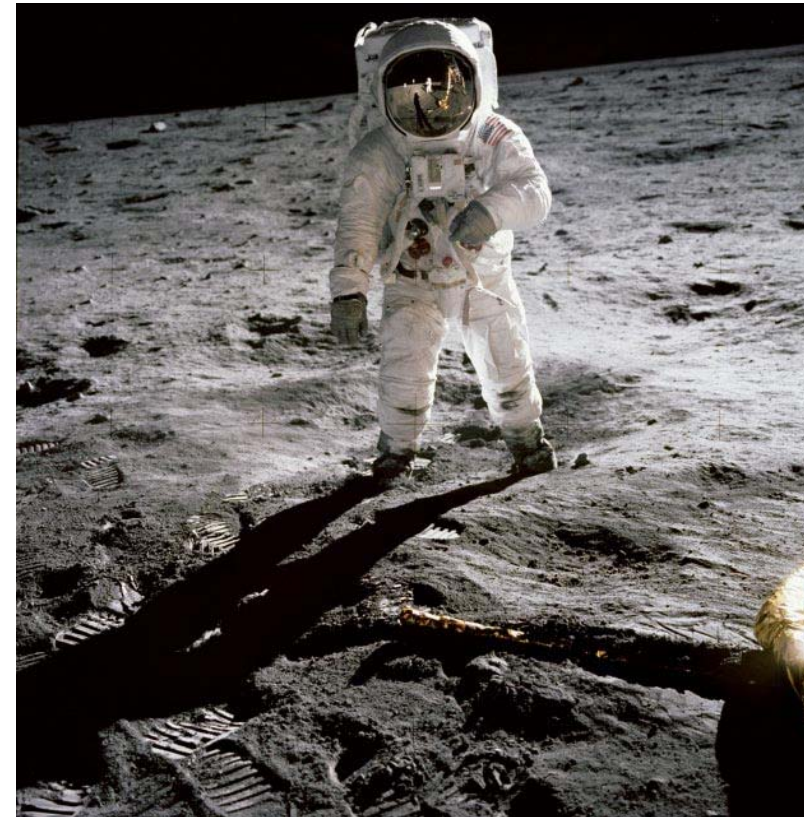


# FRAMING AIR AND SPACE

A REPORT OF A STUDY ON THE SUBJECT MATTER OF  
THE NATIONAL AIR AND SPACE MUSEUM  
FROM THE PERSPECTIVES OF VISITORS AND STAFF



SMITHSONIAN INSTITUTION  
OFFICE OF POLICY AND ANALYSIS  
WASHINGTON, D.C.  
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## DIRECTOR'S PREFACE

Framing Air and Space is an ambitious formative endeavor that involved considerable data collection and analysis. Thanks are due to the Exhibition and Interpretive Vision Group of the National Air and Space Museum (NASM) that requested the study: Martin Collins, Timothy Grove, Peter Jakab, Beatrice Mowry, Victoria Portway, and David Romanowski. They are well aware of the importance of visitors and their responsiveness to the dissemination of information on air and space.

Andrew Pekarik designed the study, led the data collection, analyzed the findings, and wrote the report. During the data collection phase he was helped by James Smith, a senior analyst from the Office of Policy and Analysis (OP&A), and Yuko Ichikawa and Anna Shkrabaliuk, OP&A interns. Pamela Blalock, Barbara Brennan, and Timothy Grove from NASM also assisted in the data collection effort. Karl Stessy, OP&A intern, helped with data entry, and Yuko Ichikawa helped with analysis.

Thanking NASM and OP&A staff who are making contributions to disseminating science and culture has become a familiar and pleasurable task for me. Again, my sincere appreciation for a job well done.

Carole M.P. Neves  
Director  
Office of Policy and Analysis

## TABLE OF CONTENTS

DIRECTOR'S PREFACE .....	i
TABLE OF CONTENTS.....	ii
THE STUDY .....	1
THE METHOD.....	1
PARTICIPANTS .....	2
SELECTIONS.....	2
IMAGE AND TEXT INTEREST LEVELS.....	2
COMPARING VISITORS AND STAFF.....	3
GROUPINGS.....	4
CATEGORIES.....	5
DIFFERENCES BETWEEN VISITORS AND STAFF .....	6
ITEMS WITHIN CATEGORIES .....	6
NAMES OF GROUPINGS .....	7
DISCUSSION.....	7
APPENDICES	
A. INTEREST LEVELS OF TEXTS .....	A-1
B. INTEREST LEVELS OF IMAGES.....	B-1
C. VISITOR CONCEPT CATEGORIES AND SUB-CATEGORIES .....	C-1
D. ALL GROUP NAMES ASSIGNED BY VISITORS AND STAFF .....	D-1

## THE STUDY

Recently the National Air and Space Museum (NASM) began a broad review of its plans for future exhibitions. The Exhibition and Interpretive Vision Group (EVIG), a cross-disciplinary committee of museum staff under the leadership of Space History Curator Martin Collins, is leading this review effort.

This study was a first step towards including visitor perspectives in this review process. It had three aims:

1. To ascertain visitors' level of interest in particular words and images
2. To understand how visitors frame the museum's subject matter
3. To determine where staff and visitor interest levels and views of the subject matter either agree or differ.

The study used a method called "concept mapping," or "concept framing," which uses card sorts to obtain a collective view of the way that participants frame a given topic, in this case, the subject matter of NASM.<sup>1</sup>

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<sup>1</sup> For an earlier use of this method at the Smithsonian's National Museum of the American Indian, and a fuller description of the method, see Office of Policy and Analysis, Mapping Treaties: Concept Mapping as a Guide for Developing a New Exhibition at The National Museum of the American Indian, August 2007. The report is available at:

[http://www.si.edu/opanda/docs/Rpts2007/Treaties\\_Report\\_Final.pdf](http://www.si.edu/opanda/docs/Rpts2007/Treaties_Report_Final.pdf)

## THE METHOD

The members of EVIG selected 100 words and 100 images that represented the range of topics and materials that are covered and collected by NASM. These words and images comprised two sets of 100 cards, a text set and an image set.

The visitor portion of the study was conducted on weekdays between December 10 and 18, 2007. This is a relatively quiet time at NASM.

Tables were set up near the center of the museum, and visitors were invited to "help the museum plan future exhibitions by looking at some cards." The sample was a convenience sample -- the selection method was not systematic. Those who were conducting the study sought out visitors when there was room at the table and an opportunity to get up from the table. Visitors were approached in the central museum area or as they passed by the table. Overall about half of the people who were asked agreed to participate.

When visitors sat at the table they were given either a set of text cards or a set of image cards. They were asked to divide the set they were given into two subsets: the words/images that they found most interesting, and the words/images they found less interesting. Upon completion of that task, the "less interesting" subset was removed and visitors were asked to divide the most interesting words/images into groups, in whatever way they pleased, with as few or

as many in a group as they wished. When they finished with this, they were asked to give a name or title to each of their groups. The contents of each of these groups and their titles were recorded on a form for later analysis. In addition, each participant was asked if this was his/her first visit to the museum, and the sex and age of the participant was estimated and recorded. Each visitor did only one sort, either image or text. The entire process took an average of 15-20 minutes per sort, and usually multiple sorts were conducted simultaneously at the tables. Altogether 100 visitors did image sorts and 96 visitors did text sorts.

NASM staff was also invited to participate in this study. A table near the main staff elevator and a nearby conference room were used for this purpose over a two-day period (December 19 and 20). In this case participants were asked to do both text and image sorts, following the same procedures used with visitors. Image sorts were completed by 54 staff members, and 50 of them also did text sorts. Staff members included curators, administrators, interns, and other professionals.

## PARTICIPANTS

Males comprised 57% of visitor participants. Ages ranged from 5 to 80s, with a median estimated age in the 30s. Staff participants were also 57% male, with median estimated age in the 50s. Exactly half of the visitors were in the museum for the first time.

## SELECTIONS

On average, both visitors and staff chose about half of the images and texts as very interesting (visitors: 48 images, 53 texts; staff: 51 images, 52 texts).

When they organized them into groups, visitors formed an average of five image groups and six text groups, while staff created an average of eight image groups and eight text groups. In general staff members put more effort into creating comprehensive groupings, e.g., 3% of visitor groupings were “miscellaneous,” compared to 1% of staff groupings. Altogether there were 1,116 groupings made by visitors in their 196 sorts, and 833 groupings made by staff in their 104 sorts.

## IMAGE AND TEXT INTEREST LEVELS

For these visitors as a whole the three most interesting texts were:

- *Space Shuttle* (selected by 74%)
- *Spying from space, reconnaissance* (73%)
- *Space station* (73%)

The three least interesting texts were:

- *Crop dusting* (selected by 23%)
- *Model airplanes* (24%)
- *Uniforms* (27%)

For the staff who participated in this study the most interesting texts were:

- *Apollo* (78%)
- *Mercury* (78%)
- *Spacecraft* (76%)
- *Exploration* (76%)
- *Wright Brothers* (76%)

Least interesting for these staff members were:

- *Airline security* (12%)
- *Business aviation* (16%)
- *Safety* (18%)

For the participating visitors the most interesting images were:



(85% each)



Least interesting for these visitors were:



(10% each)



For participating staff the most interesting images were:



(91%)  
(87%)



For these staff the least interesting images were the same two that were least interesting for visitors (13% each).

For both groups the exceptional events, earth from space and moon landings, were most interesting, while the everyday scenes, baggage claim and flight attendants, were least interesting.

## COMPARING VISITORS AND STAFF

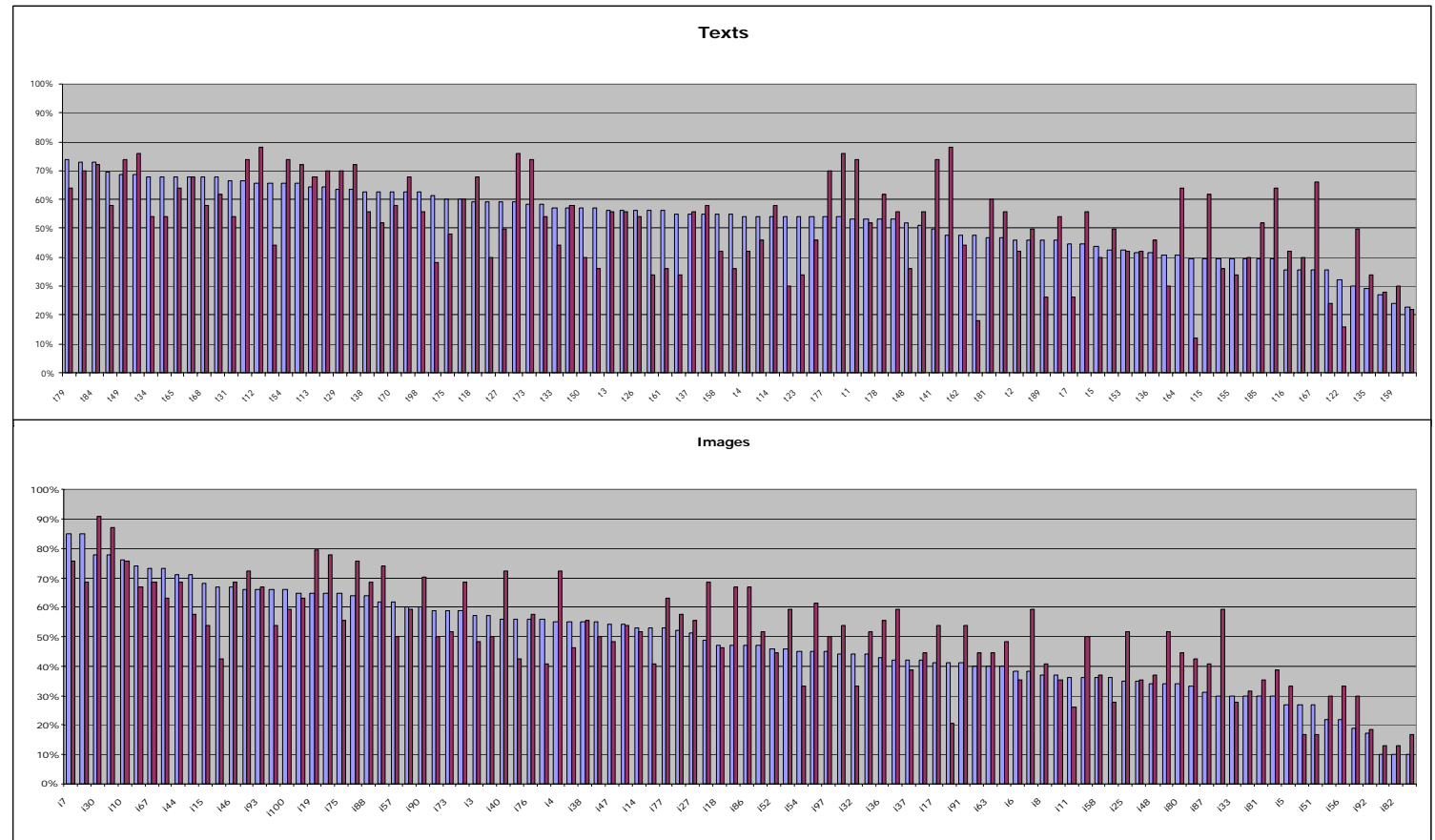
The upper graph on the right shows the percentage of visitors and staff that found particular texts interesting. (See Appendix A). The texts are ordered in decreasing percentages of interest among visitors (blue bars). Gaps below the implied line show where staff participants were less interested than visitors, while red bars that rise above the implied line indicate higher levels of interest among the participating staff. The lower graph presents the image interest levels in the same way (see Appendix B).

Note that some images generated higher levels of interest than texts, (image interest levels range from 91% to 10%; text interest levels from 76% to 12%). The graphs show that visitors and staff participants did not differ very much from one another in their levels of interest in either texts or images.

There are only a few extreme differences:<sup>2</sup> Among images visitor participants were much more interested in the Global Flyer (67% vs. 43%, left below) and staff participants were much more interested in the Buck Rogers Card (59% vs. 30%, right below).



<sup>2</sup> Extreme here refers to a difference greater than twice the standard deviation of the mean.



Among the texts, visitor participants were much more interested in *Safety* (48% vs. 18%) and *Airline security* (40% vs. 12%). Staff participants were much more

interested in the text cards *Mercury* (78% vs 48%) and *Popular culture* (66% vs. 35%).



## GROUPINGS

After participants had selected the most interesting texts or images, they organized them into groupings. As shown in Appendix D, their names for these groupings reflected a diversity of perspectives.

The groupings were analyzed for what they have in common. How frequently did texts or images appear in the same grouping? Analyzing the entire set of groupings together establishes how closely each text or image was associated with each other text or image.

The cards that participants more closely associated with one another can be viewed as a cluster, and these clusters can be examined for what they share. The shared dimensions of these clusters reveal aspects of the participants' thinking. In other words, cards that are similar in some way tend to appear together in the groupings made by participants because that similarity is part of their way of seeing these texts or images.

The figure at the right is a two dimensional representation of the text sorts done by participating visitors. The spacing represents how associated the texts are in the groupings: items closer to one another appeared together in groupings more often. The clusters are delineated with dashed lines and have been assigned names based on what they share.

## TEXT CLUSTERS

### DERIVED FROM VISITOR GROUPINGS



**Key:** Each square represents a different text card. The percentage is the median percent that chose each of the items in the cluster. Green shading indicates medians over 60%; blue 50-60%; red under 50%.



## CATEGORIES

As illustrated on the previous page, analysis of the associations among participating visitors' text groupings indicates that they can be clustered in six categories:<sup>3</sup>

1. **Astronomy** (median interest level 64%)
2. **Space Flight** (59%)
3. **Aviation Technology** (56%)
4. **Military Aviation** (56%)
5. **Aviation Systems** (48%)
6. **Non-military Aviation** (40%)

The same analytical process for texts grouped by staff participants provides a similar clustering:

1. **Astronomy** (68%)
2. **Space Flight** (64%)
3. **Popular Culture** (64%)
4. **Pioneers** (56%)
5. **Aviation Technology** (54%)
6. **Military Aviation** (53%)
7. **Non-military Aviation** (34%)

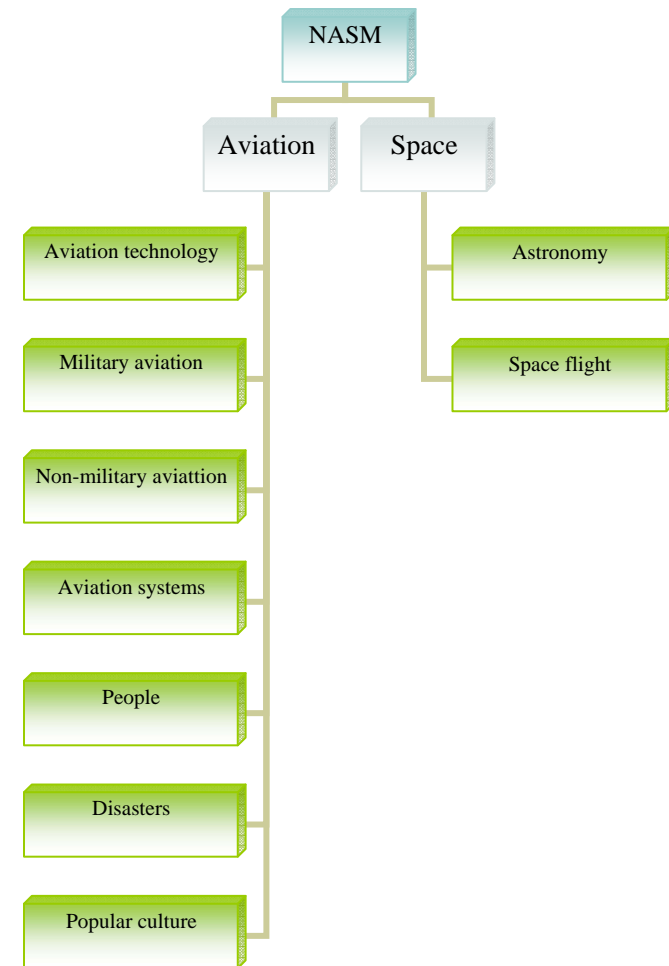
Analysis of images grouped by visitors leads to:

1. **Disasters** (62%)
2. **Space Flight** (60%)
3. **Aviation Technology** (56%)
4. **Military Aviation** (56%)
5. **Astronomy** (54%)
6. **People** (44%)
7. **Non-military Aviation** (30%)

Analysis of images grouped by staff participants yields these categories:

1. **Space Flight** (67%)
2. **Astronomy** (66%)
3. **Disasters** (61%)
4. **People** (56%)
5. **Aviation Technology** (54%)
6. **Military Aviation** (50%)
7. **Popular Culture** (48%)
8. **Non-military Aviation** (30%)

If the clustering process were to be allowed to continue, all aviation elements would eventually cluster together, and all the astronomy and space flight elements would cluster together. In other words, as both these staff and visitors conceptualize the subject matter of the museum, ultimately there is a division between everything related to aviation and everything related to space flight and the universe. Combining and simplifying this conceptual nesting across participants, texts, and images produces the overview figure on the right.



<sup>3</sup> For a fuller description of the analysis method, see Appendix tk.

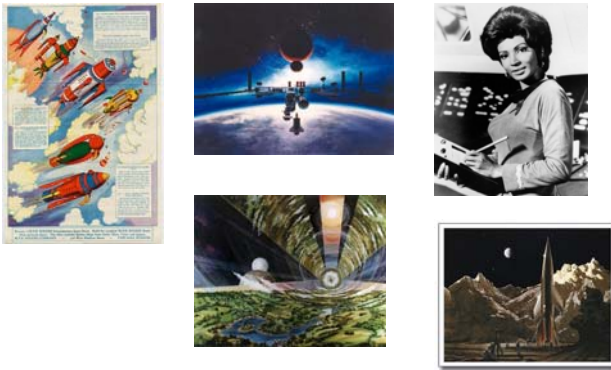
## DIFFERENCES BETWEEN VISITORS AND STAFF

The few differences between visitor and staff clusters are worth noting. Staff text and image groupings suggest a concept of popular culture, while visitor text groupings suggest a concept of aviation systems.

### Popular Culture (Staff)

Among the texts, the staff's popular culture category is based on the close association of six terms: *Aerospace art*; *Science fiction*; *Star Trek*, *Star Wars*; *Popular culture*; *Exploration*; and *Search for extraterrestrial life*.

In images it describes this cluster of five images:



Visitors placed these texts and images with other categories. Except for the text card *Exploration*, which visitors placed with other items linked to **Astronomy**,

visitors associated all the other terms, i.e., *Aerospace art*; *Science fiction*, etc. with terms in the catch-all category of **Non-military Aviation**.

Similarly visitors tended to group the image of the woman (Lt. Uhura in *Star Trek: The Original Series*) along with images of airplanes, airplane interiors, airports, stewardesses, etc. in **Non-Military Aviation**, while the other images were embedded in the cluster described as **Astronomy**.

### Aviation Systems (Visitors)

This category arises from the close association of thirteen related terms in the text sorts done by visitors:

- *Airline security*
- *Airports*
- *Air traffic control*
- *Pilot*
- *Commercial aviation*
- *Safety*
- *Search and rescue*
- *Crashes, accidents*
- *Black boxes*
- *Cockpits*
- *Navigation*
- *GPS*
- *Aerial photography*

## ITEMS WITHIN CATEGORIES

Analysis and clustering of the text and image groupings for visitor and staff participants led to nine key categories, as noted above. Each of these categories, however, can be further analyzed to identify sub-categories within them.

Within the **Aviation Systems** category, for example, further analysis identifies three sub-categories:

#### Infrastructure:

*Airline security*; *Airports*; *Air traffic control*; *Pilot*; *Commercial aviation*;

#### Safety:

*Safety*; *Search and rescue*; *Crashes, accidents*; *Black Boxes*

#### Instrumentation:

*Cockpits*; *Navigation*; *GPS*; *Aerial photography*

For the complete contents of all visitor categories and sub-categories, see Appendix C.

## NAMES OF GROUPINGS

Participants were asked to name the groups that they formed during the sorting process. Visitors assigned 630 different names to their 1,116 groups and staff gave 502 names to their 833 groups. (See Appendix D for a list of all group names.)

Among visitors there were three group names that appeared in more than 10 percent of the card sorts:

Space (35%)  
Military (21%)  
History (11%)

Among staff there were eleven group names that appeared in more than 10 percent of the card sorts:

Military aviation (22%)  
Popular culture (21%)  
Space (19%)  
Astronomy (18%)  
Early flight (13%)  
Science fiction (12%)  
Patriotism (12%)  
Military (11%)  
Commercial aviation (11%)  
Technology (11%)  
World War II (11%)

## DISCUSSION

The most notable finding of this study is the fundamental division of the subject matter into nine major categories, two of which are aspects of space and seven of which relate to aviation. Among these categories, the texts and images associated with space and astronomy generated the highest levels of interest.

Before the study began, it was hypothesized that staff and visitors might have markedly different views of the subject matter. The study showed that this was not the case. Visitors and staff were very similar in the way they viewed this subject matter, including levels of interest, clustering of images and texts, and names for groupings. They differed in only a few respects.

Visitors were much more interested than staff in *safety* and *airline security*, and their sorts revealed a category of **Aviation Systems** (including the sub-categories of **Safety**, **Infrastructure**, and **Instrumentation**). Staff was more interested in *popular culture* and staff card sorts demonstrated a category of **Popular Culture** that included the subcategories **Science Fiction**, **Aerospace Art**, and the **Search for Extraterrestrial Life**.

These differences are minor, although they do suggest some future program possibilities that might have been easily overlooked.

Another striking finding is how closely the current arrangement of the museum corresponds to the major

concept categories of visitors, starting with the physical division into air (primarily west wing) and space (primarily east wing).

Many of the visitors' conceptual categories and subcategories (see Appendix C for the complete listing) have their own dedicated exhibition or major portion of an exhibition within the museum: **Astronomy** (Universe, Telescopes, Space Travel, Exploration); **Space Flight** (Space exploration, Space program, Spacecraft, Rocketry); **Aviation Technology** (Historical, Experimental, Technological Change/Innovation); **Military Aviation** (War, Warplanes, Space Spying, Weapons, Air War); **Non-military Aviation** (General Aviation, Airports and Planes, Air Travel, Climate, Extraterrestrials); **Aviation Systems** (Infrastructure, Safety, Instrumentation).

The two categories least supported by the current arrangement are **People** (Historical, Military) and **Disasters** (Explosions, Crashes).

Overall the study demonstrates that the museum is well-positioned to respond to the interests of its visitors, and suggests some areas that might be considered in future planning.

## APPENDIX A

### INTEREST LEVEL OF TEXTS

#### NOTE ON USING THIS APPENDIX:

This appendix lists all the texts sorted by visitors.

Texts are listed in descending order based on the percentage of visitors who selected the text as especially interesting.

























Text	Visitors	Staff	Text	Visitors	Staff	Text	Visitors	Staff
Space Shuttle	74%	64%	Extraterrestrials, UFOs	57%	44%	Terrorism	46%	26%
Space station	73%	70%	Global warming	57%	58%	Weather forecasting	46%	54%
Spying from space, reconnaissar	73%	72%	Iraq and Afghanistan war	57%	40%	Air traffic control	45%	26%
Supersonic flight	70%	58%	Jet engines	57%	36%	Science fiction	45%	56%
Invention	69%	74%	Aerodynamics	56%	56%	Air racing	44%	40%
Spacecraft	69%	76%	Airship, blimp, Zeppelin	56%	56%	Black aviators, astronauts	43%	50%
Fighter plane	68%	54%	Commercial spacecraft	56%	54%	Korean War	43%	42%
How things fly	68%	54%	Jet age	56%	34%	Engineering	42%	42%
Planetarium	68%	64%	Naval aviation	56%	36%	Flight suits, G-suits	42%	46%
Planets	68%	68%	Air shows	55%	34%	Airports	41%	30%
Rocket	68%	58%	Flight testing	55%	56%	Pioneers	41%	64%
World War II	68%	62%	Flying Tigers	55%	58%	Airline security	40%	12%
Experimental aircraft	67%	54%	Missile	55%	42%	Aerospace art	40%	62%
The Moon	67%	74%	Ultralight aircraft	55%	36%	Commercial aviation	40%	36%
Apollo	66%	78%	Air Force	54%	42%	Mechanics	40%	34%
Helicopter	66%	44%	Aircraft carrier	54%	46%	Pilot	40%	40%
Mars	66%	74%	Atomic bomb	54%	58%	<i>Star Trek, Star Wars</i>	40%	52%
Solar system	66%	72%	Black boxes	54%	30%	Tuskegee Airmen	40%	64%
Astronomy	65%	68%	Cockpits	54%	34%	Balloon	35%	42%
Universe	65%	70%	Golden Age of Flight	54%	46%	Glider	35%	40%
Early flight	64%	70%	Space age	54%	70%	Popular culture	35%	66%
Galaxies	64%	72%	Wright brothers	54%	76%	Transport airplanes	35%	24%
Flying boats	63%	56%	Aerial photography	53%	74%	Business aviation	32%	16%
Military aviation	63%	52%	Cold War	53%	52%	Barnstorming	30%	50%
Satellite	63%	58%	Space race	53%	62%	Flight attendant, stewardess	29%	34%
Stars	63%	68%	Women aviators, astronaut	53%	56%	Uniforms	27%	28%
World War I	63%	56%	Human-powered aircraft	52%	36%	Model airplanes	24%	30%
Search and rescue	61%	38%	Soyuz, Soviet spacecraft	51%	56%	Crop dusting	23%	22%
Sound barrier	60%	48%	Gemini	50%	74%			
Space telescopes	60%	60%	Mercury	48%	78%			
Big Bang	59%	68%	Navigation	48%	44%			
Bomber	59%	40%	Safety	48%	18%			
Crashes, accidents	59%	50%	Space suits	47%	60%			
Exploration	59%	76%	Telescopes	47%	56%			
Search for extraterrestrial life	58%	74%	Aerobatics	46%	42%			
Vietnam War	58%	54%	GPS	46%	50%			

## APPENDIX B










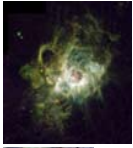














### INTEREST LEVEL OF IMAGES





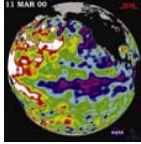



















#### NOTE ON USING THIS APPENDIX:








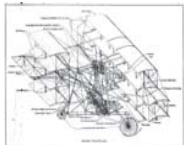
















This appendix lists all the images sorted by visitors. Images are listed in descending order based on the percentage of visitors who selected the image as especially interesting.




ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff			
Aldrin on moon		85%	76%	Graf Zeppelin		71%	69%	World Trade Center on 9/11		66%	54%
EVA		85%	69%	WWII bombers		71%	57%	Bonestell painting		65%	80%
Earth from Moon		78%	91%	Breitling Orbiter balloon		68%	54%	Mercury 7 Astronauts		65%	78%
Moon rover		78%	87%	Hindenburg		67%	69%	Apollo 11 capsule		65%	63%
Apollo 11 launch		76%	76%	Global Flyer		67%	43%	Igor Sikorsky		65%	56%
Space Shuttle night launch		74%	67%	Galaxy M51		66%	72%	Earth		64%	76%
B-2		73%	69%	WASPs		66%	67%	V2 rocket		64%	69%
Planets		73%	63%	North American X-15 and		66%	59%	Challenger Shuttle disaster		62%	74%



ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff			
Marine helicopter		62%	50%	Glenn and Mercury capsule		56%	72%	Pilots license		54%	54%
Viking Lander on Mars		60%	70%	SpaceShipOne		56%	57%	International Space Station		54%	48%
Hubble Telescope in Shuttle		60%	59%	Huey Helicopter in Vietnam		56%	43%	Spirit of St Louis		53%	63%
Star nursery		59%	69%	Concorde		56%	41%	Balloon race St Louis 1909		53%	52%
Shuttle astronauts sleeping		59%	52%	Aviation accident		55%	72%	Bell X-1 cockpit		53%	41%
Atomic blast		59%	50%	Sikorsky flying boat Pan Am		55%	56%	Tobbert Goddard		52%	57%
Gossamer Albatross		57%	50%	P-51 Mustangs		55%	50%	Amelia Earhart		51%	56%
Aircraft carrier deck		57%	48%	Chandra astronomical observatory		55%	46%	Wright Flyer first flight		49%	69%

ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff			
Mobile Quarantine Facility		47%	67%	Loudenslager Laser		45%	33%	Bessie Coleman		41%	54%
Tuskegee Airmen		47%	67%	Earth satellite image		44%	54%	Very Large Array		41%	54%
WWI pilot		47%	52%	P-26A Peashooter		44%	52%	Crop dusting		41%	20%
Sopwith Snipe biplane		47%	46%	Shuttle main engine		44%	33%	V2 victim Antwerp 1944		40%	48%
Charles Lindbergh		46%	59%	Female aircraft factory worker		43%	56%	Space monkey Able		40%	44%
Langley Quarter scale		46%	44%	Barnstorming		42%	59%	Oneill Space colony		40%	44%
Mission Control		45%	61%	Mail truck and mail plane		42%	44%	Early flight and children		38%	59%
WWII pilots		45%	50%	WWII Flight jackets		42%	39%	Commercial airport		38%	35%

ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff	ID (not shown to participants)	Visitors	Staff
 Aloha Airlines disaster	37%	41%	Travel poster	 34%	52%	Air mail pilot journal	 30%	31%
 Pilots in fighter plane	37%	35%	Star Trek - Uhuru	 34%	44%	Curtiss motor	 30%	28%
 Enola Gay	36%	50%	Jacobs multiplane drawing	 34%	37%	Airplane interior	 27%	33%
 Medal of Honor	36%	37%	Bell X-1 plans	 33%	43%	Cessna 150	 27%	17%
 Pan Am 747 airliner	36%	28%	TWA airliner and a family	 31%	41%	King Air	 27%	17%
 Air Traffic Control	36%	26%	Buck Rogers card	 30%	59%	Early Map	 22%	33%
 Copernicus	35%	52%	Travelers	 30%	39%	Aerial Camera	 22%	30%
 Early Space Station	35%	35%	Stewardess	 30%	35%	Early aviation tools	 19%	30%

ID (not shown to participants)		Visitors	Staff
Washington National Airport		17%	19%
TSA sign		10%	17%
Baggage Claim		10%	13%
Flight attendants		10%	13%

|

## APPENDIX C

### VISITOR CATEGORIES AND SUB-CATEGORIES FOR TEXT SORTS AND IMAGE SORTS

#### NOTE ON USING THIS APPENDIX:

This appendix displays the clustering of all texts and images sorted by visitors.

Each major category (e.g., Astronomy) is a cluster identified in the analysis.

Sub-categories (e.g., Universe, Telescope, Exploration) are sub-clusters within the category.

Within the sub-categories the individual texts and images are positioned according to their relationships, i.e., items most closely related to one another are arranged horizontally.

# ASTRONOMY

## Texts

### UNIVERSE

*galaxies stars universe astronomy solar system*

*Big Bang*

*Mars planets the Moon planetarium*

### TELESCOPES

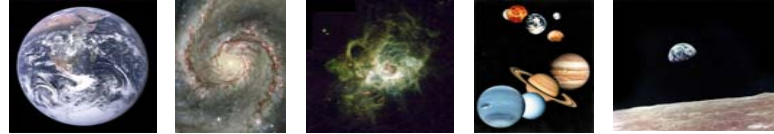
*Mercury telescopes space telescopes*

### EXPLORATION

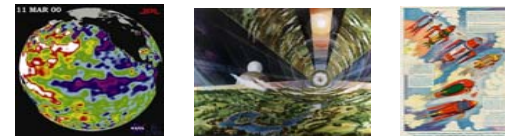
*exploration*

## Images

### UNIVERSE



### SPACE TRAVEL





## SPACE FLIGHT

### Texts

#### SPACE PROGRAM

*space age space race*

*Soyuz, Soviet spacecraft*

*commercial spacecraft*

*space suits Gemini*

#### SPACECRAFT

*space shuttle*

*space station*

*Apollo*

*spacecraft*

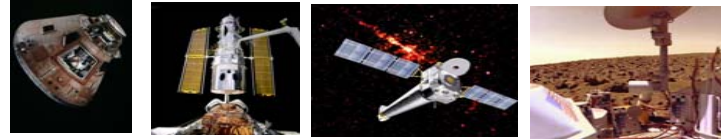
#### DELIVERY SYSTEM

*rocket*

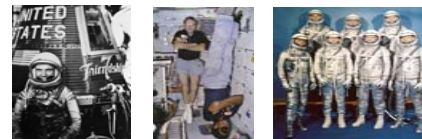
*sattelite*

### Images

#### SPACE EXPLORATION



#### U.S. SPACE PROGRAM



#### ROCKETRY





# AVIATION TECHNOLOGY

## Texts

### HISTORICAL

*early flight Wright brothers Golden Age of flight Jet age  
ultralight aircraft flying boats human-powered aircraft  
air racing air shows aerobatics airship, blimp, zeppelin*

### EXPERIMENTAL

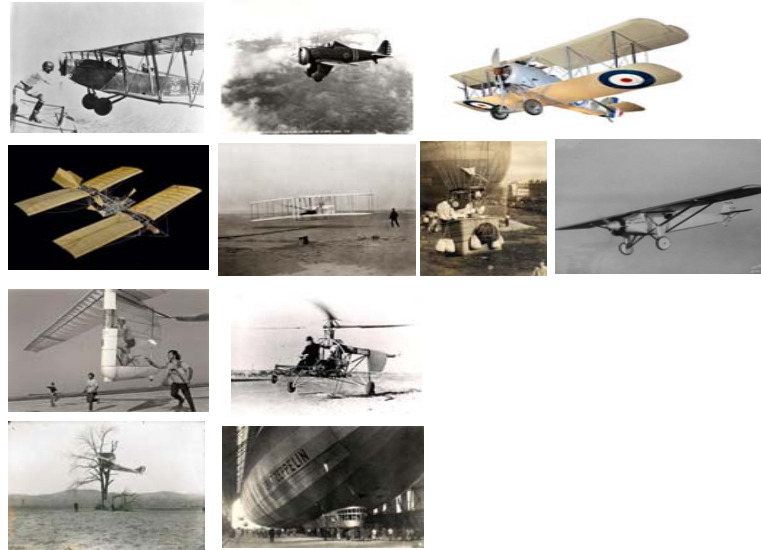
*how things fly sound barrier invention*

### TECHNOLOGICAL CHANGE

*aeordynamics jet engines supersonic flight flight testing*

## Images

### PIONEERS



### INNOVATION



## MILITARY AVIATION

### Texts

WAR

*Cold War Vietnam War World War I World War II Iraq & Afghanistan wars  
Korean War Tuskegee airmen Flying Tigers terrorism*

SPACE SPYING

*spying from space, reconnaissance*

WEAPONS

*atomic bomb missile  
aircraft carrier Naval aviation Air Force military aviation bomber  
fighter plane*

### Images

WARPLANES



AIR WAR



## NON-MILITARY AVIATION

### Texts

#### GENERAL AVIATION

*engineering mechanics aerospace art flight suits  
model airplanes business aviation crop dusting glider balloon  
barnstorming uniforms transport airplanes flight attendant  
pioneers popular culture  
Black aviators, astronauts women aviators, astronauts*

#### CLIMATE

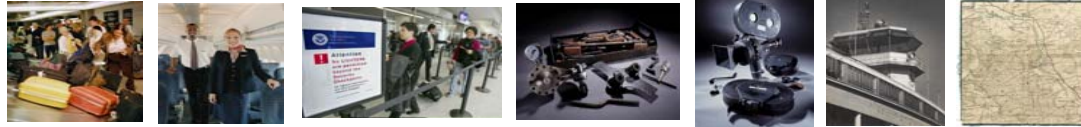
*global warming weather forecasting*

#### EXTRATERRESTRIALS

*extraterrestrials, UFOs search for extraterrestrial life  
science fiction Star Trek, Star Wars*

### Images

#### AIRPORTS AND PLANES



#### AIR TRAVEL



## AVIATION SYSTEMS

### Texts

#### INFRASTRUCTURE

*airline security airports air traffic control*

*pilot commercial aviation*

#### SAFETY

*safety search and rescue black boxes crashes, accidents*

#### INSTRUMENTATION

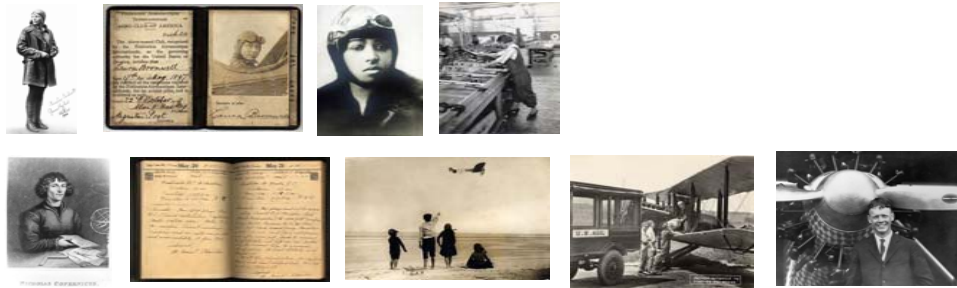
*cockpits navigation*

*GPS aerial photography*

# PEOPLE

## Images

### EARLY FLIGHT



### MILITARY



# DISASTERS

## Images

### EXPLOSIONS



### CRASHES



## APPENDIX D

### ALL GROUP NAMES ASSIGNED BY VISITORS AND STAFF

#### NOTE ON USING THIS APPENDIX:

This appendix lists all the names that visitors and staff gave their groupings of selected texts and images.

The list includes the number of times the name was used by visitors, by staff, and total.

The first 202 names, those used more than once, are listed in descending order of the total number of times they were used.

The remaining names, those used only once, are listed in alphabetical order.

Since there were approximately 200 visitor sorts and 100 card sorts, the percentage of visitors who used a particular name can be calculated by dividing the number in the Visitor column by two.

Percentage of staff who used a given name is approximately the same as the number in the Staff column.



Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
space	69	20	89	planets	6	2	8	space travel	4		4
military	41	11	52	safety	8		8	space-related	2	2	4
astronomy	10	19	29	space flight	2	6	8	Star Trek	4		4
history	21	8	29	spacecraft	4	4	8	weather	2	2	4
military aviation	6	23	29	balloons	2	4	6	aerobatics	3		3
popular culture	6	22	28	flight	5	1	6	Aerospace art		3	3
science fiction	13	12	25	historical	5	1	6	air transportation		3	3
Patriotism	12	12	24	planes	6		6	aircraft operation	1	2	3
commercial aviation	10	11	21	terrorism	5	1	6	airlines	1	2	3
disasters	11	9	20	accidents	1	4	5	airports	3		3
space exploration	10	10	20	air shows	4	1	5	aliens	3		3
technology	8	11	19	astronauts	3	2	5	aviation history	2	1	3
early flight	5	13	18	cockpits	1	4	5	bombs	2	1	3
war	15	3	18	destruction	3	2	5	civil aviation	2	1	3
World War II	6	11	17	environment	4	1	5	cold war	2	1	3
aviation	9	6	15	experimental	2	3	5	commercial flight	2	1	3
global warming	12	3	15	helicopter	1	4	5	culture		3	3
exploration	4	10	14	navigation	3	2	5	earth		3	3
aircraft	9	4	13	space race	3	2	5	equipment	3		3
universe	8	5	13	women	3	2	5	experimental flight		3	3
wars	12		12	Aerial photography	2	2	4	Golden Age	1	2	3
commercial	6	5	11	Air Force	3	1	4	Historical aviation	1	2	3
general aviation	5	6	11	air traffic control	3	1	4	history of aviation	3		3
Invention	5	6	11	exploring the universe		4	4	human interest	2	1	3
pioneers	5	6	11	explosion	3	1	4	infrastructure		3	3
pilots	6	4	10	flight testing	3	1	4	innovation	2	1	3
art		9	9	how things fly	2	2	4	inter-war aviation		3	3
early aviation	2	7	9	human space exploration		4	4	Jet Age	2	1	3
engineering	6	3	9	planets and the universe	4		4	manned space flight		3	3
experimental aircraft		9	9	rocketry	2	2	4	mechanics	3		3
airplanes	8		8	search and rescue	3	1	4	military aircraft	2	1	3
crashes	4	4	8	security	4		4	model airplanes		3	3
history of flight	4	4	8	solar system	1	3	4	other worlds		3	3
lighter than air	1	7	8	space age	2	2	4	photography	1	2	3
outer space	8		8	space stuff	4		4	planetarium	2	1	3

Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
planetary science		3	3	galaxy	2		2	system of control		2	2
planetary studies		3	3	Golden age of flight		2	2	technical	2		2
rockets		3	3	helicopters	2		2	telescopes	2		2
science	3		3	heroes		2	2	the future	1	1	2
sound barrier	3		3	historic	2		2	the universe		2	2
space program	2	1	3	historic period		2	2	things that fly	2		2
space stations	3		3	human component		2	2	travel	2		2
sport aviation		3	3	human space flight		2	2	types of crafts		2	2
tools	2	1	3	innovations	2		2	UFOs	2		2
uniforms	1	2	3	interesting stuff	1	1	2	unknown		2	2
World War I		3	3	inventions	2		2	unusual aircraft	1	1	2
Aerial application		2	2	LTA		2	2	Vietnam War	1	1	2
aerospace	2		2	mapping	2		2	violence		2	2
aircraft carrier	2		2	mechanical aspect, equipment	2		2	virtual flight		2	2
airline security	2		2	military and wars	1	1	2	war / aggressive	1	1	2
airship	2		2	moon	2		2	warfare		2	2
airships	2		2	mysterious		2	2	weather forecasting		2	2
Apollo	1	1	2	planets and galaxies	1	1	2	what it's like to fly		2	2
beginning of flight	2		2	planets and solar system	2		2	women and aviation		2	2
Capitalism		2	2	problems		2	2	women in aviation	2		2
cockpit	2		2	propulsion		2	2	women's history		2	2
commercial aircraft	1	1	2	race and gender		2	2	world beyond earth		2	2
cool aircraft	1	1	2	remote sensing		2	2	world events	2		2
crop dusting	2		2	risk		2	2	Wright brothers	1	1	2
design		2	2	rockets and stuff	2		2	1920's and 1930's		1	1
different types of flight	1	1	2	science and technology		2	2	1920s and 1930s aviation	1		1
earlier aviation	1	1	2	September 11th	2		2	a 19th century world of flying		1	1
earlier flight		2	2	space age / technology	2		2	accident and rescue		1	1
early U.S. human space flight		2	2	space and universe	2		2	accidents and events	1		1
engineering and science		2	2	space science	1	1	2	accidents, catastrophes	1		1
engines	2		2	space shuttle	2		2	accidents, disasters		1	1
extraterrestrial	2		2	space technology	2		2	acrobatics	1		1
fantasy	2		2	space vehicles	2		2	activists		1	1
flight attendant	2		2	Star Trek, Star Wars	2		2	adventure flying	1		1
fun stuff	1	1	2	stars and planets	2		2	advertisement	1		1

Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
Aerial		1	1	airport, airlines and passenger experience	1		1	aviation history, early science	1		1
Aerial camera		1	1	airports and commercial aviation	1		1	aviation human factors	1		1
Aerial planet	1		1	airspace	1		1	aviation milestones		1	1
aerobatics, experimental flight		1	1	alternative model of flight		1	1	aviation minorities		1	1
aerodynamics and aircraft type		1	1	Amelia Earhart		1	1	aviation topics		1	1
aerospace engineering		1	1	American history		1	1	aviation, astronauts	1		1
Aerospace technology		1	1	American stuff	1		1	aviators		1	1
Aesthetic aircraft	1		1	Americans into space		1	1	Aviones	1		1
aesthetic engineering		1	1	application		1	1	background of flight		1	1
African American		1	1	applications	1		1	ballistic		1	1
African-American air/space	1		1	applications of flight	1		1	balloons and early photography	1		1
after disasters		1	1	architecture	1		1	balloons, airship		1	1
age of helicopter		1	1	archival documents		1	1	barnstorming		1	1
ages	1		1	armed forces	1		1	barrier breakers		1	1
ages and war	1		1	art and culture		1	1	basics	1		1
air destruction, disaster	1		1	art and literature		1	1	battle		1	1
air flight	1		1	art and popular culture	1		1	beginning	1		1
air info	1		1	artifacts		1	1	beginning to newest aircraft	1		1
air pilot		1	1	artwork	1		1	behind the science of flight		1	1
air racing	1		1	aspects of flying	1		1	beyond earth		1	1
air things that are not space	1		1	associate of the people		1	1	Big Bang	1		1
air travel	1		1	astronauts and others	1		1	big ideas		1	1
aircraft safety	1		1	astronauts and planes	1		1	Black history		1	1
aircraft types		1	1	astronauts and special moments	1		1	blast off		1	1
airline business	1		1	astronauts/ pilots	1		1	blimp		1	1
airplane design	1		1	astronomy and space exploration	1		1	blueprints, maps, advertisements	1		1
airplane staff	1		1	astronomy and theories	1		1	broader universe		1	1
airplane stuff	1		1	astronomy, sun system, air photography	1		1	Business	1		1
airplanes and accidents	1		1	Atmosphere		1	1	business and aviation	1		1
airplanes and what you can do with them	1		1	atomics	1		1	business aviation	1		1
airplanes models	1		1	attempting to fly		1	1	catastrophes	1		1
airplanes- non-military	1		1	attractive flying	1		1	categories of aircraft	1		1
airplanes, flight	1		1	aviation clothing		1	1	century of innovation	1		1
airport architecture		1	1	aviation disasters		1	1	Charles Lindbergh		1	1
airport design	1		1	aviation experiments	1		1	civic aviation	1		1

Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
civilian	1		1	developmental	1		1	early science		1	1
classic aircraft	1		1	devices or parts	1		1	early science from space		1	1
climate		1	1	different		1	1	early space program		1	1
climates	1		1	different form of aviation	1		1	early space station	1		1
cold war and space race	1		1	different images, space	1		1	early U.S. space program		1	1
commerce and space	1		1	different kind of things	1		1	early, general flight	1		1
commercial airlines	1		1	different things		1	1	earth and beyond	1		1
commercial aviation/ business application	1		1	different types of aircraft	1		1	earth-related		1	1
commercial flying	1		1	disaster and consequences		1	1	ecology		1	1
commercial space flight		1	1	disaster and war	1		1	education		1	1
commercial use of satellites	1		1	disasters that can happen	1		1	elements of flight	1		1
commercialism	1		1	disasters, turning points		1	1	emotional		1	1
competition		1	1	documentary history of aviation	1		1	enabling technology		1	1
concepts and reality of space flight		1	1	documentation		1	1	engineering and flight testing		1	1
cool firsts	1		1	documents	1		1	engineering and testing		1	1
cool things	1		1	dramatic		1	1	engineering- related	1		1
crashes and rescue	1		1	E.T.	1		1	entertainment	1		1
crashes and safety	1		1	earlier astronauts		1	1	entertainment in aviation	1		1
crashes, explosions	1		1	earlier design and development	1		1	environment and space	1		1
created by war	1		1	earlier history	1		1	eras		1	1
creative things to do with planes	1		1	earlier pioneering	1		1	ethics		1	1
crucial		1	1	earlier space exploration		1	1	ETS		1	1
cultural advancement	1		1	early aeronautics	1		1	events	1		1
culture of flight		1	1	early air explorers	1		1	events and history	1		1
curious items	1		1	early American space exploration		1	1	evolution of travel	1		1
current affairs	1		1	early commercial transport		1	1	exhibition flight		1	1
current aviation	1		1	early days of flight		1	1	exhibits		1	1
current event	1		1	early design	1		1	expeditions in space	1		1
current issues	1		1	early designs	1		1	experiment		1	1
cute picture	1		1	early existence	1		1	experimental aviation		1	1
death and destruction		1	1	early history		1	1	experimentation	1		1
death of airlines	1		1	early milestones	1		1	explaining the universe		1	1
defense	1		1	early pioneers		1	1	exploration aircraft		1	1
deferent kinds of aviation	1		1	early postal era	1		1	exploration and study of the universe		1	1
destructive stuff	1		1	early posters / air posters		1	1	exploration of space	1		1

Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
exploratory things	1		1	flying apparel	1	1		ground control / tracking		1	1
explorer	1		1	flying boat and balloons	1	1		hands-on knowledge		1	1
explorers		1	1	flying boat and helicopters		1	1	height of aviation		1	1
exploring	1		1	flying boats	1		1	helicopter history		1	1
exploring other worlds		1	1	flying device	1		1	heroism		1	1
extra-dramatic and dangerous		1	1	flying groups		1	1	Historic Periods	1		1
extraterrestrials	1		1	flying utensils	1		1	historical / educational	1		1
extreme technology		1	1	forecasting	1		1	historical facts	1		1
famous people	1		1	frequent, what is what	1		1	historical issues	1		1
famous people in space aviation		1	1	from the air		1	1	historical milestones		1	1
far space	1		1	fun	1		1	historical people	1		1
fiction	1		1	funky aircraft	1		1	historical period		1	1
fighter aircraft	1		1	funky events in aviation history	1		1	historical space		1	1
fighter planes	1		1	Future	1		1	history and aircraft	1		1
finding		1	1	future and unknown	1		1	history I' vet known	1		1
finding and locating things	1		1	future aviation	1		1	history of aerospace	1		1
first		1	1	futurist	1		1	History of aircraft	1		1
first moon mission		1	1	gadget	1		1	history of aviation and space exploration	1		1
flight aircraft		1	1	gadgets		1	1	history of flight and space exploration	1		1
flight and space		1	1	gallery ideas	1		1	history of helicopter use	1		1
Flight and War	1		1	Gemini	1		1	history of human flight		1	1
flight by balloons	1		1	Gemini, Mercury and Apollo	1		1	history of planes at war	1		1
flight control	1		1	general aircraft		1	1	history of rocketry	1		1
flight envelope		1	1	General Areas (broad category)	1		1	history of space	1		1
flight exploration	1		1	general earth		1	1	history of space travel	1		1
flight history	1		1	general flight	1		1	history of technology	1		1
flight maintenance	1		1	general knowledge	1		1	history through today	1		1
flight on plane	1		1	general space	1		1	how do they do that		1	1
flight science		1	1	general topics of interest		1	1	how do they work		1	1
flight space	1		1	generalized concepts		1	1	how it all began	1		1
flight story, mistakes	1		1	global weather		1	1	how it works	1		1
flight suits		1	1	Golden Age / pioneers	1		1	how things work		1	1
flights and earth	1		1	GPS	1		1	how to get to the moon	1		1
flying	1		1	gravity	1		1	human experience in space		1	1
flying / anything that goes into the air	1		1	great monuments		1	1	human exploration		1	1

Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
Iconic image of 20th century		1	1	key concepts		1	1	military float		1	1
Iconic pictures		1	1	Korean conflict		1	1	military history and early flight		1	1
Icons		1	1	later flight		1	1	military x-15		1	1
Icons of flight		1	1	launching pad		1	1	military-related		1	1
ideas	1		1	lighter than air flight		1	1	minorities			1
ideology		1	1	literature		1	1	minority history			1
imagery of space exploration	1		1	living and working in space		1	1	mishaps / disasters		1	1
imagination		1	1	logistics	1		1	missiles		1	1
imaginative responses to space flight		1	1	LTA flight		1	1	missions			1
imaging	1		1	machines, devices for earth	1		1	models / examples		1	1
impact		1	1	Man's continuing exploration flight	1		1	modern aircraft			1
important people	1		1	manned spacecraft		1	1	modern aviation			1
in space	1		1	manned spaceflight		1	1	modern day airports		1	1
individual people	1		1	map	1		1	modern military			1
info	1		1	maps / true prints	1		1	modern space exploration			1
info about where we come from	1		1	Marine	1		1	modern space flight			1
innovation of technology		1	1	Marine aviation	1		1	modern technology		1	1
innovation, advances	1		1	Mars and Moon		1	1	money makes planes fly			1
Innovative flight	1		1	mechanical drivers		1	1	monitoring in space		1	1
inspiration		1	1	mechanical exploration		1	1	monitoring/ trading / analyses		1	1
instruments of air	1		1	mechanics of flying	1		1	moon stuff exploration		1	1
intel	1		1	mechanics, the How	1		1	more modern stuff		1	1
interested in knowing more	1		1	Medal of Honor		1	1	moving towards space		1	1
interesting old stuff		1	1	memorable		1	1	my work at NASM			1
interesting planes	1		1	method	1		1	NASA, related to the space program		1	1
interesting projects	1		1	milestones in aviation	1		1	natural stuff about the universe		1	1
International cooperation	1		1	milestones in history	1		1	nature / universe		1	1
international war	1		1	military / Air Force	1		1	naval aviation			1
invention and tools		1	1	military / intelligence		1	1	navigating		1	1
invention flight		1	1	military / the future	1		1	neat stuff			1
inventional exploration		1	1	military / war		1	1	neat thing		1	1
Iraq war	1		1	military and defense	1		1	nebulae		1	1
jet	1		1	military application	1		1	negative impact			1
jet engines	1		1	military conflict	1		1	neutral		1	1
jet travel	1		1	military conflicts and their weapons		1	1	new and odd technology			1

Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
new design		1	1	people-what are they doing	1	1		political circumstances		1	1
new types of aircrafts	1		1	personal	1	1		political space		1	1
new wars	1		1	personal equipment	1	1		politics		1	1
new ways of seeing the world		1	1	personal stories	1	1		politics, equipment	1		1
non-airfoil craft	1		1	personalities and history	1	1		pop culture	1		1
non-made thing	1		1	phenomena	1	1		popular people, astronauts	1		1
non-traditional air vehicles	1		1	philosophy / theology	1	1		post World War II		1	1
not easily accessible	1		1	photography / Art	1	1		post-war military aviation		1	1
not necessary, but cool	1		1	physical		1	1	practical things	1		1
nothing will stop us		1	1	physics and mechanics	1		1	pre World War I flight		1	1
novelty		1	1	pictures from space	1	1		preliminary flight	1		1
novelty flight	1		1	pilot	1	1		preparation		1	1
object in space		1	1	piloting	1	1		present, how it is like today	1		1
objects	1		1	pioneer aviation	1	1		pretty picture	1		1
objects of interest		1	1	pioneering	1		1	primary sources		1	1
observation		1	1	pioneering flight		1	1	Principles of flight		1	1
ocean planet		1	1	pioneering people		1	1	private golden age of flying	1		1
odd fun stuff		1	1	pioneers / the beginnings	1		1	process of space exploration	1		1
old aircraft	1		1	pioneers of early aviation		1	1	progress of aviation	1		1
old documents		1	1	pioneers of flight	1		1	progress of women/ social progress	1		1
old history	1		1	Pioneers of flight and space exploration	1		1	progression of technology		1	1
old interesting stuff		1	1	plane design	1		1	propulsion systems	1		1
old pictures	1		1	planes and men	1		1	recent space flight and exploration		1	1
older design		1	1	planes and people	1		1	record breakers		1	1
ordinary people	1		1	planes and theory evolved	1		1	record setters		1	1
other forms of transportation	1		1	planet	1		1	related to the work	1		1
parts of aircraft	1		1	planet picture	1		1	rescue / safety	1		1
people and aerospace	1		1	planet study and exploration		1	1	research		1	1
people and teams	1		1	planetary		1	1	research aircraft		1	1
people in aviation	1		1	planetary exploration		1	1	research to avoid war	1		1
people in flight	1		1	planetary space	1		1	research, advancement of knowledge	1		1
people in space	1		1	planetary study and astronomy		1	1	risks of air travel	1		1
people memories	1		1	planets and solar system exploration	1		1	rocket and space race	1		1
people on the aviation	1		1	playfulness		1	1	rocket engine		1	1
people vs nature		1	1	political	1		1	rocket ships	1		1

Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
rocketry and missiles	1		1	space / universe	1		1	Star Wars, flight fantasy	1		1
Rockets- crashes	1		1	space aliens	1		1	stars	1		1
Rockets- stuff being launched	1		1	space and exploration	1		1	stars and stuff	1		1
rotary wing		1	1	space and future	1		1	stars and universe	1		1
safety / security	1		1	space and past-present-future	1		1	stunt flying	1		1
safety in future way	1		1	space and planets	1		1	stunts		1	1
safety, crash	1		1	space and spacecraft		1	1	suits	1		1
satellite	1		1	space and technology	1		1	supersonic flight	1		1
satellites		1	1	space artifacts	1		1	survival	1		1
science / science fiction	1		1	Space fantasy and the Wonder of space	1		1	system exploration	1		1
science behind everything	1		1	space frontier	1		1	systems	1		1
science behind everything	1		1	space gadget	1		1	teaching		1	1
science behind flight	1		1	space history		1	1	teamwork	1		1
Science fiction / fun stuff	1		1	space imaging		1	1	technical / mechanical	1		1
science fiction and extraterrestrials	1		1	space interest	1		1	technical things	1		1
science fiction and the world that lay beyond		1	1	space launch		1	1	techniques which you can see in movies	1		1
science fiction, contemporary issues	1		1	space observation	1		1	technological & engineering advancements	1		1
science from space		1	1	space photography	1		1	technology advances	1		1
science, science fiction	1		1	space race, cold war		1	1	technology H1624/ invention	1		1
scientists, engineers	1		1	space race, planet		1	1	Technology of space and aircraft control	1		1
scientists, technology, exploration	1		1	space reconnaissance		1	1	technology of space exploration	1		1
search for extraterrestrial life	1		1	space safety	1		1	technology used	1		1
security and military	1		1	space shuttle machines		1	1	technology, how things work	1		1
selling aviation		1	1	space thing	1		1	telescope	1		1
September 11th, disasters	1		1	space things	1		1	tension		1	1
signals	1		1	space walking	1		1	terrorism / accidents	1		1
signature and space		1	1	space-oriented	1		1	terrorism and security		1	1
Skylab		1	1	spacecraft and human space flight		1	1	terrorism invention	1		1
smoke	1		1	spaceship	1		1	testing	1		1
so you want to get there faster		1	1	spaceship, astronomy, space science	1		1	the 50's	1		1
social and cultural aspects		1	1	spaceship, new discovery	1		1	the bomb		1	1
social and cultural change		1	1	specialized aircraft	1		1	the everyday		1	1
Soyuz		1	1	spinoffs of the space program	1		1	the experience of the end-user	1		1
space missions		1	1	sports and flight	1		1	the factory		1	1
space / space exploration	1		1	spying	1		1	the fun group	1		1



Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.	Group Name	Vis.	Stf.	Tot.
the future and theory	1		1	tragedies	1		1	vision		1	1
the future of the space exploration	1		1	tragedies, disasters	1		1	visual aerospace	1		1
the future space		1	1	tragedy	1		1	visual art, aviation art	1		1
the hero		1	1	transport		1	1	visually compelling		1	1
the human component		1	1	transportation		1	1	Voyager		1	1
the international		1	1	traveling to the moon		1	1	want to know more	1		1
the not-quite-real		1	1	trippy	1		1	war / combat / airplanes	1		1
the planets		1	1	Tuskegee airmen		1	1	war / military aviation	1		1
the public face of aviation		1	1	types		1	1	war and defense	1		1
the roles of women and African Americans		1	1	types of aircraft	1		1	war and espionage	1		1
the state		1	1	Types of aircraft / pilots	1		1	war and flight	1		1
the tools that help look beyond		1	1	types of machines	1		1	war and history	1		1
the transnational and capitalism		1	1	U.S. in space	1		1	war and security terrorism		1	1
the way things work		1	1	uncertainty		1	1	war confident	1		1
themes		1	1	unconventional flight / not airplanes	1		1	war involving aircraft	1		1
things about airports	1		1	unfounded vision	1		1	war time	1		1
things I don't believe in	1		1	unidentified objects	1		1	war veteran experiences	1		1
things I'd like to see	1		1	unique aviation images	1		1	war-oriented	1		1
things my mother would find interesting	1		1	universe / nature	1		1	war-related	1		1
things people do	1		1	universe, things out of the human reach	1		1	war, disasters	1		1
things that appeal to general public	1		1	unknown air / early aviation	1		1	war/ space/ etc	1		1
things that are out there	1		1	unknown thing	1		1	wars, history	1		1
things that move fast	1		1	unmanned spacecraft		1	1	way things work		1	1
things that should not fly		1	1	unusual air travel	1		1	weather environment	1		1
things within human reach	1		1	use of aircraft	1		1	what the public sees in an airport	1		1
things you need to know to fly	1		1	use of technology		1	1	who flies		1	1
time period		1	1	Utopia		1	1	why do they do that		1	1
timeline	1		1	vehicles and weapons of war		1	1	why fly		1	1
Timeline of planes		1	1	Vietnam	1		1	women / invention		1	1
tools and experiments	1		1	Vietnam conflict	1		1	women / minorities		1	1
tools and maintenance of aircraft	1		1	Vietnam era		1	1	women and aviation history	1		1
tools and the people who use them		1	1	views from above	1		1	women in airspace	1		1
topics of aviation		1	1	views from soil	1		1	women pilots		1	1
tourism	1		1	violence	1		1	women pioneers		1	1
traffic control	1		1	virtual aircraft		1	1	World War I aviation	1		1

<b>Group Name</b>	<b>Vis.</b>	<b>Stf.</b>	<b>Tot.</b>
World War II bombing		1	1
World War II people		1	1
Wow!		1	1
writing stuff	1		1
yet to come		1	1