## Create a Critter Teacher Guide

**Title:** Code a Plant

**Grade:** 3rd

**Time:** 1 hour

**Lesson Overview:** In this lesson, students will be given a biome, and then they will be asked to create a critter that is best adapted to survive in that biome. Students will consider the various traits on the "decoder wheel," similar to a codon wheel, as they design their critters.

**Next Generation Science Standards (NGSS):**

### Performance Expectations:

- 3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.
- 3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.
- 3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.
- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

### Practices:

#### Developing and Using Models

● Develop and/or use models to describe and/or predict phenomena.

#### Analyzing and Interpreting Data

● Compare and contrast data collected by different groups in order to discuss similarities and differences in their findings.

#### Constructing Explanations and Designing Solutions

● Construct an explanation of observed relationships.

**Engaging in Argument from Evidence**

● Construct and/or support an argument with evidence, data, and/or a model.

**Crosscutting Concepts:**

**Cause and Effect**

● Cause and effect relationships are routinely identified, tested, and used to explain change.

**Patterns**

● Patterns can be used as evidence to support an explanation.

## Common Core State Standards (CCSS):

**Comprehension and Collaboration:**

CCSS.ELA-LITERACY.SL.3.1

Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.3.1.D

Explain their own ideas and understanding in light of the discussion.

**Vocabulary Acquisition and Use:**

CCSS.ELA-LITERACY.L.3.4

Determine or clarify the meaning of unknown and multiple-meaning word and phrases based on grade 3 reading and content, choosing flexibly from a range of strategies.

CCSS.ELA-LITERACY.L.3.5.B

Identify real-life connections between words and their use.

## Driving Question:

- Why are organisms different from one another?
- What affects organisms' survival?

**Learning Goals/Understandings:**

**Students will know…**

- the following vocabulary terms in context: adaptation, characteristics, code, function, genetic code, organism, pattern, sequence, structure, trait, variation.
- certain traits allow some critters to be better adapted to certain biomes than others.
- how to use a decoder wheel.

**Students will be able to…**

- use a decoder wheel to find the code for a particular trait and draw each trait to create a critter.
- explain how certain traits make a critter better suited to a particular environment by completing "If…then…because…" statements on their "Create a Critter" worksheets.

**Materials:**

- Biome cards
- "Create a Critter" decoder wheels
- "Create a Critter" worksheets
- Colored pencils/crayons/markers (green, blue, yellow, pink)
- PPT
- Computer/projector

**Sequence of Instruction:**

1) Give students a biome card, and ask students to find other students with the same biome card. Students will meet with those students and talk about the features of the biome and the organisms living in them. Teacher will circulate, assist, and observe.

2) Reconvene as a whole class. Tell students that they will create a critter that can survive in their given biome. Hand out worksheets and instruct students to write their biome on their worksheets, in the space provided.

3) Discuss worksheet with students, modeling how they can complete it. Use PPT during this discussion.

- Be sure to focus on the criteria. Explain that the body covering protects and supports organisms living in that biome. For "What will help you sense your environment?" explain that the critter needs a way to see, smell, and hear.

- Emphasize that students can use multiple traits from each category, which is why there are three codes for body covering and five for sensing the environment.
- Model how to fill in the data table with the first trait.
  - Call on a student to share his or her biome.
  - Encourage students to look at their decoder wheels for a body covering that would be best for a critter living in that biome.
  - Call on some students to share possible body coverings, and record this trait in the space provided in the data table.
  - Then, ask students what the code for this trait was, and fill it in on the data table.

4) Students work on the first page of the worksheet to complete the data table. Circulate, observe, and assist.

5) After most students finish the first page of the worksheet, tell students about the next part of the worksheet. Explain that they already thought about the traits; now, they have to explain why those traits are best for that biome. Provide examples and model how to complete the "If…then…because…" statements as needed. Circulate and assist.

6) Once most students finish their explanations, tell the class that they will draw their critters. They will use their data tables to find out what to draw. Explain that, when scientists discover a new organism, they get to name it, so students get to name their new critter. Students can also draw their critters in biomes.

7) Once students finish drawing their critters, have them share their pictures with other students. Have the students read the codes, using the decoder wheel, based on the picture. Students can also guess which biome the critters live in and explain why. Circulate, observe, and ask students questions about the critters' traits. Encourage students to use vocabulary words, which can be written on an anchor chart.

8) Debrief with the class. Organize critter pictures according to biome. Students can take a gallery walk around the room to note the similarities and differences in the drawings, focusing on the traits. After the gallery walk, lead a discussion where students share their observations. Discuss which traits were more common in which biomes and the variation among and within the different biomes.
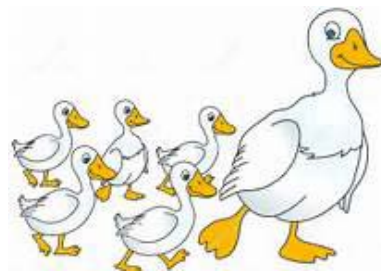
**Assessment:**
Students will be assessed based on the following:
- Completed "Create a Critter" worksheets
- Answers to questions
- Participation in discussions
- Observations

# Vocabulary for Genome Project

| Term | Definition |
|---|---|
| Adult | The final stage of an organism's life cycle. *A butterfly is the **adult** form of a caterpillar.* |
| Acquired traits | A characteristic or behavior that is gained from the environment (ex. Scars, broken horns, learned behaviors) *Spiderman acquired his superpowers when a radioactive spider bit him.* |
| Adaptation | A structure of behavior that enables an organism to survive in its environment. |
| Behavioral Traits | The way an organism acts to help it survive. |
| Characteristics | Distinguishing trait, quality or property. The words we use to describe an organism. Hair color, eye color, and height are examples of characteristics. |
| Code | A sequence of symbols that have meaning. |
| Expression | What is seen when a code is read (decoded). *The expression of the genetic code in a plant was see as pointy leaves.* |
| Function | The action or job of a part (structure). |
| Genetic Code | A sequence of symbols that cause traits in an organism. *The genetic code determines if a human has brown or blue eyes.* |
| Heredity | The passing of traits from parents to their offspring. |
| Inherit | To receive traits from a parent. |
| Inherited Trait | A characteristic passed from parent to offspring *Superman inherited his superpowers from his parent on his home planet, Kypton.* |
| Instinct | An adaptation that an animal is born with and that controls its behavior (ex. Hibernation, migration, web spinning, nest building). |
| Learned Traits | Behaviors that are influence by the environment *Batman had to learn to be a superhero by studying.* |
| Offspring | The babies produced by parents. |
| Organism | A living thing. |
| Parent | One that creates offspring. |
| Pattern | Similar characteristics in organisms. |

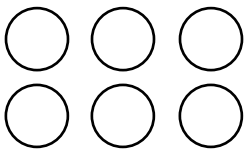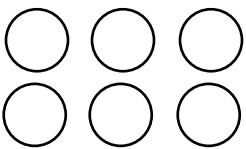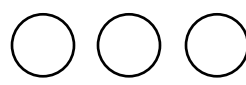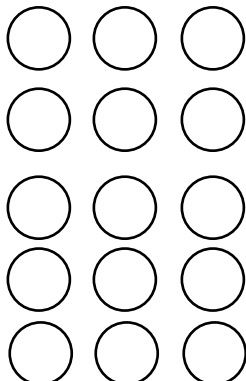| Reproduce | To make new individuals or organisms of the same kind. |
| --- | --- |
| Sequence | A connected series. |
| Structure | A part of a whole organism. |
| Variation | A different form of a structure of a feature of the same kind of living thing. |

# Create a Critter

**Name:** _____

**Directions:**

- Think about the traits that your critter will need to survive in a _____ biome.
- Use your decoder wheel to find the genetic code (DNA) for the needed traits and fill in the chart below:
    - Color the code
    - Write the message

## My Critter Data Table

| Criteria | Message (Trait) | Genetic Code (DNA) |
|---|---|---|
| What covers my body? Does the covering have colors or patterns? | | ○ ○ ○<br>○ ○ ○ |
| What will I eat? How will I eat? | | ○ ○ ○<br>○ ○ ○ |
| What makes me move? | | ○ ○ ○ |
| What will help you sense your environment? | | ○ ○ ○<br>○ ○ ○<br>○ ○ ○<br>○ ○ ○<br>○ ○ ○ |

Explain why you chose these traits for your critter to survive in the
_____ biome.

1) If my critter has _____, it will be able to survive in a
_____ biome because _____.

2) If my critter has _____, it will be able to survive because
_____.

Create a model of your critter in the _____ biome:

**Critter Name:** _____