



## Section 2

# A Healthy Pregnancy

### Objectives

- ▶ **Identify** four behaviors that are essential for a healthy pregnancy.
- ▶ **Explain** the importance of prenatal care throughout pregnancy.

### Vocabulary

- prenatal care
- obstetrician
- trimester
- ultrasound
- chorionic villus sampling
- amniocentesis
- ectopic pregnancy
- miscarriage
- preeclampsia
- gestational diabetes

### Warm-Up

• **Myth** A pregnant woman doesn't need to visit the doctor until she begins to show, or look pregnant.

• **Fact** Regular doctor visits from the beginning of pregnancy until the birth are recommended to ensure health.

• **WRITING** List some other do's and don'ts for pregnant women. Review and update your list when you complete this section.



## Staying Healthy During Pregnancy

Amanda starts her day with a bowl of oatmeal. Later, she and her husband go out for a brisk walk. At night, she skips a party where people will be smoking.

Amanda and her husband are thinking about having a baby. Even before she becomes pregnant, Amanda started taking extra care to have a healthy pregnancy. **Getting proper nutrition and exercise and avoiding drugs and environmental hazards are especially important both before and throughout pregnancy.**

**Proper Nutrition** “Now you're eating for two,” people sometimes say to pregnant women. This is because a pregnant woman needs to eat more calories to support the growth of her own body and the developing embryo or fetus. During pregnancy, a woman needs to consume about 300 more calories than usual. The best way to obtain these extra calories is to eat a well-balanced diet rich in the key nutrients listed in Figure 4.

One vitamin that is especially important during pregnancy is folic acid, or folate. Folic acid is essential for proper development of an embryo's neural tube, which later develops into the spinal cord and brain. The neural tube forms early in an embryo's development, often before a woman knows she is pregnant. Therefore, a woman should not wait until she knows she is pregnant to get enough folic acid. Doctors recommend that all women of childbearing age consume at least 0.4 mg (400 micrograms) of folic acid every day.

**Exercise** Regular physical activity is also important for a healthy pregnancy. A fit woman will better meet the extra energy demands of carrying the fetus. She also reduces her risk for diabetes and other health problems during pregnancy. A woman should get her doctor's approval for her exercise program. Some forms of exercise should be avoided—for example, horseback riding, where there is a high risk of falling.

**Avoiding Alcohol and Other Drugs** As soon as she plans to become pregnant, a woman should abstain from all alcohol, tobacco, and any other drugs not prescribed or approved by her doctor. These substances, even in small amounts, can harm or kill the developing baby, decrease the newborn's chance to live, or cause lifelong problems. For example, women who drink alcohol during pregnancy risk having a baby with fetal alcohol syndrome. As you read in Chapter 15, symptoms of fetal alcohol syndrome may include mental retardation, minor to severe heart defects, and delayed growth.

Some drugs that are typically safe outside of pregnancy can cause harm to a fetus. A pregnant woman should talk to her doctor before using any prescription drugs or over-the-counter drugs, including pain medications, creams and lotions, and vitamins. Likewise, a woman should get her doctor's approval before drinking herbal teas or using other herbs.

**Connect to  
YOUR LIFE**

Which recommendations for pregnant women are also good everyday advice for yourself?

**FIGURE 4** Proper nutrition contributes to the healthy development of a baby.  
**Reading Tables** Name three nutrients that play a role in the development of the nervous system.

**Important Nutrients During Pregnancy**

Nutrient	Needed For
Folic acid	Formation of neural tube; brain and spinal cord development
Protein	Muscle formation and growth
Calcium	Bone and tooth formation; nerve and muscle development
Iron	Oxygen delivery by blood cells
Vitamin A	Cell and bone growth; eye development
Vitamin B complex	Nervous system development



**Avoiding Environmental Hazards** Some common substances found in the environment, including many chemicals and disease-causing organisms, can seriously harm a fetus. Pregnant women should take care to avoid exposure to these substances.

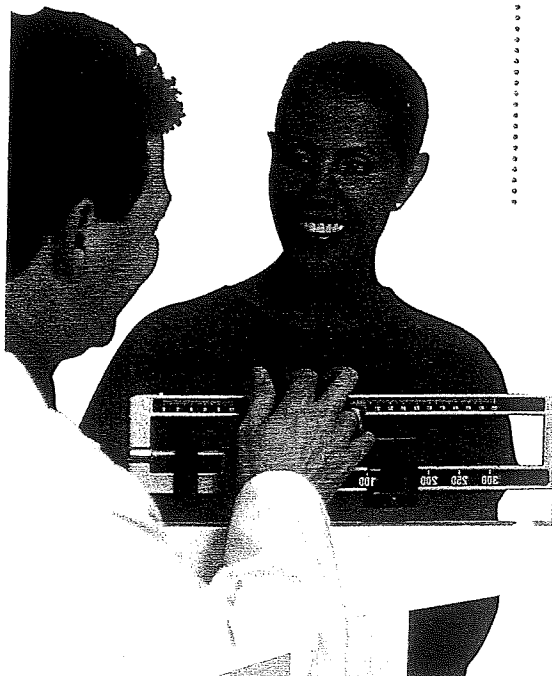
- ▶ **X-rays** The radiation from X-rays can harm a developing embryo or fetus. This is why doctors and dentists ask women if they could possibly be pregnant before taking an X-ray.
- ▶ **Lead** The main source of exposure to lead is from lead-based paint present in older homes. If a pregnant woman lives in a home built before 1978, she should contact her state health department for information on getting her home tested for lead.
- ▶ **Mercury** Most exposure to this dangerous metal comes from eating contaminated fish. Pregnant women should eat commercially caught fish only once a week, and should not eat swordfish or shark.
- ▶ **Cat litter** Cat feces can contain a parasite that is especially dangerous to a developing fetus. Pregnant women should avoid contacting soiled cat litter or garden soil.

**FIGURE 5** A doctor monitors the health of the mother-to-be and her fetus during regular prenatal visits.

## Prenatal Care

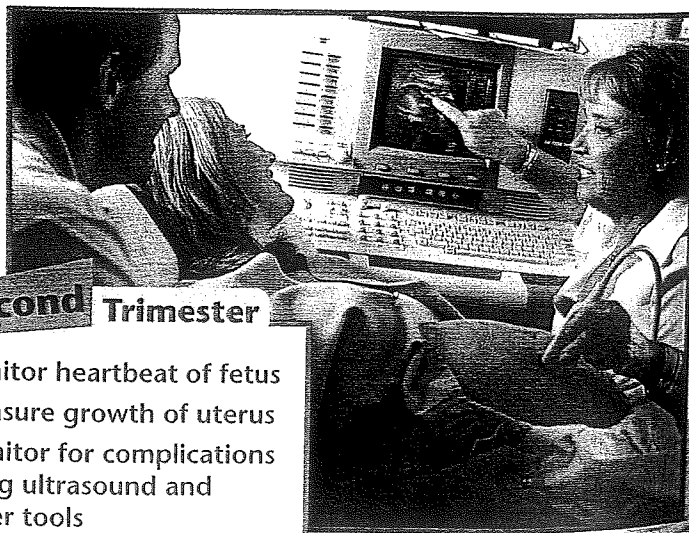
Besides taking care of herself at home, a woman also needs to plan for **prenatal care**, or medical care during her pregnancy. Her doctor visits should be under the supervision of an **obstetrician**, a doctor specialized in pregnancy and childbirth. **The chances of having a healthy baby greatly increase if the mother visits her doctor or clinic for regular checkups throughout pregnancy.**

**The Three Trimesters** A pregnancy is divided into three periods of time—**trimesters**—each of which is approximately three months long. Figure 5 lists things the parents-to-be can expect at routine visits.



### First Trimester

- Record medical history and weight
- Note conditions that could affect the pregnancy
- Prescribe prenatal vitamins as needed



### Second Trimester

- Monitor heartbeat of fetus
- Measure growth of uterus
- Monitor for complications using ultrasound and other tools

**Monitoring Tools** Prenatal care gives a pregnant woman access to the latest medical tests and technologies.

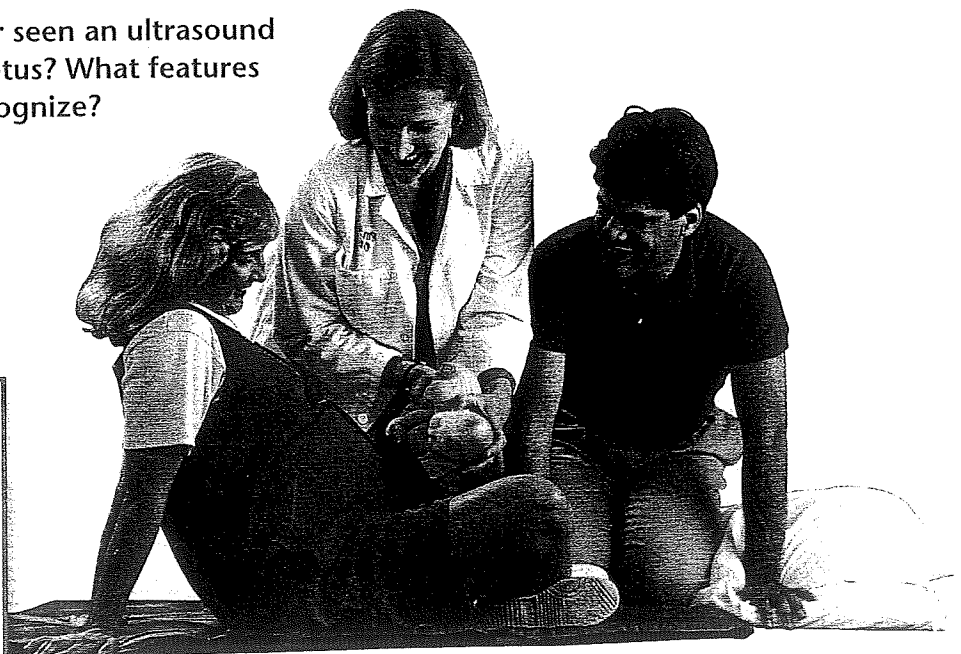
- ▶ **Ultrasound** Did you know that your first pictures may have been taken months before you were born? High-frequency sound waves, or **ultrasound**, are used in most pregnancies to create an image of the developing fetus. Ultrasound may be used at any point during pregnancy, although it is typically used in the sixteenth to twentieth week. Using ultrasound, a doctor can tell the age of the fetus, whether it is a boy or girl, and if the heart, muscles, and bones are developing normally. Ultrasound may also detect the presence of more than one fetus or confirm the position of the fetus in the uterus.
- ▶ **Chorionic Villus Sampling** Around the eighth week of pregnancy, some women will undergo a test called **chorionic villus sampling**, or CVS. To perform the test, the doctor removes and tests a small piece of the developing placenta. CVS can detect inherited disorders in the embryo such as hemophilia or extra chromosomes. The test is only done when risk factors are present, such as a family history of genetic disorders or when the mother is over the age of 35. An older mother has an increased risk of having a baby with Down syndrome or other chromosomal abnormalities.
- ▶ **Amniocentesis** Another test that may be done around the fourteenth to sixteenth week of pregnancy is **amniocentesis** (am nee oh sen TEE sis). The procedure involves inserting a needle into the woman's abdomen and uterus to remove a small amount of amniotic fluid surrounding the fetus. The doctor then tests fetal cells naturally found in this fluid for abnormalities. Like CVS, amniocentesis is only performed when the fetus is at higher risk for a genetic disorder. CVS and amniocentesis are not routine tests because they slightly increase the risk of miscarriage, or death of the fetus.

**Connect to  
YOUR LIFE**

Have you ever seen an ultrasound picture of a fetus? What features could you recognize?

**Third Trimester**

- Check position and size of fetus
- Check for warning signs of premature, or early, birth
- Continue to monitor for complications
- Discuss birth process



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**Complications** Problems can occur anytime during pregnancy. For some of these complications, timely treatment can reduce negative consequences or even save the life of the woman or fetus.

- ▶ **Ectopic pregnancy** In the very rare case of an **ectopic pregnancy**, the blastocyst implants in the fallopian tube or elsewhere in the abdomen, instead of in the uterus. It cannot develop normally and may put the mother's life at risk. Surgery is necessary to remove the embryo and repair the damaged fallopian tube.
- ▶ **Miscarriage** The death of an embryo or fetus in the first 20 weeks of pregnancy is called a **miscarriage**. Over 20 percent of pregnancies end in miscarriage. Miscarriage almost always occurs during the first trimester, sometimes before a woman knows she is pregnant. Miscarriage is usually caused by a serious genetic defect, but is sometimes due to illness or a drug the mother has taken. In other cases, there is no apparent reason for a miscarriage.
- ▶ **Preeclampsia** Also called toxemia, **preeclampsia** (pree ih KLAMP see uh) is characterized by high blood pressure, swelling of the wrists and ankles, and high levels of protein in the urine. Its onset is usually in the second or third trimester. Preeclampsia prevents the fetus from getting enough oxygen. This serious condition is treated with bed rest or medication.
- ▶ **Gestational Diabetes** Diabetes that develops in pregnant women is called **gestational diabetes**, and is marked by high blood sugar levels. Like preeclampsia, it usually develops later in pregnancy. If left untreated, excess blood sugar that passes through the placenta to the fetus may cause the fetus to grow too big. This increases the risk of a difficult birth, as well as breathing problems and obesity in the newborn.

## Section 2 Review

### Key Ideas and Vocabulary

1. List four healthy habits that a pregnant woman should adopt before and during pregnancy.
2. Why is prenatal care so important throughout pregnancy?
3. About how long is each trimester of a pregnancy?
4. What is **chorionic villus sampling**? Under what conditions is it sometimes recommended?
5. Describe three symptoms of **preeclampsia**. How is it treated?

### Health at Home

**Ultrasound Pictures** Ask your mother or other relative with children if she saved any ultrasound pictures from her pregnancy. Ask permission to see the pictures. Ask about her emotions during the ultrasound—were she and the father scared, happy, excited? Write a paragraph about the pictures and the parents' experience. **WRITING**

### Critical Thinking

6. **Evaluating** From the following list, which food choice is generally recommended for pregnant women: swordfish, spinach, wine, herbal tea?
7. **Comparing and Contrasting** How are chorionic villus sampling and amniocentesis alike? How are they different?

## Section 3

# Childbirth

### Objectives

- ▶ **Identify** the three stages of the birth process.
- ▶ **Describe** four complicating factors that may arise at birth.

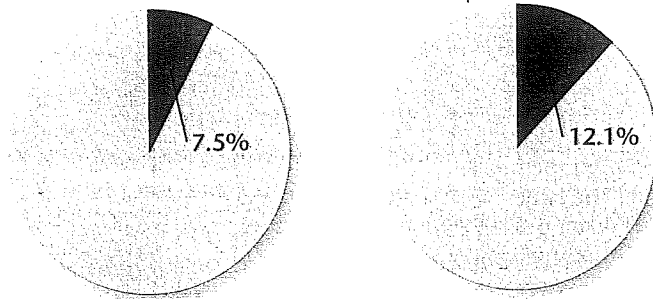
### Vocabulary

- certified nurse-midwife
- labor
- postpartum period
- stillbirth
- cesarean section
- premature birth
- low birthweight
- multiple birth

### Warm-Up

**Health Stats** How does smoking during pregnancy affect the risk for low birthweight?

**Percentage of Babies With Low Birthweight**



**When Mothers Didn't Smoke**

**When Mothers Smoked**

**WRITING** Propose a plan that could help decrease the number of pregnant women who smoke.

## The Birth Process

As the baby's due date approaches, the mother and father prepare. Most couples choose to have their baby in a hospital, where obstetricians, specially trained nurses, and medical equipment are available should something go wrong. If the pregnancy has gone well and the mother is in good health, a couple may choose to have the baby at home or at a home-like setting with the help of a certified nurse-midwife. A **certified nurse-midwife** is a nurse who is trained to deliver babies.

Near the end of the ninth month of pregnancy, the head of the fetus moves lower in the uterus. The birth process begins when the muscular walls of the uterus begin a series of contractions that will push the fetus out of the mother. Birth takes place in three stages—labor, delivery of the baby, and delivery of the afterbirth. Refer to Figure 6 to see what happens during each stage.

### Connect to YOUR LIFE

What mix of emotions might expectant parents feel during the birth process?

**FIGURE 6** The three stages of birth include labor, delivery of the baby, and delivery of the afterbirth.

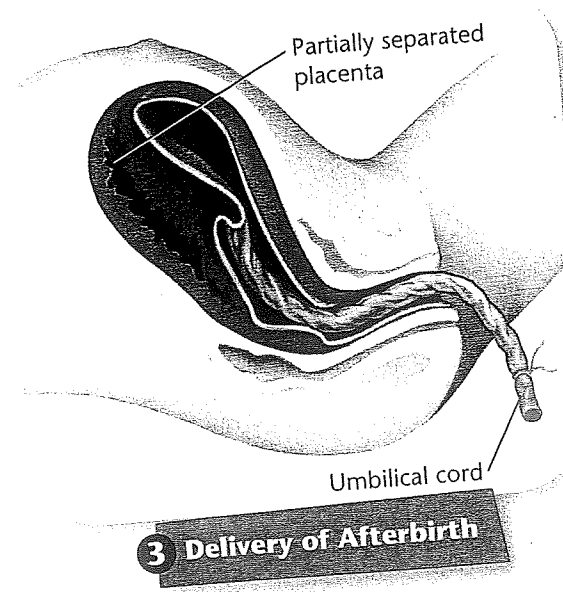
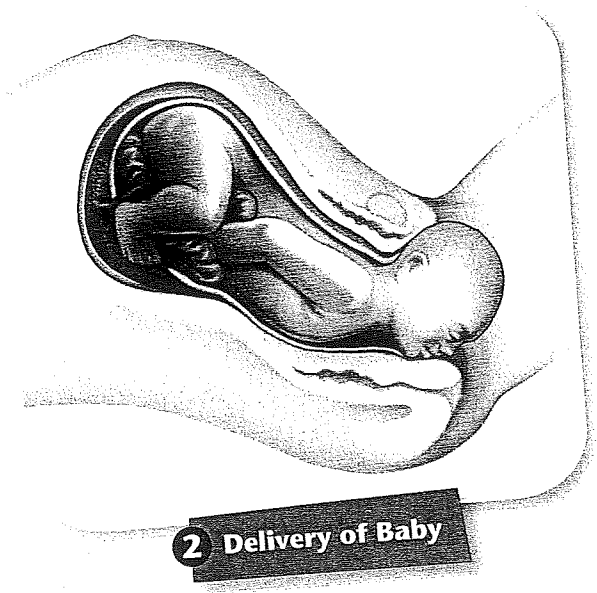
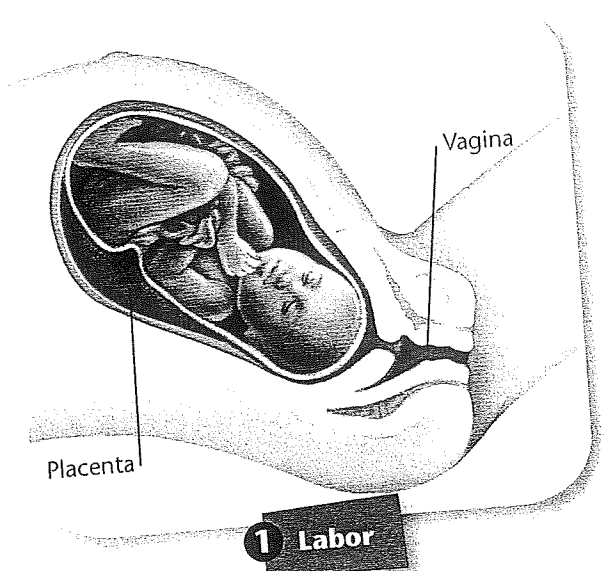
**1 Labor** The work performed by the mother's body to push the fetus out is called **labor**. Labor for a first child may last from about 2 to 24 hours or longer. During this stage, strong contractions of the muscles of the uterus cause the cervix to increase in width, or dilate.

Each contraction typically lasts from 30 to 90 seconds. At first, the contractions may be minutes apart, but by the end of labor, they are usually only a few seconds apart. Near the end of this first stage, the amniotic sac breaks, and the cervix becomes softer and wide enough for the fetus to pass through.

**2 Delivery of Baby** Stage two involves the actual birth, or delivery, of the baby. This stage can take from half an hour to more than two hours. Contractions of the uterus continue, and the baby is pushed out, usually head first, through the cervix and vagina.

Once the baby is out, the doctor clamps and cuts the umbilical cord. There are no nerve endings in the cord, so this does not hurt the baby or the mother. The baby's nose and mouth are suctioned to remove mucus and make breathing easier. Eye drops are put in the baby's eyes to prevent infection, and an injection of vitamin K is given to prevent excessive bleeding from the cut umbilical cord. The doctor may also prick the baby's heel for a blood sample, which will be tested for abnormal protein levels. Abnormal test results may indicate a genetic disorder.

**3 Delivery of Afterbirth** Even though the baby is born, the birth process is not complete. The third stage involves contractions of the uterus that push out the placenta, also called the afterbirth. This stage typically takes about 15 to 30 minutes.





## Hands-On Activity

### Be a Parent for a Day

#### Materials

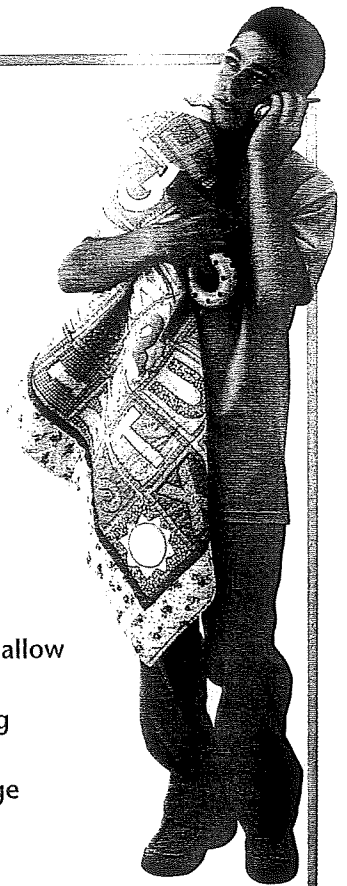
5-pound bag of flour  
plastic bag with tie

#### Try This

- 1 Place the bag of flour inside the plastic bag and fasten it shut. For the next 24 hours, you will be responsible for your bag of flour as if it were a real baby.
- 2 Choose a name for your "baby."
- 3 Follow these rules for taking care of your "baby."
  - Every 5 hours, including night, feed your "baby" for 20 minutes. During this time, you must remain seated in one place and devote your full attention to your "baby."
  - Every 3 hours during the time that you are awake, allow 5 minutes for changing your "baby's" diaper.
  - Spend 15 minutes in the evening talking or reading to your "baby."
  - Never leave your "baby" alone. If necessary, arrange for someone to babysit.

#### Think and Discuss

- 1 How did being a parent of a bag of flour affect your lifestyle?
- 2 In what ways is a bag of flour an appropriate object to use to represent a baby?
- 3 When do you think is the best time for a person to become a parent? Explain.



**The Postpartum Period** After the birth, a period of adjustment for the parents and their newborn begins. During the first six weeks, called the **postpartum period**, many changes take place. Immediately after the birth, the newborn's lungs begin to function for the first time. The circulatory system and heart undergo changes that send more blood to the lungs, where the baby now gets oxygen from the air. The nervous system reacts to new sensations: light, air against the skin, a parent's touch, hunger, and pain. While its organs adjust to life outside the uterus, the newborn is learning to get what it needs by forming a strong bond with its mother and father.

For the mother, changing hormone levels signal the breasts to produce milk and cause the uterus to gradually shrink back to its normal size. Hormonal changes and fatigue may cause the mother to feel overwhelmed, or even very sad, during the postpartum period. Usually, these "baby blues" pass within a few days. If, however, the sadness lasts longer or causes the mother to withdraw from the baby and other people, she should seek prompt medical attention. She may need to be treated for a serious condition called postpartum depression.

## Complications at Birth

Although the birth process usually proceeds smoothly, problems can sometimes occur. Some complications result in a surgical delivery or premature birth. Low birthweight and the birth of more than one baby also may cause complications. In addition, very rarely, a pregnancy may end with a stillbirth. A stillbirth occurs when a fetus dies and is expelled from the body after the twentieth week of pregnancy.

**Surgical Delivery** Sometimes delivery through the cervix and vagina is not possible because of the position of the fetus in the uterus or the narrowness of the mother's hips. Other times, illness or other conditions may make labor and vaginal delivery dangerous for the mother or the fetus.

In these circumstances, the obstetrician will perform a cesarean section. A **cesarean section** (suh ZEHHR ee un) is a surgical method of birth. The operation takes about one hour to complete, and the mother may be awake or asleep during the procedure. First the doctor makes an incision in the lower abdomen into the uterus, then he or she removes the baby and placenta. About 25 percent of all babies born in the United States are delivered by cesarean section.

**Premature Birth** Sometimes a baby is born before it has developed fully. Delivery of a live baby before the 37th week of pregnancy is called **premature birth**. The earlier the birth, the more problems the baby tends to have. The lungs of a premature baby are usually not fully developed, and in some cases, the baby cannot breathe by itself. The baby may also have additional problems if other organs aren't fully developed. A premature baby may receive care in an incubator, a chamber designed to protect the baby until it has developed more.

### Connect to YOUR LIFE

What misconceptions about premature babies did you hold before reading this section?



On average, hospital costs for premature babies are 14 times as high as costs for healthy newborns.

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For: More on the birth process

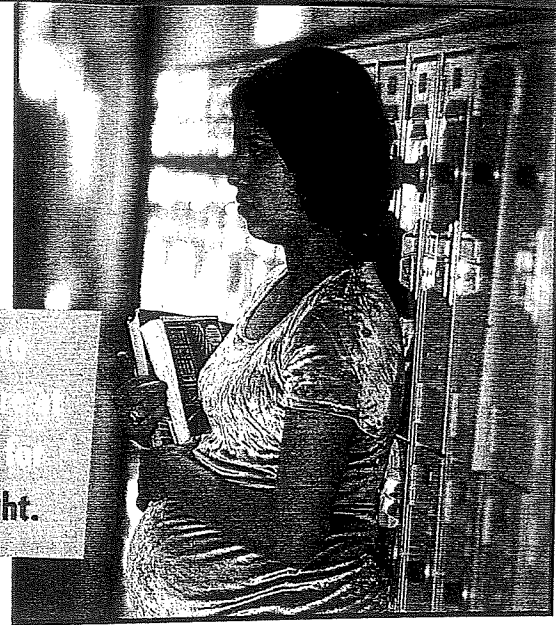
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**FIGURE 7** A premature baby may need extended hospital care until it becomes more fully developed.

**FIGURE 8** Risk factors for having a baby with low birthweight include smoking or dieting during pregnancy and teenage pregnancy.

**Babies born to teen mothers have an increased risk for low birthweight.**



**Low Birthweight** A newborn that weighs less than 5.5 pounds at birth is considered to have **low birthweight**. Some low-birthweight babies are also premature. Others are full-term, but just didn't grow enough before birth.

Premature and low-birthweight babies face an increased risk of health problems as newborns, chronic lifelong health problems, and even death. Not all cases are preventable—however, the number of premature and low-birthweight babies could dramatically decrease if more women adopted healthy habits during pregnancy. For example, a woman reduces her risk of having a baby with low birthweight by about 40 percent by not smoking during pregnancy.

## Multiple Births

The delivery of more than one baby—for example, twins, triplets, or quadruplets—is called a **multiple birth**. These births carry greater risk to the mother and babies, and are closely monitored by doctors. Delivery by cesarean section is more likely for a multiple birth than for a single birth.

What causes more than one fetus to develop? Figure 9 shows how the two types of twins develop.

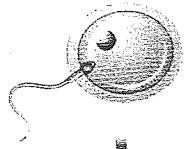
**Identical Twins** Twins that develop from a single fertilized egg, or zygote, are called identical twins. Early in development, the embryo divides into two identical embryos. Because they develop from identical embryos, identical twins have the same inherited traits and are the same sex.

**Fraternal Twins** Sometimes two eggs are released from the ovary and are fertilized by two sperm. When this happens, fraternal twins develop. Fraternal twins are no more alike than any other siblings, and they may or may not be the same sex.

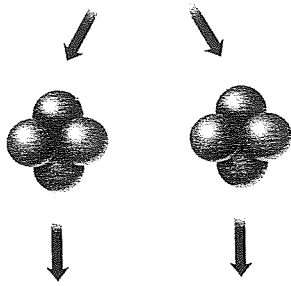
**Triplets or More** Triplets, quadruplets, and other multiple births are less common than twins. The number of births to three or more babies has increased dramatically in the last 25 years.

## Identical Twins

A sperm fertilizes a single egg.



Early in development, the embryo splits and forms two identical embryos.

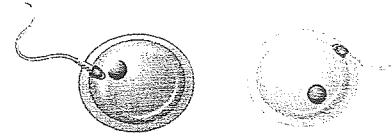


Identical twins result.

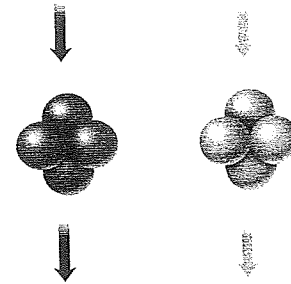


## Fraternal Twins

Two different sperm fertilize two eggs.



Each of the fertilized eggs develops into an embryo.



Fraternal twins result.



**FIGURE 9** Identical twins inherit identical traits, whereas fraternal twins do not. **Applying Concepts** Why can fraternal twins be different sexes while identical twins cannot?

## Section 3 Review

### Key Ideas and Vocabulary

1. What are the three stages of birth?
2. Describe what happens during labor.
3. What is the **postpartum period**? List two changes that happen in the newborn and two changes that happen in the mother during this period.
4. What are four complicating factors that may arise at birth?
5. What is a **cesarean section**? Give two reasons why a cesarean section may be performed.

### Health at School

**Twins Interview** Interview twins you know at your school or in your community. Ask them how they think being twins affects their relationship as siblings. Write a transcript of your interview. **WRITING**

### Critical Thinking

6. **Relating Cause and Effect** Describe two risk factors for low birthweight.
7. **Comparing and Contrasting** How do fraternal twins differ from identical twins?

# Pregnancy: Two Truths and a Lie Activity

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Name: \_\_\_\_\_

Period: \_\_\_\_\_

**Directions:** For each topic, one of the three statements is a lie. Circle the number of the lie for each letter.

**A. Pregnancy Symptoms**

1. Everyone stops having periods as soon as they get pregnant.
2. Common pregnancy symptoms are breast tenderness, nausea and food cravings.
3. Many pregnancy symptoms are caused by a change in the female's hormones.

**B. Pregnancy Testing**

1. A person can get a pregnancy test at a health clinic or buy a urine test in a drug store.
2. Pregnancy tests can show results as early as one hour after conception.
3. There are two ways to confirm a pregnancy: a urine test or an abdominal exam by a health care professional.

**C. Clinics and laws**

1. A person can get a pregnancy test at a Public Health clinic, Planned Parenthood or school based health center even if she is less than 18 years old.
2. The results of a pregnancy test are kept confidential in WA State.
3. All states have the same laws about minors (under 18 years old) and reproductive health care.

**D. Conception**

1. The ovum and the sperm meet in a female's Fallopian tubes.
2. The period of time between conception and birth during which the fetus grows and develops is called gestation.
3. It takes a million sperm to create a pregnancy.

**E. Fetal development**

1. A trimester is three months long.
2. For the first eight weeks the developing baby is called a fetus.
3. The most vulnerable time in terms of diseases and drugs is the first trimester.

**F. Sex Determination**

1. The number of multiple births in the United States is increasing.
2. The egg determines the sex of the baby.
3. An X egg fertilized by a Y sperm makes an XY baby: a boy.

## 2 Truths and a Lie - ANSWER KEY

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The "LIES" below are highlighted and explained...

### A. Pregnancy Symptoms

1. **Everyone stops having periods as soon as they get pregnant.** (Not true. Some women *don't* miss a period until they have been pregnant for a couple of months! Their periods might just seem lighter and shorter at first.)
2. Common pregnancy symptoms are breast tenderness, nausea and food cravings.
3. Many pregnancy symptoms are caused by a change in the female's hormones.

### B. Pregnancy Testing

1. A person can get a pregnancy test at a health clinic or buy a urine test in a drug store.
2. **Pregnancy tests can show results as early as one hour after conception.** (Not true. Urine tests are usually accurate 10-14 days after intercourse. But there's no need to wait longer than that. The sooner a woman starts prenatal care or has an abortion, the safer it is.)
3. There are two ways to confirm a pregnancy: a urine test or an abdominal exam by a health care professional.

### C. Clinics and laws

1. A person can get a pregnancy test at a Public Health clinic, Planned Parenthood or school based health center even if they are less than 18 years old.
2. The results of a pregnancy test are kept confidential.
3. **All states have the same laws about minors (under 18 years old) and reproductive health care.** (Not true. No state laws *require* doctors to notify parents about pregnancy tests. Some doctors or insurance companies might anyway. People who need privacy should ask when they make the appointment. Some states *do* require parents' consent for prenatal care or abortion. *In our state ...* (NOTE to teachers: Explain your own state's law here. See Appendix 2 – Pages 3 and 9.)

### D. Conception

1. The ovum and the sperm meet in a female's Fallopian Tubes.
2. The period of time between conception and birth during which the fetus grows and develops is called gestation.
3. **It takes a million sperm to create a pregnancy.** (Not true. Hundreds of millions are released in ejaculation. But just a few hundred are needed to wear away the egg's protein coat so that one can penetrate it and become part of the embryo.)

### E. Fetal development

1. A trimester is three months long.
2. **For the first eight weeks, the developing baby is called a fetus.** (Not true. For the *first* eight weeks it is called an *embryo*.)
3. The most vulnerable time in terms of diseases and drugs is the first trimester.

### F. Sex Determination

1. The number of multiple births in the United States is increasing. This is likely due to greater use of assisted fertility methods like in vitro fertilization.
2. **The egg determines the sex of the baby.** (Not true. The *sperm* contains an X chromosome [female] or a Y [male]. All eggs have X-shaped chromosomes.)
3. An X egg fertilized by a Y sperm makes an XY baby: a boy.