

# Communication

## G.A.C. Pack

Here are some fun ways for you and your partner to “Get the Message” before the next Girls at the Center Discovery Day.

Xin Chao

Dzien' dobry

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vitayu



A national collaboration to encourage family involvement in girls' science learning

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## Puzzled about Communication?

The dictionary tells us that communication is “a means of sending messages.” There are many different ways to send messages, as you will find out when you and your partner do the activities in this G.A.C. Pack.

Send a message to other G.A.C. partners about what communication means to you. Illustrate your message with markers on the puzzle piece enclosed. Your message can be in code, words, pictures, different languages. It can focus on the science of communication, inventions, important people, methods and devices. The possibilities are endless. Be creative. Ask questions.

Bring your puzzle piece to the next **Discovery Day**. Join in the fun as we assemble the giant **COMMUNICATION** puzzle designed by **Girls at the Center**.

# G.A.C. SECRET CODE WHEEL



A code is an arrangement of letters or figures to make a message short or secret. Codes have played an important role in military, government, and business activities. Today, codes are still very important, especially in business and communications. If you think about it, you use codes in your life on a daily basis. Next time you go shopping, fix a meal, or read a paper, look for codes.

Many codes are based upon relationships between numbers, or numbers and letters, using a key, or cipher. In order to write or decipher a message, you need that key.

## You will need:

a code wheel (enclosed)  
a thumbtack  
an eraser from a pencil  
a pair of scissors

## What to do:

1. Find the Secret Code Wheel card and cut out the two circles along the dotted line.
2. Write your name on the line where indicated.
3. Lay the circle with the notches on top of the circle with the letters. Push the thumbtack through the middle of the two circles (between the "C" and "R" of "Secret"). Put the point of the thumbtack into the pencil eraser to attach the circles.
4. Your very own code wheel is ready to encode and decode! Line up a letter at the top of the wheel and write the coded letter that appears below. GOOD LUCK! Can you send your partner a message?

*Note: If you want to make another code wheel for your partner or friends, you can find it online at the Just for Girls Web page, under Codes, or trace this one.*

## Girl Scout Program Links



## HOT LINKS

### For Brownie Girl Scouts:

The **Point, Click, Go!** Try-it patch is a fun way to learn about computers.

### For Junior Girl Scouts:

The **Technology** Badge (online only) is a great place to start. Go for an upgrade with the **Computer Fun** and **Math Whiz** badges. The **Video Production** badge explores the technology of visual effects.

### For Cadette and Senior Girl Scouts:

Get the message with any of the **Communications** interest project patches. Combine creativity and technology with **Desktop Publishing**, **Audiovisual Production**, **Graphic Communications**, and **Story Writing**. Surf the net with **Internet Explorer**.

"Sign" on to learn more about sign language and the deaf community. **Animated American Sign Language** includes a dictionary of signs. <http://www.bconnex.net/~randys/index2.html>

Read familiar children's stories written in American, Brazilian, and Nicaraguan sign language at **Sign Language Literature**.  
<http://www.signwriting.org/cindoo.html>

Why do cows go 'muuu' in Spanish, but 'moo' in English? Find out at **Sounds of the Animal World**.  
<http://www.georgetown.edu/cball/animals/animals-spelling.html>

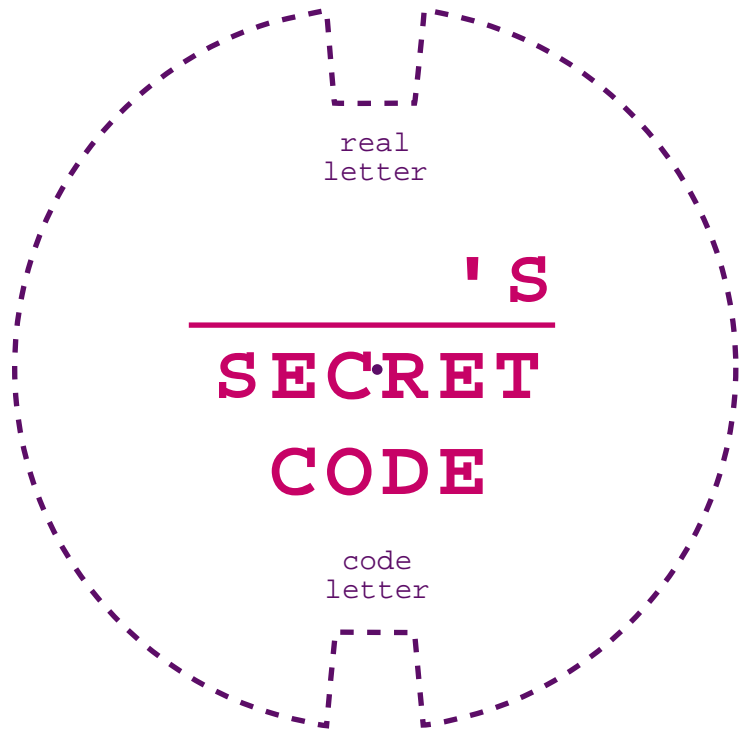
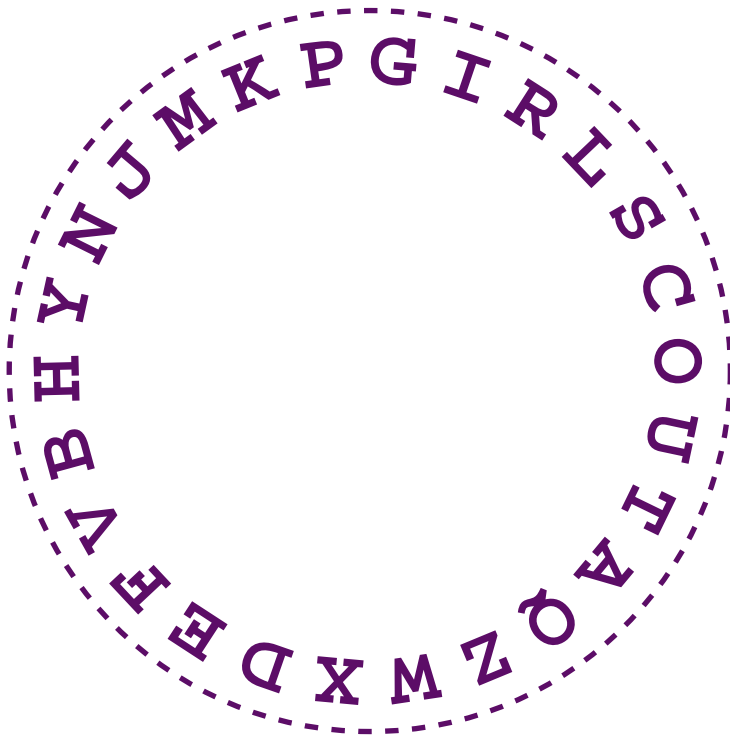
Want to become net-wise? Check out **Yahooligans**, a kid-friendly guide to the Net. <http://www.yahooligans.com>

Surf the net to learn more about **museums** around the world. Log on to <http://www.icom.vlmp/index.html>

Go online to find out more about Girl Scouting and G.A.C. At **Just for Girls** you can contribute your thoughts and ideas, find more fascinating links, or send a question to "Dr. M". Look for fun "get the message" activities and interesting interviews at the place just for G.A.C. girls and their partners. <http://www.girlscouts.org/girls>

# G.A.C. SECRET CODE WHEEL

Directions for this activity are on the second card



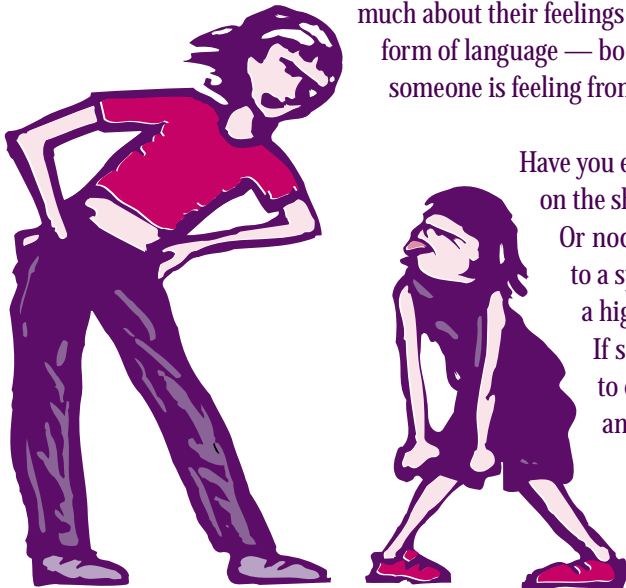
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- First Union
- The Boeing Company
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- Bank of America
- George and Frances Armour Foundation
- Best Buy Children's Foundation

# BODY LANGUAGE

We all know how to read a book, but how do we read a *person*?

People do not always use words to tell us how they feel, but they can reveal much about their feelings and emotions by using another form of language — body language. You can tell how someone is feeling from how she moves or sits.



Have you ever patted another person on the shoulder to comfort her or him? Or nodded your head while listening to a speaker? Or given someone a high-five to congratulate them? If so, you have used body language to communicate specific messages and feelings.

## Partner Challenge

What message does each of the following body movements or postures communicate?

Do the following and see what your partner thinks you are "saying."

- ◆ pat on the back
- ◆ arms folded across chest
- ◆ repeatedly licking lips
- ◆ thumb and index finger in circle
- ◆ palm outward with fingers together
- ◆ fist pounded on table



How do people from different cultures interpret these gestures?

# FACING FACTS

Facial expressions are another way in which people communicate without words. But does everyone recognize a smile as a sign of happiness and a frown as a sign of sadness? Scientists have found that although expressions of emotion can be different from one culture to another (and even from one person to another), people from different parts of the world tend to show similar facial expressions when experiencing certain emotions.

Human beings are capable of a greater variety of expression than any other animal on earth.

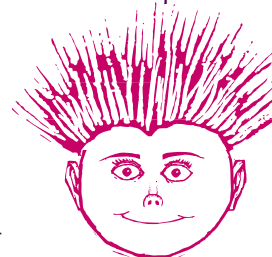
Anger, disappointment, grief, and happiness are only a few of the emotions our facial muscles help us to display.

The human face has dozens of small muscles. Did you know that it takes 34 muscles to frown (*really* frown) and only 13 to smile?

If you don't exercise certain muscles, they become useless. Can you wiggle your ears?

## Facial Fun

Exercise your facial muscles with these expressions.



Open your nostrils.  
Close your nostrils.



Open your mouth wide. Pull your upper lip down.



Lift your ears. Pull your ears back.



Make a big frown, then a big smile.



Wink with one eye, then the other.

Can you guess which facial expressions of emotion most people recognize? Solve the word scramble to find out the answers!

AGNRE YJO OSRRWO

Answers: anger, joy, sorrow

# TALKING TO

# OUTER SPACE



Where can you find

- ◆ Instruments that can hear a whisper from a billion miles away?
- ◆ Secret codes that send pictures from outer space?
- ◆ Robots that “talk” to Martian rocks?

Such exciting communication devices are developed at NASA’s Jet Propulsion Laboratory (JPL).

JPL’s Deep Space Network provides radio communications for NASA spacecraft located far out in the solar system – over **a billion miles** away from Earth.

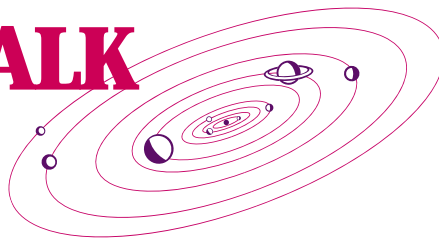
Communicating with deep or outer space presents unique challenges because the distances are so staggering. For one thing,

by the time the signal has traveled all those miles to Earth, it is *very* weak, barely a whisper. It takes **extra large** dish-like antennas to hear the signals. Also, the antennas have to be located in places that have very few people so that power lines, radio and television stations and household appliances do not interfere with the signals.

Scientists use **microwaves** to communicate with far-away spacecraft. (Did you know that microwave radio-frequency bands are also used for television, cellular telephone networks, radar, and FM radio broadcasts?) Can you speak microwave? Neither could space scientists. Spacecraft engineers and computer scientists had to invent a special language — actually a “secret code” so people could communicate with machines and talk to outer space.

Log on to the NASA/JPL web site at <http://spaceplace.jpl.nasa.gov> to find out about Space Talk and the Secret Code.

## SPACE TALK



Creating word games can be great fun! You can challenge your partner and your friends by using scrambled word sets, coded words, or Word Find games. Here are some space science terms from which to choose and directions for making a Word Find game board.

- VENUS
- PLANET
- MOON
- JUPITER
- MARS
- MERCURY
- SATELLITE
- SIGNAL
- COMMUNICATION
- SPACECRAFT
- MICROWAVES
- DATA
- ASTRONAUT
- EARTH
- SUN
- VOYAGER
- SATURN
- ROCKET
- GRAVITY
- MISSION
- VOLUME
- DECODE
- TECHNOLOGY
- LAUNCH
- COMET
- ASTEROID
- SOLAR SYSTEM
- ORBIT
- ANTENNA
- NASA

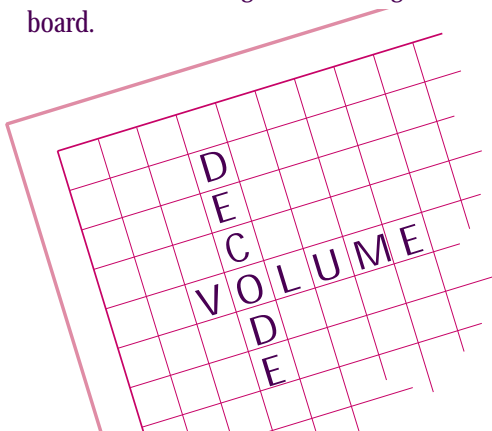
## WORD FIND GAME BOARD

**You will need:**

graph paper, pencil, space science terms.

**What to do:**

1. Pick a starting box, and count 15 squares across and 15 squares down from the starting box.
2. Choose the space science terms you wish to include on the game board.
3. Form words on the board by placing a letter in each box. You can write them from left to right, right to left, on a diagonal, and up or down.
4. Fill in the blank squares with any letters you want!



Most of us are able to hear well. But there are sounds that our ears alone can't hear. And there are differences in people's ability to hear sounds. Communication by hearing sometimes requires that sounds be louder. Have you ever seen the **really big** speakers at a rock 'n' roll concert? A person wearing a hearing aid? A police officer with a megaphone? All of these devices amplify or make sounds louder.

## I CAN'T



## HEAR YOU!

## Make your own amplifier or ear trumpet

It's easy. All you need is a large piece of poster board and tape.

What to do:

- ◆ Roll the poster board into a cone shape. The big end of the cone should be as wide as possible. The other end should be narrow enough to fit comfortably against your ear.
- ◆ Tape the ends to hold them in place.
- ◆ Take your cone outside or go into a quiet room.
- ◆ Put the small end near your ear. **DO NOT STICK THE NARROW END INTO YOUR EAR.**
- ◆ Point the cone in different directions and listen carefully.
- ◆ Notice how different the world sounds with and without the cone to aid your hearing.
- ◆ What sounds did you notice with the cone that you did not notice before?

### How It Works:

Sound travels through the air in *waves*. The air shakes back and forth very fast as the sound energy waves pass. These shaking movements are called vibrations. If the vibrations reach our ears, we "hear" the sound. The loudness of a sound depends on just how much energy there is in the sound waves. As sound waves spread out they become smaller and harder to hear. The funnel or cone shape of your paper ear trumpet collected the sound energy and stopped it from being lost so quickly. The waves move along the cone and out through the narrow end into your ear.

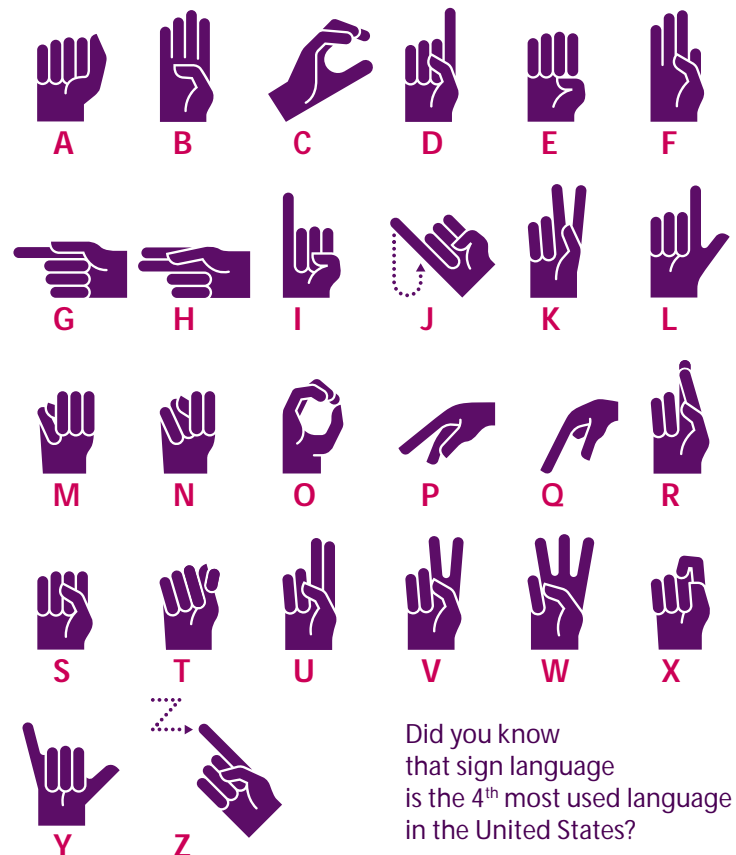
How would you communicate if you could not hear sounds? Turn over the card to learn about talking without sound.

## TALKING WITHOUT SOUND

Learning different ways to communicate helps you understand how important and how complex communication is.

Many deaf people use **sign language** to communicate. They use hand signals in two ways. The first way is "finger spelling," where each letter of the alphabet has its own hand sign. People can "talk" by spelling out all the words they want to communicate. The second way is called "signing." A sign is made with one or both hands to communicate a word or idea.

Learn the letters and signs used by deaf people. How long does it take you to feel comfortable using them? Can you teach them to your partner? Sign a message to your partner. How about "GIRLS ARE GREAT"?



Did you know that sign language is the 4<sup>th</sup> most used language in the United States?

# ECHO ...

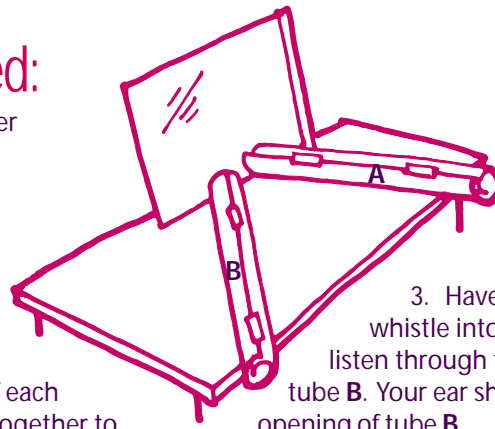
## ECHO...

### ECHO...

Did you ever make a loud noise in a room and hear your voice not once but twice? What you heard is an **echo**. An echo is a sound that bounces off an object like a wall and returns to your ears. The closer you are to a wall, the faster the echo returns; the farther away you are, the slower the sound returns. When the sound waves hit a soft surface, a very faint echo or no echo is created. Sound waves that hit a hard surface create a loud or strong echo. Try making echoes with your partner.

### You will need:

6 sheets of newspaper  
metal cookie sheet  
masking tape  
pen



### What to do:

1. Place 3 sheets of newspaper on top of each other and roll them together to make a long tube with an opening of 1 1/2 inches in diameter. Put tape along the tube to hold it together. Make a second tube with the other three sheets. Use your pen to label one tube **A** and the other tube **B**.
2. Stand the cookie sheet against the wall at the end of the table. Place tubes **A** and **B** at the same angle to the cookie sheet. Keep the end of the tubes about 2.5 centimeters (1 inch) away from the cookie sheet.

3. Have your adult partner whistle into tube **A** while you listen through the opening in tube **B**. Your ear should touch the opening of tube **B**.

4. Now you can whistle or talk very quietly into tube **B** while your adult partner listens at the end of tube **A**.

How well do you hear the whistle through the tube? How do you think the sound gets from one tube to the other?

#### Partner Challenge.

Try to bounce sounds off other surfaces. Compare a cork tile, an egg carton, and a wooden block. Try to make even longer tubes to bounce sounds and messages over even longer distances.

## Echo Communication



What do bats, sonograms, yodeling, sonar, and dolphins have in common? They all communicate using echoes.

**BATS** have very poor eyesight yet can fly around safely in complete darkness. How? Bats send out high-pitched squeaking sounds (which humans cannot hear) as they fly. These sounds hit an object and return to the bat as echoes. The use of echoes to tell the type of object, how far away it is and where it is located is called **echolocation**.

**DOLPHINS**, porpoises, and killer whales use echoes in the ocean as bats do in the air. Echoes help dolphins distinguish one

object from another and tell them where to swim to go toward the object or away from it. (Dolphins make sounds at a higher pitch than bats.)

**SONAR** is used by submarines to travel underwater without hitting coral reefs, icebergs, or other subs. The sonar sends sound into the water where it is reflected off objects and comes back to the sonar system as an echo. From the type of echo and the time it takes to return, the sonar can tell the size, shape, distance, and location of the object.

**SONOGRAMS** are often performed on women who are going to have a baby. Sounds from the outside of a woman's body are sent toward the baby. The sound is bounced off the baby and returns to a machine that uses these echoes to form a picture of how the baby looks. This technique is also called **ULTRASOUND**.

**YODELING** is a special type of singing done by some people in the Alps. The yodeler sings in a loud voice, switching back and forth from low to high notes. If the yodeler stands in the right place, the singing will echo from mountain to mountain, making a unique sound.

# ANIMAL TALK



Animals may not use words, but they do communicate by using calls and body movements. Animal behaviorists observe animals and then try to figure out what their behavior means. Can you and your partner figure out what some neighborhood animals are “saying” by observing them?

## Observing Neighborhood Animals

- ◆ Pick at least two animals to observe. You may choose any two animals, as long as they are easy to spot in your neighborhood.
- ◆ Observe each animal on two different days. Be sure to observe its behavior for at least three minutes. The longer you observe each animal, the more you’ll learn about it.
- ◆ Ask yourself and your partner questions about what you see.
- ◆ Use the chart on the other side of this card to jot down your observations.

## Where Can You Find Animals?

- ◆ In a friend’s home
- ◆ In a pet shop
- ◆ At a local zoo
- ◆ In your community
- ◆ At a park near you

## Did you know...

that iguana lizards communicate by doing push-ups and other athletic exercises? Territoriality, courtship, and other messages are sent through these movements.

that bees talk by “dancing”? The dance steps communicate the type and location of nectar supplies.



## Animal Talk Chart

Pick two animals to observe. Observe each one for at least three minutes on two different days.

Jot down any behavior—sound or movement—that each animal makes, then try to figure out with your partner what each one means.

Here’s an example: **Kind of Animal:** Dog **Behavior:** Growling **What we think it means:** Warning to stay away



**Animal #1**

Kind of Animal:

**Behavior**

**What we think it means**

1.

2.

3.

4.

**Animal #2**

Kind of Animal:

**Behavior**

**What we think it means**

1.

2.

3.

4.



# HAPPY BIRTHDAY, INTERNET!

## Partners on the Internet

Every address on the Internet, whether Web site or E-mail, has a domain address, or place of residence on a computer server. Here are the most common:

- ◆ **.org** stands for organization;
- ◆ **.com** represents commercial business;
- ◆ **.edu** stands for an educational site, such as a museum or school;
- ◆ **.gov** is a government site.

Go on an Internet scavenger hunt and find a science-related site at each of the above domain addresses. Find out about a career in communications.

Did you know the Internet celebrated its 30<sup>th</sup> birthday on October 29, 1999? Did you also know that no one person is credited with “inventing” the Internet, as is the case with other forms of communication such as the telephone or telegraph?

The birth of the Internet was a continuous collaboration — a **partnership** between scientists and engineers working in different fields in different parts of the country — just as G.A.C. is a **partnership** between Girl Scout councils and science museums and girls and adults.

Check out the “byte” line below for some Internet milestones:

1969	1972	1984	1991	1999
<b>First connection of the Internet installed.</b> <b>First message sent: “login”</b>	<b>@ symbol invented; beginning of E-mail</b>	<b>Domain address system established</b>	<b>World Wide Web is born</b>	<b>50 million servers (for example, AOL, Yahoo)</b>

## TALK THE TALK

Part of learning about the Internet is learning to speak its “language.” Here is a word game to help get you and your partner acquainted with Internet terms.

## INTERNET WORD SCRAMBLE

- Its connections form an electronic quilt:

TNTIRENE    \_ \_ \_ \_ \_ (T) \_ \_ \_ \_ \_

- A type of electronic communication:

ALMIE    \_ \_ \_ \_ \_ (M) \_

- Where you go to talk with friends:

TMOHRCAO    \_ \_ \_ \_ \_ (O) \_ \_ \_ \_ \_

- When surfing the net, you are said to be:

LOENIN    \_ \_ \_ \_ \_ (N) \_ \_

- What you use with computer hardware:

OTFEWASR    (O) \_ \_ \_ \_ \_

- A real-life environment involving a computer:

CPABYRCESE    \_ \_ \_ \_ \_ (P) \_ \_ \_ \_ \_

- A nickname for the Internet:

PHHYWESRUGIA    \_ \_ \_ \_ \_ (H) \_ \_ \_ \_ \_

Unscramble the letters above, then use the circled letters to answer this question:

Where can you find a location on the Internet?    (O) (M) (E) (N) (I) (N)

ANSWERS: INTERNET,  
EMAIL, CHAT ROOM,  
ONLINE, SOFTWARE,  
CYBERSPACE,  
SUPERHIGHWAY,  
WEBSITE.

# Communication Careers



Can you and your partner match the description of the job to the career?

## Career

1. Animal behaviorist
2. Audiologist
3. Broadcast technician
4. Computer programmer
5. Graphic artist
6. Journalist
7. Linguist
  
8. Mathematician
9. Public relations professional
10. Speech-language pathologist

## Job Description

- A. Tells a computer what to do
- B. Creates visual and printed messages
- C. Helps people with their speech
- D. Studies languages and their development
- E. Uses numbers to communicate ideas
- F. Helps people improve their hearing
- G. Develops persuasive messages to convince people to buy products and services
- H. Studies how animals act
- I. Researches and writes news stories
- J. Installs, tests, repairs, and sets up electronic equipment used to transmit radio and television programs

Answers: Please note that some of the tasks might be performed by more than one career area. 1H; 2F; 3I; 4A; 5B; 6I; 7D; 8E; 9C; 10C

## WOMEN IN SCIENCE

Meet Cassandra Walker, author, newspaper columnist, inspirational speaker, and media personality. Cassandra writes and speaks about the ups and downs of growing up. In her books *Becoming Myself* and *Stories from My Life*, she shares true stories from her own teenage years and provides advice to kids on how to become self-assured and successful adults.

Cassandra studied Communications at Western Illinois University. She began her career as a media personality, hosting both television and radio shows. Her interest in “getting the message” of hope and encour-



agement to children and teens grew out of her own “good, bad, and ugly” experiences growing up near Chicago.

Cassandra Walker was honored as a Black Women of Distinction in Kansas City, Kansas, for her work in helping to inspire young people to believe in themselves, make healthy choices about their lives, and become the best people they were meant to be.

## What is a Media Personality?

Do you have a favorite DJ? Talk show host? Author? Newspaper columnist? Then you know a media personality. People who become well-known as a result of their work in the media are called media personalities.

Media communication reaches or influences large numbers of people. The media take many forms: broadcast, such as radio or TV; print, which includes newspapers and magazines; or technological, as in the Internet.

One of the hottest media trends today is setting up your own web site. Check out the web sites on the “HOT LINKS” card. What kinds of techniques do they use to communicate their message?