Categorization/Classification

Teacher: Sean Arnold
Grade Level: 4-6
Subject: STEM (Science)
Time: 5-7 periods (45 min)

LESSON OVERVIEW

Summary:
• Explore how organisms live, grow, respond to their environment, and reproduce.
• Demonstrate how living things can be sorted into groups in many ways based on similar characteristics.

Essential Questions:
• How are organisms alike and different?
• How do different organisms meet their needs for survival?
• How do the structures of organisms enable life’s functions?
• How can we use the observable properties of organisms to group them?

OBJECTIVES

Students will be able to...
• Identify physical characteristics of different organisms.
• Describe the function of the characteristics
• Compare the physical characteristics/functions of different individuals/organisms.
• Develop a classification system for grouping organisms.

STANDARDS

CCLS (ELA or Math): ELA-W.K-05.03-.06, 08,.10; RL.K-05.02, .03, .06
ISTE SS: 1c, 2b, 2d, 3a, 3b, 3c, 4a, 4b, 4d, 5c, 6a, 6b, 6c, 6d, 7b, 7c

Key Vocabulary:
• classification
• characteristic, property
• kingdom, species
• mammals, birds, fish, reptiles, amphibians, insects
• vertebrate, invertebrate
• warm-blooded, cold-blooded
• tissue

LEARNING PLAN

PRE-PLANNING

Formative Assessment: animal survey, surveys, discussions, sorting activity, Nearpod assessment, Flipgrid videos, BrainPOP quiz, SMART Lab sort, Classify It, animal cards

Summative Assessments: Minecraft EDU classification world, summative project and presentation, summative quiz

Tech Tools: Flipgrid, Nearpod, SMART Learning Suite, BrainPOP, OneNote, Classify It, Discovery EDU, Google Expeditions, Pages, Keynote, Clips, iMovie, Aurasma/HP Reveal, Google Sites, Google Forms, Minecraft EDU

PREP: Gather fields guides that have pictures and information about classifications of animals and their properties and display them. Create a visual gallery of the animals that builds as the lessons progress. For ease many of the activities can be built into a single Notebook or Nearpod lesson (as I have done).
SESSION I: Grouping Organisms

Materials: student devices, fields guides, printed animal cards

Tech Tools: Flipgrid, Nearpod, SMART Learning Suite, BrainPOP, OneNote, Classify It, Discovery EDU, Google Expeditions, Pages, Keynote, Clips, iMovie, Aurasma/HP Reveal, Google Sites, Google Forms, Minecraft EDU

Optional: Flocabulary, Padlet, Google Slides, PBS Learning Media, RWT Card Creator, Trading Cards app, Quizlet, Photoshop, Pixelmator, Square Panda, AR Talking Cards, Switch Zoo, Quizizz, CoSpaces EDU, Nova Evolution Lab, Classflow.

Related Videos: Khan Academy-Classification, Taxonomy BrainPOP-Six Kingdoms, Classification various characteristics & species videos, Flocabulary-Six Kingdoms, Classification, Ecosystems, Adaptation, Food Chains, Life Cycles, Discovery Streaming; PBS-Smart Animals, Dinosaur Train Classification


General Differentiation: general accessibility technology, OneNote learning tools (written, typed, recorded, etc.) visual, grouping, communication symbols, etc., sorting activity by feature/category, classification cards, BP jr. Students who struggle with writing can document with audio or images in an app like OneNote or Notability

Recommended Procedures (alternative options, differentiation, & extensions below)

HOOK-ENGAGE (20-50 min)

Using Flipgrid, query students about their favorite animals and why they like that animal. Using Nearpod Collaborate, have students share their knowledge about animal similarities and differences between certain the animals they discussed or pre-selected pair (i.e. birds and insects, different plants). If necessary, use the video prompt.

Introduce students to the concept of animal classification utilizing the BrainPOP or Flocabulary classification video. Feel free to pause the video and ask pertinent questions at any point. Use the virtual word wall and/or quiz features to check for understanding.

Game: The Name Game-Choose five children to separate themselves and take on an animal (or tv character creature) persona. The children return and give the teacher a list of their new animal names. The class will try to guess who belongs to each new name by asking “yes-no” questions about the creatures’ properties such as eye color, hair color, etc. Students chart the responses of their classmates using OneNote notebooks. When they have enough information have they can guess the identity of one student.

Focus Questions: We all have traits that describe us. What traits define a group? (i.e. Insects are considered arthropods. What are three common features of arthropods?) Scientists like to group animals. What questions need to be answered to classify an organism? Most animals have many names. How do scientists know which animal they are talking about?

MODEL-EXPLORE (60-100 min)

Have students begin developing a classification system. Students can then begin to practice classifying and grouping animals a SMART Lab Super Sort that forces them to question animal characteristics. Have the class, either collectively or in groups depending on your needs, begin sorting animals into categories (i.e. animals and plants or mammals, reptiles, and birds).

Introduce students to the 6 kingdoms and the hierarchy of classification with the BrainPOP or Flocabulary video on the six kingdoms. Use SMART
Categorization/Classification

Notebook to recreate a dichotomous key on the taxonomy of various organisms. Have student draw comparisons to determine how closely related different organisms are. Explain that scientists have to classify animals beyond their common names.

Now you can begin sorting based on structure and functional properties (structures they use to reproduce, move, or obtain nutrients). Now you can resort your categories. After developing classification categories, students can check it against Discovery’s organism grouping tool.

**Game:** Using BrainPOP’s Tree of Life Sortify, Classify It, Science Net Links, or any of the Sheppard Software Animal Classification Games like What Kind of Animal Is This? students can practice their animal categorization skills.

**Focus Questions:** Scientists have identified nearly two million individual species. How do scientists classify different organisms into groups? Why Is It Important to Classify Organisms? Common names for animals can vary from place to place. How do scientific names help improve communication among scientists? How is the Modern Classification System Organized? A dog can be classified into groups from domain to species. What does a dog have in common with other members of each group? Organisms are classified into a series of groups that go from broad to more specific. How does taxonomy help show relationships among organisms? Explore the characteristics scientists use to classify organisms into kingdoms. What characteristics do organisms in each kingdom share?

**WHOLE GROUP-EXPLAIN (50-80 min)**

Students begin by reviewing Discovery EDU information on scientific explanation. We will then explore in Google Expeditions the How Animals See The World lesson. They will continue exploring materials in Discovery’s Science tech book on habitats, ecosystems, physical characteristics and/or life cycles. This includes accompanying videos. We will examine how the different features are unique to each animal group.

Students will build on that with additional research to create digital animal cards using a Pages template. The animal cards will contain information on each animal (size, diet, range, etc.). All the while they will be gathering evidence, reasoning, and claims to answer the focus question.

The cards will then be set up by students using Aurasma/HP Reveal to display augmented reality information about the animal. Students will then tour the classroom augmented menagerie noting the difference and similarities in their OneNote notebooks.

**Game:** Classifying Cards - Students form small groups and take the animals cards with them. Ask students to group the animal cards based on one property (i.e. body covering). Students report to the class about how they have grouped their animal cards.

Ask the students to organize their cards in a different way and report back to the class. This will show them that there are many ways to group, or classify, animals. Note on a display the properties that the students used to classify their animals cards.

**Focus Questions:** How and why are organisms classified?

**GUIDED-ELABORATE (20-100 min)**

Students use a dichotomous key to inform the creation of their own newly discovered animal species. Students will create a presentation detailing the features (habitat, diet, behavior, and physical characteristics) of their new animal. Students will link artifact for their projects to sections of a collective Google Sites.

**Projects:** movie (using Clips or iMovie), song/podcast, physical model and explanation card, drawing and essay, poster, visual blog post, Keynote presentation
Categorization/Classification

Focus Questions: Taxonomists classify fossils as well as living organisms. How do taxonomists describe a new species in a fossil?

INDEPENDENT-EVALUATE (30-60 min)
Students will deliver and discuss their presentations and need to be able to answer other students questions about the creature. Students will then take a summative assessment using Google Forms.

Game: In Minecraft EDU, students will collectively create and sort their newly created animal species along with in-game creatures into paddocks that decrease in size based on their kingdom, phylum, order, and class. Alternately students can create a 3D space using CoSpaces EDU. You can also utilize Nova Evolution Lab.

Optional Procedures

HOOK
Students can be queried verbally, utilizing picture symbols, a chart, Padlet, Classflow, SMART Notebook, Google Slides, PBS Learning Media Page on Animal Classes. Use other videos and images aid in student understanding. You can use the BrainPOP Jr. classification video or any of the other related videos for simplification. You can continue with an interactive lesson about animal classification like the one available on Nearpod. Students can respond to the built in assessments.

In the game instead of charting individually, the teacher can chart on the display or it can be done in groups.

MODEL
Use BrainPOP’s Make-a-Map, Notebook, Classflow, physical manipulatives, or any display tool to visualize the models.

WHOLE GROUP
For research use BrainPOP, Discovery or World Book Online. More advanced students can use Google Explore tool.

To create cards students can use RWT Card Creator, Trading Cards app, or Quizlet. Advanced students can use Photoshop or Pixelmator. Optional AR platforms include Square Panda or AR Talking Cards.

GUIDED
Students could create simpler displays of their invented animals using Switch Zoo. Instead of creating a site students can map the information with map on BrainPOP, Notebook, Google Slides, PBS Lesson Builder or the Storyboard in PBS Learning Media.

EVALUATE
The summative exam could be created using Discovery, Quizizz, or Smart Response.

PBL Extensions: organisms in your neighborhood, classify whales by song, classifying unknown organisms, species richness. Also students will document the behaviors they notice in animals (in general or in regards to their specific animal) using my clues or observations style worksheets.

Extension Game: 20 Questions Game Mystery Animal-One person thinks of a specific animal and its properties and says, “I’m thinking of an animal.” The other students ask “yes-no” questions about the animal’s properties in an effort to guess its identity. Students use the classification properties used in previous games (lays eggs, has feathers, etc) or just ask, “Is it an amphibian?” and then use even more specific properties, such as color, size, how it moves, what it eats, where it lives, how it grows, etc., to help identify the animal. When the students have enough specific information, they may try to guess the animal’s identity.