Daily Lesson Plan Template

Lesson Title: Dragon Genetics Lab, Part 1- Principles of Mendelian Genetics

Overview

Brief description of the lesson topic or activity

After learning about DNA, reproduction (specifically sexual), and basic genetics, students will complete this Dragon Genetics Lab (http://www.cpet.ufl.edu/wp-content/uploads/2013/03/Dragon-Genetics-Lab-Principles-of-Mendelian-Genetics.pdf). Students will learn about how chromosomes pass genetic information from parent to offspring, how traits can be inherited or learned, how generations change over time, and how certain traits are more advantageous than others.

Process Standards

List the process standards addressed in this lesson (include literacy standards)

Nature of Science

- Plan and carry out investigation- often over a period of several class lessons- as a class, in small groups or independently.
- Collect quantitative data with appropriate tools or technologies and use appropriate units to label numerical data.
- Incorporate variables that can be changed, measured or controlled.
- Test predictions with multiple trials
- Keep accurate records in a notebook during investigations.
- Analyze data, using appropriate mathematical manipulation as required, and use it to identify patterns. Make inferences based on these patterns.

The Design Process

- Throughout the entire design process, document the design with drawings (including labels) in a portfolio or notebook so that the process can be replicated.
- Redesign to improve the solution based on how well the solution meets the need.

Reading for Literacy in Science

- 6-8.RS.3: Follow precisely a multistep procedure when carrying out experiments or taking measurements.
- 6-8.RS.7: Integrate quantitative information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

Writing for Literacy in Science

6-8.WS.1, 6-8.WS.2, 6-8.WS.4, 6-8.WS.10, 6-8.RS.9

Content Standards

List the content standards and indicators covered in this lesson

Primary:

- 8.3.3: Explain that genetic information is transmitted from parents to offspring mostly by chromosomes.

Secondary:

- 8.3.5: Identify and describe the difference between inherited traits and the physical and behavioral traits that are acquired or learned.
- 8.3.7: Recognize and explain that small genetic differences between parents and offspring can accumulate in successive generations so that descendants may be different from their ancestors.

— 8.3.8: Examine traits of individuals within a population of organisms that may give them an advantage in survival and reproduction in given environments or when the environments change.

Essential Questions

List the question(s) that will drive this lesson/investigation

How do offspring get certain physical traits from their parents?

How do chromosomes work?

How are chromosomes, genes and DNA related? How are they different?

How do generations change over time (i.e. how do individuals change each generation)?

How are these traits and changes (dis)advantageous?

Objectives

The students will be able to…

— Identify which traits are inherited, and which are a product of nurture/the environment
— Explain how chromosomes, genes and DNA work (specifically chromosomes)
— Group individuals into lineages/families based on inherited traits
— Explain how/why descendants differ from their ancestors
— Differentiate between advantageous, non-advantageous and neutral traits

Co-Teaching Model

Describe how you will implement co-teaching in the lesson

Both teachers can go around to assess student knowledge, answer questions, and spark/further ideas. If the class is split in half or into groups (each trying to breed for different traits), one teacher can take on each group or a select number of groups.

Procedures

Describe your procedures for each of the following:

Preparation needs (lab or presentation materials, etc.)

Handout, chromosome popsicle sticks, pre-drawn dragons or templates for each body part

ENGAGE/Introducing the lesson (Describe how you will engage students in the lesson, assess prior knowledge, or present the question/problem/challenge for the day)

Prior to this lesson, students will learn about sexual and asexual reproduction, genes, and DNA. They will then do reading about chromosomes and inherited traits as their homework the night before. The day of this class, students will have a quick review of the information so that I can assess the knowledge they gained from the reading material. I will ask them if they understand how babies inherit traits from their parents, and introduce the idea of making our own babies (except way cooler than regular human babies!).

Student instructions for students

Instructions can be found on the handout linked at the top of the lesson plan. The teacher will clarify if necessary.

Activities or teacher presentations (Procedures/Plans)

A homework-assigned reading the night before, as well as a class discussion/review on the reading.

Productive Questions you anticipate using

What kind of traits do you think your dragon will inherit? Why?

How could you go about breeding for angry, violent or calm, happy dragons?

What changes were there between parents and offspring? How did they look similar/different?

Would selective breeding of dragons be beneficial or detrimental in any way? Could it be done?

How/when will you assess learning

I will ask productive questions throughout the process, hopefully talking to every student at least once. I can then use their final handout products as a means of assessing how well they understood the lab, especially before moving on to part 2 (selective breeding).

Closure: concept recap, preview, assignment

Students will share their final outcomes and relevant information, including answers to some of the above productive questions. We will have discussions around these questions, and I will answer any new questions that come up. Their homework assignment would be to try and answer the questions, "Using what you learned in class today, think about what kinds of traits were easy to pass on, and also difficult to pass on (a.k.a. dominant and recessive). If you had the chance to breed for select traits, what would you try to select for and why/how?" It would be a short essay, maybe two paragraphs, about five sentences each.

Resources/Materials

List presentation materials, lab equipment, handouts,

Handout, chromosome popsicle sticks, spare paper, colored pencils, stencils

Assessment/Evaluation

List the assessment instruments/worksheets/etc.

Handout with generational chromosomes and characteristics listed, drawing of the final dragon they created.

Presentation to class of the final product.

Participation/student involvement (Actively seeking out other students to "breed with," etc.)

Short essay answering closure questions.