Genetics, Birth Defects, and Reproduction
Unit #2

A. Identify Heredity and Environmental Factors influencing birth defects
1. Analyze the influences and effects of genetics and heredity
2. Identify the differences between heredity and environment
3. Define recessive and dominant gene
4. Identify benefits for genetic counseling

B. Explain Factors of Birth Defects
1. Know Causes and Characteristics of Down syndrome, PKU, Muscular Dystrophy, Fetal Alcohol Syndrome, Neural Tube Defect, Cleft lip/Palate, and Club foot

C. Identify Lifestyle and Environmental Factors influencing birth defects
1. Specify lifestyle factors that minimize environmental birth defects (drugs, alcohol, etc...)
2. Know the role of Folic Acid in the prevention of neural tube defects
3. Know the role of appropriate nutrition and weight gain during prenatal development
4. Know the role of prenatal testing in detecting birth defects (ultrasound, amniocentesis, CVS)
5. Know the importance of early prenatal and ongoing prenatal care
6. Know how the Father’s diet, lifestyle, habit’s, and attitude play a big part in a healthy baby

D. Explain Correct Facts Concerning Reproduction and Conception
1. Discuss appropriate ways to teach young children about sexuality
2. Review reproductive organs and the functions of each
3. Describe the reproductive process

E. Understand How Teens are Affected by Pregnancy
1. Explain how a teen pregnancy affects the physical, emotional, financial, social, educational, and health aspects of both the male and female teen.
# Birth Defects Chart

<table>
<thead>
<tr>
<th>Birth Defect</th>
<th>People Affected</th>
<th>When this appears</th>
<th>Method of Inheritance (use your study guide)</th>
<th>Effects on the person</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft lip/ Cleft Palate</td>
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<td>Clubfoot</td>
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<td>Down’s Syndrome</td>
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<td>Fetal Alcohol Syndrome</td>
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<td>Muscular Dystrophy</td>
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<td>PKU</td>
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<td>Spina Bifida Neural Tube Defects</td>
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<td>1 Drug Related Defect</td>
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<td>1 Sexually Transmitted Infection Related</td>
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1. Which birth defect did you find most interesting to learn about? Why?

2. Which birth defect did you find sad or scary? Why?

3. Learning about genetics, heredity, and birth defects has helped to prepare me to become a parent by….

4. How are you going to use this new information to better your future?
**HEREDITY and GENETICS**

**True or False Questions - fix the False answers**

1. _______ The passing on of traits from parent to child is called heredity. Environmental influences are the surroundings that we are placed in.

**READ The Scenario:** Sammy has brown eyes and is five years old. She attends a neighborhood preschool every day. Her teachers have fallen in love with her witty personality and honey-colored hair. She is very intelligent and does well with the tasks assigned to her. Sammy’s parents are divorced and she misses her father very much. Sammy has juvenile arthritis and must see the doctor often. At her last doctor’s visit, the doctor reminded Sammy’s mom that diabetes has run in her family for several generations and that Sammy should be watched closely for any early symptoms of diabetes. Sammy’s growth chart shows that she will probably be small for her age.

- **List the Heredity Influences in the above scenario:**
- **List the Environmental Influences in the above scenario:**

2. _______ Genes carry inherited traits that are passed on from generations to generations. Hundreds of thousands of genes, which make up the traits of human beings, are carried on every chromosome.

3. _______ Heredity influences such personal aspects as eye color, personality, and food preference.

4. _______ Dominant genes are stronger genes and recessive genes are weaker.

5. _______ In the formation of a new individual where the genes are both recessive and dominant, the dominant will always overpower.

Determine the chances of passing on a genetic trait in the following situation:

The wife is blue-eyed and carries genes for blue eyes on both of the chromosome pairs. The husband is brown eyed and carries a gene for brown eyes on one of the pairs and a gene for blue eyes on the other one of the pairs. Complete the following grid to determine the chances for each of their children to be born with blue or brown eyes.

- **Wife**: b
- **Husband**: B
- **Wife**: b
- **Husband**: b

There is a _______________ in four chance that the child will have brown eyes and carry a gene for blue eyes.

There is a _______________ in four chance that the child will have blue eyes and carry genes for only blue eyes.

<table>
<thead>
<tr>
<th>Wife</th>
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B. Explain Factors of Birth Defects

Use the words to fill in the blanks

environment perinatal damage recessive disorder mutated multi-factoral six guidelines amniocentesis sex-linked syndrome eggs fertilize metabolic defects congenital malformation dominant disorder ultrasound sperm carrier blood disorder birth defects genetic counseling check-ups chromosomal error miscarriage

**DEFINE and Understand:**
1. An abnormality of structure, function, or body metabolism which often results in a physical or mental handicap, a shorter life span, or is fatal. _____________________
2. Heredity (20%), __________________________ (20%), and a combination of both (60%)
3. The first ____________ weeks of prenatal development is the most sensitive period for birth defects to an unborn baby.

**METHODS OF INHERITANCE or CLASSIFICATION** (use this information for your Birth Defect Chart)
4. The fertilized egg cell, which contains chromosomes in an abnormal number, structure/shape, or arrangement ____________________
5. Reduced or missing blood component, or an inability to do its full share of the work. ____________________
6. A condition that is present at birth where part of the body might be missing, missapen, or duplicated. ____________________
7. Factors, mainly environmental, that cause damage to the fetus before or during birth like infections, chemical substances, complications, and natural disorders of abnormalities. ____________________
8. Diseases of the body chemistry that causes the inability of cells to produce necessary substances like enzymes or proteins or to carry substances from one place to another. ____________________
9. When an X chromosome from mom is faulty, there is a 50/50 chance of the child inheriting the disorder. ____________________
10. The interaction of many genes with other genes or with environmental factors. ____________________

**RELATED TERMS TO KNOW**
11. A person that carries and passes on a disease or condition without having it him/herself. ____________________
12. When one parent is a carrier for a disorder or trait and they have a 50% chance of passing it on to the child. ____________________
13. Both parents are carriers of the disorder or trait so there is 25% chance of the child inheriting abnormal genes and having the disorder, a 25% chance of receiving normal genes, and a 50% chance of just being a carrier. ____________________

**MATERNAL AND PATERNAL FACTORS THAT INFLUENCE BIRTH DEFECTS**
14. Name and explain 5 of the maternal factors that influence a baby having a birth defect

15. Name and explain 3 paternal (father) factors that influence birth defects
16. Women have all of the ________________ needed to create a child before they themselves are even born.

17. Men create new ________________ about every 72 hours.

18. Sperm can become ________________ due to the father’s environment, heredity or a combination of both., but even damaged sperm can ________________ an egg and create a child.

19. Men should follow ALL ________________ given to a woman to prevent birth defects if they are sexually active.

ENVIRONMENTAL OR LIFESTYLE FACTORS THAT CAN CAUSE BIRTH DEFECTS

20. List 5 of these factors

21. Of all of the environmental and lifestyle factors presented, which are preventable? OR Which would be considered your fault?

MEDICAL CARE TO PREVENT AND/OR DETECT BIRTH DEFECTS

22. What form of medical care helps couples to understand their genetic codes and how they might affect their children? ________________

23. This is a test performed during pregnancy where a small amount of amniotic fluid is drawn out and examined to detect chromosomal abnormalities. ________________

24. High Frequency sound waves to locate the position, size, and structure of the fetus, and placenta in the womb. ________________

25. A pregnant woman should go to 13 prenatal ________________ before the baby is born and begin these by week 13 of her pregnancy to ensure a higher percentage of a healthy pregnancy.

26. A ________________ is nature's way of expelling a baby incapable of surviving.

27. List 5 actions on your own that you will take to prevent birth defects from happening to your future children.
C. Identify Lifestyle and Environmental Factors influencing birth defects

BIRTH DEFECTS CAUSED BY LIFESTYLES AND ENVIROMENT

Match the words in the word bank with its definition.

General anesthetic  active  immunization shots  weight gain  amniocentesis  withdrawal  low birth weight  pre-natal
doctor visits  toxemia  premature  folic acid  rest and relaxation  weeks  food guide pyramid  feeding a fetus
medication  radiation  smoke  alcohol  still born  sexually transmitted diseases  rh factor  fetal alcohol syndrome
ultrasound  sexually active  caffeine  20 – 35  Birth defect

HEALTH AND NUTRITION

1. _________________________Optimum age to have a baby is during these years.
2. _________________________The first 6 are the most crucial for development. Mom doesn’t even know she is pregnant.
3. ___________________________ is the recommended amount for a pregnant woman who is 24-30 pounds.
4. ___________________________ The recommended amount is 2500 calories for a pregnant woman vs. 2200 calories for the average pregnant woman.
5._________________________Follow this to ensure a pregnant person gets a proper diet and amounts of nutrients.
6. ___________________________When it comes to distributing nutrients, the mom’s body meets her need’s first and then the fetus scavenges for what nutrients are leftover.
7. ___________________________This is the number one cause of birth defects.
8. ___________________________Lack of this nutrient contributes to a neural tube defect which will occur before the mom even knows she’s pregnant.
9. ___________________________Maintain this lifestyle throughout the pregnancy.
10. ___________________________Get a lot of both of these. Practice techniques that will help you to stay calm and keep your heart rate low.
11. ___________________________Make sure these are up-to-date before you get pregnant to avoid any unwanted illness.
12. ___________________________Also known as German Measles, does not affect the mom but will affect a developing fetus by causing them to be blind, deaf, retarded, or dead.
13. ___________________________Only use this, in any form, under doctor’s care—even for a little headache or cold.
14. ___________________________Avoid this during pregnancy. The dentist and that cavity can wait.
15. ___________________________Get this early on in the pregnancy and throughout it. Receive 13 check-ups before you deliver.
16. ___________________________Know this and your RH type to prevent a blood incompatibility between you and your partner.
LIFESTYLE AND HABITS

17. ________________Like Herpes, AIDS, syphilis, and Chlamydia, will cause major birth defects or death to the fetus.

18. ________________If this is you, male or female, you should act, do and think as of you are pregnant so as not to harm the developing fetus. Better to be cautious then to harm your baby.

19. ________________Including x-rays will cause gene mutilation of the nervous system and the brain to stop developing which will equal retardation.

20. ________________This is found in the air and causes severe malformation, physical defects, and cerebral palsy so be careful what you breath.

21. ________________This is still being studied, but in large quantities of coffee or certain sodas it can cause malformations, miscarriage, or premature births.

22. ________________Using or smoking this restricts blood flow, oxygen and nutrients to developing fetus. It crosses the placenta and harms the fetus’s developing organs or cause growth retardation.

23. ________________When the mom drinks this, it bleeds thru to the baby and the baby ends up with the same blood alcohol level as the mom. This will stay with the baby for 2 times longer than it will with the mom.

24. ________________**Fetal Alcohol Syndrome** (FAS) In large quantities, alcohol causes FAS because the fetus does not process the alcohol as well as the mom.

   It is a combination of mental and physical birth defects like: facial abnormalities, retardation, learning disabilities, emotional problems, liver disease, and possible alcohol addiction. Most of these are evident at birth. A direct result of mom drinking during pregnancy.

25. ________________Using these cause avoidable tragic birth defects. With each puff, pop, shoot, or snort, the mom poisons her fetus. Heart attacks, stroke. Seizures, malformations, miscarriages, stillbirth, SIDS, neurological problems, irritability, unresponsive tremors, low birth weight, and abnormal vision are just SOME of the effects on the baby.

26. ________________The fetus and baby must go thru this just like the “loving” user mom will, but it is much worse on them.

27. ________________Like what you might find in cat litter boxes, on stray cats, in poorly cooked meats, cleaning supplies, paint, and lead, can lead to birth defects or deaths to developing fetus.

PREGNANCY COMPLICATIONS AND PROBLEMS

28. ________________This birth occurs at least 2-3 weeks before pre-natal development is complete.

29. ________________This is when the baby weights less than 5 ½ pounds at birth even if it has spent the full 40 weeks in uterus.

30. ________________When the baby is involuntarily expelled from the mom’s body because it’s incapable of surviving.

31. ________________When the fetus appears to be developmentally normal, but for some reason is born dead.
D. Explain Correct Facts Concerning Reproduction and Conception

1. What are 3 reasons for teaching children about sexuality?

2. Tell appropriate ways to teach sexuality to children?
   1. Begin teaching when children start __________________________. If a child has not started asking by _____________, begin talking about it with them.
   2. Always tell the ____________________________.
   3. Use correct ____________________________.
   4. Answer only the ________________ the child ________________ and in terms They can ________________.
   5. Always leave the ________________ for more ________________ later.
   6. Explain your ________________ standpoint as part of every ________________.
   7. Remember that children are naturally ________________ about physical differences.

3. Refer to the Reproduction Diagram for the male and female reproductive organs and their functions.

E. Understand how Teens are affected by pregnancy

1. Complete the chart below

<table>
<thead>
<tr>
<th>How Does Teen Pregnancy Affect:</th>
<th>FEMALE</th>
<th>MALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physically</td>
<td></td>
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<tr>
<td>Financially</td>
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<td>Emotionally</td>
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<td>Socially</td>
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<tr>
<td>Educational</td>
<td></td>
<td></td>
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<tr>
<td>Health Risks to the baby</td>
<td></td>
<td></td>
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<tr>
<td>Health Risks to the Mother</td>
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</tbody>
</table>
Teen Sexuality and Teen Pregnancy – In Your Opinion

1. Can you have a good dating relationship without having sex?

2. At what age would be you begin talking to your child about having sex and / or pregnancy and the consequences?

   How do you see yourself explaining this topic?

3. What would be your reaction if it was your teenage daughter that was pregnant? Why?

4. What would be your reaction if it was your teenage son that got a girl pregnant? Why?

5. If you knew your teenage daughter was having sex, what would you say to her?

6. If you knew your teenage son was having sex, what would say to them?

7. What options would you consider if it was your daughter that was pregnant?

8. What do you feel is the male’s role in a teenage pregnancy?

9. Do you feel that the parents have any responsibility in the event of their teenager’s pregnancy?