

How Do Humans Grow and Develop?



Focus: Students explore changes in physical and behavioural traits in humans as they grow and develop. These traits are compared to the development of other animals.

Specific Curriculum Outcomes

Students will be expected to:

- 14.0 communicate procedures and results [GCO 2]
- 19.0 select and use materials to carry out their own explorations and investigations [GCO 2]
- 40.0 pose new questions that arise from what was learned [GCO 2]
- 46.0 investigate changes in humans as they grow and develop [GCO 1/3]
- 47.0 compare human growth and development to that of other animals [GCO 1/3]

Performance Indicators

Students who achieve these outcomes will be able to:

- describe characteristics of physical and behavioral traits of humans at various stages of development

NOTES:

Attitude Outcome Statements

Encourage students to:

- work with others in exploring and investigating [GCO 4]

Cross-Curricular Connections

Social Studies

Students will be expected to:

- describe changes in their lives and their reactions to these changes [2.1.1]

Math

It is expected that students will:

- construct and interpret concrete graphs and pictographs to solve problems [2SP2]
- compare and order objects by length, height, distance around, and mass using non-standard units and make statements of comparison [2SS3]
- gather and record data about self and others to answer questions [2SP1]

Art

Students will be expected to:

- create art for a variety of purposes and recognize there are many kinds of visual art [2.3.1]

English Language Arts

Students will be expected to:

- respond personally to a range of texts [GCO 6]
- interact with sensitivity and respect, considering the situation, audience, and purpose [GCO 3]

Getting Organized

Components	Materials	Before You Begin	Vocabulary
• <i>Our Love Grows</i> (Read Aloud) • Science Card 10 • IWB Activity 7 • <i>What Is the Inquiry Process?</i> poster • BLM <i>It's Better to Be...</i> Literacy Place: • <i>Whales</i> (Guided Reading, Level J)	• Velcro strips • large piece of felt • students' Science Folders • large sheets of paper and markers • construction paper • string • interlocking cubes • modelling clay	• Collect images of people at various ages. Ask students to bring in pictures of people from home. (Not precious family photographs.) Mount the images on Velcro squares. • Arrange for a visit from a mother and baby and/or an elderly person. • Arrange for a trip to a farm. • Arrange to partner with different classes for the Human Changes Inquiry activity.	• newborn • infant • baby • toddler • child • teenager • adult • elderly

Science Background

- To introduce students to the idea of behavioural changes, help students consider what people can do at different ages. Behavioural development in humans is most dramatic in the first few years of life, and detailed information is available on milestones parents can use to check their baby's development month by month. Milestone charts for the first year and beyond are readily available online. Here is a sample showing some of the developmental milestones for a child at 3 months, 8 months, and 18 months.

Selected Developmental Milestones

Age	Movement	Social Skills and Language	Learning and Thinking
At 3 months, most babies can...	- roll from front to back - raise head and chest when lying on stomach - bring hands to mouth	- copy body movements and facial expressions - smile when you smile and on their own	- watch faces closely - follow moving objects - recognize objects and people they know
At 8 months, most babies can...	- sit on their own - support whole weight on legs - control upper body - hold and shake a toy	- reach for a person they know - smile at self in mirror - copy speech sounds	- find a partially hidden object - try to get objects out of reach - watch a falling object
At 18 months, most babies can...	- walk without help - climb stairs one at a time with help - build a 3-block tower - use a spoon	- say 20 or more words - follow a simple instruction - point to a named body part	- use objects as tools - fit related objects together (e.g., use a shape sorter)

Source: Caring for Kids: Information for parents from Canada's paediatricians [http://www.caringforkids.cps.ca/handouts/your_childs_development]

Possible Misconceptions

- Students may believe that human development stops once people reach their maximum height in their teenage years. Use examples in the activities to show that people continue to change and develop in physical and behavioral ways throughout their life.

ACTIVATE

Read Aloud: *Our Love Grows*



Summary

A young panda named Pip asks, “Mama, when will I grow big?” Mama uses examples in nature to show that like the things around him, Pip will grow and so will her love for him.

Before Reading

Share a memory of when you weren't big enough to do something you wanted to do. For example, "I remember when I was very young, about 2 years old, and I tried to ride a tricycle but I could barely reach the pedals." Then share an example of how you've changed such as, "I've gotten much bigger since then. I've grown much too big to ride a tricycle."

Invite students to recall a time when they wanted to do something but weren't big enough to do it. Ask:

- **How big were you?**
- **Do you remember how old you were?**
- **How have you changed since then?**

Tell students that you're going to read a story about a young panda bear named Pip who wonders when he will grow big.

During Reading

As you read the story to students, pause frequently to discuss the text and illustrations, and to clarify any new concepts. Alternate by asking students to respond in a whole group or with a partner. Prompts for discussion could include:

After reading the first four pages:

- **When Pip asks when he will be big, Mama says, "You're bigger than you were before." What does she mean?** (Pip is growing and changing as he gets older, and he will continue to change with time.)

After reading the next two pages:

- **What is Mama comparing Pip with in this series of images?** (She's comparing Pip with a tree that has grown as it gets older.)
- **What else do you see in the images that show that Pip has grown?** (Pip's toy Birdy was almost as big as Pip in the first image but Pip is quite a bit bigger than Birdy in the final image.)

After reading the next four pages:

- **What is a paw print?** (an animal's footprint)
- **What does "every step was far to go?" suggest to you?** (When Pip was smaller, distances seemed much further away and it took longer to reach places because he took more, smaller steps.)
- **Do you remember a time when a distance felt greater than it does now?**

After reading the next two pages:

- **How does saying, "Birdy was all bright and new" indicate the passing of time?**
- **Look at the image. Does blanky [Pip's blanket] still cover all of Pip?**
- **How do you think Pip has changed over time?**

After reading the next two pages:

- **Which activities lasted longer when Pip was young than they would now? Why do you think they lasted longer?** (young children love to do things over and over again; sometimes young children miss seeing things that are obvious to older children)
- **What can Pip do better/faster now that he is bigger?** (find mama when they are playing hide and seek)

After reading the next two pages:

- **Why do you think “flowers blooming and petals falling,” and “pines cones tumbling down” indicate time passing?**

After reading the next two pages:

- **Would Pip still fit so snugly in Mama’s arms?**

After reading the rest of the book:

- **What else does Mama say has grown bigger over time?** (her love for Pip)

After Reading

Discuss with students the types of changes that take place in people as they develop and grow older. Prompts for discussion could include:

- **How else can someone change as they get older?**
- **What physical changes take place?** (e.g., hand and foot size, height, weight)
- **How do their behaviours or abilities change?** (e.g., learn to walk and talk; be able to do more difficult tasks such as learning how to kick a ball)

Simon Says

Tell students that you will be playing “Simon Says” with a twist. The twist is that the actions called out will be actions related to things humans do or learn to do at different stages of their development. (Recall that students should do the action you say only if you preface the action with “Simon Says....”)

Here are some actions you could use:

- crawl like a baby
- walk like a toddler
- walk with a cane
- rock a newborn baby
- eat like a baby
- play basketball
- play patty cake
- shake a rattle
- jump up and down
- high five a friend
- drink from a baby bottle
- write your name (with a pretend pen in the air)
- eat with a fork
- go swimming
- ride a bike



IWB Activity:

- Students can sequence photos of people according to age using Activity 7: *Youngest to oldest* (see the Teacher's Website).

After the game, write the following terms spaced out on the board: newborn, baby, toddler, child, teenager, adult, elderly adult. Ask students to recall actions from the game. As each action is mentioned, ask:

- **At what age do people do this action? (Or, at what age do people learn to do this action?)**
- **Are there ages when people can't or don't do this action? Why is that?**

Have students think of other actions that people do at some ages but not others. Show them Science Card 10 to prompt further ideas. Ask:

- **What ages are these people?**
- **What evidence do you have?**
- **What actions are they doing?**
- **Could these actions be done by people at all ages?**
- **What other actions could people do at these ages?**

Record actions next to the appropriate age-related term, building simple concept maps for each as you go. Record any questions students have on the I Wonder Wall.

Youngest to Oldest

Collect 20 or more images of people at various ages. Ask students to help by bringing in images. Be sure to include babies, young children, teens, middle-aged people, and elderly people. You can find suitable images on the Internet or in magazines. Mount the images on cardboard and add Velcro to the back. Mount a large piece of felt on the wall labelled “youngest” at one end and “oldest” at the other end.

Challenge a student or small group of students to put 5–10 of the images in order. Use a timer and allow 30 seconds per trial. After their time is up, have students explain why they ordered the images the way they did. Clues can involve both observable physical traits and what the person is doing or how they are behaving in the picture.

Human Babies and Animal Babies

Divide students into groups. Each group is assigned one animal other than humans. Provide time for groups to conduct research to find out the following:

- **How long does my animal take care of its babies, if at all?**
- **What does my animal do to take care of its babies?**

Come together as a class and have each group present their findings. Prompts for discussion could include:

- **How long do human parents take care of their children?**
- **Why is this necessary?**
- **What are the reasons for the different kinds of care different animals receive from their parents?**



Record any new questions on the I Wonder Wall.



Literacy Place Connection:

Read or revisit *Whales* (Guided Reading, Level J). After reading pages 4–11, ask:

- How is the development of whales similar to the development of humans?
- How is it different?

CONNECT

Class Visits

If your class is not already participating in the Roots of Empathy program, arrange for a one-time visit from a mother with a baby. Provide a large clean blanket for the baby to move around on. Students can sit in a circle around the blanket. The mother can talk about what it is like to take care of a baby, what the baby needs from her, and how the baby has changed since birth. She may choose to demonstrate changing a diaper or feeding the baby. Encourage students to observe the traits and behaviour of the baby and to ask questions.

Alternatively, or in addition, arrange for a visit from an elderly person, who can talk about some of the changes that happen with aging, and how he or she has coped with them. An Elder or an Indigenous Knowledge Keeper can talk about how a person's traditional roles and responsibilities change as they age.

Field Trip to a Farm

If possible, arrange for students to visit a farm where they can observe and compare baby and grown animals, such as chicks and chickens or lambs and sheep. After the visit, have students select one animal they observed and find out more about its growth and change throughout its life cycle. Students can then use a graphic organizer such as a T-chart to compare characteristics of the animal's growth and change to that of humans. Students can store their completed charts in their Science Folders.



Timeline

Have students bring in photos of themselves, siblings, friends, and parents at various ages. Arrange the photos on a timeline on which ages or stages (infant, baby, toddler, etc.) have been marked so students can observe how different people change physically and behaviourally over time. Code the photographs so students can tell which photos show the same person, for example by labelling each person with their own colour of sticker dot or with names written on sticky notes.

My Old Shoes

Ask students to bring in single outgrown shoes from home. (If they do not have any, they can instead bring in the shoe of a parent or younger or older sibling—the important thing is that the shoe be significantly larger or smaller than the shoes they currently wear.) Provide large sheets of paper and markers. Have students trace the outgrown shoe and a current shoe on the same piece of paper. They can label each shoe with the age at which they wear/wore it. Then have students measure the length of each shoe in interlocking cubes and label each tracing with its measurement.

Challenge students to use the data from this activity to predict how large their shoes will be in two years. Have them explain their reasoning. As an extension, consider making a concrete graph with the students to show the variety of *current* shoe sizes within the class. Give each student a shoe shape cut out of construction paper. Provide an x-axis on large paper labelled with the range of lengths (number of cubes) seen in the classroom. Students can then glue or tape their small shoe shape to the appropriate column to make a bar graph. Ask:

- Which is the most common shoe length in the class?
- Which is the least common?

This activity models for students the type of investigation they can do in the Human Changes Inquiry activity.

My Growth and Development: Revisited

Have students redo the measurements and photos they did at the beginning of the unit or year in the My Growth and Development activity (see pages 13–14). Have students make a poster to display how they have changed. These results may be used in the Human Changes Inquiry activity.

Human Changes Inquiry

Explain to students that they will be investigating how humans change. Review the *What Is the Inquiry Process?* poster with students and discuss each step.

1. Ask a question. Make a plan.

Provide a list of physical characteristics that students can measure. Tell students that they will need to collect measurements of this physical characteristic from their classmates, other students, friends, and family members. Characteristics that students might choose to measure include:

- head circumference
- leg length
- foot length
- hand size
- height

Help students frame a question to focus their inquiry. For example, “How does hand size change as people grow?” or “Are boys of the same age always taller than girls of the same age? (Or vice versa.)” “Are taller people always





older than shorter people?” Have students make a plan in their Science Journals to describe how they will measure their chosen characteristic. (For example, students can use yarn to measure and record head circumference or draw tracings of hands.) Help students focus their plans by asking:

- **What are you going to measure?**
- **How will you take your measurements?**
- **How many measurements will you take?**
- **How will you record your measurements?**

Students may plan to use data from the My Growth and Development activity (see pages 13–14).

Examine and discuss each student’s plan before proceeding.

2. Explore. Record your results.

Have students carry out their plan for investigating their question. If possible, partner with a kindergarten class and a class of older students to allow your students to gather data from them. Remind students to record the name and age of each person from whom they gather their data, and whether the person was male or female.

3. Think about the results. Make conclusions.

Help students draw meaning from their data. Ask students questions to help them think critically about the results they obtained. For example, suppose a student measured head circumference. You could ask:

- **What was the size of the the largest/smallest head (or hand, etc.) that you measured?**
- **What were the differences in head sizes between people of the same age?**
- **What was the difference between the smallest and largest head size?**

Students should make a concrete graph, table, or other graphic organizer to display their data in a way that addresses the question they asked. Help students write a conclusion that addresses their original question based on the data they gathered.

4. Share what you learned.

Help students decide how to communicate their data. For example, students could make a poster that displays their data using a graph, they could make a brief electronic slideshow to summarize their results, or they could prepare a brief booklet that describes their experiment.

CONSOLIDATE

Modelling Human vs. Animal Change

Set up a station with modelling clay. First assign each student a stage of human development (assign some students the baby stage, some the toddler stage, etc.). Have students make models of humans at their assigned stage. Display the models, showing the progression from youngest to oldest.

It's Better To Be...

Write _____

1. Circle one of the stages below. Next, write on the lines provided to complete the sentence.
It's better to be...

Age	Adult	Child	Infant
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

2. Draw a picture of yourself at the stage you chose.

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Next, have students choose an animal found in Newfoundland and Labrador to compare with human growth. Allow students time to gather any information they need about their chosen animal. Then have students use the clay to shape models to show the growth of that animal.

Once models are complete, students can use their models to tell how the growth of their chosen animal is similar to and different from the growth and development of humans.

As an extension, students could use their models to make a short stop-motion animation movie to demonstrate the movement of their animal or a human at one stage of development.

It's Better to Be...

Copy and hand out BLM *It's Better to Be...* Ask students:

- **Is it better to be a baby, a child, or an adult?**

Have students think about this question and complete the BLM in response, including a drawing of themselves at the age they chose. Encourage students to think about and comment on human physical and behavioral characteristics for that age. Students can share their completed BLM with a partner and explain their choices.

EXPLORE MORE

Helping People at Different Ages

Have students choose one of these questions to research by asking trusted adults:

- How do parents help their babies learn to sit, stand, and walk?
- What strategies can be used to help elderly people when it becomes more difficult for them to move around?
- How do young children learn challenging new skills such as skating, swimming, or riding a bike?

Alternatively, students can come up with their own question about how to help people at different ages. Have students record the responses they receive from their interviewees using video, and share the results with classmates.

It's Better To Be...

Name: _____

1. Circle one of the stages below. Next, write on the lines provided to complete the sentence.

It's better to be a...

baby	child	middle-aged adult
toddler	teenager	elderly person

because...

2. Draw a picture of yourself at the stage you chose.