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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 1
Lesson
3

Lesson Exemplar for Science Grade 8
Quarter 1: Lesson 3 of 5 (Week 4)
SY 2025-2026

Development Team

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SCIENCE /QUARTER 1/GRADE 8

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	The learners learn that: 1. Inherited traits passed from parents to offspring are governed by the rules on the patterns of inheritance.
B. Performance Standards	By the end of the Quarter, learners learn to represent patterns of inheritance and predict simple ratios of offspring.
C. Learning Competencies and Objectives	***Learning Competency*** 1. Describe simple patterns of inheritance in organisms 2. Represent patterns of inheritance of a simple dominant/ recessive characteristic through generations of a family. ***Learning Objectives:*** Students should be able to: 1. Determine the process of creating Punnett squares 2. Predict simple ratios of offspring genotypes and phenotypes in crosses involving dominant/recessive gene pairs through Punnett squares 3. Solve simple problems on genetic inheritance through Punnett squares
D. Content	Topic: Predicting Traits Sub-topic: Monohybrid and Dihybrid Crosses
E. Integration	Discussing Punnett squares can address genetic diversity (SDG 10) and the importance of recognizing and valuing differences among individuals and populations.

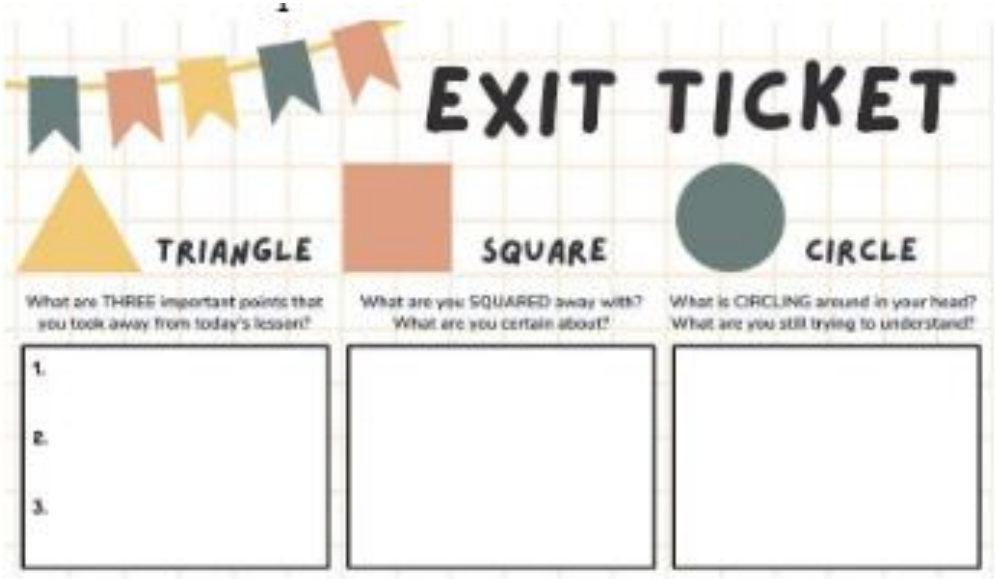
II. LEARNING RESOURCES
Genetic Crosses Worksheet. (n.d.). [Worksheet]. Retrieved from https://www.currituck.k12.nc.us/cms/lib/NC01001303/Centricity/Domain/149/Genetic_Crosses_Worksheet.pdf

<table>
<tr><th colspan="2">III. TEACHING AND LEARNING PROCEDURE</th><th>NOTES TO TEACHERS</th></tr>
<tr><td>A. Activating Prior Knowledge</td><td>
Day 1
1. Short Review
• Facilitate a game called "Gene Genius' to review students on concepts in genetics in an engaging and interactive way. Players will answer questions related to genetics and Punnett squares to earn points and demonstrate their understanding of the material.
• Divide the players into teams of 2-4 members each.
• Set up the scoreboard or scoring system where teams can track their points. (See sample score board)
• Prepare question cards with genetics-related questions of varying difficulty levels. Include questions on genetic inheritance, traits, and other related concepts.
• Each team selects a representative to start the game. The representatives will take turns drawing question cards and answering them.
• The first team selects a question card from the deck. The team representative reads the question aloud to their team.
• The team has a set amount of time (e.g., 30 seconds to 1 minute) to discuss and come up with an answer.
• After the time is up, the team representative provides the answer. If correct, the team earns points based on the question's difficulty level. If incorrect, the question goes to the next team for a chance to steal the points.
• Rotate the team representatives after each question, so every member gets a chance to participate.
• Continue playing until all the question cards have been used or until a predetermined endpoint (e.g., a certain number of rounds or a set time limit).
• The team with the most points at the end of the game wins the title of "Gene Genius."

2. Feedback (Optional)
</td><td>
Sample Question Board
<table>
<tr><td>Easy</td><td>Medium</td><td>Difficult</td><td>Bonus</td></tr>
<tr><td>Q 1</td><td>Q 4</td><td>Q 7</td><td>B 1</td></tr>
<tr><td>Q 2</td><td>Q 5</td><td>Q 8</td><td>B 2</td></tr>
<tr><td>Q 3</td><td>Q 6</td><td>Q 9</td><td>B 3</td></tr>
</table>
• Easy question: 1 point
• Medium question: 2 points
• Difficult question: 3 points
• Bonus points can be awarded for particularly challenging questions or creative answers
</td></tr>
</table>

B. Establishing Lesson Purpose	**1. Lesson Purpose** • In a city hospital, a mix-up of the most curious kind unfolded. Daddy Willy and Mommy Celia welcomed their newest addition, Baby Volty with short fair skin, into the world. But instead of joy, confusion reigned supreme. Mommy Celia was convinced of a hospital blunder, alleging their baby had been swapped. Daddy Willy, a homozygous for his dark skin, and Mommy Celia, heterozygous with a history of fair-skinned relatives would like to know if indeed Baby Brandy is their child. How can you help them? • *Guide Question*: 1. How can you help solve the problem of Daddy Willy and Mommy Celia? 2. How can you predict the characteristics of an offspring of an organism? **2. Unlocking Content Area Vocabulary** **Activity 1.** • Let students read the story in the LAS – Activity. • Instruct students to highlight or mark terms that are related to genetics and describe what they mean. The following are some words to unlock: a. **Genotype**: The genetic makeup of an organism, consisting of the alleles it inherits from its parents. b. **Phenotype**: The observable traits or characteristics of an organism, resulting from its genotype and influenced by environmental factors. c. **Homozygous**: Having two identical alleles for a particular gene (e.g., homozygous dominant or homozygous recessive). d. **Heterozygous**: Having two different alleles for a particular gene (e.g., one dominant and one recessive allele). e. **Genotypic Ratio**: The ratio of different genotypes produced by a genetic cross, representing the probability of each genotype occurring among the offspring. f. **Phenotypic Ratio**: The ratio of different phenotypes produced by a genetic cross, representing the probability of each phenotype occurring among the offspring.	See Learning Activity Sheet: *Activity #1: "The Colorful Tale of Bella, Benny, and Their Butterfly Brood: A Story of Genetics and Diversity"*

	• *Ask the following guide questions:* a. Which words are related to genetics? b. How are these words important for predicting the trait of an offspring?	
C. Developing and Deepening Understanding	**Day 2** **1. Explicitation** **Activity 2.** • This activity will allow students to visualize the characteristics of their future children. In effect, it will give them an idea in predicting traits of their own offspring. • Facilitate a classroom discussion about the activity. *Guide questions:* 1. What traits would you like your children to have? From your future wife or husband? Why? 2. How will you predict if such traits are inherited? **Day 3** **2. Worked Example** **Activity 3.** • Introduce Punnett squares as a tool for predicting offspring genotypes and phenotypes in genetic crosses. • Model how to set up and use Punnett squares using examples related to the trait studied in the pedigrees. • Discuss the dihybrid and monohybrid cross. • Clarify any misconceptions and ensure students understand the difference between genotype and phenotype. • Let students accomplish LAS Activity. • Assign groups to present their work in class and check students' answers. **Day 4** **3. Lesson Activity** • Provide each group with a different genetic cross involving the trait studied (e.g., homozygous dominant x homozygous recessive).	See Learning Activity Sheet: *Activity #2: My Future family* See Learning Activity Sheet: *Activity #3: Patterns of Inheritance*

	• Instruct students to predict the genotypic and phenotypic ratios of the offspring using Punnett squares. • Encourage students to discuss their predictions within their groups and justify their reasoning. • Have each group present their predictions to the class and facilitate a discussion comparing and contrasting the different crosses.	Teachers are encouraged to provide their genetic problems on mono and dihybrid crosses.
D. Making Generalizations	**1. Learners' Takeaways** Let students accomplish the exit ticket below:  **2. Reflection on Learning** • Have students reflect on their traits as individuals. Let students answer the question "Do you like your traits? Why or why not?" • Emphasize the importance of accepting and loving oneself and traits.	The teacher may propose other activities for the learners to describe their understanding of a concept, idea, and skill covered in the previous topic. Image Source: pbs.twimg.com The teacher should allow the learners to document their ways on how they think about their learning (metacognition).

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**1. Formative Assessment** Let students answer the following multiple choice test questions: 1. In a monohybrid cross between two heterozygous individuals (Rr x Rr), what is the expected genotypic ratio of the offspring? A) 1:1 B) 1:2:1 C) 3:1 D) 9:3:3:1 2. What is the phenotype of an organism with the genotype AaBb? A) Homozygous dominant B) Homozygous recessive C) Heterozygous D) None of the above 3. In a dihybrid cross between two individuals heterozygous for both traits (RrYy x RrYy), what is the expected phenotypic ratio of the offspring? A) 9:3:3:1 B) 3:1 C) 1:2:1 D) 1:1 4. If a trait is controlled by a single gene with two alleles, and one allele is completely dominant over the other, what will be the phenotype of a heterozygous individual? A) Same as the homozygous dominant individual B) Same as the homozygous recessive individual C) A blend of both dominant and recessive traits D) None of the above 5. What is the genotype of an individual with the phenotype of a recessive trait? A) Homozygous dominant	Answer Key: 1. B) 1:2:1 2. C) Heterozygous 3. A) 9:3:3:1 4. A) Same as the homozygous dominant individual 5. B) Homozygous recessive 6. B) Yy 7. A) 1/4 8. A) 1/16 9. B) Codominance 10. C) 9:3:3:1

B) Homozygous recessive
C) Heterozygous
D) Cannot be determined

6. If a pea plant with yellow seeds (YY) is crossed with a pea plant with green seeds (yy), what will be the genotype of the F1 generation?
A) YY
B) Yy
C) yy
D) Both YY and Yy

7. In a monohybrid cross between two heterozygous individuals (Ss x Ss), what is the probability of producing a homozygous recessive offspring?
A) 1/4
B) 1/2
C) 1/3
D) 1/8

8. In a dihybrid cross between two individuals heterozygous for both traits (RrYy x RrYy), what is the probability of producing an offspring with the genotype rrYY?
A) 1/16
B) 1/8
C) 1/4
D) 1/2

9. If a trait is controlled by a single gene with two alleles, and both alleles are expressed equally in the heterozygous condition, what kind of inheritance pattern does it exhibit?
A) Incomplete dominance
B) Codominance
C) Multiple alleles
D) Polygenic inheritance

10. What is the expected genotypic ratio of the offspring in a dihybrid cross between two individuals heterozygous for both traits (RrYy x RrYy)?

<table>
<tr><td></td><td colspan="3">A) 1:2:1
B) 1:1:1:1
C) 9:3:3:1
D) 3:1

2. Homework (Optional)</td><td>The teacher may give homework for extended deliberate practice.</td></tr>
<tr><td rowspan="5">A. Teacher's Remarks</td><td>Note observations on any of the following areas:</td><td>Effective Practices</td><td>Problems Encountered</td><td rowspan="5">This lesson design component prompts the teacher to record relevant observations and/or critical teaching events that he/she can reflect on to assess the achievement of objectives.

The documenting of experiences is guided by possible areas for observation including teaching strategies employed, instructional materials used, learners' engagement in the tasks, and other notable instructional areas.

Notes here can also be on tasks that will be continued the next day or additional activities needed.</td></tr>
<tr><td>strategies explored</td><td></td><td></td></tr>
<tr><td>materials used</td><td></td><td></td></tr>
<tr><td>learner engagement/ interaction</td><td></td><td></td></tr>
<tr><td>others</td><td></td><td></td></tr>
<tr><td>B. Teacher's Reflection</td><td colspan="3">Reflection guide or prompt can be on:
▪ <u>principles behind the teaching</u>
What principles and beliefs informed my lesson?
Why did I teach the lesson the way I did?</td><td>This lesson design component guides the teacher in reflecting on and for practice. Entries on this component will serve as inputs for the LAC sessions,</td></tr>
</table>

	▪ *students* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* ▪ *ways forward* *What could I have done differently?* *What can I explore in the next lesson?*	which can center on sharing the best practices discussing problems encountered and actions to be taken; and identifying anticipated challenges and intended solutions. Guide questions or prompts may be provided here.