# NORWIN SCHOOL DISTRICT
## LESSON PLAN

**SUBJECT:** 9th Grade Academic Biology

**DATE:** March 16, 2010

**Return Tests 2 and Chapter 9 Introduction**

<table>
<thead>
<tr>
<th>STATE STANDARD NUMBER</th>
<th>OBJECTIVES</th>
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</thead>
<tbody>
<tr>
<td>3.3.10.C NS.9-12.3</td>
<td><strong>OBJECTIVE:</strong> SWBAT compare the process of mitosis and meiosis, as well as compare the end products of mitosis with those of meiosis.</td>
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<tr>
<td>3.3.10.C NS.9-12.3</td>
<td><strong>OBJECTIVE:</strong> SWBAT recall and explain the events of the cell cycle, binary fission, gametogenesis, and DNA packaging.</td>
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<tr>
<td>3.3.10.C NS.9-12.3</td>
<td><strong>OBJECTIVE:</strong> SWBAT identify Gregor Mendel and his contributions to the field of Genetics.</td>
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<td>3.3.10.C NS.9-12.3</td>
<td><strong>OBJECTIVE:</strong> SWBAT describe the steps involved in Mendel's experiments on garden peas.</td>
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<tr>
<td>3.3.10.C NS.9-12.3</td>
<td><strong>OBJECTIVE:</strong> SWBAT distinguish between dominant and recessive traits.</td>
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<tr>
<td>3.3.10.C NS.9-12.3</td>
<td><strong>OBJECTIVE:</strong> SWBAT state three principles of heredity that were developed from Mendel's work.</td>
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## PROCEDURES/ACTIVITIES:

**Periods 3 and 7 Only:**

1. Return the students' graded essays from the Chapter 8 test. Go over the correct answers. Selected students should read excerpts from their essays (Period 3: and, Period 7: and).

2. Make sure that all students have the first three pages from the Chapter 9: Genetics unit.

3. Begin introducing Chapter 9 and Gregor Mendel to the students.

**Periods 1, 3, and 7:**

4. Show the students the "Gregor Mendel from the Garden to the Genome" video. Students should take notes on five interesting facts about Gregor Mendel.
   - Period 1 will begin watching this video where they stopped yesterday (~16:30).

5. Asking for student participation, list all of the interesting facts that the students learned from the video on the whiteboard.

   - The students should take notes in their 9.1 note packets from the PowerPoint presentation and my comments.

## MATERIALS:

1. Computer, Projector, and Speakers
2. Handout: Students' Graded Essays from Chapter 8 Test
3. Handouts for Chapter 9
4. "Gregor Mendel from the Garden to the Genome" Video: http://www.youtube.com/watch?v=6OPJnO9W_rQ
5. Chapter 9 PowerPoint Presentation
6. Handout: Chapter 9.1 Student Notes
7. Handout: 9.1 Homework

### EVALUATION/ASSESSMENT:

**Informal Assessment:**
- Check for understanding by asking if the students have questions about Chapter 8.
- The students will take notes about Gregor Mendel in their notebooks. We will generate a class list on the whiteboard after watching the "Gregor Mendel from the Garden to the Genome" video. (The students will each be responsible for five facts.)

**Formal Assessment:**
- Return the students' graded essays from the Chapter 8 test.
- Assign homework from section 9.1 (to be due after the entire lecture is completed).

### PERSONAL REFLECTION:

Period 1 was frustrating today, since the students were very quiet and did not participate much during the lecture. Not only do the students in Period 1 not speak, but they do not look engaged or interested at all (except for a few students). I did my best to encourage their participation, but will continue to work with this class during my future lessons.

The students in Period 3 were much louder and interested in the lesson than the students in Period 1. However, during the viewing of the "Gregor Mendel from the Garden to the Genome" video, many of the students were falling asleep. Halfway throughout the video, I decided to have a "stretch break" so that the students could "wake up". In the future, I could try to make the students take notes throughout the video, or I could test them on the material. This experience also made me realize that some students may fall asleep during the viewing of videos, no matter what activity I have planned for them to do while watching.

Mrs. [___] commented that I needed to work on the closure portion of my lesson in Period 3. I lectured right up to the time when the bell rang, and did not leave any time for closure. I am glad that she pointed this out to me, and will definitely be sure to have closure in all future lessons.

Period 7 was successful, although I did not teach during the entire class. I had to leave class early to go to Duquesne University for the portfolio review seminar.

Submitted By: Allison Pogue
Chapter 9
Fundamentals of Genetics

Gregor Mendel

Gregor Mendel
- Entered a monastery in Brunn, Austria in 1842, at the age of 21.
- In 1851, he entered the University of Vienna to study science and mathematics.
- Mendel returned to Brno to teach high school. He also tended to a garden plot at the monastery.

Why Pea Plants?
- A large number of offspring are obtained with each cross.
- Pea plants take up a small area to grow.
- Easily distinguishable traits.
- Fast maturation process.
- They're inexpensive.
- It is easy to control their reproduction.

Objectives:
- Describe the steps involved in Mendel's experiments on garden peas.
- Distinguish between dominant and recessive traits.
- State three principles of heredity that were developed from Mendel's work.
- Describe how Mendel's results can be explained by scientific knowledge of genes and chromosomes.
- Explain the difference between an allele and a gene.

Section 9-1
Mendel's Legacy

Mendel spent two years breeding "PURE" pea plants. In 1822, he
- With the help of two full-time assistants, he repeatedly bred and crossbred hybrids from
  THIRTY THOUSAND pea plants!
- He spent over 8 YEARS on his experiments.

Why Pea Plants?
- A large number of offspring are obtained with each cross.
- Pea plants take up a small area to grow.
- Easily distinguishable traits.
- Fast maturation process.
- They're inexpensive.
- It is easy to control their reproduction.
SUBJECT: 9th Grade Academic Biology  
Chapter 9, Section 2: Genetic Crosses  
DATE: March 18, 2010

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<th>OBJECTIVES</th>
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<tbody>
<tr>
<td>3.3.10.C NS.9-12.3</td>
<td>OBJECTIVE: SWBAT simulate Mendel's experiments with pea plants by studying the pea seed color of P, F1, and F2 generations.</td>
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<tr>
<td>3.3.10.C NS.9-12.3</td>
<td>OBJECTIVE: SWBAT define and use the vocabulary terms homozygous, heterozygous, dominant, recessive, genotype, and phenotype.</td>
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<tr>
<td>3.3.10.C NS.9-12.3</td>
<td>OBJECTIVE: SWBAT explain how probability is used to predict the results of genetic crosses.</td>
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<tr>
<td>3.3.10.C NS.9-12.3</td>
<td>OBJECTIVE: SWBAT use a Punnett square to predict the results of monohybrid crosses.</td>
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PROCEDURES/ACTIVITIES:

1. Remind the students of the procedures for the severe weather drill.
2. Announce the quiz on Monday.
3. Return the students' graded lab activities, "Like Peas in a Pod".
   - Go over the correct answers to the lab worksheets and analyze the students' results as a class.
   - Use this worksheet as an opportunity to review the content from the section 9.1 notes and lecture.
4. Introduce section 9.2 to the students. Explain that they will now be learning about genetic crosses, probability, and the "lingo" of Genetics.
   - Review the daily objectives with the students from the list on the whiteboard.
5. Project the first section of the students' section 9.2 notes on the whiteboard.
   - With student input, fill in the "genotype and phenotype" table in the student note packet.
   - Work through the remainder of this note packet with the students, discussing the terms "homozygous" and "heterozygous", as well as probability.
6. Using the students' notepackets for the second part of section 9.2, teach the students how to complete a Punnett square.
   - Explain to the students background information about Punnett squares and Reginald Punnett.
   - Define the term "monohybrid cross".
   - Assess the students' prior knowledge by using their input to walk through Punnett square examples.
7. Students should work on problems from the purple Punnett square practice packet.
   - Students will use the "think-pair-share" method to complete the Punnett squares.
- Some students will draw their Punnett squares on the whiteboard and explain to the class what methods they used for solving the Punnett square problem.

8. Depending on the students' abilities and understanding of Punnett squares, assign some of the remaining problems as homework.

(Closure)

9. Reiterate the purpose of the lesson, and check for student understanding. Tell the students what tomorrow's lesson topic will be.

(Closure)

**MATERIALS:**

1. Handout: Students' Graded "Like Peas in a Pod" Laboratory Activity
2. Computer and Projector
3. Chapter 9 PowerPoint Presentation (Projection of Student Notes)
4. Handout: Chapter 9.2 Student Notes Part 1
5. Handout: Chapter 9.2 Student Notes Part 2 (Punnett Square Practice)
6. Handout: Purple Punnett Square Practice Problems (Sets #1-3)

**EVALUATION/ASSESSMENT:**

Informal Assessment:
- Check for understanding by using questioning throughout the lecture.
- Answer the students' questions during the lecture, and especially when reviewing from yesterday's lesson.
- Ask for student participation when explaining how to write genotypes and phenotypes and when completing monohybrid crosses using Punnett squares.
- Circulate throughout the classroom when the students are working individually and with partners to complete practice problems in the purple Punnett square practice packet.

Formal Assessment:
- Return the students' graded "Like Peas in a Pod" laboratory activity worksheets.
- There will be a quiz on Monday, March 22, 2010.
- Assign problems from the purple Punnett square practice packet as homework.

**PERSONAL REFLECTION:**

The Period 1 class went very well today; this lesson was successful, despite all of the objectives not being met. Due to time constraints, I was unable to address the last two objectives. However, the students understood the correct definition and use of the words, heterozygous, homozygous, dominant, recessive, genotype, and phenotype. I was able to assess the students' understanding when I circulated throughout the room, as well as when I asked students to come to the whiteboard to show their classmates how they completed the practice problems.

This lesson was very interactive. The students' explained their answers to the laboratory worksheet from the "Like Peas in a Pod" lab; they participated in filling in the genotype/phenotype and heterozygous/homozygous charts; they completed the genotype/phenotype practice problems and put their answers on the whiteboard. More students were willing to participate in this lesson, although I also called on many students that did not raise their hands at all.

If I could teach this lesson again, I would be sure to leave more time for closure at the end of my
lesson. While I was trying to wrap everything up, the period ended abruptly. I am trying to improve my closure, and I will continue to work on this issue in future lessons.

Submitted By: [Signature]
Like Peas in a Pod

1. In the Parent (P) Generation, there is one yellow seed from a pure yellow plant and one green seed from a pure green plant.

2. What is self-pollination?
   - Pollen is transferred from the **anthers** of a flower to the **stigma** of the **same** flower or a flower from the **same** plant.

3. a. What color do you think the offspring's seeds will be if you self-pollinate the plant from which the green seed came from (a pure green plant)? **Green**
   b. What color do you think the offspring will be if you self-pollinate the plant from which the yellow seed came from (a pure yellow plant)? **Yellow**

4. What is cross-pollination? **Involves fertilization from the flowers of separate plants.**

5. When you cross-pollinate the Parent plants (pure yellow seeds x pure green seeds), what could you call the offspring? **F1**

6. If you cross-pollinate a pure yellow pea plant with a pure green pea plant (pure yellow seeds x pure green seeds), what color do you hypothesize the offspring will be? **Yellow** because it's the dominant gene for the color of seeds.