

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MASTER