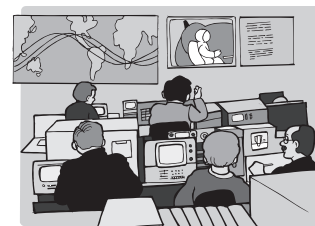
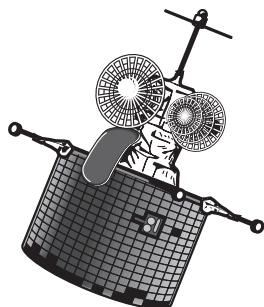




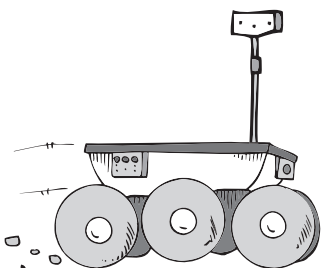
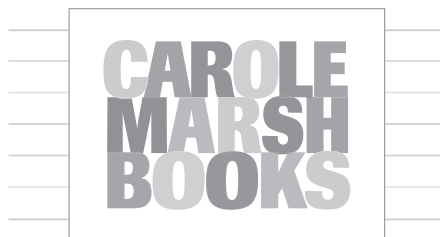
The  
**MISSION POSSIBLE**  
 Mystery at  
**SPACE CENTER  
 HOUSTON**

# Teacher's Guide

by  
**Carole Marsh**



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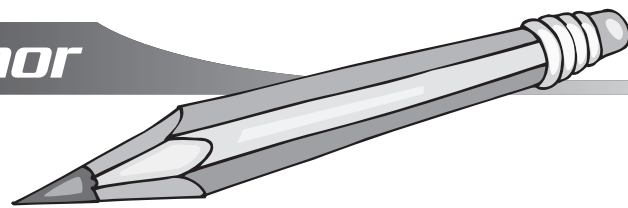
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## A Word from the Author



Dear Teachers,

Houston is one of those cities that has always fascinated me—that combination of cowboys, mesquite barbecue, and the Johnson Space Center, mission control for NASA’s space adventures! The idea of flying to the moon was such a daunting prospect back in the 1960s. Could the United States really win the space race and put a man on the moon first, as President Kennedy had challenged?

I remember vividly being glued to our television way back in 1969 when Neil Armstrong and Buzz Aldrin landed on the moon. What an amazing accomplishment for our space program! From then on, I was hooked! I followed the space missions like I had an important stake in them.

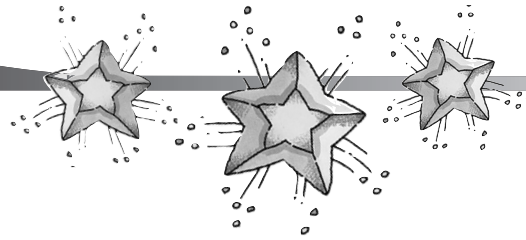
As a real NASA and space fan, I love all things astronomical. In fact, I even wanted to be an astronomer when I was a kid. To me, Space Center Houston is ground zero for much of today’s “space excitement,” and I hope this book will plant a seed in many young minds that working in space sciences could be a really cool career!



*Carole Marsh*



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As a mother and an author, one of the fondest periods of my life was when I decided to write mystery books for children. At this time (1979) kids were pretty much glued to the TV, something parents and teachers complained about the way they do about video games today.

I decided to set each mystery in a real place—a place kids could go and visit for themselves after reading the book. And I also used real children as characters. Usually a couple of my own children served as characters, and I had no trouble recruiting kids from the book's location to also be characters.

Also, I wanted all the kids—boys and girls of all ages—to participate in solving the mystery. And, I wanted kids to learn something as they read. Something about the history of the location. And I wanted the stories to be funny.

That formula of real+scary+smart+fun served me well. The kids and I had a great time visiting each site and many of the events in the stories actually came out of our experiences there.

I love getting letters from teachers and parents who say they read the book with their class or child, then visited the historic site and saw all the places in the mystery for themselves. What's so great about that? What's great is that you and your children have an experience that bonds you together forever. Something you shared. Something you both cared about at the time. Something that crossed all age levels—a good story, a good scare, a good laugh!

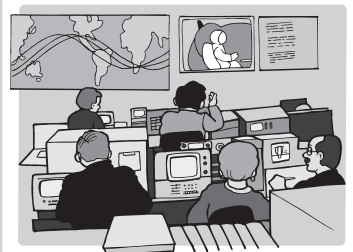
30 years later,



*Carole Marsh*

## Johnson Space Center

The Lyndon B. Johnson Space Center, or JSC, is NASA's command center for space flights. The center, which opened in 1963, is located in southeast Houston on over 1,600 acres of land that was originally donated to NASA by Rice University. It wasn't always called the Johnson Space Center. When it first opened, the center was called "Manned Spacecraft Center." At this location, astronauts are trained for space flight.

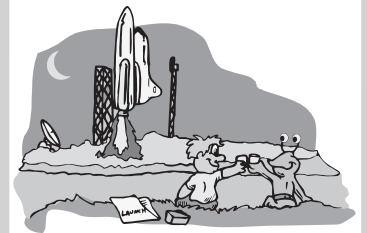
Mission Control Center, or MCC, is located at the JSC. They monitor all space flights and are responsible for the missions on the International Space Station.



| Chapter | Subject    | Explore!  |
|---------|------------|---|
| 1       | Literature | When Christina fears that her <i>curiosity had gotten her in over her head</i> , she means that she is dealing with something she probably can't handle.  |
| 1       | Science    | Sound travels very fast, about 768 mph. That's a mile in five seconds! Aircraft that break the sound barrier create a sonic boom, which is a loud explosion.  |
| 1       | Vocabulary |  A <i>nautical mile</i> is the same as 1,852 meters and is used to measure distances on oceans, seas, and air flights.   |
| 2       | Reasoning  | If you had the opportunity to explore space, would you do it? What do you think it would be like?   |
| 2       | Vocabulary | When someone says "Snap out of it!" it's because you appear to be in a daze.  |
| 2       | Science    |  A simulation allows a person to experience something without any real danger. Astronauts, deep sea divers, doctors, and pilots may go through simulation training to prepare them for the real thing. |
| 2       | Literature | When Mimi tells Christina that scientists and engineers at Johnson Space Center helped the astronauts land on the moon for the first time, she is referring to the fact that the Johnson Space Center is a command center.  |

## Kennedy Space Center Fun Facts!

- It's located on a Florida island called Merritt Island.
- The site is only 34 miles long and 6 miles wide.
- NASA launches its space vehicles from here.
- The site is also home to a wildlife sanctuary.
- The center was named after President John F. Kennedy after his assassination in 1963.
- In 1962, after the center first opened, the lunar project started with the goal of putting the first man on the moon.



2 Language



When Christina says to her grandmother that she is *out of this world*, she is making a play on words—that Mimi is great for letting them tag along to Houston, and that the visit will include a trip to the space center.

2 Language

Using comparisons (as \_\_\_ as) helps us quickly describe something, as in the rock is “as rough as sandpaper...”

2 Movies

When Grant exclaims, “To infinity and beyond!” he is borrowing a phrase from the endearing space toy Buzz Lightyear from the movie *Toy Story*.

2 Military Culture

To *stand at attention* refers to the stiff-legged stance military personnel take when they are speaking with superiors.

3 Vocabulary

If something is a *humdinger*, it means that it is outstanding. It is sometimes used sarcastically like, “I’m having a humdinger of a time changing this tire!”

3 Expression



When Christina says that the crime was an *inside job*, she is saying that the crime must have been committed by someone who works there and has access.

3 Language

When Christina says, “What better way,” she could also have said, “There is no better way.”

3 Imagery

The description “nerves on edge” conjures up the image of someone who is very frightened.

## Some Pretty Cool Space Inventions!

These very useful products and materials were invented by NASA for use in space, and have been applied for use in daily life on Earth!

- ◆ The ear thermometer: a fast and accurate way to check body temperature
- ◆ Recycled pavement: a great way to build roads using the rubber from old tires
- ◆ Shoe soles: The “Viscoelastic” bubbles used to cushion astronauts for takeoff are replacing the rubber found in the soles of sneakers
- ◆ Fire resistant fabric: Used in fire suits to keep firefighters safe
- ◆ Invisible braces: That tough, clear, ceramic stuff used in spacecrafts has been applied in dentistry
- ◆ Smoke detectors: NASA scientists invented these in 1979 to protect astronauts on missions





3 Science



In space, there is no gravitational pull on the ink in a pen, so space pens take care of that problem by using pressurized ink cartridges.

4 Imagery

By describing the maze of roads as being “like spaghetti” is a great example of using imagery in writing.

4 Writing

Papa talks about the history of the Astrodome and the AstroTurf that is used there. Write about other places where you have seen AstroTurf. Are there places that you can think of that might benefit from using the stuff?

4 History



When Grant saw the cowboy approaching their car wearing a bandana across his face, he announced that it was a holdup. He was referring to the cowboy bandits that would *hold up* trains and steal money and valuables from passengers long ago.

5 Body Language

Judy felt bad that her friends arrived during a dust storm, so she gave *sympathetic* hugs.

5 Personification

In writing, when inanimate objects or animals are given human characteristics, this is an example of personification, like when the chair “protested.”

6 Writing

Wouldn't it be great if we could really “rewind” what we've said and “start over”? Write about a time when you said something you wished you could take back.

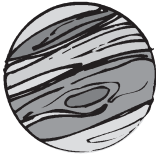
## Space Exploration Firsts

- 1st animal in space: 1957: Laika, a dog aboard the Russian Sputnik 2
- 1st human in space: April 12, 1961: Russian cosmonaut Yuri Gagarin orbited Earth one time on the Vostok 1
- 1st American into space: May 5, 1961: Alan Sheppard, aboard the Mercury 3
- 1st American to orbit the earth: February 20, 1962: John Glenn circled the earth three times aboard the Friendship 7 capsule, which lasted five hours
- 1st woman in space: June 16, 1963: Soviet cosmonaut Valentina Tereshkova aboard the Vostok 6, which lasted 90 minutes
- 1st space walk: March 18, 1965: Cosmonaut Alexei Leonov floated 17.5 feet from his spacecraft
- 1st man on the moon: July 20, 1969: Neil Armstrong was the first man to walk on the moon on the Apollo 11 mission



6 Body Language When Junko says, “thrill, thrill” and yawns, those around her understand that she is really just bored.

7 Imagery The description of Jupiter as a kaleidoscope of colors is imagery, or the use of vivid language to create a mental picture or image.



7 History Grant says “Roger!” to mean okay. *Roger* stands for the letter R in radio alphabet. It means that the message was *received*.

7 Science Saturn is the sixth planet from the sun and is surrounded by rings.

8 Vocabulary When someone does something *absentmindedly*, it means they don’t realize they are doing it.

8 Vocabulary A *klutz* is a fun word that means *clumsy*.

8 Expression Christina *made a beeline* for the bathroom, which means she took the shortest route to get there—a straight line.



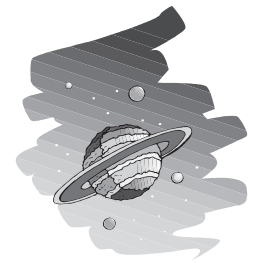
9 Vocabulary *Dumbfounded* means to be amazed.

11 Expression Christina tells Grant to *stop monkeying around*, an expression that means to stop acting in a way that gets others’ attention and may cause an accident.

11 Vocabulary *Sarcastic* means to say one thing, but mean something else. When you are speaking *sarcastically*, you expect the other person to understand your real meaning.

## Saturn Fast Facts

- Galileo first observed Saturn 400 years ago with a telescope.
- In Roman mythology, Saturn was considered the god of agriculture.
- In 1979, NASA’s Pioneer 11 first visited the planet.
- It is a gas planet, made up of 75% hydrogen and 25% helium. It also has traces of water and rock.
- The center of Saturn is made of rock, ice, and gases and is very hot.
- Three of Saturn’s rings are very bright and can be seen from Earth, and all have independent orbits around Saturn.
- Saturn’s rings are made mostly of ice mixed with rock.
- Saturn has 34 named moons.



12 Culture



The *moonwalk* gained in popularity in the early 80s when pop star Michael Jackson performed the technique in his music videos. Moonwalking gives the impression that you are walking forward, but you are really sliding backward.

13 Personification

When inanimate objects or animals are given human characteristics, this is an example of personification, like when the humidity “slapped” Christina.

13 Vocabulary

To thumb through a magazine or newspaper means to not read it carefully.

13 Science

Christina borrows a space expression when she says, “Houston, we have a problem!” If a problem arises on a space mission, the astronaut would direct concerns to mission control in Houston.

14 Vocabulary



A *gaggle* actually refers to a flock of geese that isn’t flying. So a *gaggle* of kids means a group of kids.

14 Expression

“The coast is clear!” is a popular expression that means there is no danger and movement is possible.

14 Vocabulary



To make a *stirrup* that would support a person, you clasp your hands together tightly so they can step up, much like a stirrup attached to a saddle to help someone climb onto a horse.

## Comets Anyone?

The next time you want to describe a comet, you can use two new terms: nucleus and coma. The center of a comet is the nucleus, which is icy water and other gases. The nucleus is surrounded by a dusty, cloud-like coma. So, comets are like dusty snowballs that orbit the sun!

How do you think the coma is formed? As the comet travels around the sun, the icy nucleus is warmed by the sun and the gases vaporize into that funny cloud of dust. A comet can have two tails as it nears the sun: a straight gas tail and a curved dust tail.

**Challenge:** Do some research to find out why the gas tail is straight and the dust tail is curved.



- 15 Expression To *feel like heaven* means to feel very good, like a cool pool in summertime. A key lime pie might *taste like heaven*.
- 15 Expression When Todd says that Grant’s question is a *fair question*, he’s saying that the question is worth answering despite the controversial content.
- 16 Expression Todd warns the kids to stay with the group, threatening them with a “one-way ticket out of here.” Of course, the reference to a ticket doesn’t have anything to do with buses, trains, or airplanes, but only that they would have to leave camp and not return.



- 16 Body Language When Phillip threw his head back and laughed, we can see that he enjoys a good joke.
- 16 Science A shuttle mock-up at Space Center Houston gives visitors a visual idea of what’s inside a typical space shuttle.
- 16 Mystery Christina is gathering evidence and making deductions about the clues she finds.
- 17 Expression Junko suggests naming the cricket Cricket Ham *in honor of* Ham the Chimpanzee. This shows that Junko holds Ham the Chimp in high esteem.

- 17 Imagery Using the word *corkscrewed* to describe the way the rocket propelled through the air is using imagery to depict how it looked.



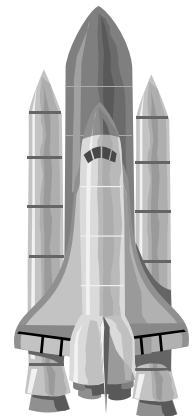
## Space Shuttle Divided by Three

A space shuttle has three parts: the Orbiter, the Solid Rocket Boosters (SRBs), and the External Fuel Tank (ET).

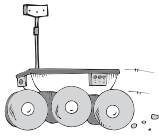
The Orbiter holds the space crew and supplies. It returns the crew safely back to Earth. The orbiter is reusable.

Without the SRBs, the space shuttle wouldn’t get off the ground in the first place. After these boosters propel the shuttle to an altitude of 150,000 feet, they break off and land in the Atlantic Ocean, where they are recovered and reused.

The ET powers the main engines during lift-off and ascent. Once the Orbiter reaches orbit, the ET separates from the orbiter at about 70 miles above Earth. As it falls back through Earth’s atmosphere, it burns up. Any surviving parts fall into the Indian Ocean, where they remain.



17 Science



The NASA rovers named *Spirit and Opportunity* are on Mars collecting data about the “red planet.”

17 Language

To say something “sheepishly” is to admit guilt.

17 Vocabulary

“Bazillion” is not a real number, but it is used to express a large number.

17 Expression

Christina expresses her ignorance of what the “Neutral Buoyancy Lab” is when she says “whatever that is.”

18 Idiomatic Expression

“Down to earth” can refer to a person as well as a fact. When a person is described as being “down to earth,” they are practical, sensible, and realistic.

18 Vocabulary

A *ruckus* is a disturbance.

18 Idiomatic Expression

The expression “up to something” is used a lot. An example might be: “He’s up to something! I just know it!” It means that someone is doing something they probably shouldn’t be doing.

18 Body Language

The kids “cowered together,” which gives the impression that they are *not* feeling very brave.

18 Idiomatic Expression



Christina felt sick while she was on the centrifuge and felt like she was “going to lose her lunch.” This expression just means she feels like she is going to vomit. The expression can actually be used after any meal!

## Looking at the Moon

Look at the moon when it is full, and you see the same image every time. The side we see is called the *Near Side*, while the other side, which lies in the dark, is called the *Far Side*.

Scientists describe the *Near Side* as having both *Highlands*, which are high in altitude—like hills on Earth. The darker, shadowy part is called *Maria*, which are lower in altitude and mean *seas*, though there are no seas at all, but actually hardened lava! Both the *Highlands* and the *Maria* are full of craters from meteor hits!

**Trivia:** Did you know that on the *Far Side* of the moon, there is very little *Maria*!



18 Science Human centrifuges used by NASA test how well pilots and astronauts can tolerate acceleration, or speeds, that are not experienced here on Earth.

18 Mystery



A great expression used to express that someone is being followed is that the police are on “his/my/their trail.”

19 Science

Astronauts train in large pools to imitate the feeling of weightlessness they will have while in space.

19 Writing

To “pull strings” is an idiomatic expression that means to use your position of authority to get favors. Write about a time when someone “pulled strings” for you.

19 Idiomatic Expression

“To make it up to you” means to seek forgiveness by doing something nice for someone.

19 Body Language

When Christina *hung her head*, she was accepting defeat.

20 Language



Papa described Mimi as having a “rodeo of a time,” which is a play on words, meaning she’s having a great time at the ranch.

20 Vocabulary

To *rehash* means to go over something in detail.

20 Vocabulary

*Gobbledygook* means gibberish, or something that doesn’t really make sense.

## Around and Around We Go!

A centrifuge is very useful in medical clinics. A vial of a patient’s blood is put in the centrifuge to separate the components of the blood. The clear stuff that stays at the top can be tested for elevated white blood count, which means that the body is fighting a germ. If the white blood count is abnormally low, it might mean the body can’t fight infection.

NASA uses a giant centrifuge that has seats attached. Astronauts sit in the seats and are spun around to help prepare them for space travel.



20 Science



Junko informs her friends that astronauts must use mirrors attached to their wrists because they can't bend down to read things in their spacesuits.

20 Culture

Grant yells "9-1-1," which normally would never be spoken. Nevertheless, it was a cry for help.

20 Culture

A *reel* is fast fiddling.

21 Vocabulary

An *impersonator* is someone who acts like someone else, either legally for entertainment, or illegally for criminal gain.

21 Emotion



There are several ways to express emotion using a combination of face and blood. For example, when blood drained from Christina's face, she was feeling sick. When blood rushes to your face, you might be feeling embarrassed.

21 Body Language

When Mimi tapped her red high heel, she was demonstrating that she felt impatient for an answer.

22 Idiomatic Expression

By *staying one step ahead* of someone, a criminal is avoiding being caught.

22 Vocabulary

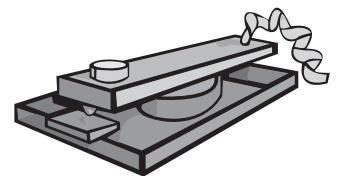
Lots of relationships or goals you want to meet have a *rocky start*, but later fix themselves.

## Distress Call!

Before technology made Morse Code unnecessary, SOS was used as a distress code on ships. It is untrue that SOS stands for "Save Our Ship." In fact, it doesn't stand for anything. It was used because it's hard to misinterpret the telegraph message. In Morse Code, the "S" is three dots, or three short taps, and the "O" is three dashes, or three long taps. So, it looked like this:

••• --- •••

Watch old war movies, and the chances are good that you'll see first-hand how these machines worked. The radio distress signal that people still use today on ships and airplanes is *mayday*, which may have come from the French word *m'aidez*, which means "help me!"



## Discussion Questions

1. Whenever Christina senses a mystery, the back of her neck starts to itch. In other words, she senses that something isn't quite right. Have you ever had the feeling that you were in danger? How do you feel when you sense danger?
2. When Grant arrived in Houston, his idea of what the big city would be like was totally wrong. What did he think Houston would be like? What was Houston really like? Talk about a time when you had a preconceived idea of something and you were totally wrong. It might be a food you tried for the first time, or a person you met for the first time, or even a place you visited for the first time.
3. Grant doesn't seem to follow the rules in this mystery. Talk about the situations where Grant acted impulsively. For example, he entered Kent's office without permission and he jumped on the experimental rover.
4. If Grant had followed the rules, do you think the mystery would have taken the same direction? Discuss how things might have turned out differently.
5. Junko's character goes through a transformation as the mystery progresses. Talk about these changes.
6. Junko is very knowledgeable about Space Center Houston. Talk about how she contributed to solving the mystery.
7. After reading the mystery, do you feel you are more knowledgeable about the space program? Discuss the things you learned or found very surprising. Do you think you might pursue a career as an astronaut? Why or why not?

## Everyone Loves a Parade!

Macy's Thanksgiving Day Parade is an annual event held in New York City. Since 1924, Macy's department store has been hosting this event, which draws thousands of spectators every year. The parade is famous for its floats, music, and balloons. For several years, the Central Park Zoo loaned the parade several of its animals for display at the parade. These animals were eventually replaced by giant animal-shaped balloons floating in the sky that were released at the end of the parade.

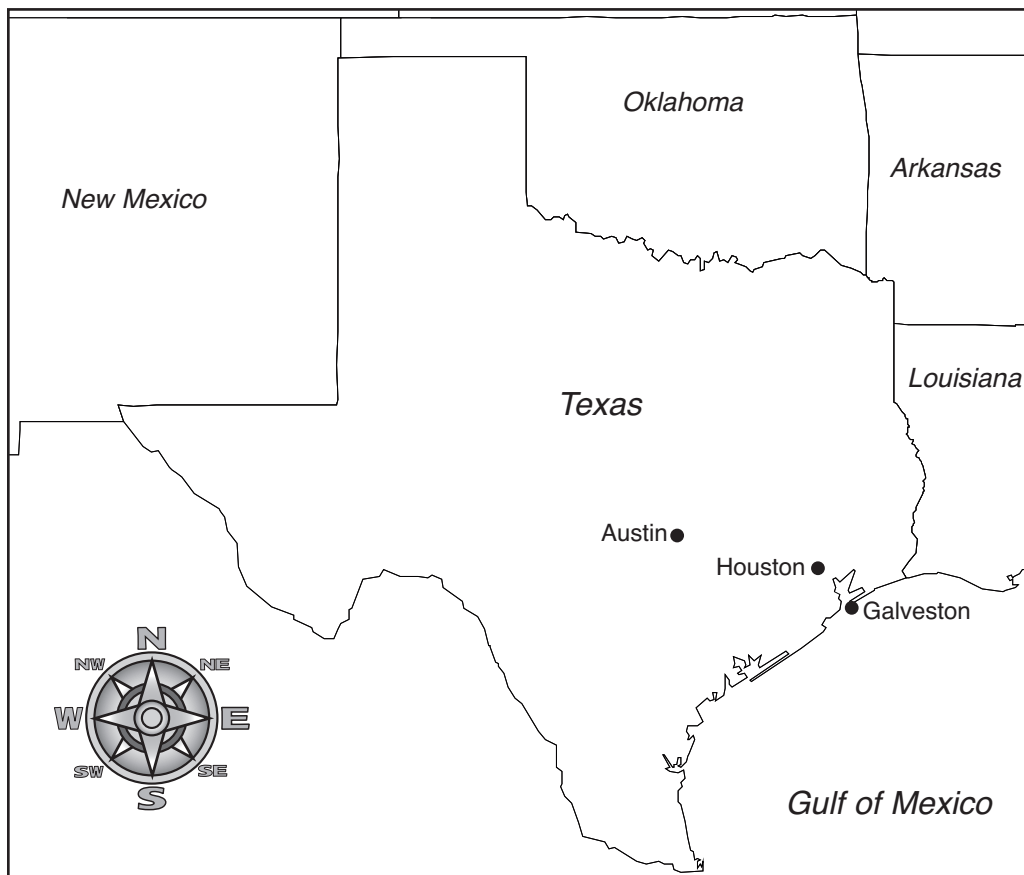
**Trivia:** After a while, these giant balloons would make their way down to the ground. Anyone who returned the balloons to the address on the label would get a prize from Macy's.





# Geography: Find it!

1. Can you locate Houston on the map below?
2. In what part of Texas is Houston located?
3. Where is the capital city of Austin in relation to Houston?
4. What large body of water can be found east of Houston?
5. Which bordering state is closest to Houston?
6. What city lies southeast of Houston on the coast?



## Houston Fun Facts

- Houston was named after General Sam Houston, the former president of the Republic of Texas (Texas was a country before it became a state in 1837.)
- Only three other cities in the United States have populations that exceed that of Houston: New York City, Los Angeles, and Chicago.
- Houston is the largest city in Texas, with a population of 3 million people.
- “Houston” was the first word that Neil Armstrong uttered when he landed on the moon.
- Over 60 different ethnic groups call Houston home.
- Houston is home to Space Center Houston.
- It is also home to NASA Johnson Space Center.
- Though Houston does experience extremes of temperature, the average temperature year round is 70 degrees Fahrenheit.



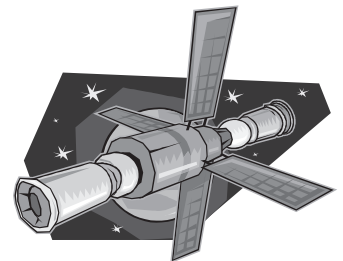
# Mathematics: Calculate It!

1. One Houston oil company produces 178,000 barrels of oil a day. How many barrels of oil would it produce in one year (not a leap year), if oil production stopped on Sundays?
2. John Glenn orbited the earth 3 times, while Gordon Cooper went around 22 times. Using a fraction, compare Glenn's and Cooper's achievements.
3. What is the order of the space missions, from first to last?  
Clues:
  - The Mercury missions came before the Apollo missions.
  - The Apollo missions immediately followed the Gemini missions.
4. One story in a building is typically 10 feet high. How many stories would a 300-foot-tall building have?
5. If there are 27 camp-goers and the camp counselor asks the campers to divide into groups of 4, how many groups of 4 can form? How many campers will not be in a group of 4?
6. If there are 95 camp-goers, and 40 percent are girls, what is the number of boy campers?
7. Probability is the likelihood that an event will occur. The probability of an event can be described using these words: likely, unlikely, certain, impossible. Use one of these words to describe the probability of each of the following events.
  - a. The probability that Grant will do something clumsy.
  - b. The probability that Christina and Grant will get in a dangerous situation.
  - c. The probability that Christina and Grant will find clues.
  - d. The probability that Christina and Grant will not solve the mystery.
8. If the ISS orbits the earth in 90 minutes, how many times does the ISS orbit the earth every day?

## Out of this World!

The International Space Station is a very expensive project! Located 250 miles above Earth, the ISS will be a "city in space" where people from countries around the world will be able to work and live—and study space. The entire space station is being constructed in space! Here are some fast facts!

- 16 countries are involved in making the ISS a reality (the United States, Russia, Canada, Japan, Brazil, and 11 European countries, including the Netherlands, Germany, and France).
- To remain in orbit, the space station must continue moving at 17,500 miles an hour.
- The ISS is about the size of two football fields.
- It will cost about \$60 billion to complete.
- It orbits the earth in 90 minutes.



1. Plan a trip to Space Center Houston. Do some research to find out how long it would take to get there from where you live; the best mode of transportation; what you would need to take on your trip; where you would stay while visiting Houston; and how much money you would need to have a terrific time while you are there. Now write about it!
2. Imagine that you have the opportunity to visit the International Space Station. Describe what it might feel like to float in space.
3. Sixteen countries from around the world are involved in making the ISS a reality. Why do you think it is so important to have such international cooperation?
4. You are out hunting for clues, when suddenly you are locked in a closet. Luckily, you have your handy flashlight. Look around you. Describe what you see in the closet. Be creative. Will these items help you get out of the closet?
5. Astronauts need a lot of training before they can go out in space. From what you've read, what kinds of training do astronauts need?
6. Imagine orbiting Earth from space. Describe what you see. Now, imagine circling the earth in a hot air balloon. Describe what you see.

### Zero Gravity

You may have heard the term zero gravity, but can you explain what it is? You might think it means that Earth's gravity no longer has an effect on you in space. But, actually, it does!

Imagine that you've finally been convinced that bungee jumping is the greatest sport in the world. You peer over the side of the cliff, waves crashing against the side, and you jump! Now, you are falling, wind hitting your face. You will eventually stop falling and bounce, bounce, bounce!

When you are in space, you are in a constant state of falling, but without the wind. So, how do astronauts keep from falling back to Earth? They must keep orbiting the earth at very fast speeds! That's how!



# Vocabulary: Spell It!

Study the words below. All of them are taken from the mystery book. Fold the page in half and take a spelling test. Look up your word in a dictionary and write its definition on a separate piece of paper.

CURIOSITY

ASTRONAUT

NAUTICAL

AERONAUTICS

IMPATIENT

HUMDINGER

SUSPICIOUSLY

MYSTERIOUS

WHISTLED

KALEIDOSCOPE

MESMERIZING

WHISPERING

DISAPPOINTED

DECIPHER

DEHYDRATED

MANNEQUIN

ANXIOUSLY

SOMERSAULTS

EMBARASSMENT

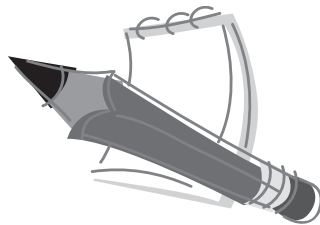
COMMOTION

BUOYANCY

CENTRIFUGE

OXYGEN

IMPERSONATOR



## What is Gravity?

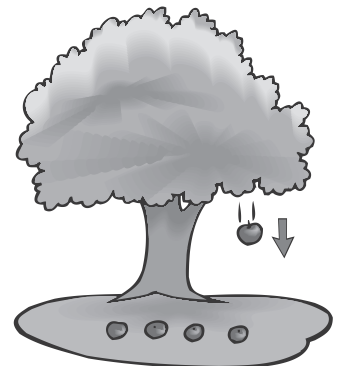
Gravity is one of nature's forces. If an object has mass (put something on a scale: if it weighs something, it has mass), then it also has a gravitational pull. Even though you can't feel it, we have a gravitational pull on things around us—and they on us! The more mass an object has, the stronger the gravitational pull.

So, it's not the size of an object (like a big balloon), but rather how much matter it has and how tightly the matter is packed into the object.

It's actually the gravitational pull of the Earth on the moon that keeps the moon in orbit around the Earth.

### Cool Moon Facts

- The moon is 27% the size of the earth.
- Stuff on the moon weighs 1/6 the weight on Earth.
- You can jump 6 times higher on the moon!



## Sun Spinner!

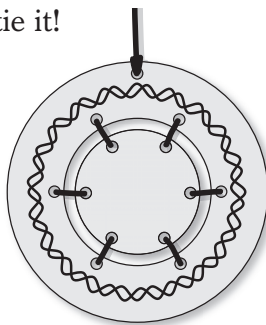
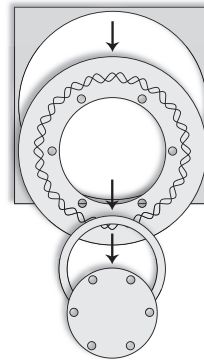
Follow the directions below to make a mobile of our “superstar”— the sun!

### Materials needed:

One 9x9” square of yellow construction paper  
scissors  
hole punch  
crayons or markers  
yarn, cut into six 6” strips and one 12” strip

### Instructions:

1. Draw a circle on the yellow paper (almost to the edge).  
Draw a smaller circle in the middle.  
Draw a fun design (anything you want!) in the area between the two circles.
2. Cut out both circles. Then, cut the small circle about  $\frac{1}{2}$ ” smaller.
3. Punch 6 holes, spaced evenly, around the inside edge of the big circle and the outside edge of the small circle.
4. Thread the 6” yarn pieces through the holes in the big circle and the holes in the little circle. Tie the yarn. You are attaching the small circle to the inside of the big one.
5. Punch another hole at the top of your big circle. Thread the 12” strip of yarn through it and tie it!
6. Enjoy your spinning sun mobile!



## Making Air from Water?

How do you make air to breathe from the water we drink? The astronauts on the ISS use a process called electrolysis to get much of the oxygen they need to stay alive! The process splits water into its two parts: hydrogen and oxygen. As you know, water is just  $H_2O$ , right? That's two molecules of hydrogen gas and one of oxygen gas. By running electricity (from the space station's solar panels) through the water, the water is mechanically separated into the two gases. There you have it—oxygen to breathe!

Did you know that plants on Earth do the same thing, minus the electricity? They use sunlight, carbon dioxide, and water to make sugars for food. And the byproduct of this exchange? You got it—oxygen!



# Science: Cook It!

Christina and Grant enjoy delicious ranch food during their mystery trip. Try making your own yummy chili with this easy recipe. Be sure to get the help of an adult!



## CHUCKWAGON CHILI

### Ingredients

- 1 pound ground beef
- 1 cup chopped onion
- 2 15½ ounce cans kidney beans
- 1 can of tomato soup
- ½ can water
- 2 tablespoons chili powder
- ½ teaspoon salt
- Pinch of pepper



### Directions

Brown the ground beef. Drain. Place the beef and the remaining ingredients in a crock pot and cook on low until ready, about two to three hours.



**NOTE: The preparation of all dishes should be carried out with the supervision of an adult.**



## Space Food!

A NASA news release dated November 6, 1973, touted a new high-energy bar that would be added to the Skylab (America's first space station) astronauts' menu. The energy bars, which are 2 by 4 inches in size and 300 calories each, came in three different flavors: vanilla, chocolate, and strawberry. The astronauts would receive one every three days during their 60-day mission. A total of 392 space bars were put on board.

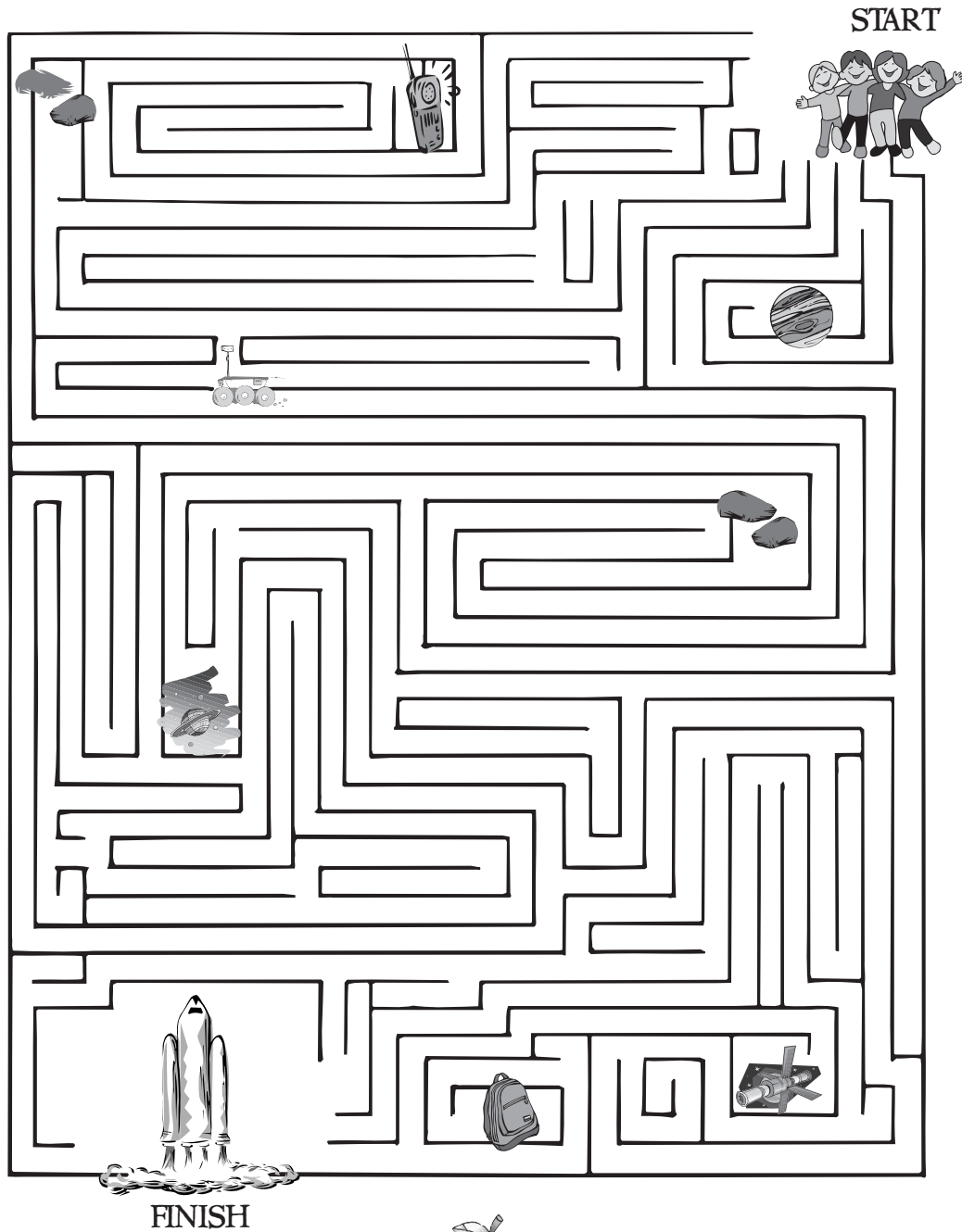
The space bars were considered supplements to the normal menu. The daily menu included breakfast, lunch, dinner, and a snack. Astronauts could expect meals including spaghetti, pork, potatoes, chicken, mashed potatoes, and dried apricot while on their space mission.



## The Mission Possible Mystery at Space Center Houston Maze



Help Christina, Grant, Phillip, and Junko find their way through the secret passage. Watch out for moon rocks!



***The Mission Possible Mystery at  
Space Center Houston  
Pair Up***



*Match the words on the left with the correct words on the right!*

FINGER

PIT

LIFT

MAN

SAND

DOWN

SPACE

SHAKE

SKY

WALK

HORSE

OFF

SPACE

SCRAPER

MILK

TIPS

COUNT

PAPER

COCK

SUIT





# ***The Mission Possible Mystery at Space Center Houston Spy Game***



*If you're going to be professional snoopers like Christina and Grant, you need to practice figuring out clues. Try this fun activity to sharpen your spying skills!*



Throughout the Mystery at Space Center Houston, Christina and Grant and their friends find clues along the way to help them figure out what happened to a very precious something! With a partner, try to find the clues listed below in the mystery. Next to the clues, write the page number where the items can be found and an explanation of what the clues mean in the story.

1. METAL STAND \_\_\_\_\_
2. PLANET \_\_\_\_\_
3. ROCK \_\_\_\_\_
4. MGA \_\_\_\_\_
5. HAM KNOWS \_\_\_\_\_
6. SATURN \_\_\_\_\_
7. FLAG \_\_\_\_\_
8. CARD \_\_\_\_\_
9. TICKET \_\_\_\_\_
10. BACKPACK \_\_\_\_\_



# ***The Mission Possible Mystery at Space Center Houston Scramble***



*Unscramble the words below to find the places and things  
Christina and Grant see on their trip to Houston.*

1. CHARN (HINT: COWS LIVE ON ONE) \_\_\_\_\_
2. WOBCOY STOOB (HINT: THEY'RE RANCH SHOES) \_\_\_\_\_
3. MONO CROKS (HINT: THEY'RE HARD) \_\_\_\_\_
4. GHLIFT ROTSMAILU (HINT: IT'S LIKE THE REAL THING) \_\_\_\_\_
5. STANTOURAS (HINT: THEY GO IN SPACE) \_\_\_\_\_
6. REVORS (HINT: THEY'RE LIKE BUGGIES) \_\_\_\_\_
7. LOOP (HINT: SPLASH SPLASH) \_\_\_\_\_
8. PEELINGS GABS (HINT: THEY'RE FOR CAMPING) \_\_\_\_\_
9. BELSWEETMUD (HINT: THEY ROLL) \_\_\_\_\_
10. BEECRABU (HINT: IT TASTES YUMMY) \_\_\_\_\_
11. TENCFIGURE (HINT: IT SPINS) \_\_\_\_\_
12. GLAF (HINT: IT FLUTTERS) \_\_\_\_\_



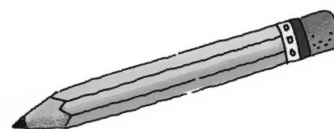
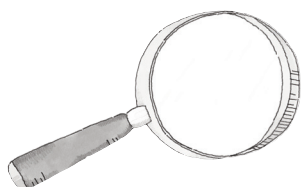
# The Mission Possible Mystery at Space Center Houston Word Search



Search for the mysteriously hidden words below!

|   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | M | F | R | V | F | P | O | I | E | N | R | N | H | S |
| O | S | O | F | A | Q | D | M | O | V | U | O | N | C | P |
| T | S | E | O | O | N | X | B | C | R | J | C | O | N | A |
| S | X | O | L | N | T | C | G | N | C | W | K | I | U | C |
| U | D | U | U | U | R | F | H | U | K | S | T | T | A | E |
| O | R | R | P | N | S | O | I | C | V | O | H | A | L | M |
| H | H | B | B | R | D | P | C | L | Q | N | I | L | E | O |
| R | C | R | N | N | C | B | A | K | K | L | E | U | L | D |
| S | C | Y | F | K | L | A | A | C | S | B | F | M | T | U |
| L | A | N | O | I | T | A | N | R | E | T | N | I | T | L |
| N | O | I | T | I | N | G | I | X | R | C | Y | S | U | E |
| S | P | A | C | E | S | U | I | T | S | I | A | O | H | S |
| S | P | A | C | E | S | H | U | T | T | L | E | P | S | K |
| B | A | L | Y | C | N | A | Y | O | U | B | A | R | S | C |
| U | B | M | I | S | S | I | O | N | P | F | G | K | I | Z |

- |              |                |               |                |
|--------------|----------------|---------------|----------------|
| IGNITION     | SPACE SHUTTLE  | LIFTOFF       | SOUND BARRIER  |
| HOUSTON      | INTERNATIONAL  | SIMULATION    | MOON ROCKS     |
| SPACESUITS   | SPACE CAPSULES | MISSION       | SHUTTLE LAUNCH |
| BUOYANCY LAB | ROCK THIEF     | SPACE MODULES | RANCH          |



# The Mission Possible Mystery at Space Center Houston Fill-in-the-Blank



Fill in the blanks to answer the questions.

1. In the simulator, the children were headed to this place:

I \_ \_ \_ \_ N \_ \_ \_ \_ O \_ \_ \_ \_ S \_ \_ \_ \_ E S \_ \_ \_ \_ I \_ \_ \_

2. NASA stands for:

\_ \_ \_ \_ \_ O \_ \_ \_ L A \_ R \_ \_ \_ A U \_ \_ \_ \_ \_ A \_ \_ D S \_ A \_ \_ E  
A \_ \_ \_ \_ \_ S \_ \_ \_ A T \_ \_ \_ \_ \_

3. The first things Grant and Papa visited at Space Center Houston were:

M \_ \_ \_ \_ \_ O \_ \_ \_ \_ \_

4. These are what hit the car at the ranch:

\_ \_ \_ \_ \_ L \_ \_ \_ \_ \_ D \_ \_

5. The words that Christina read in the rings of Saturn:

R \_ \_ \_ \_ \_ T \_ \_ \_ \_ \_ M \_ \_ \_ \_ \_

6. What astronauts wear on their wrists to read messages:

M \_ \_ \_ \_ O \_ \_ \_ \_

7. The name of the cricket that Grant helped rescue:

\_ \_ \_ \_ \_ C \_ \_ \_ \_ \_ M



# ***The Mission Possible Mystery at Space Center Houston***

## ***Matching Characters***



*Match these mystery characters with their descriptions!*

- |              |                                    |
|--------------|------------------------------------|
| 1. Papa      | a. a great detective               |
| 2. Mimi      | b. a cowboy grandfather            |
| 3. Christina | c. Grant's new-found friend        |
| 4. Grant     | d. a mysterious tour guide         |
| 5. Junko     | e. mystery-writing grandma         |
| 6. Phillip   | f. a smart but clumsy brother      |
| 7. Judy      | g. the owner of Resting Rock Ranch |
| 8. Kent      | h. a smart girl with attitude      |
| 9. Todd      | i. a very gracious host            |

## ***The Mission Possible Mystery at Space Center Houston Quiz***



*Use the clues to recall some interesting information about The Mission Possible Mystery at Space Center Houston!*

1. Blast Off Theater at Space Center Houston is located at this center:

\_\_\_\_\_

2. The number of pounds of rocks that have been brought back from the moon:

\_\_\_\_\_

3. The item that was stolen from the space museum:

\_\_\_\_\_

4. Christina was referring to this when she said, "Wonder what this is for?":

\_\_\_\_\_

5. The animals that the United States and Russia sent into space:

\_\_\_\_\_

6. The name of the type of rocket that took the Apollo mission to the moon:

\_\_\_\_\_

7. The name of the chimpanzee who successfully went into space in 1961:

\_\_\_\_\_

8. What the kids missed while they were stuck inside the Living in Space Module:

\_\_\_\_\_

9. Where Grant found a card:

\_\_\_\_\_



## ***The Mission Possible Mystery at Space Center Houston True or False***



*Mark each statement true or false.*

*Can you replace the word (or words) that is false in each statement?*

- \_\_\_ 1. Christina understood how astronauts must feel when they launch into space for the first time.
- \_\_\_ 2. Christina wondered if the shuttle to the International Space Station would run out of gas.
- \_\_\_ 3. In 1961, President Johnson wanted the United States to be the first country to put a man on the moon.
- \_\_\_ 4. Seeing the TV images of Neil Armstrong and Buzz Aldrin land on the moon in 1969 made Mimi want to be an astronaut.
- \_\_\_ 5. Whenever Christina sensed a mystery, the back of her neck would start to itch.
- \_\_\_ 6. The first clue that Christina found was the word "Space" written on a yellow piece of paper she found on the floor.
- \_\_\_ 7. The reason why Junko was acting cranky was probably because she didn't think her dad would make it to her birthday party.
- \_\_\_ 8. A bunch of grasshoppers escaped from the broken glass case at the space museum.
- \_\_\_ 9. Edward White was the first American astronaut to walk in space.
- \_\_\_ 10. Astronauts call the shuttle the orbiter.



# Answer Key...

## to The Mission Possible Mystery at Space Center Houston Activities



### Geography Questions

1. (Student locates Houston on a map)
2. Southeast
3. Northwest
4. Gulf of Mexico
5. Louisiana
6. Galveston

### Math Activities

1.  $365$  (days/year)  $- 52$  (# of Sundays) =  $313$  days  $313 \times 178,000 = 55,714,000$
2. Glenn orbited the earth about  $1/7$  the times that Cooper did.
3. Mercury, Gemini, Apollo
4.  $300 \div 10 = 30$
5. 6 groups with 3 campers left over
6.  $95 \times .60 = 57$
7. (Answers may vary) a. certain, b. likely, c. certain, d. impossible
8. 16 times

### The Mission Possible Mystery at Space Center Houston Pair Up

fingertips, liftoff, sandpaper, spacesuit, skyscraper, horseman, spacewalk, milkshake, countdown, cockpit

### The Mission Possible Mystery at Space Center Houston Spy Game

1. metal stand: pages 31, 118 (a place for the space rock)
2. PLANET: page 20 (a clue that leads to Saturn)
3. rock: page 20 (it goes missing)
4. MGA: page 42 (it stands for Mercury, Gemini, and Apollo, the 3 missions)
5. HAM KNOWS: page 55 (refers to the chimpanzee Ham and the next clue)
6. SATURN: page refers to the Saturn V rocket with the next clue
7. flag: page 76 (link to the next clue)
8. card: page 86 (refers to Robert's Spacey Collectibles)
9. ticket: page 97 (a ticket to the Neutral Buoyancy Lab)
10. backpack: pages 37, 61, 89, 120 (Todd's ever-present backpack)

### The Mission Possible Mystery at Space Center Houston Scramble

1. ranch
2. cowboy boots
3. moon rocks
4. flight simulator
5. astronauts
6. rovers
7. pool
8. sleeping bags
9. tumbleweeds
10. barbecue
11. centrifuge
12. flag

### The Mission Possible Mystery at Space Center Houston Fill-in-the-Blank

1. International Space Station
2. National Aeronautics and Space Administration
3. moon rocks
4. tumbleweeds
5. race me to the moon
6. mirrors
7. Cricket Ham

### The Mission Possible Mystery at Space Center Houston Matching Characters

1. b
2. e
3. a
4. f
5. h
6. c
7. i
8. g
9. d

### The Mission Possible Mystery at Space Center Houston Quiz

1. Johnson Space Center in Houston, Texas
2. 840
3. moon rock
4. empty metal stand on Kent's desk
5. U.S.: mice, monkeys, and chimps/Russia: dog
6. Saturn rocket
7. Ham
8. breakfast
9. in a sleeping bag

### The Mission Possible Mystery at Space Center Houston True or False

1. T
2. F (if it had brakes)
3. F (Kennedy)
4. F (astronomer)
5. T
6. F (Planet)
7. T
8. F (crickets)
9. T
10. T

