Name _____ Class _____ Date _____

Exploration Lab **RESEARCH**

Constructing a Timeline

You have begun working as an Editorial Assistant at a wildlife magazine in the Editorial Department. The editor just received this letter from a biologist.

Endangered Wildlife Magazine
350 Ecology Way
Hometown, Your State 12345-6789

Dear Editor:

Declining levels of biodiversity is a serious ecological issue that concerns us all. But it is time to face the fact that captive breeding programs are an ineffective way of protecting endangered species. The inbreeding that occurs in small populations simply reduces genetic diversity still further.

Even when the breeding program is moderately successful, the animals experience high mortality rates when reintroduced back into the wild. Sometimes they even spread diseases through the wild population that lacks resistance to these diseases. This further devastates species. Funds that are spent on these programs would be better spent on protecting habitats, preventing poaching on existing preserves, and educating the public to value and protect wildlife.

Sincerely

Professor Judith Samson, Developmental Biology

The Editor does not have time to respond, but would like to include the letter in the next issue. Your assignment is to research the topic and help draft an article for *Endangered Wildlife*. Work alone or in a small group to gather information about captive breeding programs. To organize the information, draw timelines on breeding and recovery programs for two endangered species. You might look at any of the following species for this research: Arabian oryx, California condor, Florida panther, sea otters, swift fox, trumpeter swan, and red or gray wolves.

OBJECTIVES

Organize data about the selected species.

Summarize information for a timeline.

Compare and **evaluate** captive breeding programs.

MATERIALS

- books, journals, and magazines with conservation or environmental themes
- glue sticks
- paper or notebook
- pen or pencil
- poster board
- scissors or Exacto knife
- standard ruler

Procedure

1. Your first task is to select a species to investigate. Most captive breeding programs in zoos focus on large mammals, but do not overlook programs focusing on reptiles, birds, invertebrates (e.g., butterflies), marine and smaller mammals for consideration. Select any of the listed species or choose any other species that interests you. Record the species name.

_____

2. Use the Research Summary Form found on the next page to keep track of the sources you use and to evaluate their reliability. You may use books, articles or computer Web sites.
3. Try to find out when the species was first identified, its original habitat range, and estimates of its original population size. List this information below.

_____

_____

_____

4. Gather information about human or environmental threats to the species' survival and when the species was formally added to the endangered or threatened species list. Record your findings.

_____

_____

_____

_____

5. Look for dates and any available numbers on the growth of the captive population over time. Record what you find.

_____

_____

_____

6. Find out what you can about the success or failure of any reintroduction programs associated with the species and related dates. List any organizations, zoological gardens, or foundations and when they became involved in breeding or recovery efforts.

_____

_____

_____

Name _____ Class _____ Date _____

Constructing a Timeline *continued*

RESEARCH SUMMARY FORM

BOOKS

Title:

Author:

Publisher/Distributor:

Date:

Type of source:

Main points:

Title:

Author:

Publisher/Distributor:

Date:

Type of source:

Main points:

MAGAZINES

Article:

Summary:

Article:

Summary:

INTERNET

Web site:

Organization:

Summary:

Web site:

Organization:

Summary:

Web site:

Organization:

Summary:

INTERVIEW

Person interviewed:

Organization:

Questions asked:

Analysis

1. **Describing Events** Species 1: Summarize the main events you want to include in the first timeline.

_____

_____

_____

2. **Describing Events** Species 2: Summarize the main events you want to include in the second timeline.

_____

_____

_____

3. **Organizing Data** Put the events for the first species in the format you plan to use for the related timeline. Then transfer your work to a sheet of poster board. Include a title, centerline from which information branches, and range of dates. You may add pictures.

4. **Organizing Data** Put the events for the second species in the format you plan to use for the related timeline. Then transfer your work to a sheet of poster board. Organize the chart as in Step 3.

Conclusions

5. Making Comparisons Examine the two timelines that you constructed. Compare the successes and failures of the two captive breeding programs.

6. Evaluating Write a brief reply (one paragraph) to the biologist's letter in which you take a position on whether captive breeding programs are an effective method of rescuing endangered species.

Exploration Lab

RESEARCH

Constructing a Timeline

Teacher Notes

Alecia Hagberg
Dalton
High School
Dalton, Georgia

TIME REQUIRED Two 45-minute class periods

SKILLS ACQUIRED

Collecting data
Organizing data
Constructing models
Identifying patterns
Communicating

RATING

Easy 1 2 3 4 Hard

Teacher Prep–1
Student Set-Up–2
Concept Level–2
Clean Up–1

THE SCIENTIFIC METHOD

Make Observations Procedure, steps 3–6

Analyze the Results Analysis, questions 1–4

Draw Conclusions Conclusions, questions 5 and 6

MATERIALS

Students may wish to use word processing or presentation programs, or graphic design tools to give their timelines a more polished look. They could also illustrate their timelines with photographs or drawings or find pictures of the endangered species in books or magazines.

SAFETY CAUTIONS

Students should treat scissors and Exacto knives with respect. They should never cut poster board while holding it directly in their hands. They should rest it on a flat work surface for cutting. Students should put something under the poster board so they don't damage the surface.

TIPS AND TRICKS

This activity is appropriate for a student working alone or in a small group. Remind students to always evaluate research sources for bias and to be alert for logic flaws and signs of conflicting information. If students use Web sites, the sites should be evaluated just as critically as any written source. Knowing the site's sponsoring organization will help in evaluating the reliability of the information provided. You may want to divide students into groups to simplify the research task and prevent overlap of workload. Students may present their research to the entire class.

Name _____ Class _____ Date _____

Exploration Lab

RESEARCH

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Sincerely

Professor Judith Samson, Developmental Biology

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- standard ruler

Name _____ Class _____ Date _____

Constructing a Timeline *continued*

Procedure

1. Your first task is to select a species to investigate. Most captive breeding programs in zoos focus on large mammals, but do not overlook programs focusing on reptiles, birds, invertebrates (e.g., butterflies), marine and smaller mammals for consideration. Select any of the listed species or choose any other species that interests you. Record the species name.

   Species chosen may vary with student interests.

2. Use the Research Summary Form found on the next page to keep track of the sources you use and to evaluate their reliability. You may use books, articles or computer Web sites.

3. Try to find out when the species was first identified, its original habitat range, and estimates of its original population size. List this information below.

   Answers may vary. Many species may be from biodiversity hotspots. Their range and population size will have decreased.

4. Gather information about human or environmental threats to the species' survival and when the species was formally added to the endangered or threatened species list. Record your findings.

   Answers may vary. Sample answers: habitat destruction, poaching and hunting, introduction of exotic species, pollution. Dates vary.

5. Look for dates and any available numbers on the growth of the captive population over time. Record what you find.

   Answers may vary with individual species.

6. Find out what you can about the success or failure of any reintroduction programs associated with the species and related dates. List any organizations, zoological gardens, or foundations and when they became involved in breeding or recovery efforts.

   Answers may vary. Sample answers: Wild Animal Propagation Trust (WAPT), National Zoological Park, World Wildlife Fund (WWF), Peregrine Falcon Recovery Project, World Zoo Organization (WZO)

Name _____ Class _____ Date _____

Constructing a Timeline *continued*

RESEARCH SUMMARY FORM

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Author:

Publisher/Distributor:

Date:

Type of source:

Main points:

Title:

Author:

Publisher/Distributor:

Date:

Type of source:

Main points:

MAGAZINES

Article:

Summary:

Article:

Summary:

INTERNET

Web site:

Organization:

Summary:

Web site:

Organization:

Summary:

Web site:

Organization:

Summary:

INTERVIEW

Person interviewed:

Organization:

Questions asked:

Name _____ Class _____ Date _____

Analysis

1. **Describing Events** Species 1: Summarize the main events you want to include in the first timeline.

   Answers may vary but should include dates when the species was first identified, when the species was formally added to the endangered or threatened species lists and dates when the species was reintroduced into the wild.

2. **Describing Events** Species 2: Summarize the main events you want to include in the second timeline.

   Answers may vary. Similar information should be included for both species. Students may wish to include other events that were happening in the outside world at the same time to give their timelines context.

3. **Organizing Data** Put the events for the first species in the format you plan to use for the related timeline. Then transfer your work to a sheet of poster board. Include a title, centerline from which information branches, and range of dates. You may add pictures.

   Actual timelines may vary from species to species.

4. **Organizing Data** Put the events for the second species in the format you plan to use for the related timeline. Then transfer your work to a sheet of poster board. Organize the chart as in Step 3.

   Actual timelines may vary from species to species.

Name _____ Class _____ Date _____

Conclusions

5. **Making Comparisons** Examine the two timelines that you constructed. Compare the successes and failures of the two captive breeding programs. **Answers will vary. Some captive breeding programs will appear more successful than others.**
6. **Evaluating** Write a brief reply (one paragraph) to the biologist's letter in which you take a position on whether captive breeding programs are an effective method of rescuing endangered species.

Answers may vary. Students may agree or disagree with the biologist's point of view. Sample answer: While captive breeding may not be an ideal solution, for some endangered species it may be the only chance they have to survive.