Chapter
2

# New Directions in Learning

Lesson 2.1 Brain Studies
Lesson 2.2 Acquiring Knowledge

## Essential Question

How has recent brain research enlightened people's knowledge of child development?

## Case Study

### Technology and Brain Development

Read the case study and discuss/reflect on the questions that follow. After you finish studying the chapter, think about this case study again. Have your opinions changed based on what you learned?

*Tom is a single parent with two children: Lamar, age four, and Lucinda, age two. Tom drops his children off at Penny Lane Child Care Center every day before work. By pick-up time at 5 PM, Tom is usually exhausted. After buckling the kids into their car seats, Tom hands a smartphone to Lamar to play with on the 20-minute drive home.*

*Tom remembers that they are out of groceries and stops on the drive back to pick up food for the week. Lamar continues to quietly play on the smartphone as Tom pushes the cart around the store. Lucinda starts to cry, and Tom produces a tablet that is loaded with toddler apps. Lucinda immediately stops crying and happily plays with the tablet while Tom finishes up the shopping.*

*When they get home, Tom sits both children down in front of the TV and unloads the groceries. Lamar already knows how to work the remote and quickly finds a show. Tom breathes a sigh of relief as the kids play in front of the TV for the next hour, allowing time to put the groceries away and get dinner on the table.*

#### Give It Some Thought

1. Should Tom be worried about the amount of time the children spend using technology (smartphones, tablets, TV, etc.)? Why or why not?
2. What does current research tell us about the effects of technology on children's brain development?
3. What do organizations that focus on young children (e.g., National Association for the Education of Young Children, Zero to Three, American Academy of Pediatrics) recommend concerning technology use and young children? Do you agree with their recommendations?
4. Should two-year-old Lucinda be treated differently than four-year-old Lamar when it comes to access to technology? Why or why not?

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Lesson 2.1

# Brain Studies

## Key Terms

axons
biochemistry
brain plasticity
critical periods
dendrites
firing process
glial cells
neurons
pruning
sensitive periods
sorting process
window of opportunity
wiring process

## Learning Outcomes

After studying this lesson, you will be able to

**2.1-1** **describe** how children learn.
**2.1-2** **explain** the biological processes of brain function.
**2.1-3** **compare** the critical and sensitive periods of brain development.
**2.1-4** **explain** why having needed experiences is important to a child's brain development.
**2.1-5** **identify** two offenders of normal brain functioning.

### Reading and Notetaking Activity

Skim this chapter from top to bottom and from left to right and list all the headings. Then, identify key terms with which you are familiar and scan through the chapter to find their definitions. Write a "topic sentence" and brief summary for each heading, using the key terms to explain what you think you will learn. After you read this chapter, write a new topic sentence and summary for each section, outlining the main points you learned.

## Introduction

The study of children has changed dramatically over the years. The scientific study of children emerged from the field of psychology. First it was called *child study* and then *child development*.

Researchers in child development aim to learn more about children. During the last half century, child development research has mainly focused on the intellectual (cognitive) theories of Piaget and Vygotsky. These theories remain important, but the "new" research frontier of the 21st century is brain studies.

Researchers have long been interested in the brain, but major technological advances allow for much more precise study. Because technology is changing so rapidly, research on brain development is constantly being updated.

## 2.1-1 How Do Children Learn?

In child development, people use the word *learning* in a broad sense. People might say *learning* is any permanent change in knowledge or behavior. The words *learning* and *development* are almost the same because both refer to changes in all domains. For example, a child

- learns motor skills like walking, throwing a ball, or cutting with scissors (physical development)
- acquires knowledge of people, places, objects, and events, and even learns how to think about thinking (what researchers call metacognition)
- learns to understand, speak, read, and write words (intellectual development)
- learns how to interact with others (social development)
- learns to express and understand emotions (emotional development)

Changes often result from experiences, such as personal experiences in the environment, imitation, guided discovery, or direct instruction. Although the whole body is involved in learning, the command center of the body is the brain. The brain is responsible for controlling most body functions. These include operation of the body systems, movements, thinking, memory, and feelings.

## 2.1-2 How the Brain Works

Scientists and other people who study and work with children have long been curious about the brain's growth, developmental change, activity, and potential damage. Until recently, the brain was mostly a mystery although brain development was inferred through observed behaviors in children, especially through Piaget's research on intellectual milestones (stages). In recent years, however, scientists have learned much more about brain development. Much of this knowledge is gained from the use of new technologies and advances in **biochemistry** (the chemistry of living organisms). **Figure 2.1** shows a *magnetic resonance image (MRI)*, which is a specific type of brain scan. Technology has opened so many new avenues of study, and although many questions have been answered, there is much to discover.

### Knowing Brain Biology

Brain development begins shortly after conception. Before birth, about 250,000 brain cells are formed each minute. Full-term babies have about 100 billion brain cells. The brain, however, is the least developed organ at birth. A newborn's brain is only about 25 percent of the size of the adult brain.

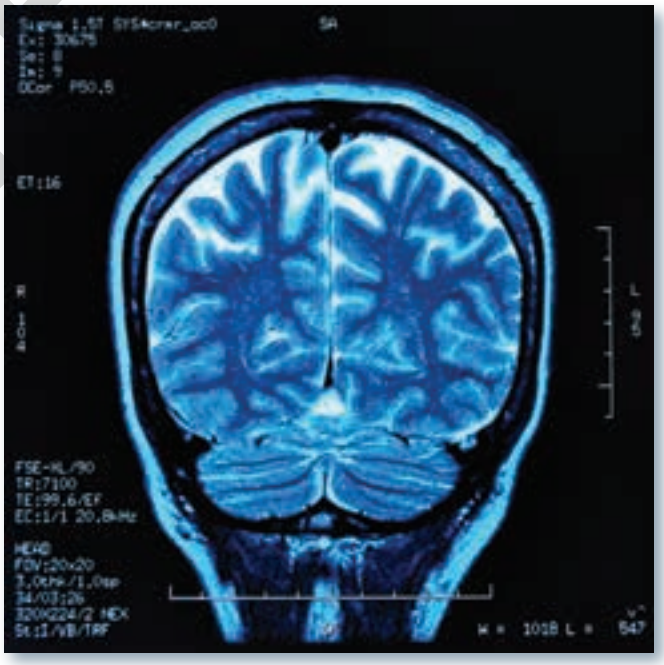

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**Figure 2.1** A magnetic resonance image (MRI) is a brain scan that can be used to diagnose diseases and disorders of the brain. These pictures of the brain have also helped scientists understand the brain at different stages of development. ***Why do you think the ability to see a living brain at work and rest is so important to understanding it?***

After birth the newborn's brain develops rapidly in stages, which can be noted by

- increases in head circumference
- increases of 5 to 10 percent in brain weight during a stage (with only a 1-percent gain between each stage)
- changes in the cells

Brain growth occurs in a predictable, biological sequence that is the same for all people. Unlike body development that goes from head to foot (what scientists call cephalocaudal), brain development begins at the base (near the neck) and moves to the front of the brain.

A lot of brain development happens before you are even born, but did you know that your brain is still developing? It's amazing to think that your own brain will continue to grow and develop well into your 20s! While the fastest brain growth takes place before birth, the stages of fastest growth after birth are shown in **Figure 2.2**. The time between each stage is used for practicing and gaining expertise and efficiency in the skills developed in previous stages. For example, between four and six years of age, motor and sensory skills combine to develop eye-hand coordination needed for activities such as catching balls, drawing, writing, playing musical instruments, and eating with flatware.

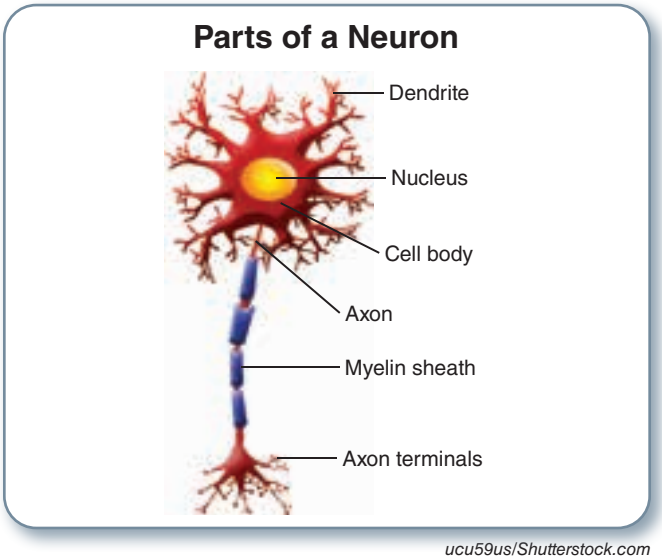
**Figure 2.2** Stages of Fastest Brain Growth After Birth

| Age | Area Maturing |
|---|---|
| **3–10 months** | Activation (turning on) and control of motor actions. |
| **2–4 years** | Maturation of the senses. (The senses function near the adult level by the end of the stage.) |
| **6–8 years** | Emergence (beginning) of logical thinking about actual experiences. (Unlike the previous stages that are genetically programmed, logical thinking must be taught and practiced.) |
| **10–12 years (biological females) and 12–14 years (biological males)** | Beginning of generalized thinking beyond actual experiences—abstract reasoning. (This ability allows older children and teens to understand higher mathematics and science.) |

The brain is made up of two types of cells—neurons and glial (GLEE-uhl) cells. **Neurons** (nerve cells) are brain cells that send and receive chemical and electrical impulses to direct the various tasks of the brain. There are three types of neurons (sensory, motor, interneurons), and each type has its own specific tasks and the following three parts (**Figure 2.3**):

**Figure 2.3** Neurons

| Types | Functions |
|---|---|
| **Sensory neurons** | Transfer information from the external environment to the central nervous system (CNS). |
| **Motor neurons** | Transfer information from the CNS to the external environment. |
| **Interneurons (associative neurons)** | Process information in the CNS and transfer information from one neuron to another within the CNS. |

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The cell body contains genetic information and proteins for cell maintenance.

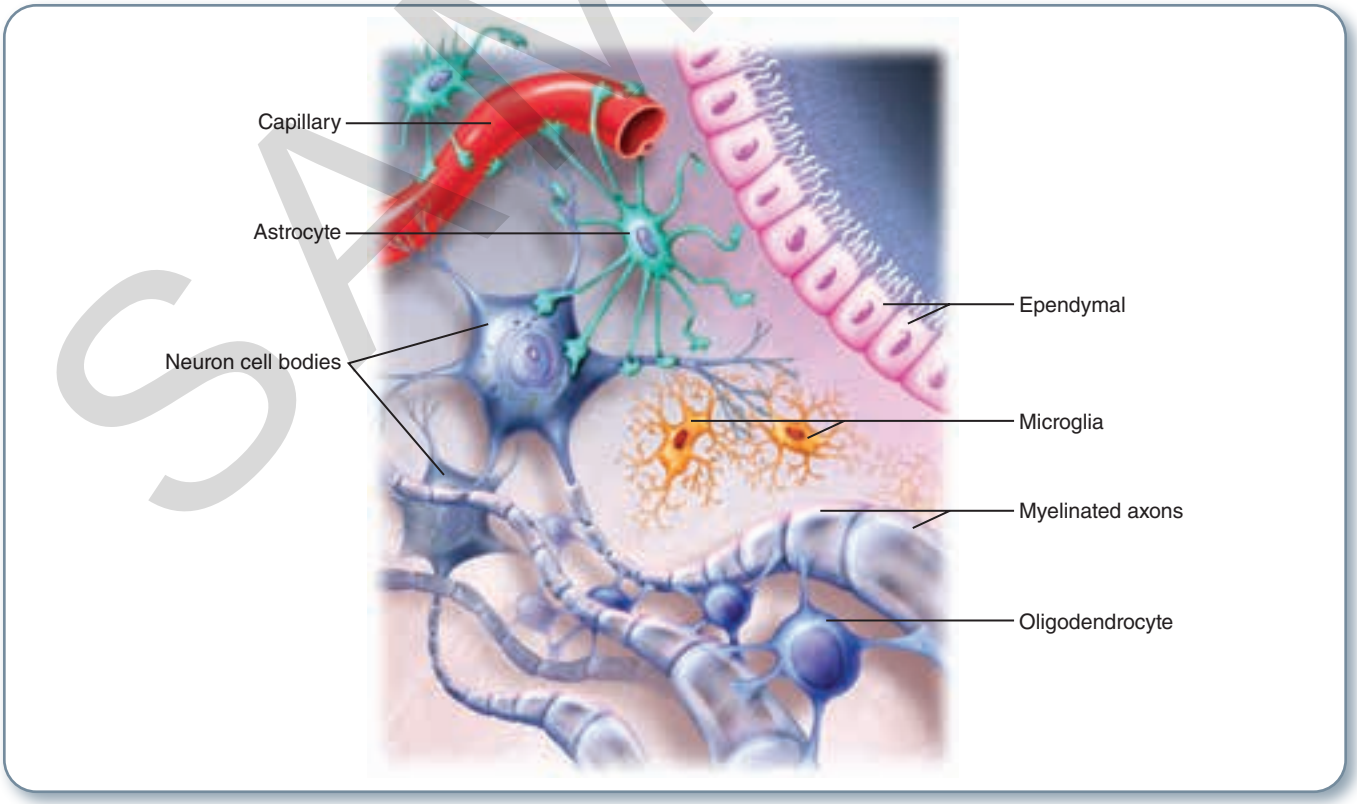
**Dendrites** (DEHN-drights) branch out from the cell body much like the branches of a tree. Dendrites allow each neuron to receive signals sent by other neurons (the input function).

**Axons** are long, thick cables with terminal buttons (small knobs at the end of the axons) that transmit signals between neurons (the output function).

**Glial cells** are brain cells that support neurons. Glial is Greek for *glue* because originally glial were thought of as the "glue" that holds neurons together. Now we know that glial do much more than that. Not only do they hold neurons together, they also support neurons, provide nourishment, and aid in *neurotransmission*. About 90 percent of the cells in the brain are glial cells. Four types of glial cells support the neurons (**Figure 2.4**). Unlike neurons, glial cells divide—especially during times of fastest brain growth. Perhaps because neurons need differing amounts of support, glial cells vary in *density* throughout the brain. Glial cells are star-shaped, with legs extending out from the body.

**Figure 2.4** Glial Cells That Support Neurons

| Types | Functions |
|---|---|
| **Astrocytes (AS-truh-sites)** | Help neurons receive nourishment.<br>Control chemical environment of the brain.<br>Prevent certain substances from entering the brain. |
| **Microglia (my-KRAWG-lee-uh)** | Remove cellular waste. |
| **Ependymal (eh-PEN-duh-muhl)** | Form a protective covering around spinal cord and central brain cavities. |
| **Oligodendrocytes (AW-lih-go-DEN-druh-sites)** | Help insulate the axons with myelin. |



## Making and Sorting Connections

Each area of the brain is highly specialized (**Figure 2.5**). Before birth, all cells must migrate to their special location. This process is broken into four steps: the wiring process, the sorting process, the firing process, and the pruning process.

## Reshaping Connections: Brain Plasticity

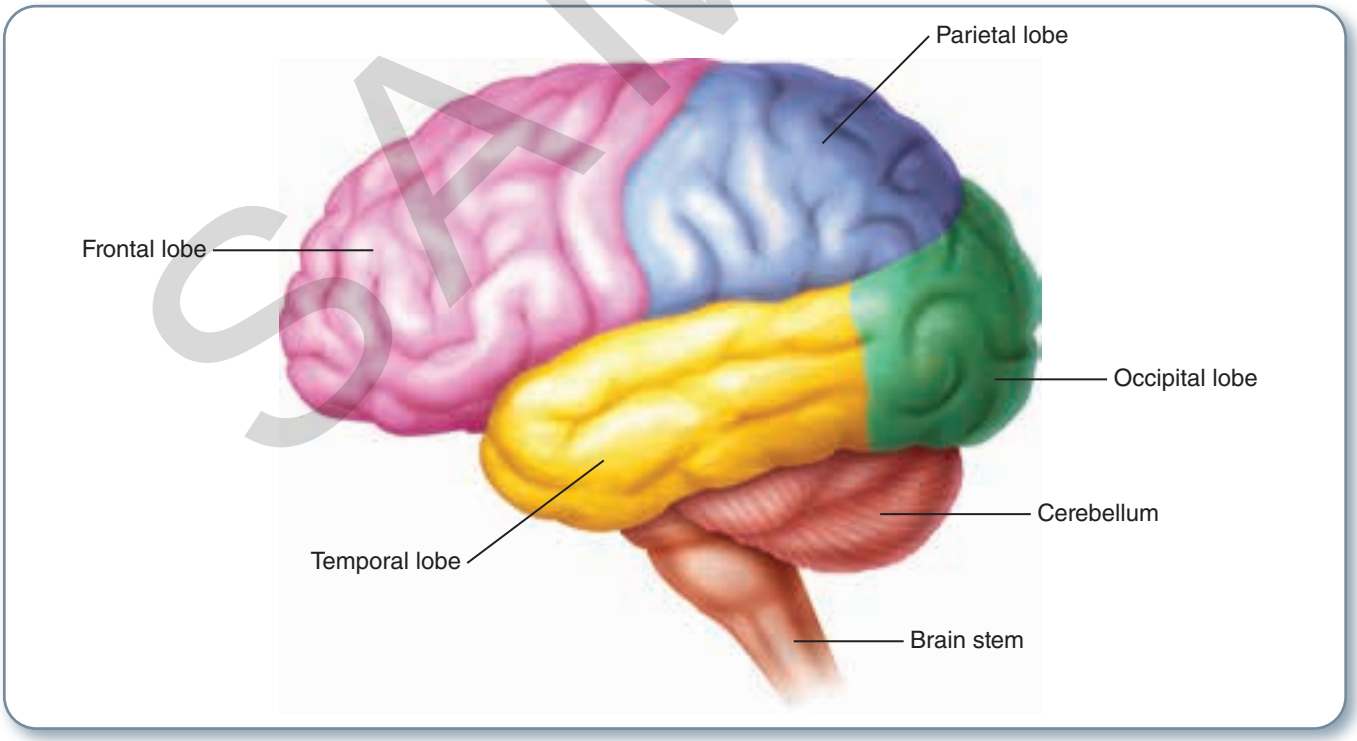
Until 10 years of age, children create many new connections in their brains. After age 10, pruning is rather aggressive. Does this mean the child who did not have quality experiences early in life cannot learn and possibly catch up with peers? Can a person who suffers a brain injury recover? Can adults who need to learn new skills for their careers do so? The answer to all these questions is *yes* because the human brain is adaptable and open to change.

The brain's ability to be shaped and reshaped is called **brain plasticity**. For many years, scientists thought the brain was only plastic during childhood. Now there is mounting evidence that our brains remain plastic and adaptable throughout our lives. Glial cells aid plasticity by dividing as a person needs more memory cells. Because the brain is plastic, a person can make up for a lost function, too.



**Figure 2.5** Areas and Functions of the Brain

| Types | Functions |
|---|---|
| **Temporal lobe** | hearing, smell, memory, speech |
| **Frontal lobe** | memory, intelligence, behavior, emotions, motor function, smell |
| **Parietal (puh-RYE-uh-tuhl) lobe** | pain, touch, sensations of hot and cold, speech |
| **Occipital lobe** | vision, speech |
| **Cerebellum (ser-uh-BELL-uhm)** | body movements and balance |
| **Brain stem** | breathing, heart rate, blood pressure, reflexes, sleep |



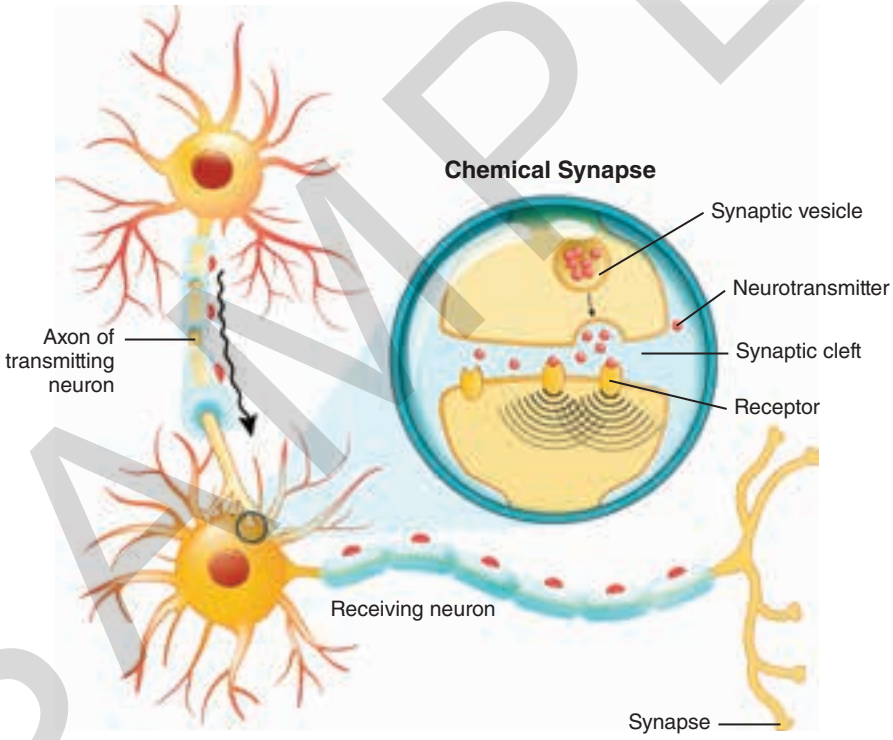
For example, although damaged neurons cannot be replaced after an injury, nearby cells can change their functions to take on functions of the damaged cells. This is another example of plasticity. While adult brains have some plasticity, children's brains are much more plastic because:

- Children have more connections than they need to function. Adults have lost many of their connections. Rerouting communication among neurons is easier with more connections.
- Chemicals that aid in making connections are far more active in the earlier years. The brain of a three-year-old is two and a half times more active than an adult's brain.
- Connections are more flexible in the early years and become more stabilized as people age.

## 2.1-3 Timing of Experiences

Although the brain is plastic, timing is an important concept when it comes to brain development. The entire brain is not wired at one time. Years ago, brain wiring was noted by observing the developmental skills in children. They called these periods the *stages of development*. Today, brain researchers use brain scans to note optimal times for making connections.

### Neuron Communication




- During the **wiring process**, a network of fibers is created. These fibers carry brain signals between neurons.
- During the **sorting process**, connections are formed when a chemical and electrical signal (called a *neurotransmitter*) jumps from one neuron to another.
- The **firing process** results in both strengthening the connections and forming more to enable more learning. Babies begin with about 1,000 trillion connections, which allows for very rapid learning during the early years.
- The brain weeds out connections that we rarely use in a process called **pruning**. Healthy pruning allows the remaining connections to become strong, which increases the speed and efficiency for often-used brain signals.

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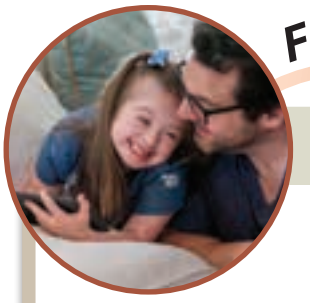

Focus on

Science

# Technology and the Developing Brain

Early experiences have such a dramatic effect on brain wiring that they can increase or decrease the final number of synapses by as much as 25 percent. The effects this has on future learning potential are lifelong. Today, at home and at school, children grow up surrounded by a variety of technologies, including tablets, smartphones, gaming systems, and televisions. What role is screen exposure playing in healthy brain development?

In the past, the American Academy of Pediatrics (AAP) published strict guidelines regarding how much time children should spend looking at screens during different stages of development. Now, they've revised those rules with an approach that focuses more on the quality of the content to which children are exposed. The AAP still stresses that screen time has no shown benefits for children under the age of two, but they do make the following recommendations for families with children two and older:

**Get involved**. Don't just hand your child a device and walk away. Think of the device as just another playground or playroom, and play with your child. Be aware of which games they are playing, which media they are consuming, and to whom they are talking online.

**Set limits**. Research shows that young children develop language skills best via two-way conversation. Too much time watching passive video presentations may delay speech development. Also, too much time engaged in sedentary activities is not healthy for physical development. Children need opportunities to develop their **gross motor skills** (abilities that allow us to do tasks that involve large muscles in our torso, legs, and arms).

**Content matters**. The quality of the content is more important than the amount of time spent on the device. Know which apps your child is using and choose educational content whenever possible.

**Create media-free times**. This is especially recommended at mealtimes and bedtimes. This will encourage family time, healthier eating habits, and improved sleep.

**Let your kids make mistakes**. If your child is exposed to inappropriate content or engages in inappropriate behavior online, talk to them about it. Use the experience as a teachable moment and an opportunity to understand what is going on in their life.

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They note two types of periods in wiring—*critical periods* and *sensitive periods*.

**Critical periods** are times when some part of the body is very vulnerable to lack of stimulation or to negative experiences. For example, if babies are born with cataracts and do not have them removed in the first few months, they will forever be blind. Vision neurons die without light stimulation. The brain is not plastic when it comes to most wiring completed during the first six months of pregnancy and for vision after birth.

**Sensitive periods** are times when the brain is best able to wire specific skills for all children. Although the brain is plastic, matching the right skills to the sensitive times means easier learning, a better foundation for later skills, and performance at a higher level than if learned later.

Why is this information useful? Knowing these sensitive periods helps families and teachers offer the right kinds of experiences for a child at the best possible times. They will know which skills they should encourage most and which will

likely come at a later time. This can help children's brains reach their full potential.

Offering the best experiences at the right times is called *using the windows of opportunity*. A **window of opportunity** is a prime period in a child's life for developing a particular skill. In this window, the child reaches a peak capacity to learn this skill if given the opportunity. At this time, a certain type of stimulation is more critical than others. The right stimulation at the right times is good for development. Just like there are windows of opportunity, there are also times when development is a greater risk of being impaired. We call these *windows of vulnerability*. During windows of vulnerability, a child might be more impacted by trauma or stress.

Each area has its own window of opportunity (**Figure 2.6**). Most windows are large, which means the favorable time for learning this skill is several years. Motor development is a good example. Some windows are small, which means the most favorable time for learning is a few months, such as the window for vision.

Often, the windows of opportunity for various tasks overlap. This means a child will likely be learning those skills at the same time if given the opportunity. Many of the overlapping skills are related, such as social attachments and emotional control.

## 2.1-4 Providing Needed Experiences

Cutting-edge science on brain development confirms what many families and caregivers have known for years. The earliest years are the most important for all areas of growth and development (physical, intellectual, and social-emotional). All experiences affect the brain's performance.



**Figure 2.6** Windows of Opportunity

| Skill Area | Skills | Sensitive Time |
|---|---|---|
| **Motor** | • Posture and coordination<br>• Large muscle<br>• Small muscle | • Birth–2 years<br>• Birth–5 years<br>• 6 months–9 years |
| **Vision** | • Sight<br>• Acuity<br>• Binocular | • Birth–4 to 6 months<br>• Birth–7 years<br>• 1–3 years |
| **Language** | • Phonemes (FO-neems) in languages one will speak<br>• Idea of connections between words and objects<br>• Vocabulary<br>• Syntax | • Birth–7 to 11 months<br>• 4 months–1 year<br>• Birth–3 years<br>• Birth–6 years |
| **Social** | • Attachment<br>• Independence<br>• Cooperation | • Birth–2 years<br>• 1½ years–3 years<br>• 2–4 years |
| **Emotional** | • Trust<br>• Intelligence (read other's emotions)<br>• Control<br>• Cope with stress | • Birth–14 months<br>• Birth–4 years<br>• Birth–3 years<br>• Birth–2 years |
| **Thinking skills (including math)** | • Prelogical (perceptual)<br>• Logical | • 6 months–5 years<br>• 5 or 6 years–puberty |
| **Music** | • Absolute ("perfect") pitch<br>• Appreciation<br>• Learning | • Birth–5 years<br>• Birth–9 years<br>• 3–9 years |

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## Investigate Special Topics

# The Impact of Trauma on a Developing Brain

As you are learning in this chapter, there are many processes involved in healthy brain development. How do you think these processes are impacted when a child experiences a trauma (a deeply distressing or disturbing experience)?

The U.S. Center for Disease Control defines Adverse Childhood Experiences (ACEs) as potentially traumatic events that occur in childhood. These events may include violence, abuse, neglect, death of a loved one, or growing up in a family with mental health or substance abuse problems. Exposure to trauma can create what is called toxic stress, which can disrupt healthy brain development and lead to chronic health problems, mental illness, and substance abuse in adulthood.

Trauma-informed care (TIC) is an approach to working with children who have suffered an ACE. Research suggests that TIC offers a variety of benefits for children, including a higher chance of returning to normal brain function. The National Child Traumatic Stress Network defines TIC as a seven-step approach and advises people who work with children to apply the following:

1. Routinely screen for trauma exposure and related symptoms;
2. Use evidence-based, culturally responsive assessment and treatment for traumatic stress and associated mental health symptoms;
3. Make resources available to children, families, and providers on trauma exposure, its impact, and treatment;
4. Engage in efforts to strengthen the resilience and protective factors of children and families impacted by and vulnerable to trauma;
5. Address parent and caregiver trauma and its impact on the family system;
6. Emphasize the continuity of care and collaboration across child-service systems; and
7. Maintain an environment of care for staff that addresses, minimizes, and treats secondary traumatic stress and that increases staff wellness.

If TIC is not administered after a trauma, the child has a higher chance of developing negative coping skills such as substance abuse, self-hate, and aggressive behaviors. The goal of TIC is to promote **resilience**. Resilience is the ability to move on from a traumatic event with positive coping strategies and habits. Trauma cannot be erased from the brain, but its negative effects can minimized with consistent, evidence-based TIC.

### Writing Activity

Imagine you are a kindergarten teacher at an elementary school. You were recently informed that a child in your class suffered an ACE. The principal wants to make sure the child receives proper TIC. She asks you to screen for and document any trauma symptoms you observe in the child for the rest of the school year.

On your own or with a partner, research the signs and symptoms of ACEs. Make a list of the symptoms you will be looking for in your student. Then make a list of ways you could help foster resilience in your student. Using the items from your lists, write a one- or two-paragraph plan for creating the best possible environment for your student while collecting thorough and accurate data for your principal. Share your plan with your class.

*Photo: Tom Wang/Shutterstock.com*

The best experiences for young children include interaction with loving adults engaged in daily tasks and family-type activities. (Even child care programs for children under three years of age should have a home-like atmosphere.) Babies and very young children need not be taught in a formal way. Children learn by playing, especially with caring adults. Children need choices in what and how to learn. Closely observing children and following their lead in play activities is often "best practice." Children usually choose age-appropriate experiences that parallel the windows of opportunity. Children need time to practice and develop their skills. Repetition of experiences develops the brain and strengthens connections between neurons. Good books and a few quality toys that allow for open-ended, creative play (blocks, balls, art materials, sand, and water) are better than toys with limited possibilities. In future chapters, we will learn about how our knowledge of brain development helps shape and guide best practices to support and encourage optimal development.

## 2.1-5 Protecting the Brain

The brain is part of the human body. Nutrition, sleep, physical activity, and general health all affect a person's brain (**Figure 2.7**). For example, 60 percent of daily nutrients are used by the brain during the first year. The fat content in breast milk or formula for infants and whole milk for weaned toddlers is essential for myelin development. Do you know why tired people become fretful and say that their thinking is not clear? Without rest, the neurotransmitters become depleted. Rest restores the working of the brain.

Without stimulation and quality early experiences, brain connections can be pruned too much and windows of opportunity missed. Overstimulation can be harmful, too. It can make children feel overwhelmed, tired, frustrated, and unable to focus. Overstimulation, such as loud music, can even cause hearing neurons to die.

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**Figure 2.7** An infant or child's nutrition can dramatically affect their brain health and development. ***Why do you think nutrition can have such an impact on the brain?***

## Lesson 2.1 Review and Assessment

1. Which of the following is *not* something that children learn? (2.1.1)
   A. Motor skills like walking, throwing a ball, or cutting with scissors
   B. Public speaking skills
   C. Understanding, speaking, read, and writing words
   D. How to interact with others
2. Which of the following is *not* a characteristic of newborn brain development? (2.1.2)
   A. Increases in head circumference
   B. Increases of 5 to 10 percent in brain weight during a stage
   C. Changes in the cells
   D. Decreased activity in frontal lobe
3. **True or False**. Sensitive periods are times when some part of the body is very vulnerable to lack of stimulation or to negative experiences. (2.1.3)
4. The best experiences for young children include _____. (2.1.4)
   A. interaction with loving adults engaged in daily tasks and family-type activities
   B. regular introduction of new caregivers
   C. situations that make them uncomfortable so they learn to face their fears
   D. exposure to age-inappropriate toys
5. **True or False.** Nutrition, sleep, physical activity, and general health all affect a person's brain. (2.1.5)

# Lesson 2.2

# Acquiring Knowledge

## Key Terms

cognitive flexibility
developmental tasks
essential life skills
executive functions (EFs)
inhibition
lifelong learning
reinforcement
working memory
explicit
implicit
manipulating
neuroscience

## Learning Outcomes

After studying this lesson, you will be able to

**2.2-1** **differentiate** between four types of knowledge.
**2.2-2** **explain** how knowledge of child development is used in education.
**2.2-3** **identify** and **describe** three executive functions.
**2.2-4** **analyze** Galinsky's seven life skills.

## Reading and Notetaking Activity

Before reading, skim the headings in this chapter. List the headings to create an outline for taking notes during reading and class discussion. Under each heading, list any key terms. Finally, write two questions you expect to have answered in class. After completing each chapter, ask your instructor any questions you still have about the concepts or terms you learned.

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**Figure 2.8** Child care and education centers are natural, ideal environments in which to watch children interact and learn. ***What other locations or situations would make an ideal environment for observing children?***

## Introduction

Child development involves the study of children and the adults in their lives. The first goal of child development research is to advance knowledge. The other goal is to apply knowledge. People who work with or for children, especially in education, not only use available research knowledge, but also create more knowledge. For example, child care and education programs are natural laboratories for the study of children (**Figure 2.8**). Schools for older children are also using child development research to guide curriculum decisions. Popular phrases in today's schools are words coming from brain studies, such as *windows of opportunity* and *brain-compatible learning*.

Professionals in health and protective services also contribute to the knowledge of child development. These experts try to prevent and treat mental health issues in children. They are returning to Erikson's theory and brain studies to provide more answers. It is becoming clear that the roots of mental health problems, for children and adults, are in the stressors of childhood. Although the scars of trauma and stress may be seen on the bodies of children and in their behaviors, the real scars may be within their brains.

## 2.2-1 Types of Knowledge

The last lesson posed the question "How do children learn?" You learned that biology coupled with broad experiences determined how children learn. Because the brain is so plastic, people can learn almost anything. Thus, the *how* question does not answer *what* children should learn.

In every culture throughout history, adults have asked, "What should children learn?" The answer has always been "Children need to know the values and practices of the culture and have the skills needed to thrive in their world." The answer to the question does not change, but the specifics do.

In this 21st century culture, the answer to the specifics of what children should learn rests in the educational system (the schools). Schools transmit the values of the culture and teach skills needed for the workforce. The responsibility of the schools, however, is no longer as simple as it was in the past.

Families are looking to the schools to help educate their children at younger ages than in the past. By law children must receive 12 or 13 years of education. Today, however, many children enter the educational system during infancy or the preschool years and continue their education through college.

Focus on

### Careers

## Elementary School Teacher

An elementary school teacher is responsible for creating lessons and teaching students appropriate grade-level materials. One teacher may be responsible for multiple subjects, including math, reading, language, science, and social studies. Teachers monitor educational development, assess student learning, and prepare students for the next grade level.

*Career cluster:* Education and training.

*Education:* Educational requirements vary by state, but a bachelor's degree in elementary education is the minimum. Other requirements may include an additional degree in a specific subject area, a teaching certificate, and a master's degree. Education requirements for private schools also vary. Continued education is also required.

*Job outlook:* Future employment opportunities for elementary school teachers are expected to grow as fast as the average for all occupations.

To learn more about a career as an elementary school teacher, visit the United States Department of Labor's *Occupational Outlook Handbook* website. You will also be able to compare the job responsibilities, educational requirements, job outlook, and average pay of elementary school teachers with similar occupations.

*Photo: MBI/Shutterstock.com*

In this century, schools can no longer determine the exact skills needed for the workforce of the future. Because knowledge is expanding and changing so rapidly, the needed skills of today will change before the current workforce retires. This means that learning must be ongoing, which is called **lifelong learning**. Workers must adapt to changing career demands or even to new careers. Furthermore, people in today's culture are part of a world community that requires broader knowledge, such as global economies and multicultural understandings. Schools today have a much broader responsibility for preparing students for today's world and giving them the skills to adapt to a changing world.

Today, schools are teaching four types of knowledge needed now and in the future. The specifics of what children should know are embedded in each type of knowledge and are sequenced in state curriculum standards and college-degree programs. Your textbooks, other learning materials, and achievement tests closely follow these standards.

## Explicit Knowledge

*Explicit knowledge* refers to knowledge about "facts." It is sometimes called *codified knowledge* because it is written. When young children learn to name colors, shapes, animals, and objects, they are acquiring codified knowledge (**Figure 2.9**). Schools require students to have a broad base of **explicit** (clearly described) knowledge. Because no one can learn more than a small amount of codified knowledge, education beyond high school focuses to a great extent on explicit knowledge in the specific area of study, such as computer technology, medicine, law, or child development.

baona/E+ via Getty Images

**Figure 2.9** Children gain explicit knowledge by learning the names of colors, shapes, animals, and objects. ***What is one way you use explicit knowledge in your typical day?***

## Implicit Knowledge

*Implicit knowledge* (also called *experienced-based knowledge*) refers to skills-based knowledge. Think about the **implicit** (implied or understood without describing in detail) knowledge involved in specific tasks, such as teaching, managing a large corporation, or operating a complex machine. Often, this knowledge cannot be completely written. Young children begin acquiring implicit knowledge when they learn to ride a bike, swim, or balance blocks while building a structure (**Figure 2.10**). In school, implicit knowledge is needed to turn ideas into an essay or project or to become a leader in a student organization.

wavebreakmedia/iStock via Getty Images Plus

**Figure 2.10** Implicit knowledge is skill-based and can be gained by learning to swim, ride a bike, interact with people, or balance blocks on a structure. ***What are some ways you use implicit knowledge in your everyday life?***

## Scientific Knowledge

*Scientific knowledge* refers to the ability to create knowledge. This type of knowledge underlies new technological development, scientific discoveries, and process advances. Although the knowledge is often acquired in laboratories, it is used in many other careers. For example, as doctors learn about new drugs or procedures, they use them in their practices. Acquiring scientific knowledge begins when young children, even babies, try different actions with their toys (**Figure 2.11**). For example, their scientific questions might be "How can I make the pans sound louder or the boat move faster?" Part of the curriculum in schools involves critical thinking and problem solving. Some teens take this form of knowledge to a high level as seen in science project competitions.

## Knowledge About Experts

*Knowledge about experts* (also called the *knowledge network*) involves knowing who has the other forms of knowledge. The knowledge network is used in all careers to get access to needed explicit, implicit, and scientific knowledge. Knowledge about experts is becoming more and more important. Again, even young children begin to acquire this knowledge. They quickly learn which parent, sibling, or friend has the knowledge or skills they desire. They even know whether this person gives them correct information.

Schools teach this type of knowledge when they require students to use valid and reliable sources of information. During this course, your teacher may ask you to interview someone or to give a group presentation. To do these activities will require you to choose someone who can share the information you need.

PeopleImages/E+ via Getty Images

**Figure 2.11** Children gain scientific knowledge by experimenting with their toys and determining how their actions can affect objects in the physical world. ***What do you think makes this type of knowledge scientific?***

Focus on

## Speech

### Group Presentations

Break into small groups and create a presentation on one of the following types of knowledge: explicit knowledge, implicit knowledge, scientific knowledge, or knowledge about experts. In your presentation, analyze how this type of knowledge is learned and practiced over each of the six stages of child development. (Review Figure 1.2 for the six stages of child development.)

Complete the following steps to prepare your presentation:

1. In your group, discuss examples of your chosen type of knowledge for each of the six stages of child development. Consider the question: How does this type of knowledge develop in each stage?
2. After discussing, divide the stages of child development among all group members. Each group member should be responsible for presenting on one stage of child development.
3. Make notes on index cards about important points to present. Before presenting, evaluate each other's notes and offer suggestions.
4. Deliver your presentation to the class. The person presenting on the first stage of child development should go first, the person presenting on the second stage second, and so on. Be prepared to answer any questions your classmates have, and ask questions about the other presentations in your class.

*Photo: naluwan/Shutterstock.com*

Mastering this type of knowledge requires understanding what knowledge is needed, knowing who has this knowledge, and building a social relationship to get access to experts and their knowledge.

## 2.2-2 Linking Child Development Knowledge to Education

Until the 1950s, the schools were mainly concerned with preparing children to become productive workers for jobs in a slower-changing world. Schools could teach the needed skills for a lifetime career, such as typing and shorthand to students wanting to be secretaries. These skills were not expected to change. *Rote memorization*, or memorization without full comprehension, was the way children learned many facts. Learning theories seemed to be the "best fit" for this type of education. Learning theories used **reinforcement** (rewards) for mastery of facts and skills. For example, children might be given a reward for learning multiplication tables. Rote learning did not work as well after the primary grades due to the complexity of many concepts and skills.

As the world changed, educators realized rote memorization was not best for learning needed skills. Robert Havighurst (1900–1991), a psychologist, began to develop educational theory based on child development concepts. His research led him to the concept of developmental tasks. **Developmental tasks** are skills that should be mastered at a certain stage in life. Havighurst coined the term *teachable moment* as the best time to teach a specific skill. He thought educators would be more effective if they used tasks for a particular level of development rather than using rote learning. Havighurst believed that the child's readiness for a developmental task came from the following three sources:

- ***physical maturation.*** A baby comes into the world as a helpless being. As their body matures, the child is able to learn many new skills, such as walking and reading.
- ***social pressures.*** Through rewards and penalties, society pressures the child to learn important tasks. Developmental tasks differ from culture to culture because each group may value different skills. Tasks differ from region to region, too. Over time, tasks also change to reflect changes in society.
- ***inner pressures.*** The actual push to achieve comes from within children. In the end, the child is responsible for mastering each task. Children work harder to learn tasks they like (**Figure 2.12**).

The United States is no longer an industrial economy but is a *knowledge-based economy* (knowledge and information along with technology drive the present production of goods and services and future economic growth). Children must be educated for today's world and also adaptable and creative for the future. Although the theories of Piaget and Vygotsky are not theories of education, these theories, rather than learning theories, are being used to inform "best practices." Constance Kamii and Rheta DeVries, psychologists who studied under Piaget, have "translated" Piaget's theory into educational practice. Together and individually, they developed and researched specific math and physical knowledge curricular ideas for teachers using the *constructivist approach to education*. In this approach, the child does not ingest teacher-taught facts and procedures, which they see as a path to failure. Rather, the curriculum is designed to challenge groups of children to collaboratively work on inquiry-based learning activities, called *games*. Teachers encourage children to ask questions, explore, and assess their current knowledge through which children construct new knowledge at ever-higher levels.

## 2.2-3 Using Knowledge Effectively

For people to reach their full potential in school, in careers, and in their personal lives, they must not only acquire knowledge, but make good use of it. Everyone needs to know how to learn (study, recognize important information, remember, and make associations with other knowledge).

**Figure 2.12** Developmental Tasks

| Description | Tasks Arise from Three Sources: | Example of the Actual Push to Achieve |
|---|---|---|
| **Area:** Motor task<br>**Task for middle childhood:** Learning skills needed for common games<br>**Example of task:** Learning skills needed to play ball<br>  <br>*kali9/E+ via Getty Images* | 1. **Physical maturation.** Child needs bone and muscle growth. The child's eyes and hands must work smoothly together.<br>2. **Social pressures.** Other children reward skillful players (praise or accept them as friends) and punish failures (tease or reject them as friends). Families and coaches may also expect children to become proficient at the skills.<br>3. **Inner pressures.** Child desires to be admired by other children, families, and coaches. | **Child must see new possibilities for behavior.**<br>• Child sees older children playing ball.<br>**Child must form new concept of self.**<br>• Child thinks, "I can be a player."<br>**Child must cope with conflicting demands.**<br>• Child thinks, "I can get hit with a ball or be teased for striking out, but if I do not play, the other kids will make fun of me, and my family and coaches will not consider me grown-up."<br>**Child wants to achieve the next step in development enough to work for it.**<br>• Child now spends hours in practice. |

People also need to know how to make plans, organize and prioritize tasks, keep track of information, and communicate effectively. Knowing how to stay focused on the task at hand, but being able to return to the primary task after being interrupted are also important skills to learn. Some people, however, are weak in these skills. Often, they cannot achieve as much as they should and have problems in working effectively with and for others. The good news is that these skills can be improved.

## Executive Functions

**Executive functions (EFs)** are cognitive functions people use to manage themselves and their resources (knowledge, time) to achieve goals. (EFs are also called *managing functions*.) EFs are used in achieving all tasks. Some researchers believe EFs may predict a person's success more than intelligence. Not all researchers list the same EFs, but the following three functions are always listed:

- **working memory**—storing, organizing, and **manipulating** (moving or changing) information while working on a task. Some people refer to *working memory* as *short-term memory*, but *short-term memory* refers only to storing information while working on a task.
- **cognitive flexibility**—being able to adjust to changing demands.
- **inhibition**—filtering thoughts and feelings so as not to act impulsively (**Figure 2.13**).

EFs have their developmental roots in early childhood, are easily seen around nine years of age, and mature at 25 years of age. The lack of EFs is most often seen in children with learning and behavioral problems. Many other children, however, have weak EFs. EFs are fragile, and the lack of EFs can be seen for a short time in anyone who is sleep deprived or stressed. During these times, people cannot focus and distractions seem to rule behavior.

The exact causes of weak EFs are not known. Adverse effects on EFs include a chaotic and stressful environment and child neglect and abuse. Treatments can only help, not cure, weak EFs.

**Figure 2.13** Symptoms and Aids for Weak Executive Functions

### Working Memory

| Symptoms | Examples of Aids |
|---|---|
| • Has problems following multistep oral directions.<br>• Cannot tell or write story details in order of occurrence.<br>• Forgets a question or intended response while waiting.<br>• Cannot remember a phone number while placing a call or a thought while writing it.<br>• Forgets about assignments and projects.<br>• In sounding out letters, has problems remembering the first sounds by the end of the word, so cannot combine sounds to form one word.<br>• In reading a book section, has problems connecting concepts, so comprehension is weak.<br>• Cannot remember oral messages.<br>• In playing games, cannot keep track of moves (chess, checkers) or what has been played (dominoes, cards). | • Sort many objects by one attribute (color, shape, size).<br>• Play memory games, such as *concentration*.<br>• Engage in dramatic play. (Child must remember the specifics of the role and keep track of sequence.)<br>• Play games with rules.<br>• Play games that require memory of moves or what has been played.<br>• Break oral instructions into small chunks.<br>• Use lists or drawings or repeat information to aid comprehension.<br>• Establish routines.<br>• Use calendars and assignment planners.<br>• Organize materials and prioritize tasks.<br>• Remove distracters.<br>• Make plans, follow plans, and discuss the activity at the end.<br>• Use memory aids such as acronyms. |

(Continued)

**Figure 2.13** Symptoms and Aids for Weak Executive Functions (Continued)

### Cognitive Flexibility

| Symptoms | Examples of Aids |
|---|---|
| • Finds it difficult to change rules or directions, such as sort or classify by different attributes.<br>• Has problems changing behaviors for different settings (inside/outside voices; behavior at ballgames versus behavior at a religious service; behaviors allowed at home versus school).<br>• Cannot separate main ideas from supporting details.<br>• Finds math word problems difficult due to the shift from words to equations.<br>• Finds it difficult to see from another person's perspective. | • Sort or classify using the same materials, but changing attribute (use color then shape).<br>• Do multiplicative classification, or recognize several possible categories for one object or person.<br>• Engage in pretend play (changing roles and/or use the same prop, such as a block, to stand for different things).<br>• Use words with multiple meanings, such as idioms, puns, and riddles.<br>• Work jigsaw puzzles.<br>• Take turns elaborating on a made-up story.<br>• Learn more than one way to solve a problem.<br>• Play "Turn It Around." (Say two things and have children reverse the order, such as "socks and shoes—shoes and socks.")<br>• Ask about another person's perspective, such as "Why is Goldilocks afraid when the bears return?" (She's been in their house and knows they won't like it.) |

### Inhibition

| Symptoms | Examples of Aids |
|---|---|
| • Cannot pause and think before acting. (If bumped in a line, never evaluates that the bump might have been accidental. Just becomes angry and hits.)<br>• Finds it easier to "give up" than to cope with a small set-back.<br>• Has problems resisting temptations, such as watching TV when homework needs to be done.<br>• Becomes distracted when riding a bike or watching a program.<br>• Has problems focusing on a conversation in a busy room.<br>• Cannot hold a personal thought in order to not hurt someone else's feelings. | • Play "Simon Says" with new rules, such as do the action when Simon does not say it, or do the opposite of what Simon says, such as touch head when he says "toes."<br>• Play a tapping game by doing the opposite of the adult. For example, if the adult taps twice, the child taps three times and vice versa.<br>• Read color words written in the wrong color, such as RED written in green.<br>• Delay gratification. (Get a bigger reward for waiting, such as saving money for a major purchase over several smaller purchases.)<br>• Play games in which the child must wait for their turn. |



## 2.2-4 Galinsky's Seven Essential Life Skills

Ellen Galinsky wanted to learn which skills had the greatest effects on children's development now and in the future. She spent eight years interviewing more than 75 of the leading researchers in child development and **neuroscience** (study of the brain) and filming aspects of their work.

Galinsky's study led her to identify seven basic skills, which she calls *essential life skills*. She defined **essential life skills** as the intellectual, social, and emotional skills that prepare children for the

pressures of modern life. Following are Galinsky's *Seven Essential Life Skills*:

- ***Focus and self-control.*** Focus and self-control allow children to achieve goals in a rushed world filled with distractions and information overload. This skill involves being oriented toward achieving a goal by being alert and paying attention to get more out of information. It also requires having intellectual flexibility, and exercising self-control by not going on "automatic pilot" and by delaying gratification.
- ***Perspective taking.*** Perspective taking is the skill of figuring out what others are thinking and feeling. Understanding and respecting other's intentions are needed in a complex world.
- ***Communicating.*** Communicating is more than just listening, speaking, and writing correctly, although these skills are highly important. This skill involves reflecting on the message. While doing this, one person must listen and understand another person's perspective and realize how their communication will be understood by others.
- ***Making connections.*** Making connections is a skill most similar to *intelligence* itself. This skill involves seeing how things are the same or different and determining how bits of knowledge relate to each other. People who can see unusual connections between concepts and facts are creative and make advances in their fields.
- ***Critical thinking.*** Critical thinking involves obtaining and using valid and reliable knowledge to guide a person's beliefs, decisions, and actions. Critical thinking requires scientific reasoning to determine "what causes what."
- ***Taking on challenges.*** Taking on challenges is the willingness for a person to "stretch" themselves rather than simply doing what is comfortable. The skill is based on an understanding that a person's abilities can grow.
- ***Self-directed and engaged learning.*** Self-directed and engaged learning is the willingness to continue learning for a lifetime. Everyone needs to find something they are passionate about and pursue the needed learning. This skill allows people to adapt to the changing world.

Essential life skills are closely related to EFs. For example, "perspective taking," one of Galinsky's seven skills, requires a person to remember all needed information about another person and to compare the current situation with similar situations (*working memory*). Perspective taking also requires the person to view the situation from both the other person's point of view and their point of view (*intellectual flexibility*). Finally, perspective taking requires the person to put their reactions aside while looking at another person's point of view (*inhibition*). For best results, these seven skills must be fostered beginning in early childhood.

## Lesson 2.2 Review and Assessment

1. Which of the following is *not* one of the four types of knowledge? (2.2.1)
   A. Implicit
   B. Cognitive
   C. Explicit
   D. Scientific
2. **True or False.** Teachable moments are skills that should be mastered at a certain stage in life. (2.2.2)
3. Which of the following is the executive function that involves being able to adjust to changing demands? (2.2.3)
   A. Working memory
   B. Cognitive flexibility
   C. Inhibition
   D. Manipulating
4. **True or False.** According to Galinsky's study of essential life skills, focus and self-control allow children to achieve goals in a rushed world filled with distractions and information overload. (2.2.4)

# Chapter 2 Review and Assessment

## Summary

### Lesson 2.1

**2.1-1** Because technology is changing so rapidly, research on brain development is constantly being updated.

**2.1-2** Brain development begins shortly after conception.

**2.1-2** The process by which your brain makes connections is broken into four steps: the wiring process, the sorting process, the firing process, and the pruning process.

**2.1-3** The brain's ability to be shaped and reshaped is called brain plasticity.

**2.1-4** Most jobs in early childhood require at least a certificate or a degree.

**2.1-5** Nutrition, sleep, physical activity, and general health all affect a person's brain.

### Lesson 2.2

**2.2-1** In today's rapidly changing world, learning must be ongoing. This is called lifelong learning.

**2.2-1** The four types of learning are explicit, implicit, scientific, and knowledge about experts.

**2.2-2** Psychologist Robert Havighurst developed a list four of developmental tasks, or skills that should be mastered at a certain stage in life. The ability to perform these tasks derives from three sources: physical maturation, social pressures, inner pressures.

**2.2-2** A teachable moment is the best time to learn a specific skill.

**2.2-3** Executive functions are cognitive functions people use to manage themselves and their resources (knowledge, time) to achieve goals. These include working memory, cognitive flexibility, and inhibition.

**2.2-3** Researcher Ellen Galinsky identified seven essential life skills: focus and self-control, perspective taking, communicating, making connections, critical thinking, taking on challenges, and self-directed and engaged learning.

# College and Career Portfolio

## Portfolio Objective

Begin by writing an objective for your portfolio. An objective is a complete sentence or two that states what you want to accomplish. The language should be clear and specific. The objective should contain enough details so that you can easily judge when it is accomplished. For instance, "I will create a portfolio for my future education" is too general. A better, more detailed objective might read: "I will work with my teacher and spend at least three hours per week creating, editing, and compiling items which will help me get into a college child care program." A clear objective is a good starting point for building a portfolio. As you think about building your portfolio, complete the following:

- Decide on the purpose of your portfolio—temporary or short-term employment, career, and/or college application.
- Research articles about writing objectives. Look for articles containing sample objectives.
- It can be helpful to examine the portfolios or resumes of others in the field in which you want to work or study. What objectives do they list, and can you adapt this for your own use?

Once you have completed the above steps, you are ready to write an objective for your portfolio.



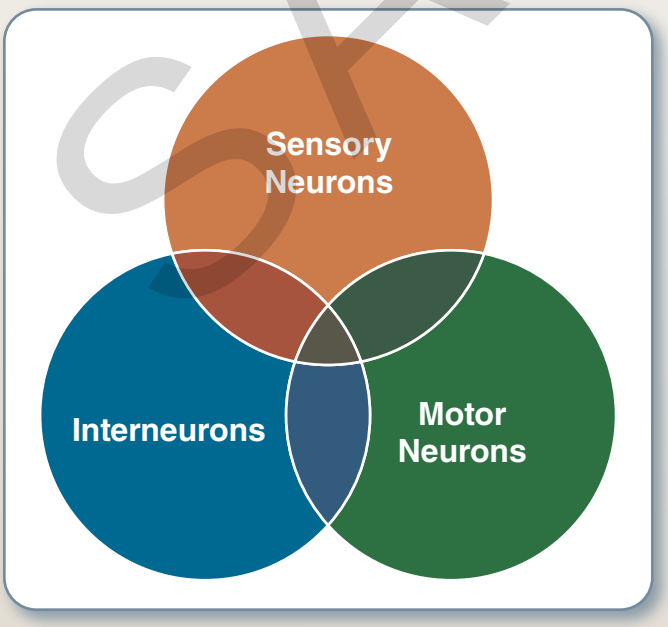
## Recall and Application

1. Although the whole body is involved in learning, the command center of the body is the _____. (2.1.1)
   A. heart
   B. eyes
   C. brain
   D. ears
2. Much of the knowledge scientists have gained about brain development comes from the use of high technology brain scans and advances in _____. (2.1.2)
   A. abundance
   B. biochemistry
   C. neurons
   D. dendrites
3. A _____ is a prime period in a child's life for developing a particular skill. (2.1.3)
   A. window of opportunity
   B. critical period
   C. sensitive period
   D. myelin
4. **True or False.** All experiences affect the brain's performance. (2.1.4)
5. Each of the following affects a person's brain *except* _____. (2.1.5)
   A. nutrition
   B. sleep
   C. physical activity
   D. clothing
6. Learning has to be ongoing. This is called _____. (2.2.1)
   A. explicit knowledge
   B. implicit knowledge
   C. lifelong learning
   D. cognitive flexibility

7. _____ are skills that should be mastered at a certain stage in life. (2.2.3)
   A. Executive functions
   B. Developmental tasks
   C. Inhibitions
   D. Scientific knowledge
8. Ellen Galinsky defined _____ as the intellectual, social, and emotional skills that prepare children for the pressures of modern life. (2.2.4)
   A. focus and control
   B. critical thinking
   C. communication
   D. essential life skills

## Critical Thinking

1. **Cause and effect.** Review Figure 2.2 and the stages of brain growth after birth. Working with a partner, thinking about children you know in each of the stages, how do you think brain growth and development impact their behavior? Give one concrete example for each age range listed.
2. **Compare and contrast.** Use the internet to research the three types of neurons (sensory, motor, interneurons) and their functions. How are their structures and functions different? How are they similar? Use a Venn diagram like the one below to document the differences and areas of overlap.




3. **Make inferences.** Two-year-old Aiden fell off a slide and is now having vision problems. His mother took him to the eye doctor, but Aiden's eyes are fine. The eye doctor recommended they see a neurologist. Why? What problems might the eye doctor suspect?
4. **Cause and effect.** Think of a special skill at which you excel (e.g., art, sports, music, etc.). How did repetition and practice help you develop this skill? How do you think it impacted the wiring in your brain?
5. **Analyze.** Research shows that teens have less myelin in their frontal lobes compared to adults. More myelin allows for better flow of information between brain regions. How do you think less myelin in this particular brain region affects your own thinking?
6. **Determine.** When is the best time to guide a child in understanding or reading others' emotions? What might happen if a child is pressured to learn these concepts too early? too late?
7. **Draw conclusions.** Based on what you have learned in this chapter, how would being deprived of loving attention and learning experiences impact the developing brain of a young child?
8. **Compare and contrast.** In what ways do you use explicit knowledge, implicit knowledge, scientific knowledge, and knowledge about experts in your everyday life? Compare answers with a partner and discuss your differences.
9. **Identify.** Identify examples of social pressures that motivate children to learn. From where do these pressures originate? Are these social pressures always positive, or can they have negative effects if applied excessively?
10. **Evaluate.** List Galinsky's seven essential life skills and assess your strength in each of these skills. Where are you strongest? Where are you weakest?

## Core Skills

1. **Research and writing.** Interview an older family member or friend. Find out what the roles and expectations were for children when they were a kid. Then, reflect on how these roles changed for your generation and how new brain discoveries may have been responsible for shifting views of childhood. Write a short essay comparing your experience to your interviewee's experience and how the differences in your childhoods may have affected the wiring of your brains.
2. **Reading.** With a partner, make flash cards of all the key terms in this chapter. On the front of the card, write the term. On the back, write the phonetic spelling of the word. (You may use a dictionary to find the phonetic spelling.) Practice reading and defining the terms aloud, clarifying pronunciations where needed.
3. **Using technology.** Using a graphics editing software, create a line drawing of a neuron and label its parts. Show your image to a partner and explain how an electrical signal is passed from neuron to neuron.
4. **Math.** Review the windows of opportunity in Figure 2.6. At what age, in months, does the latest window of opportunity begin?
5. **Listening, writing, and speaking.** Interview an early childhood (birth through age 8) educator about how they incorporate windows of opportunity into their teaching and/or caregiving. What age group do they work with? What specific skills and tasks are they working on with the children? What do they consider best practices for teaching and developing these skills? After the interview, create a presentation about the interview, highlighting how the educator does (or does not) take advantage of children's windows of opportunities. During your presentation, share with the class your own evaluation of the early childhood educator's practices and whether or not they are developmentally appropriate for that age group.
6. **Speaking.** Divide into teams and have each team select one of the following topics:
   - the four types of knowledge
   - the three executive functions
   - Galinsky's seven essential life skills

   In your team, identify the components of your topic and brainstorm as many everyday examples as possible. Present your findings to the class, using props or demonstrations to illustrate each component.
7. **Listening.** As your classmates present their findings from the previous activity, listen closely to your classmates' examples. Take notes on anything you find particularly interesting, or write any questions you think of during their presentations. Once they are finished presenting, share with the class one thought or question you had regarding their presentation. Do this for all the presentations in your class.
8. **CTE Career Readiness Practice.** Presume you are a teacher at a local preschool and kindergarten. The families of your children are concerned that you are not teaching some topics and skills early enough, and you have scheduled a collective "family-teacher conference" next week. To explain your teaching method, you decide to put together handouts about the following:
   - the windows of opportunity for children's learning
   - the four types of knowledge, the executive functions, and Galinksy's seven essential life skills—all of which you emphasize in your lessons

   Prepare these handouts and then write a short speech in which you acknowledge the families' concerns while educating them about child development and your teaching method. Distribute your handouts and give your presentation to the class.

## Observations

1. In small groups, set up a time with a local child care facility to observe young children. If you do not have access to a child care facility, you can ask to observe a family friend's children. During your observation, assess the child's or children's readiness for developmental tasks, including
   - physical maturation
   - social pressures
   - inner pressures

   Afterward, discuss your observations with your group. Do your group members agree with your assessment? Why or why not? If there are differences of opinion, consider how two people can observe a child and see two different things. As a group, present a short summary of your observations and discussion to the class.
2. If abandoned or isolated from a young age, some children may never learn language skills or other developmental tasks. These children are known as *feral children*. Watch a documentary about a feral child. Documentaries can be found at a local library or online. Be sure to note the title and citation information of the documentary you chose. As you watch the documentary, note any observations you have. Then, write a one-page essay about the documentary you watched and about what you learned. Include citations for the documentary in the APA and MLA formats. Share your essay with the rest of the class.