HEREDITY AND GENETICS, BIRTH DEFECTS, AND HUMAN 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’s syndrome, PKU, Muscular Dystrophy, Fetal Alcohol Syndrome, Neural Tube Defect, Cleft lip/Palate, and Club foot

STATE ASSIGNMENT: Complete the Unit 2 Study Guide to identify Heredity and Environmental factors influencing Birth Defects

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, habits, 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.
UNIT 2 BELL QUizzes

Day 1 Genetics and Heredity

1. To stay organized and know when work is due:
   A. Look at the front board
   B. Look at your calendar
   C. Go to the class website
   D. All of the above

2. A recessive gene will produce a trait only when transmitted by:
   A. The Father
   B. The Mother
   C. Either Parent
   D. Both Parents

3. Heredity influences all of the following except:
   A. Eye color
   B. Skin color
   C. Weight
   D. Hair color

4. Which of the following carries the inherited traits:
   A. A gene
   B. The placenta
   C. Meiosis
   D. Umbilical cord

5. If 2 ovum are fertilized what will the outcome be?
   A. Fraternal twins
   B. Siamese twins
   C. Identical twins
   D. Paternal twins

5. The chromosome combination that determines that a baby will be a boy is:
   A. XX
   B. XY
   C. YY
   D. YZ

Day 2 Birth Defects

1. Which situation concerning all electronic devices is false?
   A. When you are in class turn them off and put them away until the last 5 minutes of class.
   B. When you are in the Child Care center = off and away.
   C. They can be used, stay on your desk, or kept in your ears.
   D. If they are seen, they will be taken away until after class for the 1st time and given to the office on the 2nd time.

2. Birth defect classification in which the trait for the defect is carried by the female but shows up in the male is known as:
   A. Blood Disorder
   B. Congenital Malformation
   C. Perinatal Damage
   D. Sex (X) Linked

2. The test done by inserting a needle through the abdominal wall into the uterus to withdraw some amniotic fluid is:
   A. Apgar Score
   B. Ultrasound
   C. Amniocentesis
   D. Chorion Villi Biopsy

3. Which statement describes Down’s Syndrome:
   a. Previously known as Cystic Fibrosis
   b. Chromosome 21 has an extra chromosome, a triplet rather than a pair
   c. It affects a child’s intellectual development, but not their physical dev.

4. The birth defect caused by a baby’s inability to digest protein is:
   A. Fetal Alcohol Syndrome
   B. Cerebral Palsy
   C. Neural Tube Defect
   D. PKU

Day 3 Lifestyle and Environment Influences

1. Risk for genetic Birth Defect increases due to the Mom’s age, what is the optimum age to have a baby?
   A. 15 – 25
   B. 20 – 35
   C. 25 - 40
   D. 15 - 40

2. Which trimester is the fetus at greatest vulnerability to a Birth Defect, especially one’s caused by medication/drugs/alcohol?
   A. First Trimester
   B. Second Trimester
   C. Third Trimester
   D. Second and Third Trimester

3. Folic acid reduces the risk of this neurological birth defect that occurs in the first weeks of pregnancy:
   A. Neural Tube Defect
   B. Diabetes
   C. Cleft Lip / Palate
   D. Down’s Syndrome

4. A physical and mental Birth Defect caused by excessive or steady alcohol consumption during pregnancy is:
   A. Rh Factor
   B. Toxemia / Pre-eclampsia
   C. Fetal Alcohol Syndrome
   D. PKU

Day 4 Teaching Kids about Sex / Male Reproduction

1. All are reasons for teaching kids about sexuality except:
   A. Correct Facts
   B. Know how to have Sex
   C. Clarify values and morals
   D. Improve communication

2. Which is not a guideline for teaching kids about sexuality?
   A. Use correct terminology
   B. Teach on their level when they start asking questions
   C. Children are naturally curious, don’t panic
   D. Put it off and hope somebody else will teach it

3. The male sex cell develops in the:
   A. Seminal Veseicle
   B. Testicle (Testes)
   C. Vas Defereens
   D. Prostate Gland

4. The Sugary sticky fluid that contains sperm is called
   A. Semen
   B. Prostate fluid
   C. Seminal fluid
   D. Cowper’s fluid
### Day 5 Female Reproduction and Conception

1. Fertilization usually takes place in the:
   - A. Uterus
   - B. Fallopian Tube
   - C. Ovary
   - D. Cervix

2. The ovum is released from the
   - A. Ovary
   - B. Fallopian Tube
   - C. Uterus
   - D. Cervix

3. The opening to the uterus is called:
   - A. Vagina
   - B. Fallopian Tube
   - C. Cervix
   - D. Ovary

4. How many chromosomes are contained in each mature sex cell (sperm and ova)?
   - A. 16
   - B. 23
   - C. 32
   - D. 46

5. The cycle in which an egg is released, the uterus prepares for a possible pregnancy, and the endometrium lining thins
   - A. Ovulation
   - B. Miscarriage
   - C. Fertilization
   - D. Menstruation

### Day 6 Teen Pregnancy

1. A pregnant teen’s baby is at greatest risk for:
   - A. Toxemia
   - B. Gestational Diabetes
   - C. Still Birth
   - D. Low Birth Weight

2. Which statement regarding Teen parents is true:
   - A. Teens make better parents because the age span between the parent and the child is small.
   - B. A pregnancy will not alter a teenager’s lifestyle
   - C. Teen pregnancy poses more health risks for the expectant mother and baby.
   - D. A female under the age of 18 who becomes pregnant faces fewer health risks than an older female.

3. Two invalid reason for becoming a parent is:
   - A. To love children and want to care for them
   - B. To experience the bond between a parent and a child
   - C. To feel loved and needed by somebody
   - D. To strengthen a shaky relationship

4. Which statement is true about an undernourished pregnant woman?
   - a. The placenta does not transfer essential nutrients to the fetus
   - b. The fetus can still be adequately nourished by the mother
   - c. Vitamin supplements can provide all the adequate nutrition
   - d. Fetal growth will be increased in the first trimester

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**Diagram:**

- A: Uterus
- B: Fallopian Tube
- C: Ovary
- D: Cervix
- E: Uterine lining
- F: Ovary
- G: Fallopian tube
- H: Uterine opening
- I: Ovum

**Put an X where fertilization will occur:**
A. UNDERSTANDING HEREDITY and GENETICS
Assignment #1 scenario  Assignment #2 Genetic Gamble

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.

Assignment #1 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 and more often revealed where recessive genes are weaker and less often reveal themselves.

5. _______ In the formation of a new individual where one gene is recessive and the other is dominant, the dominant will overpower.

6. _______ It is possible that a dominant brown-eyed mother and a recessive blue-eyed father will have a brown-eyed child.

7. _______ It is possible that a child can have recessive light colored hair even though both of his parents have dominant dark colored hair.

8. _______ The female sex cell is the ovum with XY chromosomes and the male sex cell is the sperm with XX chromosomes.

9. _______ Each sperm cell and ovum cell carries 23 chromosomes and when the egg is fertilized, the sex cell will have 46 new eggs.

10. _______ 50% of the chromosomes comes from the father, but he determines the sex of the child.

11. _______ Twitterpation is the union of an ovum and a sperm or the beginning of pregnancy.

12. _______ Fraternal non-identical multiple births that come from two different eggs will look identical.

13. _______ Identical multiple births that come from one fertilized egg can be different sexes.

14. _______ Double jointed twins are when the ovum splits apart but the separation is not complete.
**B. Explain Factors of Birth Defects**

Assignment #4 Birth Defects Chart

**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, misshapen, 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.
<table>
<thead>
<tr>
<th>Birth Defect</th>
<th>People Affected and/or When this appears</th>
<th>Method of Inheritance (use your study guide questions # 4-10 sect B)</th>
<th>Effects on the person</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleft lip/ Cleft Palate</td>
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<tr>
<td>Clubfoot</td>
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<tr>
<td>Cystic fibrosis</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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<tr>
<td>Spina Bifida Neural Tube Defects</td>
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<tr>
<td>1 Drug Related Birth Defect</td>
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<tr>
<td>1 Sexually Transmitted Infection birth defect</td>
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</tbody>
</table>

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?
C. Identify Lifestyle and Environmental Factors influencing birth defects

BIRTH DEFECTS CAUSED BY LIFESTYLES AND ENVIRONMENT
Match the words in the word bank with its definition.

General anesthetic active immunization shots weight gain rest and relaxation blood type tobacco pollution malnutrition street drugs miscarriage toxins calorie intake rubella withdrawal low birth weight pre-natal doctor visits premature folic acid weeks food guide pyramid feeding a fetus medication radiation alcohol still born sexually transmitted diseases fetal alcohol syndrome sexually active caffeine 20 – 35

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 woman.

5. _________________________ Follow this to ensure a pregnant person gets a proper diet and amounts of nutrients.

6. _________________________ Lack of this nutrient contributes to a neural tube defect which will occur before the mom even knows she’s pregnant.

7. _________________________ 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.

8. _________________________ This is the number one cause of birth defects.

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 if you are pregnant so as not to harm the developing fetus. Better to be cautious than 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. _______________________ 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.

32. What Student organization/club relates to this class?  
33. What is today’s date?  
34. What Department is this class listed under?  
35. What is the next class you can take after Child Development?
D. Explain Correct Facts Concerning Reproduction and Conception
Assignment #5 Seymour and Olivia

1. What are 5 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. Explain your __________________________ standpoint as part of every ____________________.

   6. Always leave the __________________________ for more ____________________ later.

   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
Assignment #3 Teen Sex Pregnancy thoughts
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>
<td></td>
</tr>
<tr>
<td>Financially</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emotionally</td>
<td></td>
<td></td>
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<tr>
<td>Socially</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Risks to the baby</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Risks to the Mother</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. Can you have a good dating relationship without having sex?

2. At what age would 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? Explain:

What would they say? (if you had to tell them today that you were about to become a parent)

<table>
<thead>
<tr>
<th>My Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>My Friends</td>
</tr>
<tr>
<td>My Brothers and Sisters (if you had any)</td>
</tr>
<tr>
<td>My Grandparents</td>
</tr>
<tr>
<td>My Employer (if you had a job, then)</td>
</tr>
<tr>
<td>The person I am dating (or would be dating)</td>
</tr>
</tbody>
</table>
THE MENSTRUAL CYCLE (SE-8)

DURING MENSTRUATION
Days 1-5:

AFTER MENSTRUATION:
Days 6-15:

BEFORE MENSTRUATION:
Days 16-28:
Once upon a time in a far away place called Loveville, there lived a small charming young fellow named Seymour J. Sperm. He began his life in an almond-shaped gland called a **t**which was located in a sac called the **s**. This sac hung under a long organ called a **p** through which either **u** or **s** passed (but not at the same time).

Although young, immature, and underdeveloped, Seymour was a dreamer, yearning for far away places. Perhaps even a lovely female sex cell might be in his future. Before he could seek his fortune, however, he needed time to mature and become strong. So, he moved upstairs into the **e** with millions of his pals and waited until he grew up.

On the other side of town, a young egg cell named Olivia **o** had been developing with many of her friends in an almond-shaped gland called the **o**. She had been there since her mistress’s birth waiting for her turn to be sent out into the world, hopefully to meet her special guy. The day finally arrived when Olivia was forced out of the **o** and drawn into a nearby **f** tube by a waving finger-like structure called fimbriae. Carried along by the slight contractions of this tube, she came to rest about one-third of the way from where she had entered, excited by the possibility of meeting the man of her dreams. She knew that she’d only be around for about 8 to **h** hours, so she hoped he’d hurry.

Seymour, by this time, felt quite strong and ready to face the world. One day, he noticed an unusual excitement around him as if something important was about to happen. All of a sudden he felt himself being pushed into the **v**,** d**,** s** which was produced by the **s**. He felt full of energy now and began to swim vigorously into the ejaculations duct, which passed through the **p**,** g** and received even more sticky fluid. At just the right time, Seymour was forced through the **u**, a tube which usually carried urine (but not now). This tube
could be found on the underside of a long organ called the p __ __ __ __ which was now hard and filled with blood, “WOW” thought Seymour, “What a Trip!”

Propelled out of the p __ __ __ __, Seymour found himself at the back of a long tunnel called the v __ __ __ __ __. Ahead was a round doughnut-shaped structure called the c __ __ __ __ with an open hole in the center. Bulls eye! He raced for the target with his buddies in close pursuit. Seymour had to hurry, he only had 24 to ___ hours to reach the lovely female sex cell. Full of energy and determination, he swam swiftly through the donut shaped whole called the c __ __ __ __ __ and into the bottom of a pear-shaped organ called the u __ __ __ __ whose walls were covered with a thick spongy lining of blood vessels. Would he find her, the sex cell of his dreams? Seymour whipped his tail as hard as he could as he moved up through this organ until suddenly, he came to a “T” intersection where the f __ __ __ __ __ __ __ __ tubes were located. Which way should he turn? Looking back over his shoulder, he saw his buddies closing in on him. Now he was really nervous. Turn left? Turn right? Realizing that he only had a 50% chance of success, Seymour took a big breath and swam left.

Soon he entered the long narrow place called the f __ __ __ __ __ __ __ __ tube. He swam quickly along its length until there, near the other end, he saw her quietly waiting. His heart skipped a beat. He moved swiftly, closer and closer until he met her. Seymour broke through Olivia’s outer cell membrane that surrounded her and then penetrated her center cell nucleus. Seymour and Olivia each joined their __ __ chromosomes to make __ __ total chromosomes and to begin a new life. The newly formed cell, called a zygote, moved down the f __ __ __ __ __ __ __ __ tube and found a cozy spot in the e __ __ __ __ __ __ __ __ __ __ lining of the uterus. Here, it was to develop into an embryo and then into a fetus which would emerge through the v __ __ __ __ __ in about __ months as a new baby. Seymour and Olivia had met, merged, and lived happily ever after.