Stories Golden Eagles Tell: Migration on Changing Landscapes

TEACHER'S GUIDE AND BACKGROUND

To truly understand the landscape, the Golden Eagles, and the habitat that is crucial for their survival, scientists from Raptor View Research Institute and MPG Ranch have partnered for a multiple year study tracking eagles and reading the stories the birds tell with data placed on maps.

Stories Golden Eagles Tell: Migration on Changing Landscapes, asks learners to explore the pathways of magnificent Golden Eagles from data gathered by the scientists as they traverse their north-south migration route between Alaska and Montana. Reading the eagles' stories by examining sample maps, viewing pathways in real time, analyzing the data and then making inferences develops 'cognitive sweat' akin to the work scientists do every day. There are no right answers, just deep thinking.

As a teacher, you can choose to take your students on this learning journey at whatever level, in whatever way you professionally judge to be the best for your students' needs. The resources provided support basic fact gathering and skill development but also the deeper levels of application, analysis, evaluation, and creation. The intent of the project is to ask students to think deeply and create their own meaning that can be applied to the work of the world.

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Essential questions frame the activities and investigations into a purposeful map of learning. As a result of experiencing this investigation, students should be able to answer the project questions at a deep level of understanding and connect them to the broader essential questions.

Overriding Essential Questions	Related Questions Specific to Project
What are the characteristics of a species?	What are the characteristics of Golden Eagles?
What habitats and behaviors are necessary for a species to survive and thrive?	What habitats and behaviors are necessary for Golden Eagles to survive?
What impact is change having on	What impact is change having on

species?	Golden Eagles?
How is wildlife research being conducted?	How is Golden Eagle research being conducted?
What skills are needed to conduct research?	What skills are needed to conduct Golden Eagle research?

Stories Golden Eagles Tell: Migration on Changing Landscapes can be integrated into many curricular areas and multi-disciplinary units of study depending upon the age level of the students and the background knowledge of the teacher. The technology used in the project is a cross-cutting skill present in every discipline area. Some examples are:

Science	Biomes, species diversity, habitat, avian characteristics, predator/prey relationships, carrying capacity, human impact, climate change, policy and law, wildlife management
Social Studies	History of wildlife, expansion of human territory, cultural implications of wildlife, geography, map skills, international policy and law, land use, conflict resolution, human perception and the land
Literature/Writing	Parallels in literature, non-fiction reading/writing, fiction reading/writing, cultural exploration of wildlife in story, point-of-view writing
Arts	Response art on land issues, wildlife in art, iconography, musical interpretation, drama and dance interpretation.
Mathematics	Statistics and data gathering and analysis, geometry, telemetry, map building

Topics included in **Stories Golden Eagles Tell: Migration on Changing Landscapes** are:

1. Natural history of Golden Eagles
2. Habitat
3. Migration
4. Human and natural impact on the landscape
5. Research conducted on Golden Eagles
6. Data gathering and analysis
7. Inference building

Skills developed are:

1. Using interactive google earth maps
2. Analyzing and interpreting data
3. Asking and answering probing discussion questions
4. Making inferences

Teacher Resources

Key Vocabulary:
Telemetry
Migration
Habitat
Predator
Prey
Raptor

Inspired Learning Map
Student Activity Guide

Key to the Inspired Learning Map--
I Know the Basics--Knowledge and Understanding
Applying What I've Learned--Application
Picking It Apart--Analysis
Using What I've Learned to Connect to Other Information--Creation and Evaluation

Characteristics and Natural History of Golden Eagles

1. Define/list the characteristics of the Golden Eagle after viewing the video.
2. ZOOM IN! POM--Where would a Golden Eagle stop? Defend your answer with what you know about the characteristics of the eagle and habitat.
3. Eagle ID Game--As you view the photos of the birds, identify as either golden or bald eagles.

1. ZOOM IN! POM is this a good place for a Golden Eagle to stop over? Why or why not?
2. ZOOM IN! POM explain where a golden and a bald eagle would hunt and why. Use what you see in your explanation.
3. Venn Diagram--Compare and Contrast the characteristics of a golden and bald eagle.

Migration

1. After viewing the map, write your own definition of migration.
2. Explain why Golden Eagles migrate. Is it always true? Why do you think that? Discuss with a partner and come to consensus.

1. Construct a story about a chosen migratory path using data from points XYZ. Act it out for some extra fun.

1. ZOOM IN! POM Compare three stops on the migration path, Describe which is best. Why do you think that? Get together with a partner and discuss your reasoning and then share with the class.

1. ZOOM IN! POM What might happen if development continued at point X? If it happened what would be the result?
2. Predict how migration pathways might change in 10, 20, or 100 years. Why do you believe that? How will eagles adapt?

Issues Surrounding the Changing Landscape

1. ZOOM IN! Examine the example pathway on card ___. List the changes on the landscape that are human caused,
2. ZOOM IN! POM Summarize the impact at point X. Include information about migration and Golden Eagle characteristics in your summary.

1. ZOOM IN! Record the story of the example migration pathway on card__ using the data from points x,y,and z.

1. ZOOM IN! POM Interpret the data at stop over X. (Link to interpreting data video). Why do you think that? Give a specific example. What more information do you need?

1. Debate one side of a chosen issue impacting Golden Eagles on their pathway. Support your point of view with evidence.
2. ZOOM IN! POM What would be the effection of _____on point X. What would be an alternative?

Research Career Pathways

1. Find out more about RVRI and MP Scientist and their background. (Link to websites)
2. Summarize how research is conducted on Golden Eagles by RVRI. (Link to video)

1. Compare and contrast research on Golden Eagles around the world with the work that RVRI is doing. (Link to other resources.)

1. Create a research project around a raptor in your area. (Link to bird counts and citizen science resources.)
2. Why is it important to study wildlife? Who might hold another viewpoint and why?
3, Prioritize a list of stakeholders interested in Golden Eagle research. Justify the placement for each group on the list by citing evidence and examples.

Skill Builders

1. Complete the 'how to' activity for use of google earth maps. (Links to google earth activities from other places.)
2. Interpreting the data from data points. (Excercise with pop up box.) (Link to IC Interpreting Data video).

1. Construct a migration pathway from a set of data points on a Google Earth map.

1. Track a pet or person and build your own map based on the story from the tracks.

Independent Projects

1. Select an issue surrounding the hazards of Golden Eagle migration.
2. Describe the hazard and include multiple points of view or stakeholders.

1. Design a plan to bring awareness to the issue.

1. Gather data, statistics, and authoritative resources from multiple sources to support the information in your plan.

1. Organize the information in a clear and concise format appropriate for multiple, non-scientific audiences.

1. Present the findings or campaign.