

## Module 2, Lesson 3

# *Animals around the world*

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### Lesson overview

Students will explore the concept of classification and animal habitats at a global level. Using data and information they have acquired, students will locate and identify a new animal to be introduced to the zoo. They will work with data from the World Wildlife Fund (WWF), including ecoregions, biomes, continents, and countries. Students will learn different ways that the world can be divided — geographically with lines of latitude and longitude or physically using biomes and ecoregions..

While lesson 1, lesson 2, and lesson 3 can be done independently, students would benefit from doing all three lessons sequentially.

### Estimated time

Approximately 60 minutes

### Materials

The student activity can be found at <http://esri.com/geoinquiries>.

Student activity: TS\_M2L3\_StudentDirections.pdf

### Objectives

After completing the lesson, a student is able to do the following:

- Use classification and querying skills to derive information from the map
- Describe different ways to classify the world — biomes and ecoregions
- Interpret map style
- Work with tabular data
- Create a map legend for interpretation

### GIS Tools and Functions

- Open a map file
- Zoom to desired section of the map
- Identify a feature on a map
- Use the Filter to select data based on certain criteria
- Zoom to full extent of all the layers
- Add a layer to the map
  - Turn layers on and off
  - Change map style (legend)
  - Filter attribute data
  - Label features

- Sort attributes

## National Geography Standards

Standard	K-4	5-8
<b>5</b> That people create regions to interpret Earth's complexity	The concept of a region as an area of Earth's surface with unifying geographic characteristics	The elements and types of regions
<b>8</b> The characteristics and spatial distribution of ecosystems on Earth's surface	The components of ecosystems	The local and global patterns of ecosystems
<b>14</b> How human actions modify the physical environment	That the physical environment can both accommodate and be endangered by human activities	The consequences of human modification of the physical environment

## Teaching the lesson

### Introducing the lesson

Begin this lesson by reviewing or discussing the following concepts:

- The classification of living things and how organizing and categorizing animals and plants can make them easier to study and analyze
- The geographic and functional organization of the world; the division of the world into continents, countries, states, and into natural regions such as climate zones, vegetation zones, and so on
- Map legends and symbols
- How features on maps have both spatial and attribute information
- Endangered areas of the world such as the trees of the tropical rainforests or Antarctica's ice caps
- Endemic species of animals—they are unique to their own place or region and are not found naturally anywhere else

### Student activity

We recommend that you complete this lesson yourself before completing it with students. This will allow you to modify the activity to accommodate the specific needs of your students.

### Teacher Notes

- Explain the lesson to the students and ensure that they are aware of where to answer the questions asked.

- For younger grades, you can conduct the GIS activity as a teacher-led activity in which students follow along. You can lead students through the GIS steps and ask them the associated questions as a class.
- Students will each need a printed copy of the activity so they can answer questions throughout. They can mark their answers directly on the activity sheet. Alternatively, you can provide a separate answer sheet.
- Students need to complete the worksheet to unravel the mystery.
- Ideally, each student will have access to a computer, but students can complete the lesson in small groups.
- Some questions do require classroom and/or group interaction. You can decide on the best way to handle these questions.
- We recommend that students save their work as they progress through the GIS activity. Students can use either the Save command (to save their changes to the original map) or the Save As command (to save their changes to a new map). Please explain to students where and how they should save their work.

The following are things to look for while students are working on this lesson:

- Are students thinking about the underlying geographic concepts as they work through the steps?
- Are students answering the questions as they work through the steps?
- Are students experiencing any difficulties with the buttons, tools, mouse clicking, etc.?

### Concluding the lesson

- Engage students in a discussion about some of the animals that they are mapping in the activity. Look at the ranges of the animals. Where do they live? Why? What are the characteristics of their habitat and how does that make it ideal for a particular animal to live there?
- Ask students to share experiences of seeing animals in another country or another place.
- Discuss how classification made the lesson either more difficult or easier for them to complete.
- Has this activity raised any questions that they would like to explore further?

### Extending the lesson

- Have students create a layout for this map and identify where the kiwi comes from.
- Students can research the kiwi in more detail and learn things such as how big their eggs are and why kiwi don't have wings.
- Students can choose another animal on the list and look at its range of habitat. Research that animal and explain why it lives where it does.
- Create a table of "official U.S. state animals." Research each state's animal and create an attribute table that lists the animal and some of its characteristics.

- Research the WWF and other organizations with similar missions: to help preserve the world's ecosystem.)

## References

- [www.sandiegozoo.org](http://www.sandiegozoo.org)
- [www.wwf.org](http://www.wwf.org)

## Student activity answer key

*Answers appear in blue.*

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**Task 1: Open the map**

**Task 2: Enlarge the ArcGIS Online window**

**Task 3: Clue #1 — The mystery animal lives in the eastern hemisphere**

**Q1:** *On your “Animal list” worksheet, place an X under the animals located in the eastern hemisphere (either part or all of their range is in the hemisphere). **Viper, Warthog, Emu, Kiwi, Platypus, Deer***


**Task 4: Clue #2 — The mystery animal lives near the Tropic of Capricorn**

 **Q2:** *Look at your map. Is the Tropic of Capricorn located in the northern hemisphere (north of the Equator) or in the southern hemisphere (south of the Equator)?*

- a. Northern hemisphere*
- b. Southern hemisphere***

 **Q3:** *Look at your map. What continents does the Tropic of Capricorn cross? Circle all that apply.*

- 1. Africa***
- 2. Europe*
- 3. North America*
- 4. Australia***

 **Q4:** *On your “Animal list” worksheet, place an X next to the animals that are located in the southern hemisphere (either part or all of their range must be in the hemisphere). **Warthog, Emu, Kiwi, Platypus***

**Task 5: Clue #3 — The mystery animal lives in temperate, mixed-broadleaf forest areas**

 **Q5:** *What two countries in this area have temperate broadleaf and mixed forest?*

*(Hint: You are looking for the areas outlined in bright blue south of the equator and east of the Prime Meridian. You may have to click and drag the map slightly to the left to see both countries.)*

1. *Australia*
2. *New Zealand*

 **Q6:** On your “Animal list” worksheet, place an X under the names of the animals found in these two countries. *Emu, Kiwi, Platypus*

**Task 6: Clue #4 — The mystery animal is widespread across its country but lives mostly in endangered or critical areas**

 **Q7:** Look at your legend. Which areas of Australia and New Zealand are critical or endangered?


- a. *The coastal areas.*
- b. *The central areas.*


 **Q8:** Which country is mostly covered by critical or endangered areas?

- a. *Australia*
- b. *New Zealand*

 **Q9:** What is the name of the mystery animal? *Kiwi*

**Task 7: Placing the mystery animal**

 **Q10:** Draw the new enclosure on your map — be sure to label the enclosure with the name of the zoo’s newest resident. *The location of the enclosure and size will vary from student to student.*

 **Q11:** Write a brief paragraph explaining the location you chose for the animal. *Look for solid explanations perhaps based on information students have learned in the past or in this lesson.*

**Step 8: Save your work and exit ArcGIS Online**

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### Worksheet 1: Animal list

Class	Viper	Wart hog	Sloth	Emu
Lives in the Eastern Hemisphere?	X	X		X
Lives in the Southern Hemisphere?		X		X
Lives in the two countries found in step 5?				X

Class	Coyote	Kiwi	Platypus	Deer
Lives in the Eastern Hemisphere?		X	X	X
Lives in the Southern Hemisphere?		X	X	
Lives in the two countries found in step 5?		X	X	