Daily Lesson Plan Template

Lesson Title: Dragon Genetics Lab, Part 2- Selective Breeding

Overview

Brief description of the lesson topic or activity

After learning about basic genetics and natural reproduction in the 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 selective breeding/artificial selection, and participate in an "attempt" to selectively breed a dragon for pre-determined traits.

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: 8.3.10: Recognize and describe how new varieties of organisms have come about from selective breeding.

SECONDARY:

- 8.3.5: Identify and describe the difference between inherited traits and the physical and behavioral traits that are acquired or learned.
- 8.3.6: Observe anatomical structures of a variety of organisms and describe their similarities and differences. Use the data collected to organize the organisms into groups and predict their relatedness.

- 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 did we domesticate animals?

How does selective breeding relate to agriculture?

How did we get different breeds?

Objectives

The students will be able to…

- Identify which traits are inherited, and which are a product of nurture/the environment
- Determine the anatomical differences between individuals, as well as similarities
- 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
- Describe how selective breeding works
- Argue why selective breeding is beneficial/detrimental

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

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)

The day before, students will complete the first dragon genetics lab. They will have learned about meiosis, DNA, chromosomes and many other topics that need to be covered prior to this lab, through lectures, reading at home, and work in class. They will use their dragons produced from the day before, so I should have an idea of how well they caught on to various concepts. I will then introduce the idea of selective breeding, mentioning agriculture/plants, dog breeds, etc. I will then ask them to select their own traits to selectively breed for and use their fellow classmates as tools to achieve their goal.

Student instructions for students

Students will be told to use their papers from the day before to assess what kind of dragon traits they have, and what traits they want to try and breed for. They will be told to focus on three traits in particular. We will put up a projection or written list of who has what kind of dragon,

so students can find people to “breed” with in order to try and get babies that fit their desired outcome. They will follow similar instructions to the day before, in terms of how they “breed” and record their babies’ traits. They will breed up to 5 generations (or less if they can achieve all three quickly).

Activities or teacher presentations (Procedures/Plans)

Dragon Genetics Lab from the day before; a short intro power point on selective breeding and its use in society.

Productive Questions you anticipate using

How can you ensure that you will achieve (insert trait here)?

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

What traits did you have a hard time breeding for? What traits were easy?

What changed the most over several generations? What changed the least?

Why did you pick your particular traits? How would they be advantageous or not?

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

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.

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, how could you better go about breeding for your three selected traits? Would you still choose the same traits to breed for, and why or why not?” 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

Assessment/Evaluation

List the assessment instruments/worksheets/etc.

Handout with generational chromosomes and characteristics listed, including how many generations it took to get to a certain trait (or not), process behind breeding for said trait (why it was chosen, how they got there, etc.), and the genetics of each generation of dragons.

Presentation to class of the final product.

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