Learner Outcomes

W-6.3 Identify and describe the stages and factors that can affect human development from conception through birth

How To Use

This lesson plan contains several activities to achieve the learner outcome above. You may choose to do some or all of the activities, based on the needs of your students and the time available. Some of the activities build on the ones that come before them, but all can be used alone.

For a quick lesson, combine activities A, B, D and G.

Classroom Activities & Timing

A. Ground Rules (5-10 minutes)
B. Introduction to Fetal Development (15-20 minutes)
C. Exploring Fetal Development (45-60 minutes)
D. Understanding Twins (10-15 minutes)
E. Promoting Healthy Babies (30-90 minutes)
F. Fetal Development Kahoot! Quizzes (15-20 minutes)
G. Question Box (5-10 minutes)

Required Materials

CARDS: Fetal Development
HANDOUT: Exploring Fetal Development
DIAGRAMS: Fraternal Twins, Identical Twins, Biological Sex Determination

See also the Differing Abilities lesson plan
Reproduction, Pregnancy and Birth.
Grade 6 Growing a Baby

HANDOUT: Promoting Healthy Fetal Development
KAHOOT! QUIZ and ANSWER KEY: Fetal Development
KAHOOT! JUMBLE and ANSWER KEY: Fetal Development 2
All the student handouts are also available in the Grade 6 Workbook.
All the diagrams are also available as slides in Grade 6 Diagrams.

Background Information for Teachers

Inclusive Language

Language is complex, evolving, and powerful. In these lessons, gender-neutral language is used to be inclusive of all students, including those with diverse gender identities and sexual orientations. This includes the use of ‘they’ as a singular gender-neutral pronoun. The lesson plans use the terms ‘male’ and ‘female’ when referring to biological sex (sex assigned at birth), such as when discussing reproductive anatomy. A person’s reproductive system can be male, female or intersex (not clearly defined as either male or female).

People are assigned a sex at birth based on their reproductive anatomy. Sex assigned at birth is independent of gender identity. Gender identity is a person’s internal sense of identity as female, male, both or neither, regardless of their biological sex assigned at birth.

For many people, their gender matches the sex they were assigned at birth (cisgender). Others may identify as being transgender or gender diverse if their gender identity does not match the sex they were assigned at birth. A person’s gender identity can be girl, woman, boy, man, transgender, gender fluid, gender queer, agender or others. The intention in this material is to use language that reflects these many possibilities.
### Fetal Development

<table>
<thead>
<tr>
<th>Timeline</th>
<th>Changes in baby</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Trimester</strong></td>
<td></td>
</tr>
</tbody>
</table>
| 0-4 weeks | - Baby is called an embryo  
- About 6 mm long, or about the size of a grain of rice  
- Placenta, amniotic sac begin to form  
- Early structures of the brain begin to form |
| 5-8 weeks | - Embryo is 2.5 cm long, weighs less than a grape  
- Heart starts beating  
- Head, brain, internal organs and teeth are beginning to develop  
- Arm and leg buds beginning to show  
- Spine starts to show, bones begin growing |
| 9-12 weeks | - Baby is now called a fetus  
- About 7.6 cm long and weighs about as much as a tube of lipstick  
- Eyes, ears, nose, mouth, lips and tongue have formed  
- Hands, fingers and fingerprints have formed  
- Sex organs (male or female) have formed  
- Baby sucks their thumb  
- Brain cells are growing very quickly |
| **Second Trimester** |
| 13-18 weeks | - Baby is about 12.5 cm long  
- Baby’s hair and eyebrows are beginning to grow  
- Fingernails and toenails are developed  
- Baby can hear and roll over inside the uterus |
| 19-22 weeks | - Baby is growing longer quickly  
- Baby kicks, twists and turns, is often most active when mother is sitting still  
- Baby can grasp and suck  
- Baby can react to sound and light |
| 23-26 weeks | - Weighs around 1 kg and is 32 cm long  
- Baby can hiccup  
- Eyelids can open and close  
- Baby is growing but looks very skinny |
### Third Trimester

| 26-31 weeks | Most of baby’s billions of brain cells are formed  
| | Eyes have eyelashes and eyebrows  
| | Baby moves a lot, and other people can see/feel this movement from the outside |
| 32-35 weeks | Weighs about 2.5 kg  
| | Baby is building up layers of fat under the skin to stay warm after birth  
| | Baby has some immunity to diseases given by mother’s body |
| 36-40 weeks | Baby’s skin is pinker and less wrinkled  
| | Lungs are ready to breathe air after 37 weeks  
| | Baby may scratch themselves with their fingernails |

### Miscarriage

Miscarriage is the loss of a fetus before 20 weeks of pregnancy. Miscarriages are more common than most people realize. About 15-20% of pregnancies end in miscarriage, most often during the first 8 weeks of pregnancy. After the first trimester, the risk of miscarriage drops to about 3%.

Most of the time, no one knows why a miscarriage happens. Some possible reasons include:
- A problem or abnormality in the fetus
- Problems with the cervix or uterus
- Hormonal problems
- Infections
- Using tobacco products, drinking alcohol or using street drugs
- Abdominal trauma

When a pregnancy ends in miscarriage it can be a very emotional time for all members of the family. Feelings of fear, anxiety, anger and grief are normal. Some families are open about having had a miscarriage and others are not.

### Still Birth

Still birth is the death of a baby after 20 weeks of pregnancy but before birth. This can happen during pregnancy or labour. Many times, the reason for the stillbirth is not known. Like a miscarriage, a stillbirth is a very emotional time for a family. Feelings of fear, anxiety, anger and grief are
normal. Some families are open about having had a stillbirth and others are not.

A. Ground Rules

Ensure ground rules are established before beginning this lesson. For classes that have already established ground rules, quickly reviewing them can help ensure a successful lesson.

B. Introduction to Fetal Development

Students can see the changes in the fetus as it grows and develops inside the uterus, and connect the changes to each trimester of pregnancy.

1. Print the Fetal Development cards onto separate sheets of paper. Consider laminating the pages.

2. Explain that a pregnancy takes approximately nine months, and that it is divided into three stages, called trimesters.
   - Trimester one includes the first three months (0-13 weeks).
   - Trimester two includes months 4-6 (weeks 13-26).
   - Trimester three includes months 7-9 (weeks 26-40).

3. Give out just the images to the students, and have them work together to match the image with the correct trimester heading. With a large class, you could print out multiple sets of images and give one set to each group to arrange.

4. Use the answer key below to ensure the pictures are matched correctly.

5. Hand out the description cards and ask the students to place each card in the correct trimester.

6. Use the answer key to ensure all the descriptors are matched to the correct picture.
<table>
<thead>
<tr>
<th>Picture</th>
<th>Timeline</th>
<th>Card</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First Trimester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Months</td>
<td>First month</td>
<td>Baby called an embryo, is about 6 mm long.</td>
</tr>
<tr>
<td></td>
<td>Second month</td>
<td>Arm and leg buds are starting to grow. Baby is about 2.5 cm long.</td>
</tr>
<tr>
<td></td>
<td>Third month</td>
<td>Baby called a fetus. Eyes, ears, nose are formed. Baby sucks their thumb.</td>
</tr>
<tr>
<td><strong>Second Trimester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 Months</td>
<td>Fourth month</td>
<td>Baby has fingernails and toenails. Baby can taste and hear sounds.</td>
</tr>
<tr>
<td></td>
<td>Fifth month</td>
<td>Baby will kick, twist and turn in uterus. Baby about 25 cm long.</td>
</tr>
<tr>
<td></td>
<td>Sixth month</td>
<td>Baby can hiccup, and open and close eyes. Weighs about 1 kg.</td>
</tr>
<tr>
<td><strong>Third Trimester</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9 Months</td>
<td>Seventh month</td>
<td>Baby has eyelashes and eyebrows. Kicks can be seen by others.</td>
</tr>
<tr>
<td></td>
<td>Eighth month</td>
<td>Baby is building layers of fat to stay warm after birth. About 46 cm long.</td>
</tr>
<tr>
<td></td>
<td>Ninth month</td>
<td>Baby’s skin is pinker and less wrinkled. Baby weighs about 3-4 kg.</td>
</tr>
</tbody>
</table>
C. Exploring Fetal Development

Students research the stages of fetal development and share their findings with the class. You can have research material already prepared, or let groups do their own research, depending on the skills of the class. Be aware that internet searches for fetal development may bring up pro-life and pro-choice websites.

1. Divide students into groups of 4.

2. Explain that each group will be given a stage of fetal development to research, and will be asked to report back to the class on their findings. There may be more than one group researching each stage.

3. Ask students to choose a role within the group: leader, reader, recorder, or presenter. In groups of more than four students, there can be two of any role.

4. Give each group a copy of the Exploring Fetal Development instructions and questions, and explain that the leader of each group needs to help the group follow the tasks in order.

5. Allow groups to research the stage of fetal development they have been assigned. Research can be done using research materials from your school library or the Internet, or by using an approved video.

6. Ask the presenter of each group to present the group’s findings. This should be done in order, so that students who have researched trimester one present first, trimester two present second and trimester three present third.

7. Teachers can use the information provided in the background information to provide feedback.

8. Debrief this activity using the following questions:

   Why do you think we can’t remember the time we spend in the uterus before we are born?

   Why is it important for a fetus to spend as much of the nine months as possible inside the uterus?
D. Understanding Twins

Although knowledge of how twins arise is not explicitly stated in the curriculum outcomes, it is often of great interest to students.

1. Ask students what they know about the different kinds of twins, and how each are made.

2. Show the Biological Sex, Fraternal Twins and Identical Twins diagrams that demonstrate how biological sex is determined and the difference between fraternal and identical twins. About 3% of all births are twins. Fraternal twins are much more common than identical twins.

3. Students may also ask about conjoined twins (the term Siamese twins is no longer used). Conjoined twins are always identical twins, who form from a single egg that begins to divide into twins but does not completely separate into two. It is not known why the fertilized egg begins to divide into two, nor why the process is incomplete in conjoined twins. Conjoined twins are born in only about 1 in every 200,000 births.

4. Ask students to imagine that they have just discovered they have a twin they have never met, either identical or fraternal (students who are twins can imagine they are now triplets). Have students write or draw a description of their twin, including their likes, dislikes, appearance, habits and abilities. Ask them what will be the same, and what will be different, between themselves and this imaginary person. Reinforce that even identical twins have different personalities, strengths and appearances (for instance one might have long hair and one have short hair, or one might have a scar from an injury).

E. Promoting Healthy Babies

Students appreciate the importance of preconception and prenatal health, and create a health promotion message that encourages healthy fetal development.

1. Discuss the following questions and answers as a class.

Before and during pregnancy, what factors can help a person be as healthy as possible?

- Regular check-ups with a health care provider
- A healthy diet that follows Canada’s Food Guide
- Balance of rest and exercise
- Being a healthy weight
Using healthy coping strategies to deal with stress
Taking prenatal vitamins with folic acid (females only)

Why does a healthy lifestyle before pregnancy impact a future baby?

- In the first few weeks of pregnancy, the developing baby is very vulnerable to teratogens. Teratogens are harmful substances that can cause birth defects.
- A healthy lifestyle will lower the likelihood of teratogens being present during the early weeks of pregnancy, before most people even know they are pregnant.

Before pregnancy, what are factors that can affect the health of a future baby by affecting the development of eggs and/or sperm?

- Tobacco use and exposure to second hand smoke
- Alcohol use
- Use of marijuana or other drugs
- Excessive heat (sperm only)
- Some sexually transmitted infections

During pregnancy, what are some things that can negatively affect the development of the baby in the uterus?

- Smoking (first or second hand smoke) or tobacco use
- Alcohol (drinking alcohol during pregnancy can lead to Fetal Alcohol Spectrum Disorder)
- Marijuana or other drug use
- Poor nutrition
- Lack of folic acid
- Excessive stress
- Environmental conditions (e.g., air pollution, chemicals)

During pregnancy, what can a partner do to provide the fetus with the best possible conditions for healthy fetal development?

- Avoid smoking around a pregnant person, to avoid second-hand smoke impacting the baby
- Cook and eat healthy meals together
- Enjoy moderate exercise together
- Share the household tasks
- Clean out the litter box for any cats in the home. Pregnant women should not be exposed to cat feces because of the risk of toxoplasmosis.
- Attend doctor visits, prenatal classes and other appointments

What can other people do to provide the fetus with the best possible conditions for healthy fetal development?

- Avoid smoking around a pregnant person, to avoid second-hand smoke impacting the baby
- Help with housework, childcare, yard work and other family obligations to give the mother more time to rest when desired

Some cultures practice certain rituals and have certain traditions during pregnancy. There are many such practices, rituals, beliefs and offerings that are meant to protect a mother from a variety of influences. You may wish to consult with a cultural community liaison to learn more about such practices.
Grade 6 Growing a Baby

- Clean out the litter box for any cats in the home. Pregnant women should not be exposed to cat feces because of the risk of toxoplasmosis.

Who else can help?
- Midwife, doctor or nurse practitioner
- Public health nurse
- Childbirth educator

2. Give each student the Promoting Healthy Fetal Development instructions. Students must create promotional material that addresses healthy fetal development, using the guidelines.

3. Projects can be completed individually or in groups.

4. When complete, display the promotional material in the classroom or around the school.

F. Fetal Development Kahoot! Quizzes

These quizzes can be a great review, wrap-up of the unit, or a fun energizer in between other activities. For more information on using Kahoot!, visit getkahoot.com

1. Choose either the Kahoot! Quiz: Grade 6 Fetal Development or Jumble Grade 6 Fetal Development 2 to play with the students.

2. As a class, answer the questions and discuss the answers together. You can play in individual or team mode.

G. Question Box

Answer any questions from the question box in the previous lesson. Have students submit any new questions and address them next class.

Addressing the questions at the next class allows you time to review the questions and prepare responses.
Self-Reflection

During the lesson, were:

- ground rules being followed?
- good practices established regarding group work and discussion?

What will you change for future classes with this group?
What will you change for future use of this lesson?

Student Assessment

During the lesson, did students:

Knowledge:

- describe the stages of fetal development?
- identify factors that can affect fetal development?
- describe ways to ensure healthy fetal development?

Skills:

- work to create promotional materials outlining the importance of healthy fetal development?
- participate in class discussion and exhibit appropriate listening and speaking skills?

Attitudes:

- acknowledge that there are many people who can help ensure healthy fetal development?
- accept they can aid in the process of healthy fetal development?
First Trimester
Second Trimester
Third Trimester
Baby called an embryo, is about 6 mm long.
Arm and leg buds starting to grow. Baby is about 2.5 cm long.
Baby called a fetus. Eyes, ears, nose are formed. Baby sucks their thumb.
Baby has fingernails and toenails. Baby can hear sounds.
Baby will kick, twist and turn in uterus. Baby about 25 cm long.
Baby can hiccup, and open and close eyes. Weighs about 1 kg.
Baby has eyelashes and eyebrows. Kicks can be seen by others.
Baby is building layers of fat to stay warm after birth. About 46 cm long.
Baby’s skin is pinker and less wrinkled. Baby weighs about 3-4 kg.
# Exploring Fetal Development

<table>
<thead>
<tr>
<th>Role</th>
<th>Name(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leader</td>
<td></td>
</tr>
<tr>
<td>Reader</td>
<td></td>
</tr>
<tr>
<td>Recorder</td>
<td></td>
</tr>
<tr>
<td>Presenter</td>
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</tr>
</tbody>
</table>

1. The **leader** makes sure all group members are assigned a job: leader, reader, recorder, or presenter. In groups of more than four students, there can be two of any role.
2. The **reader** will read out loud the instructions and questions.
3. The **recorder** will write everyone’s names in the correct spot on the handout.
4. The **recorder** will place a checkmark beside the trimester your group is assigned to research.
5. As a **group**, research the development that takes place during the trimester you have been assigned.
6. Answer the questions below together. The **reader** will read each question, and the **recorder** will write down everyone’s ideas.
7. Work together to help the **presenter** practice their presentation to the class. The presentation includes your group’s answers to each question.
8. The **presenter** will present your group’s findings to the class when it is your group’s turn.

**Our group is researching:**
- First Trimester (months 1-3)
- Second Trimester (months 4-6)
- Third Trimester (months 7-9)
This is a group research project. Together your group must learn about one of the stages of fetal development. Research the stage you have been assigned. Everyone must share in the research.

Answer the following questions using complete sentences.

1. What is the developing baby called during this part of the pregnancy?

2. How big is the developing baby during this trimester?

3. What are the major changes the developing baby undergoes during this trimester?

4. What are the changes the mother experiences during this trimester?
Promoting Healthy Fetal Development

Produce an advertisement promoting healthy fetal development.

1. Choose ONE of the following to create:
   - Poster
   - Infographic
   - Series of 3 Instagram ads
   - Video
   - Comic strip
   - Podcast

2. Choose ONE of the following audiences:
   - A pregnant female
   - A partner of a pregnant female
   - A family member of a pregnant female
   - A grade 6 student

3. Choose ONE OR TWO of the following topics:
   - Things to avoid when pregnant
   - What a pregnant female can do to promote healthy fetal development
   - What a father/partner of a pregnant female can do to help
   - What a family member of a pregnant female can do to help
   - What a student can do to help

4. Brainstorm your ideas and plan the layout/design/script for your project.

5. Develop a finished product.
ANSWER KEY: Grade 6 Fetal Development Quiz

Correct answers are in bold text.

1. In the first trimester of pregnancy:
   - the fertilized egg attaches to the lining of the uterus
   - the embryo has eyes, ears, a spine and a functioning heart
   - fingernails and toenails are forming
   - the mother can feel the baby moving

2. In the second trimester of pregnancy:
   - the baby can hear the mother’s voice
   - the baby’s eyes can react to light
   - the baby is ready to be born
   - the mother can feel the baby move

3. In the third trimester of pregnancy:
   - the baby develops a sense of taste
   - the baby grows and gains weight
   - the baby is always bald
   - the baby learns to talk

4. Fraternal twins:
   - can be the same sex or different sex
   - come from one fertilized egg
   - are always one boy and one girl
   - always look alike

5. When pregnant, the mother can help her baby be as healthy as possible by:
   - avoiding tobacco and tobacco-like products
   - eating a healthy diet
   - losing weight
   - avoiding alcohol

6. The sperm usually meets the egg in the:
   - uterus
   - movie theatre
   - vagina
   - fallopian tube

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7. A fertilized egg:
   - takes about 9 months to grow into a full-term baby
   - will be released each month during menstruation
   - uses lining of uterus for nourishment until placenta forms
   - travels through the fallopian tubes to the uterus

8. After being released from an ovary, an egg will live inside a female’s body:
   - for about 3-5 days
   - for about 1-2 days
   - for about 12-24 hours
   - for about 2-3 hours

9. A fetus gets:
   - two X chromosomes from the mother
   - two X chromosomes from the father
   - an X from the mother and a Y from the father
   - X or Y from the father and an X from the mother

10. Identical twins:
    - are always one boy and one girl
    - come from the same egg
    - have the same chromosomes
    - always have an X and a Y chromosome
ANSWER KEY: Grade 6 Fetal Development Jumble

The correct order for the answers is shown below.

1. Put these events in order from first to last
   • First trimester
   • Second trimester
   • Third trimester
   • Birth
   The first trimester is the first three months of pregnancy. The second trimester is months 4-6, and the third trimester is months 7-9. Birth occurs at the end of the 9 months of pregnancy.

2. Put these events in order from first to last
   • Sperm fertilizes egg
   • Now called an embryo
   • Now called a fetus
   • Baby is born
   The sperm fertilizes the egg in the fallopian tube. When the fertilized egg has divided many times, implanted into the wall of the uterus and is about 10-12 days old, it is called an embryo. After about 8 weeks, the embryo is called a fetus. The baby is born after about 40 weeks of pregnancy.

3. Put these events in order from first to last
   • Baby is the size of a grain of rice
   • Baby has fingernails and toenails
   • Baby has eyelashes and eyebrows
   • Baby is ready to be born
   The baby is the size of a grain of rice (6 mm long) in the first month of pregnancy. Fingernails and toenails are developed at the beginning of the second trimester, when baby is about 12.5 cm long. At the beginning of the third trimester, baby has eyelashes and eyebrows. Babies weigh about 3–4 kg at birth, at the end of the third trimester.
4. Put these events in order from first to last

- Arm and leg buds appear
- Baby sucks their thumb
- Baby can kick, twist and turn in the uterus
- Baby's movements in uterus can be seen by other people

Arm and leg buds are beginning to develop at 5-8 weeks, when the baby is still an embryo. By the third month, baby can suck their thumb. In the fifth month, the baby can kick, twist and turn in the uterus and the movements are felt easily by the mother. By the seventh month, the baby is so much bigger that the movements in the uterus can be seen and felt by other people.