

Fifth Grade Instructional Segment for Traits, Behaviors, and Classification

This instructional segment provides the foundation for scientific classification and sets the stage for deeper analysis of the inherited traits that allow scientists to classify organisms. Students will gain information about instincts, learned behaviors, inherited traits, and acquired physical traits.

Student Science Performance

Grade level- 5

Topic- Classification of Animals and Plants; Inherited Traits and Learned Behaviors

Title:

Classification

S5L1. Obtain, evaluate, and communicate information to group organisms using scientific classification procedures.

- a. Develop a model that illustrates how animals are sorted into groups (vertebrate and invertebrate) and how vertebrates are sorted into groups (fish, amphibian, reptile, bird, and mammal) using data from multiple sources.
- b. Develop a model that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources.

S5L2. Obtain, evaluate, and communicate information showing that some characteristics of organisms are inherited, and other characteristics are acquired.

- a. Ask questions to compare and contrast instincts and learned behaviors.
- b. Ask questions to compare and contrast inherited and acquired physical traits.
(*Clarification statement:* Punnett squares and genetics are taught in future grades.)

Lesson performance expectations:

- Develop a model to illustrate phenomena.
- Use data from multiple sources to describe classification criteria.
- Understand that scientific classification procedures are based on the structures and their functions evident in organisms.
- Recognize the similarities and differences between an inherited trait and an acquired trait.
- Recognize the similarities and differences between instinct and a learned behavior.

Additional notes on student supports

Engaging Learners

Part 1 Phenomena: Native species of Georgia.

Have students observe animal and plant life outside the school. This can be done by taking the class outside to see what can be seen or the teacher can use these [images](#).

Teachers note: There are two sets of images, one set for vertebrates and one set for invertebrates. The teacher should focus on one set at a time to cut down on student confusion. Otherwise the students will attempt to classify invertebrates in the same groups as vertebrates.

Teachers note: These animals in the images are similar because they all burrow to make

their homes. However, the teacher should keep this knowledge to themselves and let the class try to link them together during the lesson.

The class can discuss the similarities and differences that they see in the animals being observed. The teacher can help guide the discussion by asking questions like the following:

- Where do the animals live?
- What do these animals eat?
- Where do these animals sleep?
- When are the animals most active?
- What physical characteristics are most noticeable?
- Etc.

Teachers note: consider writing the questions on an anchor chart for students to refer to as they work through the rest of the lesson.

Then the teacher can have students generate a list of questions that they have based on the animals that they see. The teacher can have students write their questions on sticky notes and post somewhere in the class. The teacher can assist the class in going through the questions and identifying the ones that most relate to the lesson.

Teachers note: Help the students identify the questions that relate to behavior and physical characteristics of the animals. Also, you can help guide students to asking questions about where the behavior or physical characteristic comes from...is it inherited or learned?

Part 2

Have students observe animal and plant life outside the school. This can be done by taking the class outside to see what can be seen or the teacher can use these [images](#).

Ask students if the organisms are related to one another? Tell students to think about their family and how related they are to one another. The teacher can use this [image](#) to help students see the connections.

Then ask students if their pet is related to them. How are pets similar to us and how are they different?

Tell them to think about these animals that way...what is similar and what is different?

Discuss with students' ways a scientist might be able to separate these animals into groups. Make a list on the board of student ideas.

Have students generate an initial model (this could be simple like a chart or other type of graphic organizer) of how they think all these organisms might be related based on their initial ideas of how animals are separated.

	<p><i>Teachers note: The teacher should consider providing supports to help students generate models. This could be done by assisting students at evaluating a model and then having students design their own model or other means as necessary for the students in the class.</i></p>
<p>Exploring</p>	<p>Part 1</p> <p>The teacher can group students and then let students choose 2 animals to focus their research on.</p> <p><i>Teachers note: the teacher should consider providing students with resources to find information on the animals (examples: videos, articles, websites or books as needed to assist students in finding information). Information can be found about native species at the following link https://georgiawildlife.com/educational-resources, or using the following link https://georgiawildlife.com/nuisancewildlife or at the following link https://academics.georgiasouthern.edu/wildlife/animals/mammals/</i></p> <p>Have students answer the questions that the class agreed were the most important. Then have students generate any questions that their research lead to and answer those questions.</p> <p>Once students have gathered information have them fill out t-chart 1 for behavior. One side of the t-chart should be labeled instinct and the other learned. Have students list behaviors in the side that they feel is most appropriate and then have them justify their placement.</p> <p>Then have students fill in t-chart 2 with physical characteristics and behaviors. One side of the t-chart is labeled inherited and one side is labeled acquired. Have students list behaviors and physical traits in the side that they feel is most appropriate and then have them justify their placement.</p> <p><i>Teacher note: examples are provided in the t-charts to help students get started in listing physical and behavioral traits in the correct location.</i></p> <p>Part 2</p> <p>Have students get into groups and research each organism. Is it a mammal? A reptile? A vertebrate or invertebrate?</p> <p><i>Teachers note: the teacher should consider providing students with resources to find information on the animals (examples: videos, articles, websites or books as needed to assist students in finding information).</i></p> <p>Have one student in the group focus on doing a little research on how scientist classify</p>

	<p>organisms.</p> <p>Within the group the students should discuss each of their initial models and propose some revisions. Have the students justify their revision.</p> <p><i>Teacher note: Students may need assistance determining what revisions are and what might be beneficial revisions for their models. This could be shown to students by modeling how to revise a model and then providing justification for the revision.</i></p>
<p>Explaining</p>	<p>Part 1</p> <p>Make 2 large t-charts, like the ones that the students filled out, on the board and have students add information to those t-charts. Discuss these t-charts with the class. Are these the appropriate placement for behaviors or physical characteristics? Why or why not?</p> <p><i>Teacher note: Move as needed to avoid misconceptions and remind students to move on their charts as well.</i></p> <p>Part 2</p> <p>Have students finalize their model and post for other students to see. Have 1 student from the group stay with the model to explain it to other groups. Have the other group members circulate to see how other groups divided the organisms.</p> <p><i>Teacher note: provide some questions for the students to ask as they circulate. These questions could include:</i></p> <ul style="list-style-type: none"> • <i>Why did you separate these animals?</i> • <i>What made you split the animal here?</i> • <i>What was the biggest category that you saw as you separated the organisms?</i> <p>Have students return to their groups and revise their model as needed based on what they saw. Have students justify their revisions.</p>
<p>Elaborating</p>	<p>Part 1</p> <p>Have students do some research about learned and acquired behaviors. How are they similar to one another? How are they different from one another?</p> <p>Then have students do some research about inherited and instinctive behaviors. How are they similar to one another? How are they different from one another?</p> <p>Have students generate some general questions that would allow them to identify if it was instinctive/learned or inherited/acquired.</p>

	<p>These questions could be:</p> <ul style="list-style-type: none"> • Do the parents display the trait? • Did the organism see the trait in the wild? • Did the organism display the trait as a baby, or did it show up later in life? • Etc. <p>Part 2</p> <p>Have students hypothesize how plant life might be divided into categories. Make a list on the board of student ideas. Help students narrow it down to seeds vs no seeds.</p> <p><i>Teachers note: Ideally students should examine the natural specimen rather than looking at images. It is very difficult to determine which plants have seeds and which do not based on an image. However, this may not always work and so some images and descriptions have been provided.</i></p> <p>Give students the plant handout and have them use the plant description to make a model of a plant classification chart (this could be simple like a chart or other type of graphic organizer).</p> <p>Partner students to evaluate models and make changes as needed.</p> <p><i>Teacher notes: Students may need an example of a hypothesis. This can be accomplished by showing students a hypothesis and giving students a sentence frame to write their own hypothesis.</i></p>
Evaluation	<p style="text-align: center;">Assessment of Student Learning</p> <p>Part 1:</p> <p>Have students evaluate scenarios and identify the behavior or physical characteristics as instinctive/learned or inherited/acquired. Remind students that they can use their list of questions that they previously generated to help them determine how to label the characteristics.</p> <p>Part 2</p> <p>Have students revise models as needed to be reflective of how scientist would classify organisms.</p>
<i>SEP, CCC, DCI</i>	Science Essentials
Science and Engineering	<ul style="list-style-type: none"> • Developing and using models • Asking questions and defining problems

Practices	
Crosscutting Concepts	<ul style="list-style-type: none">● Patterns● Stability and Change● Structure and Function
Disciplinary Core Ideas	From A Framework for K-12 Science Education : <ul style="list-style-type: none">● LS1.D: Information Processing● LS3.A: Inheritance of Traits● LS3.B: Variation of Traits

Additional Supports for struggling learners:

The following supports are suggestions for this lesson and are not the only options to support students in the classroom. These supports target students that struggle with science material, this lesson or a previous lesson. These are generalized supports and do not take the place of IEP accommodations as required by each student’s Individualized Education Program.

General supports for the following categories:

<u>Reading:</u>	<u>Writing:</u>	<u>Math:</u>
<ol style="list-style-type: none"> 1. Provide reading support by reading aloud or doing partner reads 2. Have the teacher model what they are thinking when reading the text 3. Annotate the text with students so that they may refer to it as they work through the lab 	<ol style="list-style-type: none"> 1. The teacher can provide a sentence starter for the students. 2. The teacher can give students an audience to write to (i.e. Write a letter to your sibling explaining this topic). 3. The teacher can provide constructive feedback during the writing process to help students understand the expectations. 	<ol style="list-style-type: none"> 1. Provide calculators as needed. 2. Remind students of the units of measurement.

Supports for this specific lesson if needed:

Performance expectations for instruction:

1. The teacher should provide information to students in various formats to reach as many students as possible.
2. The students should be given adequate time to complete each part of the lesson.
3. The students should be allowed to express their knowledge in various formats.
4. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material.

Engaging:

1. The teacher should have clear and consistent guidelines for going outside to observe nature.
2. The teacher should consider providing students with an organizer to record observations.
3. The teacher should consider using guiding questions to assist students with making observations.
4. The teacher should have clear and consistent guidelines for discussions. These guidelines should help students feel more comfortable and be more likely to participate.
5. The teacher should consider providing students with question stems to assist in generating questions.
6. The teacher should then consider making a class list of questions. Then the teacher should assist students in narrowing down the questions to the ones that are the most relevant to the standard and lesson.
7. The teacher should consider asking students about brothers, sisters, aunts, uncles, cousins, parents and grandparents’ relationships. How related are the students to each?
8. The teacher should consider asking students about pets and how related they are to their pets.
9. The teacher should consider providing students with a template to separate organisms. This can take any form and should be a rough draft.

10. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. These formats could include drawing, writing or designing a presentation.
11. Students may need additional time to complete their initial model.

Exploring:

1. The teacher should consider using guiding students to choose organisms that are not clearly related (e.g. the bullfrog and the screech owl).
2. The teacher should consider providing students with sources to find information about the organisms and classification.
3. The teacher should consider providing students with an organizer to record their research.
4. The teacher should make clear that the t-chart behaviors are specific to their organisms.
5. The teacher should use intentional and flexible grouping to group students. Best practice is to use data to drive student groupings.
6. The teacher should consider explicitly showing students the difference between the invertebrate and vertebrate.
7. Students may need additional time to complete their assignment.
8. The teacher should consider guiding questions to assist students in refining their model.

Explaining:

1. The teacher should have clear and consistent guidelines for discussions. These guidelines should help students feel more comfortable and be more likely to participate.
2. The teacher should consider using guiding questions to assist students in seeing the differences in behavioral and physical characteristics.
3. The teacher should consider providing students with a rubric for self-assessment. the teacher should provide ample opportunity for students to self-assess their work. This increases student ownership of the work.
4. The teacher should consider providing students with multiple formats that they could use to share their work. These formats could include using technology, gallery walks or presentations.
5. Students may need additional time to complete their assignment.
6. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. These formats could include drawing, writing or designing a presentation.
- 7.

Elaborating:

1. The teacher should consider providing students with sources to use in their research.
2. The teacher should consider providing examples of the differences between inherited and instinctive behaviors.
3. The teacher should consider using Venn diagrams to help students compare and contrast inherited and instinctive behaviors.
4. The teacher should consider providing students with question stems to generate questions.
5. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. These formats could include drawing, writing or designing a presentation.
6. The teacher should consider providing students with multiple ways to access the material. This could include using articles, videos or text-to-speech.
7. The teacher should consider a rubric to allow students to self-evaluate their work. This increases student ownership of their work.
8. Students may need additional time to complete their assignment.
9. The teacher should have clear and consistent guidelines for students to provide feedback. These guidelines should help students provide respectful, constructive, positive and useful feedback.

Evaluating:

1. The teacher should consider providing students with multiple ways to access the material. This could include using articles, videos or text-to-speech.
2. Students may need additional time to complete their assignment.
3. The teacher should be sure to provide multiple ways for the students to communicate their knowledge of the material. These formats could include drawing, writing or designing a presentation.

Images for Engagement- vertebrates



River otter



Bullfrog



channel catfish



Red Fox



banded king snake



Eastern Screech owl

Images for Engagement- invertebrates



Wolf Spider



Cicada



Earth Worm



Ant

[Return to Instructional Segment](#)

t-chart (1)

Behaviors T-chart

Directions: Place behaviors that you found in your research in appropriate categories.

Instinctive Behaviors	Learned Behaviors
A spider weaving a web is something that spiders can do as soon as they hatch.	A dog that can sit on command is something that the dog learned later in life.

[Return to Instructional Segment](#)

t-chart (2)

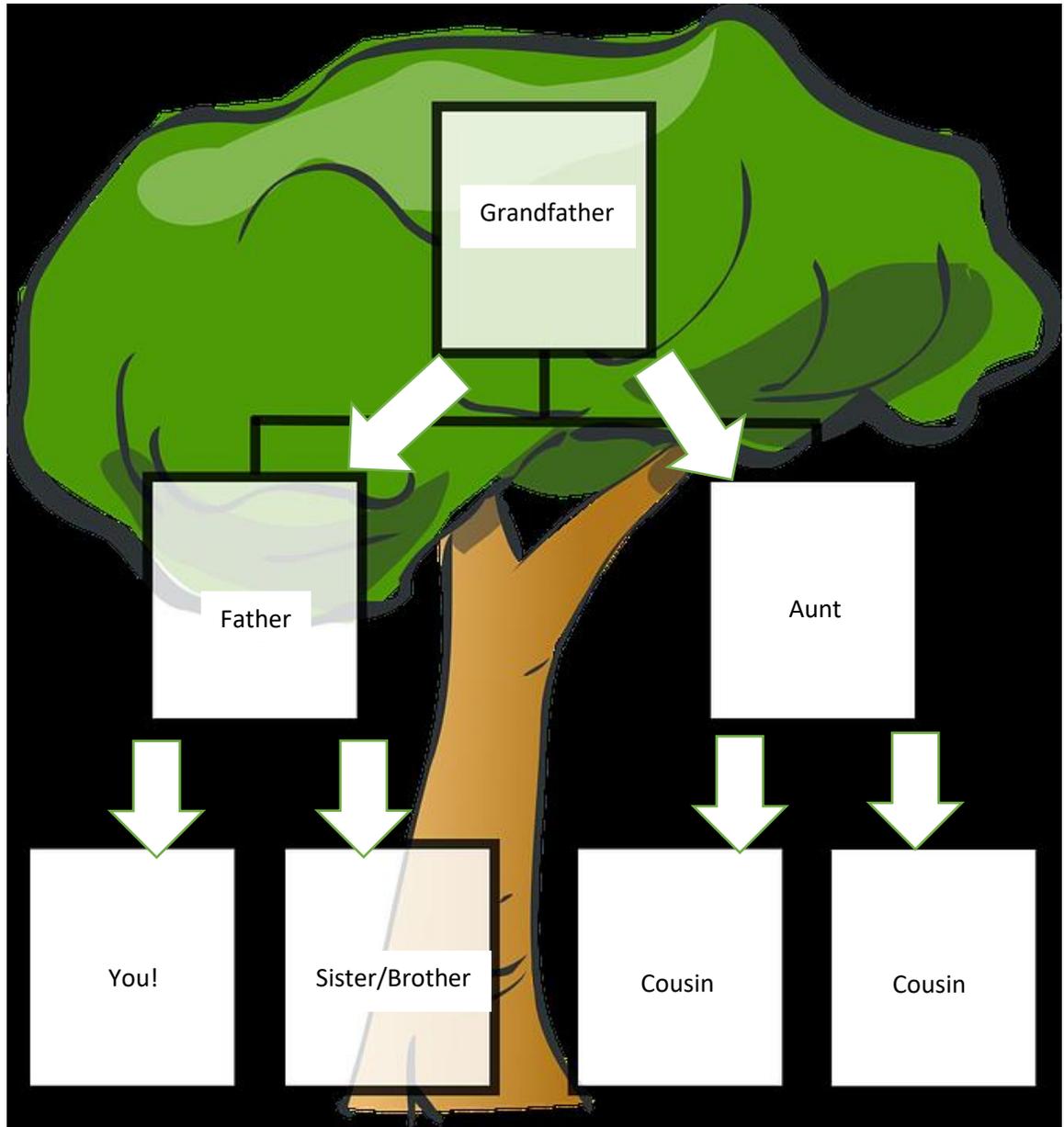
Characteristics T-chart

Directions: Place physical characteristics into the correct column

Inherited	Acquired
Eye color is passed from parent to child.	Having small handwriting is acquired.

[Return to Instructional Segment](#)

Family tree



[Return to Instructional Segment](#)

Plant handout

<u>Plant</u>	<u>Description</u>
<p data-bbox="105 247 243 277">Pine Tree</p> <div data-bbox="116 279 790 667">  </div> <p data-bbox="105 674 776 743">Above photographs: Used with permission from the photographer, Steve Golladay</p> <div data-bbox="108 779 513 1083">  </div> <p data-bbox="105 1056 743 1199">left: Photograph to the Used with permission from “Marc L. Rust, Inland Empire Tree Improvement Cooperative”</p>	<p data-bbox="820 247 1502 499">Pine trees are evergreen trees. This means that their leaves or needles stay green year-round. Pine trees produce seeds in their pinecones. The green pinecones that you see on trees contain seeds but the brown pinecones that you find on the ground in your neighborhood have usually already released their seeds.</p>
<p data-bbox="105 1276 251 1306">Dandelion</p> <div data-bbox="108 1308 602 1848">  </div>	<p data-bbox="820 1276 1502 1459">Dandelions are a wildflower native to Georgia. They have yellow flowers and seeds that are white with parachutes. Many people will pluck the dandelion seed heads and blow to see the seeds disperse. These wildflowers produce seeds to reproduce.</p>

Lady Fern



The lady fern grows close to the ground. It is frequently used by birds to make their nests. Lady Ferns do not have seeds instead they reproduce using spores.

Moss



Moss covers the ground well and grows in high moisture and low light areas. Moss does not typically reproduce using seeds but rather releases spores.

Scenarios

Learned/Instinctive behaviors

1. A river otter is swimming
2. A dog learning to sit
3. A blue bird building a nest
4. A tiger cub learning to stalk their prey
5. A bear hibernating

Inherited/Acquired traits

1. A kitten with green eyes. The owner notices that both parents have green eyes.
2. An old dog has grey hair. As a puppy the dog was completely brown.
3. A grandmother has blue hair. All the pictures of her when she was younger shows that she had blonde hair.
4. A zebra has stripes.
5. A spider builds a web.

Answer Key

Learned/Instinctive behaviors

1. Instinctive
2. Learned
3. Instinctive
4. Learned
5. Instinctive

Inherited/Acquired traits

1. Inherited
2. Acquired
3. Acquired
4. Inherited
5. Inherited