4th Period: 7th Grade Science	
Date	Lesson

Tuesday 03/28/ 2017

Dog DNA: A Recipe for Traits

Lesson:

EQ: What is heredity?
Daily Objective: Students will discover how DNA will "code" for traits by performing a lab activity where segments of paper DNA (genes) are picked at random, a list of traits is made, and a dog is drawn featuring its genetic traits.
"I can determine how DNA will "code" for traits."
Bell Ringer: in INB on page 30, Write and answer the following question: What is DNA and where is it stored in a cell?

Students should know that most cells have a nucleus, and inside the nucleus there is a set of chemical instructions for reproduction, called "DNA."
Class discussion/go over any misconceptions.

Hook/ Activate Prior Knowledge: Students should know about cells, the nucleus, and DNA. Students should know that the DNA in a nucleus has instructions for cell reproduction.
--see bell ringer

Instruction:

Guiding Questions: What are the guiding questions for this lesson?

What is a trait?
What is a gene? How do genes in DNA determine a trait?

- **Teaching Phase: How will the teacher present the concept or skill to students?**

1) Teacher will ask students to use tablets to search for a picture of their favorite dog breeds, then ask students to compare with other students and create a list of how they are alike and how they are different.
2) Teacher will introduce the term "trait" as a characteristic in an organism.
3) Students will explore traits by performing a lab activity involving Dog DNA: "A Recipe for Traits" from the Genetic Science Learning Center, teach.genetics.utah.edu/

- **Guided Practice: What activities or exercises will the students complete with teacher guidance?**

"A Recipe for Traits"--download as a PDF file

- **Independent Practice: What activities or exercises will students complete to reinforce the concepts and skills developed in the lesson?**

Homework: Students will make a list of 5 traits they inherited from their biological parents, including which parent passed on that trait to themselves. Students may also describe any traits they share or do not share with their biological siblings.

- **Closure: How will the teacher assist students in organizing the knowledge gained in the lesson?**

Students will draw their dogs with their traits, then attach the DNA to their drawings, and display their canine creations.
Students will also write down three observations/discoveries in their Science Journals.

Extensions:

Students may research different breeds of dogs, cats, horses, cattle, and other domesticated animals to discover how humans have performed selective breeding for specific traits. This can also apply to research on plants, such as food crops and ornamental plants. Students may explore why particular traits have been favored or not over time.

Assessment:

- **Summative Assessment**

  Students will display their dog drawing featuring the traits and the DNA strands, and will write down three observations/discoveries made by the end of the lab activity in their Science Journals (later read by the teacher).

- **Formative Assessment**

  Teacher should review parts of the cell prior to this lesson, particularly the nucleus, and remind students that the nucleus holds chemical instructions (DNA) for reproduction.

Reflection (**What worked and what didn't? How should assessment results adjust instruction?**):
Students will have to draw a picture of a dog with traits "coded" from segments of paper DNA; teacher can check accuracy of traits in the drawing with traits recorded from the actual DNA "strands" the students attach to their drawings.

Materials / Resources / Technology:

Materials:
- Interactive Notebook/pencil
- Pictures of various dog breeds
- Drawing paper
- Coloring tools
- Scissors/paper cutter
- Downloaded PDF file and print-outs from teach.genetics.utah.edu website
- Copier
- 4 different colors of office paper
- Envelopes
- Invisible tape

Technology:
- Activeboard
- Tablets

ESE/504:

7th:
J.B.- repeat and clarify, instruction/test in small familiar setting, technology-speech output program, verbal encouragement, highlight key words, read aloud instructions and questions, accept verbal and allow written responses, dictate responses, extended time on assignments/ assessments, mask sections of assignments/tests, cues to direct attention, frequent breaks, eliminate answer choices, read comprehension passages and questions after student has independently done so, use of color transparencies

N.E.- repeat and clarify, instruction/test in small familiar setting, verbal encouragement, highlight key words, read aloud instructions and questions, extended time on assignments/assessments, mask sections of assignments/tests, accept verbal responses
C.K.- repeat and clarify, instruction/test in small familiar setting, verbal encouragement, highlight key words, read aloud instructions and questions, extended time on assignments/assessments, mask sections of assignments/tests
H.M.- repeat and clarify, instruction/test in small familiar setting, verbal encouragement, highlight key words, read aloud instructions and questions, extended time on assignments/assessments, mask sections of assignments/tests, accept verbal responses, eliminate answer choices, open book assessments, use color transparencies
K.W.- extended time and small group setting on assessments, frequent breaks as needed

Differentiation:

Content- collaborative learning for social and struggling learners
Delivery- small group; whole group discussion; audiovisual; independent practice; hands-on cooperative groups
Product- student responses will vary; output products unique but within assignment constraints

AVID/WICOR Strategies:

Writing
Students use the skill of writing to brainstorm, practice, demonstrate knowledge, or demonstrate mastery of content.
Inquiry
Students use questioning and inquiry to explore content.
Collaboration
Students collaborate with peers to strengthen knowledge, work as a team, and demonstrate mastery of content.
Organization
Students demonstrate the ability to organize information that creates easy access to their content knowledge.
Reading
Students use reading skills and strategies to access new content, reinforce learned content, or go beyond the content.

Standards

SC.7.L.16.1 Understand and explain that every organism requires a set of instructions that specifies its traits, that this hereditary information (DNA) contains genes located in the chromosomes of each cell, and that heredity is the passage of these instructions from one generation to another.