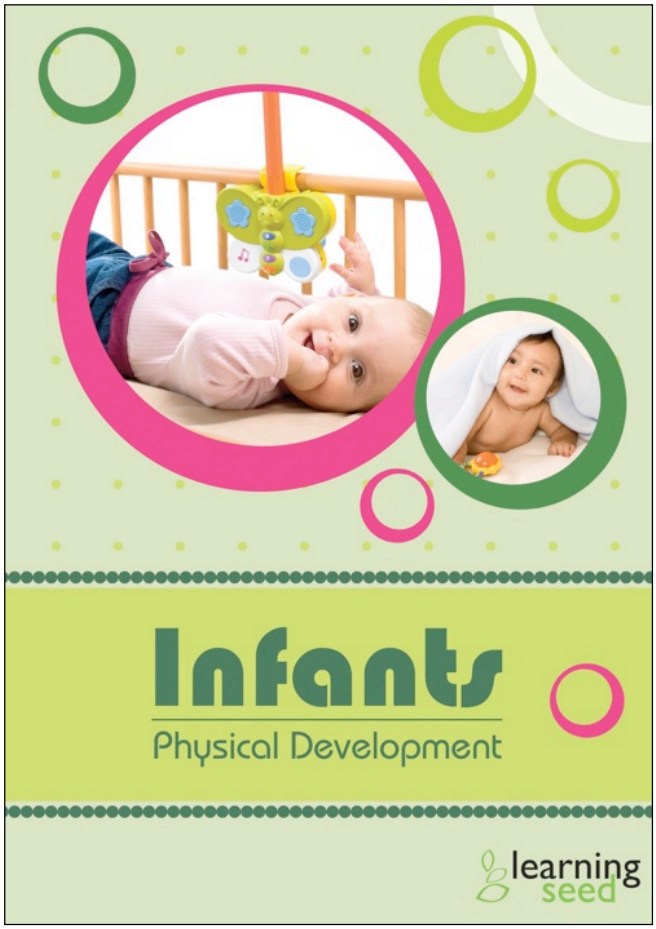
Infants:
Physical Development



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Legal Niceties

The Video

Teaching Guide

Credits

The Video

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This Teaching Guide

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Learning Seed Catalog and ISBN Numbers

DVD LS-1009-10-DVD ISBN 1-55740-575-1

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Closed Captioning

This program is closed-captioned.

Summary

Infants grow at a rapid rate during their first year of life. They begin to explore their world and reach different milestones along the way. Learn how a baby's brain develops and what activities help stimulate healthy brain growth. Also learn the importance of proper nutrition and sleep in the first year. See how infants rely on their innate reflexes and how gross and fine motor skills emerge in typically developing children as well as those with challenging conditions.

Key Facts About Growth

Size

- Most babies gain an ounce or 28 grams per day during the first two months. After that, they typically gain about a pound, or half a kilogram, per month.
- Most babies double their birth weight and grow 30% in length by the 5th month.
- By their first birthday, they typically triple their birth weight and grow more than 50% in length.

Dental Growth

- On average, a baby's first tooth appears at around 6 months.
- Some babies begin teething as early as 3 months, and others, after their first birthday.
- The lower two middle teeth usually come in first, followed by the upper two middle teeth. These are typically followed by the lateral incisors, and then the canines, and molars.
- During teething, some babies become fussy, lose their appetite, and drool.
- Experts recommend that parents clean baby's teeth regularly, avoid putting baby to bed with a bottle of milk or formula, and see a dentist before a baby's first birthday.

Key Facts About The Nervous System

Baby's Brain and Nerves

- A baby's brain reaches three-fourths of its adult weight and size by age 2!
- Babies are born with somewhere in the neighborhood of 100 and 200 BILLION neurons.
- A complex network of neurons will grow rapidly during the first few years of life.
- The neurons grow and become coated with myelin, which is a fatty substance that both protects them and speeds up the transmission of messages carried by neurotransmitters.
- Everything a baby experiences establishes synapses or neuron connections, which lay the foundation of intellectual and emotional development.
- Brain development is able to take place because of its plasticity, or the brain's ability to change and reorganize neural pathways based on new experiences

Key Facts About The Senses

- Sensation is the stimulation of the sensory organs - eyes, ears, nose, mouth, and skin.

Vision

- Within hours after birth, most infants prefer to look at their mother's face in comparison to other faces.
- By 2 and 3 months of age, infants prefer more complex stimuli to simple ones.
- In the fist 4 months, infants begin to track moving objects and begin to reach for things.
- Between 4 and 8 months, both eyes should focus equally, and eye/body coordination skills improve.
- Between 8 and 12 months they use their eyes to judge distances and depth.

Hearing

- For most infants, hearing actually started in the womb.
- Shortly after birth, they can recognize the sound of their mother's voice.
- By 4 1/2 months, infants can differentiate their name from other word.

Smell and Taste

- Most infants have a highly developed sense of smell.
- The most common taste preference for infants is sweetness.

Touch

- Touch is a highly developed sense in the youngest infants.
- Infant pain can be detected through facial expressions, an increased heart rate, and a difference in the intensity and tone of their crying.
- Infants learn a lot of information by using their mouths to feel, and explore their surroundings.
- Once they begin crawling, it's important to make sure that all choking hazards, and unsafe or toxic objects and substances are safely out of baby's reach.

Key Facts About Motor Development

Reflexes

- Reflexes are unlearned, organized, involuntary responses that occur automatically in the presence of certain stimuli.

- Rooting reflex - turns head toward things that touch his cheek
- Sucking reflex - sucks at things that touch her lips
- Gag reflex - clears throat

- Swimming reflex - kicks legs and paddles arms in a "swimming" motion if lying face down
- Eye-blink reflex - shuts and opens eyes in response to direct light
- Startle reflex - flings out his arms and legs, arches his back, and fans out fingers in response to a sudden or loud noise
- Moro reflex - thrusts out arms and legs when support is removed from head and neck
- Stepping reflex - moves legs when held upright with feet touching the floor

Gross and Fine Motor

- Gross motor skills involve the large muscles of the arms, legs and abdomen.

- Fine motor skills involve the small muscles of the hands and wrists.

- Gross motor milestones: (all ages approximate)
    - 3 months - raise their head and chest when lying on their stomach
    - 6 months - roll from their stomach to their back
    - Between 6 and 7 months- sit without support
    - Between 8 and 10 months – crawl
    - 9 months - pull themselves up to stand with support
    - 11 months - stand alone without assistance
    - 12 months – walk, first with support then on their own

- Fine motor milestones: (all ages approximate):
    - 3 months - coordination of hands, grasp objects
    - 8 months - pincer grasp
    - 11 months - grasp a crayon and "draw"

Nutrition

- Breast milk contains all of the nutrients that babies need for optimum growth and development, it's easily digestible, and provides a degree of immunity to some illnesses
- Experts recommend infants be breast-fed for the first 12 months.
- If a baby is not breast fed, enriched, iron-fortified infant formula provides all of the nutrients vital to growth and development.
- Newborns need small frequent meals and are generally fed on demand.
- They need a high intake of calories, fat, protein, vitamins, and minerals.
- Experts suggest that babies begin eating solid foods at around 6 months.
- Formula fed babies usually start drinking regular milk after their first birthday. The choice of when to stop breast-feeding varies from mother to mother.
- Infants who are malnourished or undernourished show a slower growth rate and suffer cognitive delays.

Sleep

- On average, infants sleep around 16 to 17 hours every day.
- Most babies don't sleep through the night for the first several months - so parents' sleep patterns are disturbed by a baby's nighttime needs for food and comfort.
- By the end of the first year most babies sleep through the night and have regular nap patterns during the day.

Key Facts About Special Concerns

- Down Syndrome, Cerebral Palsy, brain damage, as well has visual and hearing differences can affect an infant's development.

- Babies with Down Syndrome may have poor muscle tone, which may affect gross motor skill acquisition, and shorter fingers, and underdeveloped wrist bones, which can delay development of fine motor skills.

- Infants who have experienced some kind of brain damage can experience gross and fine motor challenges that range from slight to severe.

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- Cerebral palsy is a permanent condition which affects muscle coordination and body movements. It is caused by damage to the brain during fetal development or infancy and be improved with therapy but not cured.

- Blindness or severely limited vision, as well as hearing impairments like deafness or severely limited auditory perception can impair or cause delays in motor development because it may take longer to learn without visual or auditory cues.

- Early diagnosis and treatment will help children with physical differences reach their full potential.

Suggested Activities

- Make a side-by-side, two-column chart that depicts an infant's gross and fine motor milestones. Discuss how each column might affect the other throughout an infant's first 12 months.
- Discuss why you think infants are born with reflexes.
- Consider the senses: vision, hearing, taste, smell and touch. For each one, design a stimulating sensory activity you could do with an infant to help them learn about their world.
- Research how doctors and therapists help foster development in infants who have been diagnosed with special needs.

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Matching Quiz

Match the words in the first column to the best available answer in the second column.

_____	Hours in a day most newborns sleep.	1) rooting
_____	Approximate month-age babies begin to walk.	2) moro
_____	Reflex that an infant would show if you stepped into bright sunlight with her.	3) three
_____	Approximate month-age babies first raise their heads while on their stomach.	4) eye blink
_____	Reflex that an infant would show if you touched something to her cheek.	5) swimming
_____	Reflex that an infant would show if you placed her face down on the floor.	6) six
_____	Ability to grasp an object with the thumb and forefinger.	7) pincer
_____	Approximate month-age babies are first able to sit without support.	8) twelve
_____	Reflex that an infant would show if you removed support from her head and neck.	9) nine
_____	Approximate month-age babies are when they can pull themselves up to stand with support.	10) sixteen

Infants: Physical Development

Matching Quiz *Answer Key*

__10_	Hours in a day most newborns sleep.	1) rooting
__8__	Approximate age babies begin to walk.	2) moro
__4__	Reflex that an infant would show if you stepped into bright sunlight with her.	3) three
__3__	Approximate age babies first raise their heads while on their stomach.	4) eye blink
__1__	Reflex that an infant would show if you touched something to her cheek.	5) swimming
__5__	Reflex that an infant would show if you placed her face down on the floor.	6) six
__7__	Ability to grasp an object with the thumb and forefinger.	7) pincer
__6__	Approximate age babies are first able to sit without support.	8) twelve
__2__	Reflex that an infant would show if you removed support from her head and neck.	9) nine
__9__	Approximate age babies are when they can pull themselves up to stand with support.	10) sixteen

Infants: Physical Development

Fill-In-The-Blank

Select the correct term from the list below and write it in the blank space. Some terms may be used more than once, while others not at all.

1. Babies learn about their world through their _____.
2. _____ _____ skills involve the large muscles of the arms legs and abdomen.
3. Experts recommend that infants are breast-fed for the first _____ _____.
4. _____ _____ skills involve the small muscles of the hands and wrists.
5. Because of the brain's _____ it can change and reorganize connections to reflect new experiences.
6. Children with _____ _____ usually reach physical milestones, but later than their typically developing peers.
7. Babies can usually roll from their stomach to their back at around _____ _____.
8. Children with _____ _____ have decreased muscle coordination, caused by brain damage, which can be helped with therapy but not cured.
9. The basic nerve cells in our brains are called _____.
10. The brain sorts and interprets stimuli through _____.
11. The stimulation of the sensory organs is called _____.
12. Neurotransmitters travel between small gaps between cells called _____.

gross motor	fine motor	synapses
twelve months	six months	neurons
Down syndrome	perception	neuroplasticity
Cerebral Palsy	sensation	senses

Infants: Physical Development

Fill-in-the-Blank Exercise *Answer Key*

1. Babies learn about their world through their **senses**.
2. **Gross Motor** skills involve the large muscles of the arms legs and abdomen.
3. Experts recommend that infants are breast-fed for the first **twelve months**.
4. **Fine motor** skills involve the small muscles of the hands and wrists.
5. Because of the brain's **neuroplasticity** it can change and reorganize connections to reflect new experiences.
6. Children with **Down syndrome** usually reach physical milestones, but later than their typically developing peers.
7. Babies can usually roll from their stomach to their back at around **six months**.
8. Children with **Cerebral Palsy** have decreased muscle coordination, caused by brain damage, which can be helped with therapy but not cured.
9. The basic nerve cells in our brains are called **neurons**.
10. The brain sorts and interprets stimuli through **perception**.
11. The stimulation of the sensory organs is called **sensation.**
12. Neurotransmitters travel between small gaps between cells called **synapses**.

Additional Resources

Dental
http://www.ada.org/public/topics/teething.asp

Vision
http://www.aoa.org/x4738.xml

Nutrition
http://www.brightfutures.org/nutrition/pdf/infancy.pdf

Sleep
http://www.sleepfoundation.org/article/sleep-topics/children-and-sleep

Milestones
http://www.marchofdimes.com/pnhec/298_10203.asp

Special needs
http://www.nichcy.org/informationresources/documents/nichcy%20pubs/nd20.pdf