

The Autism Puzzle



In this unit, you will

- read about a puzzling brain disorder.
- review finding main ideas in a text.
- increase your understanding of the target academic words for this unit.

READING SKILL Making Inferences

Self-Assessment

Think about how well you know each target word, and check (✓) the appropriate column. I have...

TARGET WORDS	never seen the word before	seen the word but am not sure what it means	seen the word and understand what it means	used the word, but am not sure if correctly	used the word confidently in <i>either</i> speaking or writing	used the word confidently in <i>both</i> speaking and writing
AWL						
 appropriate						
assess						
 capable						
constrain						
infer						
interact						
 link						
mature						
 odd						
 participate						
 phase						
predominant						
ratio						
 relax						
 task						



Outside the Reading What do you know about autism? Watch the video on the student website to find out more.

 Oxford 3000™ keywords

Before You Read

Read these questions. Discuss your answers in a small group.

1. Have you ever known a person who had a disability? What was something that he or she was not able to do?
2. In what ways are people with disabilities just like everyone else?
3. What do you know about autism?

MORE WORDS YOU'LL NEED

disability: a condition in your body that makes you unable to use a part of your body properly



Read

This article from a medical website blends information about autism with the story of one autistic child. Notice how the two stories are distinguished from each other.

THE AUTISM PUZZLE

Autism is a little-understood brain disorder. It is marked by poor social and communication skills and by repetitive behavior. Meet two-year-old Shawn, who was just diagnosed with autism.

- ⁵ Shawn sits spinning the wheels of a toy car—spinning, spinning, spinning.

Shawn's parents have learned that spinning is not a typical **phase** of childhood. It is a common repetitive behavior of autistic children.

- ¹⁰ "Let's pretend we're cats," Shawn's three-year-old cousin suggests. "Meow," she says, walking on hands and knees. Shawn, also three now, flaps his hands in front of his face.

Most autistic kids can't pretend because they're not **capable** of imagining something that is not real. The **odd** hand-

- ¹⁵ flapping behavior is common in kids with autism.

"Let's go to the market," Shawn's mom says. Shawn, now four, hurries to the door and stands waiting. The market is noisy with recorded music and the clatter of shopping carts. Shawn covers his ears and is soon screaming. His mom **infers** that the

- ²⁰ noise hurts his ears.



Extreme sensitivity to loud or harsh sounds is common in autism. So is sensitivity to bright lights and various textures.

Six-year-old Shawn is watching a Sesame Street videotape.

"A B C," it sings. Shawn rewinds the tape and it repeats, "A B C."

- 25 His mother calls, "Shawn! Don't rewind the tape." He knows this isn't allowed, but he likes to see the same part over and over. "No rewind," he answers.

- Like most autistic children, Shawn likes repetition, and he can't **constrain** his behavior. His language skills are poorly developed, and he doesn't speak in full sentences.

Shawn's school textbook asks this question: Which of these smells good? (a) a window (b) a flower (c) a lamp. Shawn lifts the book to his nose and sniffs. None of them smells at all, so he leaves the answer blank.

- 35 Schools usually fail to accurately **assess** the abilities of autistic children because classroom **tasks** are not **appropriate** for them. For instance, many autistic children are not able to **link** a printed word with something that is not real.

- Shawn's family goes to visit Grandma and Grandpa. Shawn, now 40 eight, rings the doorbell, opens the door, and walks in. "Hi, Shawn," says Grandma. He ignores her and turns on the TV. "Did you get wet in the rain?" Grandpa asks. "Yes. Rain," Shawn answers.

- Like most autistic children, Shawn doesn't understand how to behave **appropriately** in social situations, and prefers to be alone. He answers questions that people ask, but doesn't understand the give-and-take of conversation.

- Eleven-year-old Shawn is playing baseball. When it's his turn at bat, he hits the ball into the outfield. "Run!" yells the 50 team coach. Shawn walks toward first base. Meanwhile, Brad picks up the ball and brings it to Shawn. Like all players on this special team, Shawn and Brad have autism.

- Most **participants** on this team are boys. That's because kids with autism are **predominantly** male, with boys 55 outnumbering girls by a **ratio** of 4 to 1. Autistic kids may have excellent physical skills, but they rarely **participate** in team sports because they don't understand the rules.

Shawn is doing math homework. He writes fast, and in less than five minutes he has solved 25 multiplication problems.

- 60 Some autistic children do well at school subjects, but most do not. Shawn is very bright, but not academically **mature**. His



speaking and listening skills are poor, but in school he is good at math and spelling. He enjoys looking at photographs, and he likes maps and calendars. He
65 frequently writes letters to Grandma and Grandpa describing places his family has visited.

*It's bedtime. Shawn showers and puts on pajamas. He brushes his teeth and climbs into bed. "I love you," says Mom, giving him a kiss. "I love you," Shawn repeats and
70 closes his eyes.*

Shawn is asleep. Finally, his handsome face and sturdy body relax.



Reading Comprehension

Mark each sentence as *T* (True) or *F* (False) according to the information in Reading 1. Use your dictionary to check the meaning of new words.

- ___ 1. Shawn's parents at first thought that spinning was a typical phase of childhood.
- ___ 2. Autistic kids are not capable of imagining something that is not real.
- ___ 3. It is difficult for autistic kids to constrain their odd behavior.
- ___ 4. Shawn's mother inferred that he liked the loud music in the market.
- ___ 5. Autism seems to be linked to the sex of a child.
- ___ 6. Autistic girls outnumber autistic boys by a ratio of 4 to 1.
- ___ 7. Autistic kids seldom participate in team sports because they don't interact with other kids.
- ___ 8. Schools are usually unable to assess the abilities of autistic children because classroom tasks are not appropriate for them.
- ___ 9. Autistic kids may be bright, but they are not academically mature.
- ___ 10. Autistic kids are predominantly male, so most of them have excellent physical skills.
- ___ 11. Autistic children can relax when they are sleeping.

LEARN

To *infer* is to use indirect information or evidence to come to a decision or a logical conclusion. Parents of an autistic child must often use *inference* to understand their child's behavior because the child may not be able to explain what he wants or what he doesn't like. For example, in Reading 1, there is a sentence:

*In the market, Shawn covers his ears and is soon screaming. His mom **infers** that the noise hurts his ears.*

Shawn's mother *made an inference* based on what she saw. Maybe she was correct, or maybe she wasn't, but it was a logical conclusion.

Read these excerpts from Reading 1. What can you infer from the information? More than one answer may be possible.

APPLY

1. "Let's go to the market," Shawn's mom says. Shawn hurries to the door and stands waiting.
 - ☒ a. Shawn understands his mother's words.
 - ☒ b. Shawn obeys his mother.
 - ☐ c. Shawn is in a good mood today.
2. Shawn rewinds the videotape and it repeats, "A B C."
 - ☐ a. Shawn knows how to operate a tape player.
 - ☐ b. Shawn likes to sing along with the tape.
 - ☐ c. Shawn likes the ABC song.
3. "Which of these smells good?" Shawn lifts the book to his nose and sniffs. None of them smells at all.
 - ☐ a. Shawn has a poor sense of smell.
 - ☐ b. Shawn can read.
 - ☐ c. Shawn expected the words to smell.
4. "Did you get wet in the rain?" Grandpa asks. "Yes. Rain," Shawn answers.
 - ☐ a. Shawn likes the rain.
 - ☐ b. Shawn likes Grandpa.
 - ☐ c. Shawn understands Grandpa's question.
5. "Let's pretend we're cats," Shawn's three-year-old cousin suggests.
 - ☐ a. Shawn's three-year-old cousin can talk.
 - ☐ b. Shawn's three-year-old cousin can pretend.
 - ☐ c. Shawn's three-year-old cousin has a cat.

REVIEW A SKILL Finding the Main Idea (See p. 21)

Each story about Shawn (except the last one) is followed by a paragraph that describes a typical behavior of autistic children. Make a list of the main ideas of each paragraph in your notebook.

Vocabulary Activities STEP 1: Word Level

- A.** Read this magazine article that gives advice to parents of autistic children. Use the target vocabulary in the box to complete the article. Compare results with a partner.

appropriate	capabilities	interact	participate	relax
assess	constrain	mature	phases	task

Experts recommend that parents enroll young children with autism in a special preschool class as early as possible. The goal is to help the children strengthen their social and language skills during the formative _____ of childhood and learn _____ classroom behavior before they enter kindergarten. Each day, the children _____ in games, songs, and play activities that encourage them to _____ with each other. Individual children are assigned a daily _____, such as feeding the class pet, to help teach responsibility. Parents are required to attend classes with their child to learn more about autistic behavior. Observing their own child in a group setting allows them to realistically _____ the child's _____ and limitations. Parents also see techniques that the trained teachers use to _____ a child's unwanted behavior, such as hand-flapping. Telling a child to _____ by taking a deep breath is one technique parents learn. As the children _____, they will remember this relaxation technique and use it to constrain their own behavior without being reminded.

- B.** A *link* is a connection between two things. Certain behaviors are linked to autism because they are common or typical in most autistic people. Working with a partner, put a check (✓) next to the behaviors that are linked to autism, according to Reading 1.

___ a. spinning	___ d. being sensitive to loud noises	___ g. excelling at math
___ b. writing letters	___ e. watching a videotape	___ h. hand-flapping
___ c. pretending	___ f. preferring to be alone	___ i. liking repetition

- C.** A *phase* is a step or stage of development. With a partner, look at the phases of language development in children. Number them in the order they are likely to occur, with the first phase as 1.

___ a. one-word sentences ("Ball.")	___ d. two-word sentences ("Mama look.")
___ b. babbling ("Dadadada")	___ e. three-word sentences ("Daddy, read me.")
___ c. cooing ("Ooooooooo")	___ f. crying

The adjective *odd* refers to something that is unusual or inappropriate for a particular situation.

*Some autistic kids have the **odd** behavior of hand-flapping.*

Another meaning for *odd* applies to numbers. An odd number cannot be divided evenly by 2, such as the numbers 1, 3, 5, 7, 9, 11, 13, etc.

*I always seem to have an **odd** number of socks in my drawer.*

As a plural noun, *odds* refer to the chances of something happening.

*The **odds** are one in a million that you will win the lottery.*

*I wouldn't give you good **odds** on finding a taxi at this hour of night.*



D. Check (✓) the combinations that you think make odd drinks. Discuss your choices with a partner.

- | | | |
|-----------------------|-------------------------|-------------------------------------|
| ___ coffee with sugar | ___ coffee with mustard | ___ milk with honey |
| ___ tea with honey | ___ coffee with milk | ___ milk with cola |
| ___ tea with garlic | ___ tea with lemon | ___ hot chocolate with chili pepper |

Vocabulary Activities STEP II: Sentence Level

Word Form Chart			
Noun	Verb	Adjective	Adverb
assessment reassessment	assess reassess	assessable	_____

E. To assess something is to judge it or to form an opinion about it. Complete this paragraph about autism assessment by using a form of *assess* in each blank.

By age two, a typical child has developed many verbal and social skills, such as speaking and interacting with others. If these skills are absent, the child's doctor may suspect autism. There is not just a single test a doctor can use to (1) _____ a child for autism. Instead, the doctor looks for the presence or absence of certain behaviors. Autism is (2) _____ only by carefully observing the behavior of a child, so the actual (3) _____ may take several hours. The doctor (4) _____ the child's attempts to communicate with his parents. He also looks for repetitive behavior, such as hand-flapping, or sensitivity to sounds or textures. If the doctor's diagnosis is autism, he may suggest a (5) _____ by a second doctor to confirm the diagnosis. Over the next several years the child will be (6) _____ regularly to see if he has made progress.

F. A task is a small job, often one that is assigned by a teacher, parent, or boss. Using what you know of Shawn's skills from Reading 1, infer which of these classroom tasks will probably be difficult for him and which he will do easily. Write sentences in your notebook about each task.

1. writing about his vacation

*Shawn can probably do this **task**. He often writes letters to his grandparents about places he visited with his family.*

2. taking a spelling test
3. solving subtraction problems
4. working with a committee to plan a class party
5. giving an oral report

The adjective *appropriate* refers to something that is suitable, proper, or correct for a particular situation. People sometimes disagree about what is appropriate or inappropriate. The noun form is *appropriateness*.

*What is **appropriate** to wear to a job interview?*

*Meg is **appropriately** dressed in a suit. Jeans and a T-shirt are **inappropriate**.*

*The interviewer commented on the **inappropriateness** of Sam's clothes.*

As a verb, *appropriate* means "to decide to give something, especially money, for a particular purpose." The noun form is *appropriation*. This meaning is rather formal and official.

*The university **appropriated** one million dollars for a new autism study.*

*The business plan includes an **appropriation** for local charities.*



G. Read these short conversations. Some of Sam's responses are odd. Write a sentence about the appropriateness of Sam's reply using the word in parentheses.

1. Mark: "Thank you for the birthday card."

Sam: "How old are you?"

(appropriate) _____

2. Mark: "Are you coming to my party tonight?"

Sam: "Thank you."

(appropriate) _____

3. Mark: "Can I borrow your pen?"

Sam: "I know how to spell."

(inappropriate) _____

4. Mark: "Have you seen my brother?"

Sam: "No."

(appropriate) _____

Before You Read

Read these questions. Discuss your answers in a small group.

1. Think of some common illnesses. What causes them?
2. Think of some common illnesses. How are they cured?
3. Why might a pharmaceutical company be willing to fund research into the causes of autism?

Read

This journal article details some of the current research into autism and some possible causes for it.

Looking for Answers

Autism is a neurological disorder that usually appears before a child's third birthday. It is marked by impaired language skills, impaired social skills, and repetitive behaviors.

RECENT INCREASE IN AUTISM

Recently there has been a dramatic and unexplained increase in the number of children diagnosed with autism. Medical scientists estimate an autism **ratio** of 1 in every 110 children in the United States. Other countries show similar high **ratios**: 1 in 160 in Australia, 1 in 250 in India, and 1 in 475 in Japan, for example. Scientists believe that the differences among countries may reflect how children are evaluated rather than the actual proportion of children who have autism. These numbers are alarming to scientists because they do not know what causes autism and do not know how to cure it. Medical researchers have been looking for answers.

THE AUTISM SPECTRUM

Scientists use the term "autism spectrum" to refer to the range of abilities that autistic people display. At one end of the spectrum, individuals are severely affected, while at the other end, individuals are only mildly affected. Some individuals cannot speak; others are highly verbal. Some are overly sensitive to noise; others seem not to notice it. Some prefer to be alone; others want friends. Some even marry and have children. Some are unable to learn school subjects; others go on to earn a Ph.D. degree. Indeed, each person with autism may have a unique set of traits.



Temple Grandin holds a doctorate degree. She also has autism.

LOOKING FOR CAUSES OF AUTISM

Although scientists agree on the traits that characterize autism, they have not yet found what causes autism. In the 1950s, autism was considered a psychological disorder, caused by “refrigerator mothers.” Their personalities were thought to be so cold and uncaring that their children grew up unable

to speak or **interact** with others. As research progressed, scientists realized that autism was actually a neurological, or brain, disorder. Studies have identified several areas of the brain that differ from the norm in autistic individuals. These areas involve emotions, critical thinking, learning, and paying attention. However, no one area seems to hold the key to autism.

Some researchers have **inferred** that faulty connections between areas of the brain may be responsible for autism. Or perhaps there are too many connections. That could cause an overload of messages within the brain.

Medical scientists have also explored brain chemistry. In a recent study,

researchers took blood samples from many newborns. When some of these babies later developed autism, the researchers tested their early blood samples and found high levels of four chemicals that influence the early **phases** of brain development. However, they have not been able to prove a direct **link** between the chemicals and the autism.

There is strong agreement that genes, the carriers of inherited traits, play a role in autism. Research continues to explore

heredity as a cause. Recently, researchers found a **link** between autism and the age of the child's father, with the **odds** of parenting an autistic child increasing with older

fathers. It is also known that among autistic children, males **predominate** by

a **ratio** of 4 to 1. Additionally, autism seems to run in families. Despite the strong evidence pointing to heredity, scientists haven't yet identified a single gene responsible for autism. Instead, they now think that hundreds of changes take place in a child's genes before birth. Some of these changes affect connections between brain cells. When genetic changes involve

connections in the brain, autism can occur.

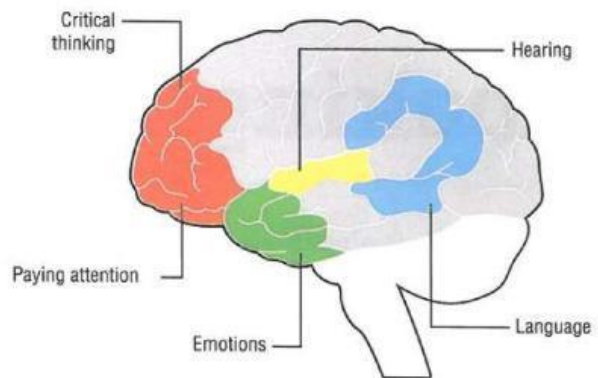
Scientists are also investigating environmental causes. They have looked into toxic metals in water and soil, harmful chemicals in household products, viruses, air pollution, and even television viewing, but have not found a consistent **link** to autism. Recently, some scientists have suggested that a

combination of hereditary and environmental factors may cause autism.

TREATING AUTISM

Despite this extensive research, scientists so far have been unsuccessful in finding either a cause or a cure for autism. However, treatment, either through medication or training, has benefited many autistic children by helping them to **relax**, to **constrain** antisocial behavior, to **participate**

socially, and to learn useful skills. Medication has worked for some children. However, it has not been widely used because it can have serious side effects. Other treatments that have worked for some children include



Areas of the brain commonly affected by autism

controlling the child's diet, providing the child with an animal to take care of, and encouraging self-expression through art. The

75 Chinese use acupuncture and **relaxation** programs.

APPLIED BEHAVIOR ANALYSIS

A common training is Applied Behavior Analysis, which breaks down a **task** into tiny steps and rewards every small success with a bit of cookie or other treat. If a child does not speak, for example, the therapist will reward even a small sound a child makes when
80 she asks him to repeat a word. It may take several sessions to get the child to utter a sound, and many more to get him to say a word, but each success is praised and rewarded. Many autistic children have improved greatly with such training, but others have not.

Whatever treatment parents decide is **appropriate**, they must be
85 aware that children are most likely to benefit if they begin early. Delaying treatment until the child **matures** is a waste of valuable time. Parents must also recognize that not all treatments benefit every child, so they must regularly **assess** their child's behavior for signs of progress. Treatment that doesn't work is also a waste of time.

90 Meanwhile, scientists are still looking for answers to solve the autism puzzle. ■



Scientists have yet to solve the "autism puzzle."

Reading Comprehension

Mark each statement as *T* (True) or *F* (False) according to the information in Reading 2. Use your dictionary to check the meaning of new words.

- ___ 1. Researchers found four chemicals that influence the early phases of brain development.
- ___ 2. As a man gets older, the odds increase that he will parent an autistic child.
- ___ 3. There is strong agreement that heredity is the predominant cause of autism.
- ___ 4. Researchers have found a link between autism and television viewing.
- ___ 5. Medication has helped some autistic children constrain their behavior.
- ___ 6. Children who participate in Applied Behavior Analysis learn a task one step at a time.
- ___ 7. Parents must regularly assess their child's behavior for signs that they are wasting time.

APPLY

Reread the paragraphs indicated. Then, write *D* for the ideas that are directly stated and *I* for those that you can infer. Write *N* if an idea is not directly stated or cannot be inferred. Discuss your answers in a small group.

PARAGRAPH 2

- D 1. Scientists do not know the cause of autism.
- ___ 2. There is no cure for autism.
- I 3. Scientists cannot explain the recent increase in autism.
- ___ 4. Scientists are not sure how many children are affected.
- ___ 5. Scientists are alarmed.

PARAGRAPH 3

- ___ 1. A person who is mildly affected with autism is highly verbal.
- ___ 2. Some people with autism are very intelligent.
- ___ 3. Not all autistic people prefer to be alone.
- ___ 4. The term "autism spectrum" was recently created.
- ___ 5. Each autistic person may have a different combination of traits.

PARAGRAPH 4

- ___ 1. Autism is not a psychological disorder.
- ___ 2. A neurological disorder is a disorder involving the brain.
- ___ 3. Scientists are not certain if faulty connections within the brain cause autism.
- ___ 4. Scientists have abandoned their study of the brain.
- ___ 5. Several areas in the brain of autistic children differ from those in normal kids.

Vocabulary Activities STEP 1: Word Level

A person who is *capable* of doing something has the necessary skills to do it. If he lacks these skills, then he is *incapable* of doing it. The words can also refer to objects.

Most autistic children are **incapable** of imagining something that is not real.

Passenger airplanes are **capable** of flying overseas without refueling.



- A.** With a partner, decide which of these activities a blind person is capable or incapable of doing. Take turns making sentences with this information.

A blind person is **capable** of listening to music.

- ☒ listening to music ☐ riding on a bus ☐ telling jokes
☐ driving a car ☐ reading a newspaper ☐ using a telephone

To **relax** means to stop working and rest. It can also mean to make your body less tense by loosening your muscles.

When he sleeps, Shawn can finally **relax** and get some rest.

To **relax something** means to make it looser or more flexible.

Teachers often **relax classroom rules** for students with disabilities.



- B.** Complete each sentence with **relax** or **relax it**.

- I've worked hard all day. It's time to relax.
- Sometimes you can cure a headache if you just _____.
- The law against speeding is too strict. I wish the government would _____.
- Don't pull the rope so tight. Can you please _____?
- I often play the piano to _____.

Word Form Chart			
Noun	Verb	Adjective	Adverb
constrain constraints	constrain	constrained unconstrained	_____

- C.** To **constrain** someone or something is to hold them back or limit their actions. With a partner, decide which behaviors you think parents should constrain in their children.

- | | | |
|---------------------------------------|---|--|
| ☐ 1. studying | ☐ 4. playing | ☐ 7. laughing |
| ☐ 2. screaming | ☐ 5. watching TV | ☐ 8. arguing |
| ☐ 3. sleeping | ☐ 6. fighting | ☐ 9. surfing the Internet |

- D.** The plural noun **constraints** is a more formal way of describing limits. Match the formal language with its more informal version.

- | | |
|--|--|
| ☐ 1. I have financial constraints. | a. I promised my parents I would visit them. |
| ☐ 2. I have medical constraints. | b. I have to finish this by tomorrow. |
| ☐ 3. I have time constraints. | c. My car won't start. |
| ☐ 4. I have transportation constraints. | d. I can't afford that right now. |
| ☐ 5. I have family constraints. | e. I need to see a lawyer about this. |
| ☐ 6. There are legal constraints to selling my house. | f. I'm not healthy enough to do that. |

Vocabulary Activities STEP II: Sentence Level

Word Form Chart			
Noun	Verb	Adjective	Adverb
maturation maturity immaturity	mature	mature immature maturational	_____

To *mature* refers to the process of becoming fully developed physically or mentally. If someone or something is *immature*, then development is delayed compared to others.

As boys **mature**, they become taller and more muscular.

Susan is ten, but she's so **immature**.

There are two noun forms:

maturation the process of developing or aging
maturity the state of being fully developed

E. Read this paragraph. Then, complete it by using the correct form of *mature* from the chart. Compare answers with a partner.

A premature baby is one that is born before it is fully developed. Because of its (1) _____, a premature baby is usually placed in a hospital incubator where it can continue to (2) _____ in a safe environment. A baby born too soon has not had time for adequate (3) _____ of body systems that are essential for life. The baby's (4) _____ lungs, for example, may not be able to supply enough oxygen, so it will need help breathing. The baby will remain in the incubator until it has achieved a safe level of (5) _____. The baby will make steady progress, but its growth will be delayed compared to that of a full-term baby. For example, a full-term baby may sit up at six months of age, but a premature infant may not reach this (6) _____ phase for several more months.

Word Form Chart			
Noun	Verb	Adjective	Adverb
predominance	predominate*	predominant	predominantly

*Note: There is no -ing form for this verb.

Predominance and its related word forms refer to being greater in importance, strength, number, or some other factor.

Tall players **predominate** in the game of basketball. They are **predominant**.

There is a **predominance** of brown-eyed people in the world.

Humans are **predominantly** brown-eyed.



- F.** Read the paragraph about Temple Grandin. Then, rewrite the sentences that follow in your notebook, using the form of *predominant* in parentheses.

Temple Grandin is autistic, yet she has a Ph.D. and is a university professor. Dr. Grandin has written several books about autism. Her superior verbal skills and intelligence have enabled her to analyze and describe how individuals with autism think. She writes, "I think in pictures. Words are like a second language to me. I translate both spoken and written words into full-color movies."

- Among high-functioning autistic individuals, most are visual thinkers.
(*predominance*)
*There is a **predominance** of visual thinkers among high-functioning autistic people.*
- Nouns are easiest because they are mostly things you can picture.
(*predominantly*)
- Most people are verbal thinkers in universities. (*predominate*)
- Dr. Grandin was surprised by the number of people who think only in words.
(*predominance*)
- Seeing pictures in her mind is the way Temple Grandin creates ideas.
(*predominant*)

- G.** A *ratio* is a mathematical expression comparing the size or amount of two sets of things. Write a sentence in your notebook to express the ratios of these groups. Discuss your sentences in a small group.

- at birth: boys, 105; girls, 100
*At birth, boys outnumber girls by a **ratio** of 105 to 100.*
- autistic children: girls, 1; boys, 4
- adults who are colorblind: men, 15; women, 1
- at age 65: women, 10; men, 7
- people in my family: male, _____; female, _____
- communication I receive: email, _____; phone calls _____
- school time: hours in class, _____; hours studying, _____