

I'm just like *you!*



God says: "Before I formed you in the womb I
knew you, before you were born I set you apart;
I appointed you as my spokesman to the world."
Jeremiah 1:5



Dear Parents and Christian Educators,

As people made in God's image, we must teach our children about Him. It is especially important that our children learn that God loves them, as unique human beings created with a purpose and a calling to serve His kingdom. When God called Jeremiah, who is described as a child, He declared this simple truth to him, which applies to our children also.

God says: "Before I formed you in the womb I knew you, before you were born I set you apart; I appointed you as my spokesman to the world." Jeremiah 1:5

Our culture, on the other hand, wants children to think they are nothing more than individuals whose sole purpose is to make themselves happy based on what they feel at any moment in time. Therefore, Anglicans For Life's goal in creating the "I'm Just Like You!" flashcards is to help our children see the awesome dignity of every human being. We want everyone to marvel at the beauty of each human person made in God's image and likeness. Why? Because human beings are the only creatures made in God's own image. He created us good, male and female—equal in dignity, but with the beauty of communion with each other and with God Himself. Each person is a unique marvel, revealing to the world some aspect of God never before seen.

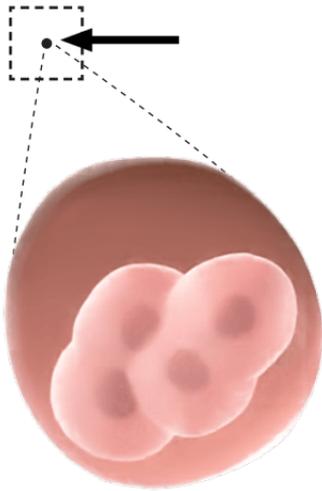
The flashcards help our children learn that, from the moment a life is created, it is worthy of love and protection. Unborn baby Chris wants his fellow humans to understand that his location and size doesn't make him less human; he wants them to see all the ways human beings inside the womb and outside are similar, so we are all treated with respect and dignity.

For families welcoming a new baby, we hope the flashcards help prepare siblings for their new family members, that they would better appreciate the uniqueness of each other as well as their similarities!

The flap at the bottom of the card can be folded up, which allows children to guess Chris' age. The gestational age in the descriptions indicate the stage of the pregnancy in weeks, based on the first day of the woman's last menstrual cycle. The fetal age is actually 10 -14 days younger. The text of the "Teaching Moment" is what you will read to the child from the back of the flashcard, while the "Digging Deeper" text and citations are included for further information for adults. The text on the front of the card allows readers to interact with the card individually.

The baby in the womb is our littlest neighbor, and we hope these flashcards help children to embrace Jesus' command to love our neighbors as ourselves!

I'm just like *you!*



“

I am very small and hard to see. I have DNA just like you. My DNA will give me green eyes, blonde hair, and strong muscles. Do you think I'll be a good swimmer?

”

WEEK

3

So God created man in His own image, in the image of God he created him; male and female He created them. Genesis 1:27

DNA

Teaching Moment

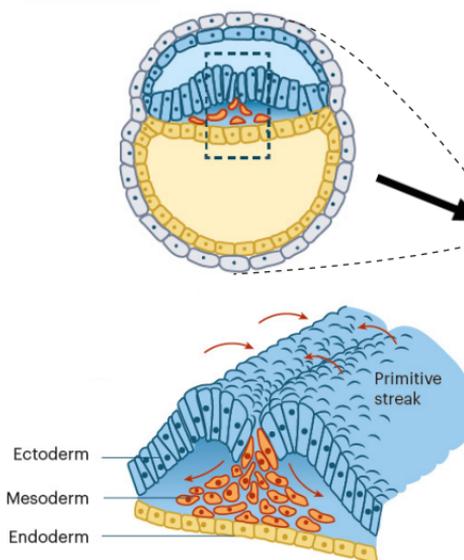
Every person was created by God and is one of a kind, but our bodies develop in the same way. We start out very small, about the size of this dot (point to dot in box on card front) which is made up of cells. The cells contain DNA molecules, and each person's DNA is unique. DNA determines everything about your body. Your height, eye color, hair color, and even whether you will be a girl or a boy! Until I am born, I live in a special part of my mommy's body called a womb.

Digging Deeper

Life begins when God unites an ovum and a sperm to create a new unique human being. At this stage the child is a single-celled human called a zygote.¹ The zygote's DNA, packaged into 46 chromosomes, has every instruction the zygote needs to develop and grow. The DNA sequence produces the genetic variation which creates a person's biological individuality, including sex, eye color, and other physical traits. The zygote is really small at this point – about the size of the dot on the front of this card, but it is growing. All the different parts of the body are forming. About six days after conception, the early embryo implants in the uterus, and the wall of the uterus will start providing nutrients to the developing embryo. The embryo is now in his permanent home in his mother's womb and will stay there until ready for birth.

1. Sadler, Thomas W. *Medical Embryology*. 14th ed., 2019.

I'm just like *you!*



“

I am growing and growing because my cells are dividing all the time. Right now my brain is the biggest part of my body. What is the biggest part of your body?

”

WEEK

5

You knit me together in my mother's womb. I praise you because I am fearfully and wonderfully made. Psalm 139:13-14

Cells

Teaching Moment

I am about the size of a sesame seed, and I am 5 weeks old. God is forming my body in layers of cells that will grow into my skin, hair, fingernails, eyes, ears, brain, bones, heart, and tummy. All the cells that will become my body parts are dividing and growing all the time, while I stay safe and fed in my mommy's womb! Did you know my brain is the biggest part of me right now, because it develops first?

Digging Deeper

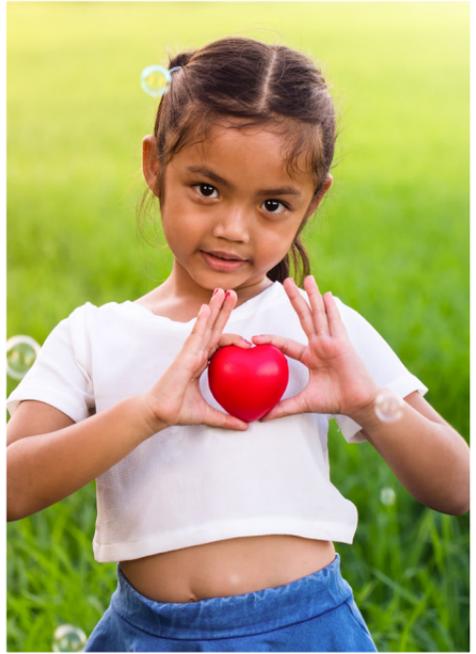
Now called an embryo, the cells have developed and divided into three layers that form the differentiated systems of our bodies:

The top layer becomes the skin, hair, fingernails, nervous system, eyes and ears. Your brain and spinal cord also form from this layer (Ectoderm Layer).¹ The middle layer becomes the muscles, bones, kidneys, heart, blood vessels, muscles, and reproductive system. The blood vessels form a web throughout the embryo and the embryo's heart cells appear by the end of the third week (Mesoderm Layer).² The third layer becomes the baby's lungs, pancreas, liver, and intestines (Endoderm Layer).

1. Sadler, Thomas W. *Medical Embryology*. 14th ed., 2019.

2. Moore, Keith L, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.

I'm just like *you!*



“

My heart is beating. Our hearts are very important and keep us alive. Did you know our hearts are not actually heart-shaped?

”

WEEK

6

Love the Lord your God with all your heart and with all your soul and with all your strength. Deuteronomy 6:5

Heart

Teaching Moment

My heart recently started beating. It will beat about 54 million times before I am born! Did you know your heart is about the size of your fist? And as you grow your heart grows, too? Our hearts do the very important job of pumping air (also called oxygen) and blood throughout our body to keep us alive. Once you are born your heart beats (expands and contracts) about 100,000 times per day.

Digging Deeper

The heart starts beating.¹ By the end of the week, the neural tube has closed and the brain has divided into three primary sections: the forebrain, midbrain, and hindbrain.² Sensory areas such as the eyes, ears, and nose start forming.³

The heart beats about 54 million times between conception and birth.⁴ The changes in the embryo between the beginning and end of the fourth week are dramatic. Like rumpling a flattened blanket, flattened embryonic tissue begins folding, forming a tube that will become the brain and spinal cord. More folding forms the chest and abdominal cavities. Clusters of cells start growing in just the right locations to form the upper and lower limb buds. These buds will become the arms and legs.⁵

1. Tan C, M, J, Lewandowski A, J: The Transitional Heart: From Early Embryonic and Fetal Development to Neonatal Life. *Fetal Diagn Ther* 2020;47:373-386. doi: 10.1159/000501906
2. Sadler, Thomas W. *Medical Embryology*. 14th ed., 2019.
3. Moore, Keith L, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.
4. EHD: Appendix. "Appendix | Prenatal Overview." Accessed April 3, 2020. https://www.ehd.org/dev_article_appendix.php
5. Tan C, M, J, Lewandowski A, J: The Transitional Heart: From Early Embryonic and Fetal Development to Neonatal Life. *Fetal Diagn Ther* 2020;47:373-386. doi: 10.1159/000501906; Asp, Michaela, Stefania Giacomello, Ludvig Larsson, Chenglin Wu, Daniel Fürth, Xiaoyan Qian, Eva Wärdell et al. 'A spatiotemporal organ-wide gene expression and cell atlas of the developing human heart.' *Cell* 179, no. 7 (2019): 1647-1660. <https://doi.org/10.1016/j.cell.2019.11.025>.

I'm just like *you!*



“

My elbows and knees have formed, which means I can kick my legs and move my arms. Maybe I will join the swim team!

”

WEEK

9

Come, let us bow down in worship, let us kneel
before the Lord our Maker. Psalm 95:6

Knees and Elbows

Teaching Moment

I have knees and elbows just like you! Knees help us kneel before God in prayer, walk, crouch down, and jump up and down. My knees are made of something called cartilage, which is strong and stretchy. I won't have knee caps made of bone until I'm 12 years old! My elbows are also forming this week. Elbows help us move our arms and hands so we can hug, clap, and feed ourselves.

Digging Deeper

Brain cells, called neurons, have already connected to one another. Networks of neurons produce brain waves that have been recorded as early as 6 ½ weeks after conception.¹ The unborn baby starts spontaneously moving his arms, hands, and legs.² Ultrasound recordings even show that the embryo can hiccup.³

Cartilage starts to harden and become bone. The first bones to form in the embryo are the collar bone and the jaws.⁴ The eyes are also taking form. Different cells and tissues develop simultaneously and quickly as they prepare to work together to create a functional eye. The eye begins to develop 17 days after conception.⁵ Out of the ectoderm and mesoderm, the cornea and lens form. Simultaneously, the back of the eye grows like a cord out from the young brain. This week, muscles that move the eyes around continue growing and the eyelids begin forming.⁶

While babies aren't born with kneecaps, they are born with cartilage that begins forming this week. Over time, the cartilage develops into the kneecap.⁷ The process can take between 2-6 years, with the kneecap (patella) fully forming by age 12.

1. Winslow J. Borkowski and Richard L. Bernstein, "Electroencephalography of the Fetus," *Neurology* 5, no. 5 (May 1, 1955): 362, <https://doi.org/10.1212/WNL.5.5.362>.

2. de Vries, J. I. P. de, G. H. A. Visser, and H. F. R. Prechtl, "The Emergence of Fetal Behaviour. I. Qualitative Aspects," *Early Human Development* 7, no. 4 (December 30, 1982): 301-22. [https://doi.org/10.1016/0378-3782\(82\)90033-0](https://doi.org/10.1016/0378-3782(82)90033-0).

3. de Vries, J. I. P. de, G. H. A. Visser, and H. F. R. Prechtl, "The Emergence of Fetal Behaviour. I. Qualitative Aspects," *Early Human Development* 7, no. 4 (December 30, 1982): 301-22. [https://doi.org/10.1016/0378-3782\(82\)90033-0](https://doi.org/10.1016/0378-3782(82)90033-0).

4. Moore, Persaud, and Torchia, *The Developing Human, Clinically Oriented Embryology*, 2016.

5. Moore, Persaud, and Torchia, *The Developing Human, Clinically Oriented Embryology*, 2016.

6. Moore, Persaud, and Torchia, *The Developing Human, Clinically Oriented Embryology*, 2016.

7. <https://www.healthline.com/health/do-babies-have-kneecaps#kneecaps-at-birth>

I'm just like *you!*



“

My ears are forming. There are many sounds to hear, like music and our mommies and daddies telling us they love us. I have two ears – how many do you have?

”

WEEK

9

Whoever has ears, let them hear.

Matthew 11:15

Ears

Teaching Moment

I have ears just like you! My ears have started forming and growing, and in two more weeks they will start to look round and shell-shaped like yours. I will begin to hear when I am 18 weeks old, and when I'm 25 weeks old I will be able to recognize the sound of my mommy's voice. Did you know that my ears will keep growing even when I am a grown up? Yours too!

Digging Deeper

About six weeks after conception, the outer ear starts as a groove on the neck, just below the mouth. Over the next two weeks, the outer ear migrates to its final position and becomes shell shaped.¹ From there, the outer ear forms more folds, reaching its final shape by 18 weeks after conception.² The ear's shape helps a person localize sounds; since every ear is shaped slightly differently, everyone's brain makes slightly different connections, so people have trouble telling the direction of sounds that are recorded inside someone else's ear.³ Oddly enough, the outer ear actually continues to grow for a person's entire life.⁴

1. Miho Kagurasho et al., "Movement of the External Ear in Human Embryo," *Head & Face Medicine* 8 (February 1, 2012): 2, <https://doi.org/10.1186/1746-160X-8-2>.

2. Y. Nishimura and T. Kumoi, "The Embryologic Development of the Human External Auditory Meatus. Preliminary Report," *Acta Oto-Laryngologica* 112, no. 3 (1992): 496–503, <https://doi.org/10.3109/00016489209137431>.

3. Guillaume Andéol, Ewan A. Macpherson, and Andrew T. Sabin, "Sound Localization in Noise and Sensitivity to Spectral Shape," *Hearing Research* 304 (October 1, 2013): 20–27, <https://doi.org/10.1016/j.heares.2013.06.001>.

4. Carsten Niemitz, Maïke Nibbrig, and Vanessa Zacher, "Human Ears Grow throughout the Entire Lifetime According to Complicated and Sexually Dimorphic Patterns—Conclusions from a Cross-Sectional Analysis," *Anthropologischer Anzeiger, Bericht Über Die Biologisch-Anthropologische Literatur* 65, no. 4 (December 2007): 391–413.

I'm just like *you!*



“

My eyes are forming. Eyes allow us to see the beauty of God's creation. All of us have different colored eyes. I think mine will be brown – what color are yours?

”

WEEK
10

But blessed are your eyes because they see, and your ears because they hear. Matthew 13:16

Eyes

Teaching Moment

I have eyes – just like you! My eyes have finished forming, but my eyelids will be shut tight until I'm 18 weeks old. Then I will be able to open and close them and blink. Most of us are born with blue or gray eyes, and sometimes they change color after we are born. Sometimes our eyes need help to see clearly, so some people wear glasses to help them see – do you?

Digging Deeper

The eyes begin forming 22 days after conception.¹ Tissue from the developing brain pushes forward towards the face to form an optic cup and the beginnings of the optic nerve, which will connect the eye to the brain. The optic cup becomes the back of the eye, called the retina, which turns light energy into neural signals. The front of the eye, including the cornea and the lens, both form from the surface tissue. Instead of becoming skin, chemical messages from the optic cup turn these structures into transparent tissue. In the sixth week, more surface tissue interacts with the cornea and lens to form the embryo's eyelids.² Interestingly, the embryo's eyelids actually fuse together around 8 weeks after conception, and only reopen about 10 weeks later.³ The front and back of the eyeball fuse together by the eighth week after conception, and muscles start moving the eyes by the tenth week after conception.⁴ Most infants are born with light blue or gray eyes. A baby's eye color finalizes between 6 and 12 months old. The color is determined by the distribution of melanin in the iris. Melanin is the same pigment that gives skin its color. If the melanin stays at the back of the iris, then the eye will be blue. If the melanin is found all over the supporting tissue in the iris, then the eye will be brown.⁵

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2. Moore, Keith L, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.

3. Hatem A. Tawfik et al., "Embryologic and Fetal Development of the Human Eyelid," *Ophthalmic Plastic and Reconstructive Surgery* 32, no. 6 (November 2016): 407–14, <https://doi.org/10.1097/OP.0000000000000702>.

4. Humphrey, Tryphena. "Some Correlations between the Appearance of Human Fetal Reflexes and the Development of the Nervous System." In *Progress in Brain Research*, edited by Dominick P. Purpura and J. P. Schade, 4:93–135. Growth and Maturation of the Brain. Elsevier, 1964. [https://doi.org/10.1016/S0079-6123\(08\)61273-X](https://doi.org/10.1016/S0079-6123(08)61273-X); Moore, Keith L, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.

5. Moore, Keith L, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.

I'm just like *you!*



“

I have 10 toes and 10 fingers! Our fingers allow us to do all sorts of amazing things, and God gave us toes to help us balance. Can you stand on your tippy toes?

”

WEEK
10

Your word is a lamp to my feet and a light to my path.
Psalm 119:105

Fingers and Toes

Teaching Moment

I have hands and feet just like you! My feet are very small, only about ½ inch long, but I can wiggle my toes now! Can you wiggle your toes? My hands and fingers are also very tiny, but I am learning how to move them and bring them together. I am even able to touch my face! Both my hands and feet will continue to grow until I am about 25 years old.

Digging Deeper

This week marks the end of the embryonic period. During the last eight weeks, the embryo has grown from a single cell into nearly one billion cells that form over 4,000 distinct anatomic structures.¹ The adult has about 4,500 named body parts, so this means that over 90% of these structures first appear during the embryonic period.² The embryo can now bend his elbows and bring his hands together. The embryo can also roll over within the amniotic sac, squint, grasp, and point his toes.³ When the embryo touches his face, he will frequently move his head away.⁴ The embryo even makes intermittent breathing motions.⁵

In the eighth week after conception, the digestive system and kidneys start working. The stomach and pancreas start making most of the digestive enzymes.⁶ Interestingly, there is not enough space in the fetal abdomen for the entire intestine, so a few of the loops of intestine remain just under the umbilical cord until 10 weeks after conception.⁷ The kidneys start to filter toxins out of the blood stream. The embryo starts to produce urine and pee into the amniotic fluid.⁸ After an adult swallows food, contractions in his esophagus and intestines help propel the food forward in a process called peristalsis. Peristalsis begins in the embryo's large intestine in the eighth week and continues for the rest of his life.⁹

1. O'Rahilly, R, and F Mueller. *Human Embryology and Teratology*. 3rd ed. Wiley-Liss, 2001.

2. O'Rahilly, R, and F Mueller. *Human Embryology and Teratology*. 3rd ed. Wiley-Liss, 2001.

3. de Vries, J. I. P. de, G. H. A. Visser, and H. F. R. Prechtl. "The Emergence of Fetal Behaviour. I. Qualitative Aspects." *Early Human Development* 7, no. 4 (December 30, 1982): 301–22. [https://doi.org/10.1016/0378-3782\(82\)90033-0](https://doi.org/10.1016/0378-3782(82)90033-0).

4. de Vries, J. I. P. de, G. H. A. Visser, and H. F. R. Prechtl. "The Emergence of Fetal Behaviour. I. Qualitative Aspects." *Early Human Development* 7, no. 4 (December 30, 1982): 301–22. [https://doi.org/10.1016/0378-3782\(82\)90033-0](https://doi.org/10.1016/0378-3782(82)90033-0).

5. de Vries, J. I. P. de, G. H. A. Visser, and H. F. R. Prechtl. "The Emergence of Fetal Behaviour. I. Qualitative Aspects." *Early Human Development* 7, no. 4 (December 30, 1982): 301–22. [https://doi.org/10.1016/0378-3782\(82\)90033-0](https://doi.org/10.1016/0378-3782(82)90033-0).

6. Robert K. Montgomery, Andrew E. Mulberg, and Richard J. Grand, "Development of the Human Gastrointestinal Tract: Twenty Years of Progress," *Gastroenterology* 116, no. 3 (March 1, 1999): 702–31, [https://doi.org/10.1016/S0016-5085\(99\)70193-9](https://doi.org/10.1016/S0016-5085(99)70193-9).

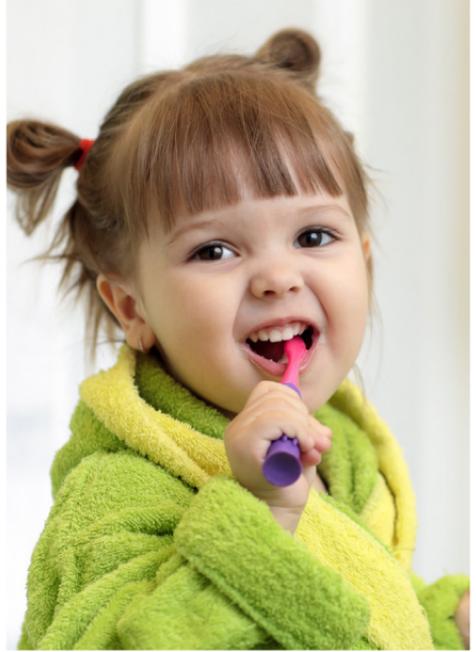
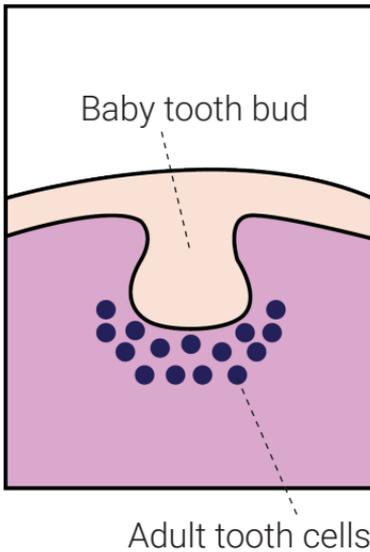
7. Moore, Keith L, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.

8. Moore, Keith L, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.

9. Richard J. Grand, John B. Watkins, and Frank M. Torti, "Development of the Human Gastrointestinal Tract: A Review," *Gastroenterology* 70, no. 5 (May 1, 1976): 790–810, [https://doi.org/10.1016/S0016-5085\(76\)80277-6](https://doi.org/10.1016/S0016-5085(76)80277-6)

I'm just like you!

Tooth Bud Diagram



“

I am growing teeth! Teeth are very important; we use them to chew food and smile. We must take good care of our teeth and brush them!

”

WEEK

11

A glad heart makes a cheerful face Proverbs 15:13

Teeth

Teaching Moment

I have teeth—just like you! Did you know that when we are born our teeth are still hiding? My baby teeth have started forming beneath the gums in my mouth, but they won't break through my gums until I'm about 6 months old. All of us have baby teeth that will fall out and grown-up teeth will replace them. Teeth are important for chewing our food and smiling. Can you smile?

Digging Deeper

Teeth start developing about 7 weeks after conception. They form from the interaction of cells near the early neural tube, called neural crest cells, and the external tissue layer, called ectoderm. Basically, the enamel coating on teeth comes from the ectoderm while the inner structure of a tooth, including the roots and dental pulp, comes from the neural crest cells.¹ About 9 weeks after conception, the bud of a second tooth starts to form behind the first tooth. The second tooth will slowly develop into the permanent adult tooth. The first tooth to form becomes the baby tooth.² Baby teeth usually emerge from the gums about 6 months after birth, and adult teeth replace the baby teeth throughout childhood. Why do people get two sets of teeth – baby teeth and adult teeth? Humans have two sets of teeth because a child's jaw is too small to fit the adult teeth. Plus, the second set of teeth lets accidents and poor dental hygiene have fewer long term consequences.

Teeth start as buds in the seventh week after conception. Around nine weeks after conception, each bud splits into a small, dormant tooth bud that will develop into a permanent tooth, and a larger bell-shaped tooth that will develop into a baby tooth. Next, the jaw bone forms around the baby tooth and permanent tooth, holding them in place. Then the tooth grows by adding layers of dentin inside the tooth and enamel outside the tooth. Finally, the baby teeth start to poke out of the gum, starting roughly six months after birth.³ Most children have their full set of 20 baby teeth by age 2. Permanent teeth form inside the jaw bone through early childhood. When children shed their baby teeth, only the crown and the uppermost part of the root fall out. The permanent teeth use the same artery and bone socket that the baby teeth used.⁴

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2. Sadler, Thomas W. *Medical Embryology*. 14th ed., 2019.

3. Sadler, Thomas W. *Medical Embryology*. 14th ed., 2019.

4. Moore, Keith, TVN Persaud, and Mark G. Torchia. *The Developing Human, Clinically Oriented Embryology*. 10th ed. Philadelphia: Elsevier, 2016.

I'm just like *you!*



“

My fingerprints are forming. Every person God creates has unique fingerprints. Place your finger on a stamp pad, then press it on paper to see your fingerprint.

”

WEEK
12

For we are his workmanship, created in Christ Jesus for good works. Ephesians 2:10

Fingerprints

Teaching Moment

I have nails and fingerprints just like you! This week my hands, fingers, toes, and feet have been growing, and now my fingernails have started to grow, too! Also, another exciting part has started to develop—have you ever heard of fingerprints? Did you know we all have fingerprints but that everyone’s fingerprints are different? God has made everyone unique. Even twins have different fingerprints.

Digging Deeper

This week, the unborn child’s fingernails start to grow. Just like an adult’s, the fetus’s nails grow out slowly from the nail bed. The fingernails won’t reach the fingertips until approximately 30 weeks after conception.¹ The toenails start growing at 14 weeks after conception and finish growing by 34 weeks after conception.²

Every person, including individuals with an identical twin, has unique fingerprints. These fingerprints start forming in the 10th week after conception when some cells in the middle layer of the skin, called the basal layer, start growing faster than the cells in the inner layer of dermis or outer layer of epidermis. The extra cells cause the skin to buckle and fold into ridges.³ As the fingers grow, new ridges and branches form. Between 15 and 17 weeks after conception, a layer of keratin coats the surface of the skin. Smaller, secondary ridges form out of uneven keratin growth. Any factor that can influence friction in the womb can influence a fetus’s fingerprint pattern. These factors include the density of the amniotic fluid, and the fetus’s size, location, and movement patterns.⁴ The pattern of fingerprints established by 17 weeks remains consistent as the child grows.⁵

1. Mark Hill, "Integumentary System," UNSW embryology, 2020, https://embryology.med.unsw.edu.au/embryology/index.php/Integumentary_System_-_Nail_Development#Development_Overview.

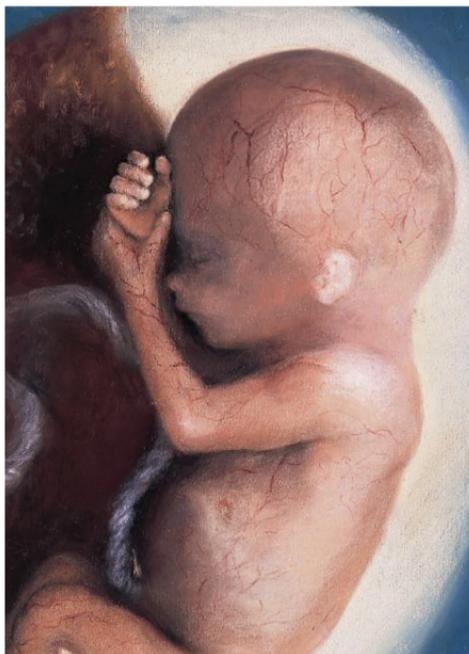
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3. W. J. Babler, "Embryologic Development of Epidermal Ridges and Their Configurations," *Birth Defects Original Article Series* 27, no. 2 (1991): 95–112.

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I'm just like *you!*



“

My nose, lips, and mouth can be seen. I can also stick my tongue out and yawn! Can you stick your tongue out?

”

WEEK
13

But the things that come out of a person's mouth come from the heart. Matthew 15:18

Lips and Nose

Teaching Moment

I have a nose and lips—just like you! For a long time my nose and lips have been forming below the surface of my face, but now my nose and lips have formed. Our nose is important because that is how we breathe in and out to get air into our lungs. Lips are important too, as they help us talk, smile, and give kisses.

Digging Deeper

This week, the lips and nose have matured into their adult shape.¹ Now the preborn child has complex facial features. The major components of the face arise from two important tissue types – pharyngeal arches and neural crest cells. In the developing embryo, there are six pharyngeal arches. The pharyngeal arches form from mesoderm about four weeks after conception. Each pharyngeal arch has its own blood vessel, cranial nerve, and bar of cartilage which will later form bones. Neural crest cells are special cells that come from areas directly adjacent to the neural tube.² Between 4 and 6 weeks after conception, a set of neural crest cells proliferates to make the frontonasal prominence. This area of the developing face becomes the nose and forehead. The first pharyngeal arch also proliferates and becomes the jaw, lips, cheeks, and outer ears. About 6 weeks after conception the face is mostly developed, but the nostrils are very large and the left and right cheeks are completely separate from one another – there is no upper lip area yet. By 10 weeks after conception, the tissue of the cheeks has fused together under the nose, forming the upper lip and allowing for unique differences in facial identity.³

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I'm just like *you!*



“

I'm excited to have eyebrows. They keep sweat and water out of our eyes. This week I can move my eyebrows up and down. Can you do that?

”

WEEKS
15-16

The Lord bless you and keep you; the Lord make his face to shine upon you. Numbers 6:24-25

Eyebrows

Teaching Moment

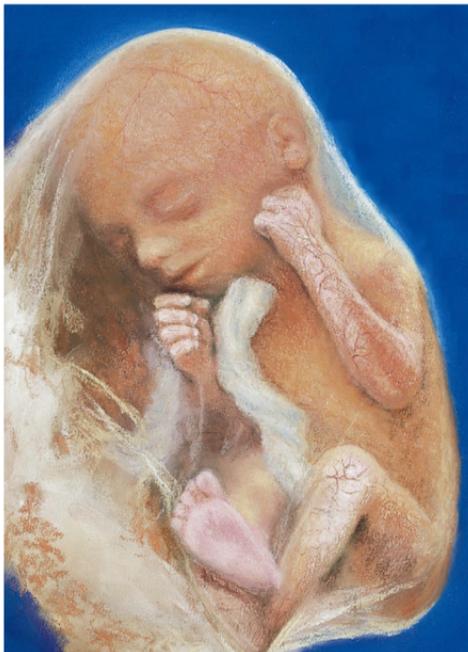
I have eyebrows, just like you! Eyebrows are funny things on our faces that can move up and down. Mine have now formed, so if you take an ultrasound picture of me, you may notice them go up and down! I can also move my fingers, respond to touch, and taste sweet or bitter, depending on what my mommy just ate! What is your favorite food to eat?

Digging Deeper

Eyebrows have formed.¹ The fetus will swallow more amniotic fluid if the amniotic fluid tastes sweet and less if it tastes bitter.² The stomach lining reaches its mature structure and secretes digestive enzymes into swallowed amniotic fluid.³ More of the preborn baby's skeleton hardens from cartilage into bone. If a doctor took an X-ray this week, the fetus's skeleton would be visible.⁴ The preborn baby's circulatory system pumps about 26 quarts of blood per day at 13 weeks after conception. For comparison, an adult heart pumps 6,000 quarts of blood each day.⁵ Thirteen weeks after conception, the fetus's entire body responds to light touch, with the exception of parts of the back, buttocks, and thighs.⁶ The fetus also starts moving each finger separately.⁷ Interestingly, boys and girls move differently in the womb. In fact, girls open and close their mouths more often than boys do!⁸

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I'm just like *you!*



“

I have muscles just like you! I can kick my legs, and my mommy can feel them! I can also feel pain.

”

WEEKS
17-18

Elizabeth exclaimed...“When the sound of your greeting came to my ears, the baby in my womb leaped for joy.” Luke 1:42-44

Muscles and Pain

Teaching Moment

I have muscles just like you, and they are growing everyday. I'm strong enough that when I kick my legs, my mommy will feel it in her womb! I can also feel pain if someone pokes me with a needle, and I don't like it. I am almost halfway through my time in my mommy's belly, and all my body parts are developed. I will continue growing until I am born!

Digging Deeper

The baby's muscles have been growing since week 10, but now he is big enough that the mother can feel kicks/movement. A pregnant mother can usually feel her unborn child moving between 16-18 weeks after conception.

The fetus can feel pain. For the fetus to perceive pain, he or she must have functional pain receptors and nerve connection to the brain. Pain receptors develop in the skin between 10- and 17-weeks' gestational age.¹ The first sensory receptors in the skin form and connect to the spinal cord at six weeks' gestation, but these nerves are specific for touch information, not pain.² The neurotransmitters specific to pain processing, substance P and enkephalins, appear early in development at 10-12 weeks' gestation and 12-14 weeks' gestation, respectively.³ The spinal nerves needed to transmit touch and pain information to the thalamus forms by 15 weeks'.⁴ The thalamus forms connections with the neurons that will migrate into the cerebral cortex as early as 12 weeks' gestation,⁵ and the thalamus forms connections with the true cerebral cortex after 24 weeks' gestation.⁶ While some scholars suggest that the cortex is absolutely necessary for the perception of pain, a growing body of research suggests that it is not. While the cortex may not be fully developed, a number of brain structures that process pain activity including the brainstem, insula, and thalamus, are sufficiently mature to process pain at 15 weeks' gestation.⁷ Furthermore, pain processing appears to develop before the mechanisms that moderate pain signals, so the fetus may experience a greater intensity of pain at 15 weeks' gestation than an older fetus or child.⁸

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I'm just like you!

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Scripture Quotations

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Additional child development resource websites:

1. <https://babyolivia.liveaction.org/>
2. <https://www.priestsforlife.org/myheartbeats/index.aspx>
3. <https://www.erf.science/origins-of-prenatal-global-imagery/>
4. <https://www.ehd.org/>



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