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Heredity and the Environment [8th grade]

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UNDERSTANDING BY DESIGN

Unit Cover Page

Unit Title: Heredity and the Environment

Grade Level: 8th Grade

Subject/Topic Area(s): Science

Designed By: Dustin Demoin

Time Frame: 20 days

School District: North East ISD

School: Jackson Middle School

School Address and Phone:

4538 Vance Jackson
San Antonio, TX 78230
(210) 442-0550

Brief Summary of Unit (Including curricular context and unit goals):

This unit attempts to provide the connections for a four week unit that covers Ecosystems, Genetics, and Stresses (both internal and external). The unit first recaps the information that should have already been covered in 6th and 7th grade with respect to ecosystems. This includes the performance assessment which centers on using their knowledge to reconnect the concepts they already know with the ones they are still struggling to learn. Next, the unit draws connections to genetics, specifically traits and DNA. These are impacted by the ecosystem and human and environmental factors. These factors are focused on last, but are discussed in the ecosystems (including the performance assessment) and genetics sections as well. Thus, the cohesive unit highlights specific parts of the enclosed unit flow chart for defined amounts of time, but the connections are much more than originally meet the eye. This unit strives to be interactive and informative, yet is focused on getting students depth not just breadth. Deep understanding is the goal at every step and students should be encouraged to come up with all of the connections they can between the sections of the unit and their world. This unit aligns with the North East ISD scope and the TEKS: 8.6 (C), 8.11 (A-C), and 8.14 (B). The TAKS workbook also calls for DNA to be addressed (but its molecular structure to be left out), and thus this too has been added to the curriculum.

Unit: Heredity and the Environment.

Grade: 8

Stage 1: Desired Results

Content Standards (TEKS)

- (8.6) The student knows that interdependence occurs among living systems. The student is expected to:
- C. Describe interactions within ecosystems.
- (8.11) The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms. The student is expected to:
- A. Identify that change in environmental conditions can affect the survival of individuals and of species;
 - B. Distinguish between inherited traits and other characteristics that result from interactions with the environment; and
 - C. Make predictions about possible outcomes of various genetic combinations of inherited characteristics.
- (8.14) The student knows that natural events and human activities can alter Earth systems. The student is expected to:
- B. Analyze how natural or human events may have contributed to the extinction of some species
- 8th grade TAKS Objective 2
The student will demonstrate an understanding of living systems and the environment.
- 8th grade TAKS Objective 5
The student will demonstrate an understanding of Earth and Space systems.

Understandings

Students will understand that...

- 1) Everything in an ecosystem has a specific role.
 - Misunderstanding: Because something negatively affects humans, it has no purpose (scorpions and spiders). Instead of “can’t we get rid of this,” students ask “what does this do and why is it important?”
 - Human interactions with our surroundings cause extinctions and adaptations.
 - Misunderstanding: Animals are not meant to be in the city; don’t they know that people live here? The animals adapt their behaviors to coexist in the city, although not necessarily safely for people (e.g. raccoons in garbage, snakes on the front door step, deer crossings, etc.).
- 2) Traits are inherited through genes (DNA).
 - Traits can be dominant, recessive, or have incomplete dominance.
- 3) Phenotypes and genotypes are affected by interactions with the environment.
 - Example: Animal’s fur changes color in the winter.

Essential Questions

- Why is balance in ecosystems important?
- Are humans the heroes or the villains of the ecosystem?
- Can you predict what traits your children will have? (physical, intellectual, social, etc.). Your grandchildren? Your great grandchildren?
- Which is more powerful – genes or the environment?

Knowledge

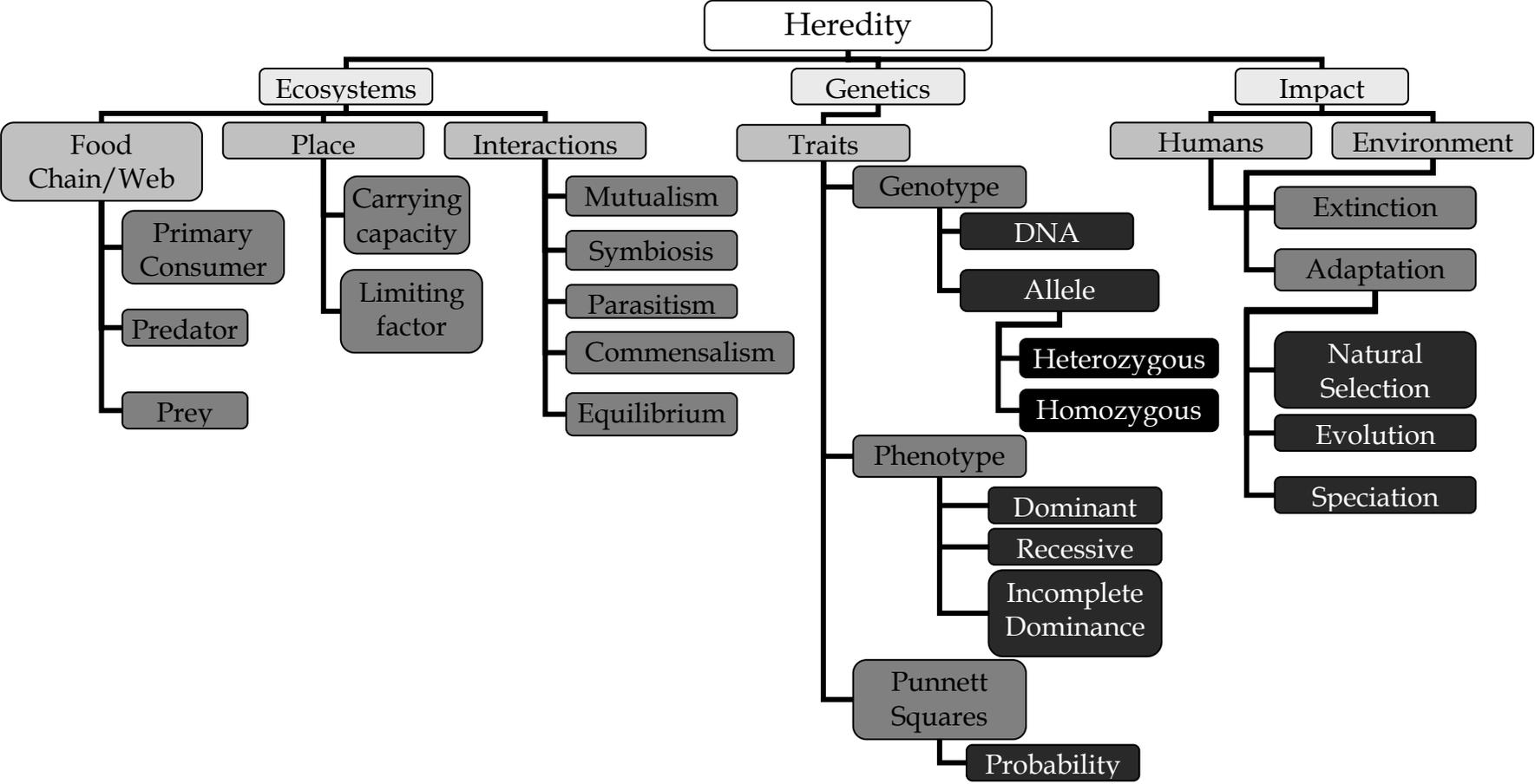
Students will know:

- District Vocabulary
- Interdependence occurs among living systems
- Traits of species can change through generations
- Instructions for traits are contained in the genetic material of the organisms
- Natural events and human activities can alter Earth systems
- Environmental conditions affect the heredity of the species
- The difference between dominant, recessive, and incomplete dominance with examples.
- About Natural Selection and its vocabulary.
 - This could lead to evolution and speciation.
- Factors that contribute to extinction.
- Human events that may contribute to extinction.
- Ecosystem vocabulary: Predation, predator, symbiosis, mutualism, parasitism, and commensalism (should be refreshers to understand ecosystems).

Skills

Students will be able to:

- Use a Punnett square
- Differentiate between genotype and phenotype
- Discuss the negative and positive effects of humans on ecosystems/environment/genetics
- Describe interactions within ecosystems
- Identify that change in environmental conditions affect the survival of organisms
- Distinguish between inherited traits and other characteristics that result from interactions with the environment
- Make predictions about possible outcomes of various genetic combinations of inherited characteristics
- Identify limitations to models.
- Interpret the information from a food web.



Stage 2: Assessment Evidence

Performance Task:

What do these things do?

Students will be asked to present one idea for a new show on Animal Planet called “What do these things do?” The students will each pick one animal from a list of those provided and will have to investigate what function the organism does and then project what the world would be like without the organism. Students can write an essay, create a story board (PowerPoint, Poster Board, Science Backboard, etc.), write a script, or film a short version of their segment in the series. Students will present their idea for the new show and what they want to accomplish in the thirty minutes provided by the producers. The other students in the class will evaluate the presenters on their ideas (research and projected future), presentation style, and interest in putting it in the show. The teachers will assess the project on research (what they found out about the function of the organism), creativity of future (logical thoughtfulness), creativity of presentation, and interest (did the student make the idea interesting for the viewer). A rubric will be provided to help the students organize what exceeds, meets, and does not meet expectations.

Other evidence:

(quizzes, tests, academic prompts, etc. note – these are usually included where appropriate in Stage 3 as well)

Vocabulary quizzes (split into thirds):

1. Ecosystems
 - a. Primary consumer, carrying capacity, limiting factor, mutualism, commensalism, parasitism, symbiosis, equilibrium, food web, and food chain
2. Genetics
 - a. Trait, allele, dominant, recessive, homozygous, heterozygous, phenotype, genotype, Punnett square, and probability
3. Impact (not graded separate, included on final test)
 - a. Adaptation, natural selection, evolution, extinction, and speciation

Tests: Major test to ask information about the information covered for the unit (all four weeks) in the TAKS format

Student Work: Punnett Squares Lab; Celebrity Cross Lab (exit slip); Giraffes Lab; and Toothpick Lab (exit slip)

Checklist

- Performance Task
- Assignment Sheet for Performance Task
- Rubric for Performance Task
- Prompts
- Quizzes
- Tests
- Student Work
- Other

I am: _____

I am in _____ period.

What do these things do?

Animal planet has recently decided to start a new series called "What do these things do?" You have been hired as a writer/idea person to investigate the function of organisms within ecosystems and to present a cohesive show. The overall presentation of the show is supposed to start with what organisms do currently in their ecosystems and then end with a view of what would occur if the organism was to become extinct. You should think of a creative way to present your ideas and you will have time to work on these during class. We will work in groups of two to prepare these proposals. As in real life, you will need to work together to make the best presentation possible. There will be two components to your project. The written or visual component will require you to turn something in to the producers (Mr. Demoin and Mr. Ryan) and the presentation component will require you to pitch your idea to a focus group (the class).

What do I have to have?

Research about the function of the organism (you need to cite sources)

Logical progression of what will occur if the organism's species was to become extinct.

Correct usage of vocabulary terms

Proof of your work (something tangible)

A presentation for the class

What do I get to choose?

Your animal

Your partner

How to present your ideas (poster, PowerPoint, script, science backboard, video, etc.)

What you turn in with your ideas (poster, paper, script, science backboard, video, etc.) to the producers

When do I do it?

Day 1, November 1, 2006

- Choose a partner
- Choose an organism
- Let Mr. Demoin & Mr. Ryan know
- Start Research

Day 2, November 2, 2006

- Research Function
 - A "Day" in the life of the organism
 - Its role in the ecosystem (labeled visual of the ecosystem?)
 - Use of vocabulary to identify the different parts of the ecosystem and where your organism "fits in."
 - What eats your organism/ what does it eat/ what depends on it
 - What's cool or interesting about your organism?
 - How is this organism useful to humans?
- **Turn-in a completed research sheet to Mr. Demoin or Mr. Ryan**

Day 3, November 3, 2006 (Library)

- Research Extinction Affects
 - What happens first? Second? Third?
 - Things to think about:
 - What if it stopped eating? Would those organisms overpopulate?
 - What if the things that ate it no longer had food? Would those organisms die?
 - What if those organisms died?
 - How could this affect humans? What steps would be needed to get to the human change?
- **Turn-in a completed research sheet to Mr. Demoin or Mr. Ryan**

Weekend, November 4-5, 2006

- Perhaps meet with your partner and discuss how you are going to present the project (if possible)
- Fill-in any gaps of your research

Day 4, November 6, 2006 (Library)

- Prepare your five minute presentation with your partner (*share the time equally!*)
- Practice your presentation
- Make it creative!
- **Turn-in your presentation to Mr. Demoin or Mr. Ryan (or show us "what you have done")**

Day 5 & 6, November 7-8, 2006

- All groups will be given exactly five (5) minutes to propose their idea
- **All students will evaluate presentations**
- The group presentation should be divided equally!
- **You and your partner will evaluate one another on your contribution to the project**
- **Turn-in your tangible project items**

Monday, November 13, 2006

- **Interactive Homework Due** (You can turn this in earlier)

Monday	Tuesday	Wednesday	Thursday	Friday
		¹ Introduction of Project Partner & Organism	² Research: Function (Classroom)	³ Research: Extinction Event (Library)
⁶ Prepare Presentations (Library)	⁷ Presentations Partner Assessment	⁸ Presentations Presentation Assessment & Tangible Project	⁹ Presentations (If Needed)	¹⁰
¹³ Interactive Homework Due				

Categories	Exceeds Expectations (100-90%)	Meets Expectations (89-75%)	Does Not Meet Expectations (74-50%)
Research (40 points)	<ul style="list-style-type: none"> ❖ Uses a variety of sources (more than 3 total) ❖ Function, Ecosystem, and Niche clearly stated ❖ Proper use of vocabulary terms ❖ Properly referenced to the source material 	<ul style="list-style-type: none"> ❖ Uses at least 3 sources ❖ Function, Ecosystem, and Niche clearly stated ❖ Proper use of Vocabulary terms ❖ Properly referenced to the source material 	<ul style="list-style-type: none"> ❖ Uses less than 3 sources ❖ Function, Ecosystem, and Niche are not clearly stated ❖ Incorrect use of Vocabulary terms ❖ Source material not properly cited
Logical Progression of events after extinction event (20 points)	<ul style="list-style-type: none"> ❖ Very logical from one step to the next ❖ Adequate information provided to support why the next step would occur 	<ul style="list-style-type: none"> ❖ Clear logical progression from one event to the next; A few leaps in logic, from one step to the next ❖ Evidence is present, but not always well thought out and properly supported 	<ul style="list-style-type: none"> ❖ No clear tie from one event to the next ❖ No evidence to support reasoning ❖ Events state that are not true or not possible (i.e. then all people would fly)
Creativity of Presentation (10 points)	<ul style="list-style-type: none"> ❖ Very organized and prepared proposal ❖ Time is shared equally by all members ❖ Both visually and audibly appealing ❖ Shows much effort was spent preparing for the oral presentation 	<ul style="list-style-type: none"> ❖ Well thought out proposal ❖ Time is equally shared by all members ❖ PowerPoint, Visuals, and voice inflection are properly used ❖ Some effort was spent preparing. 	<ul style="list-style-type: none"> ❖ Haphazard proposal ❖ Time is not equally shared ❖ Visually and audibly unpleasant due to poor planning ❖ Shows little effort in preparing proposal
Interest (5 points)	<ul style="list-style-type: none"> ❖ The group's proposal was accepted by both producers and over 50% of the audience 	<ul style="list-style-type: none"> ❖ The group's proposal was accepted by both producers and 50% of the audience 	<ul style="list-style-type: none"> ❖ The group's proposal was denied by one of the producers and/or more than 50% of the audience
Interactive Homework (10 points)	<ul style="list-style-type: none"> ❖ Returned before the deadline with parent signature 	<ul style="list-style-type: none"> ❖ Returned on the deadline with parent signature 	<ul style="list-style-type: none"> ❖ Returned after the deadline with parent signature
Group Participation (15 points)	<ul style="list-style-type: none"> ❖ Both group members agree that the work was divided equally with respect to the research and presentation ❖ Overall score was at least 90% for both group members 	<ul style="list-style-type: none"> ❖ Both group members agree that the work was divided equally with respect to the research and presentation ❖ Overall score was at least 75% for both group members 	<ul style="list-style-type: none"> ❖ One or both group members state that the work was not divided equally with respect to the research and presentation ❖ Overall score was at less than 75% for one or both group members

I am: _____

I am in _____ period.

What do these things do?

During the presentations you will need to score the presentations on a scale of 1-10 using the following table:

Group	Interesting (1-4)	Research (1-3)	Future (1-3)	Total (10 max)	Include in the Show (Yes or No)	Why or Why not?
1	1 2 3 4	1 2 3	1 2 3		Y N	
2	1 2 3 4	1 2 3	1 2 3		Y N	
3	1 2 3 4	1 2 3	1 2 3		Y N	
4	1 2 3 4	1 2 3	1 2 3		Y N	
5	1 2 3 4	1 2 3	1 2 3		Y N	
6	1 2 3 4	1 2 3	1 2 3		Y N	
7	1 2 3 4	1 2 3	1 2 3		Y N	
8	1 2 3 4	1 2 3	1 2 3		Y N	
9	1 2 3 4	1 2 3	1 2 3		Y N	
10	1 2 3 4	1 2 3	1 2 3		Y N	
11	1 2 3 4	1 2 3	1 2 3		Y N	
12	1 2 3 4	1 2 3	1 2 3		Y N	
13	1 2 3 4	1 2 3	1 2 3		Y N	
14	1 2 3 4	1 2 3	1 2 3		Y N	
15	1 2 3 4	1 2 3	1 2 3		Y N	
16	1 2 3 4	1 2 3	1 2 3		Y N	

What are two things that you learned during the presentations?

1)

2)

Is it OK for humans to just kill other organisms they feel are pests? Why or why not?

Are human actions always correct in killing those organisms that are considered pests?

I am: _____

I am in _____ period.

My partner was: _____

Please score your partner on the following criterion by circling one number in each of the columns (5 is the best; 1 the worst):

Shared the Workload Equally	Was Helpful	Would Work with him/her again	Additional Comments?
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	

I am: _____

I am in _____ period.

My partner was: _____

Please score your partner on the following criterion by circling one number in each of the columns (5 is the best; 1 the worst):

Shared the Workload Equally	Was Helpful	Would Work with him/her again	Additional Comments?
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	

I am: _____

I am in _____ period.

My partner was: _____

Please score your partner on the following criterion by circling one number in each of the columns (5 is the best; 1 the worst):

Shared the Workload Equally	Was Helpful	Would Work with him/her again	Additional Comments?
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	

I am: _____

I am in _____ period.

My family partner is: _____

Relationship: _____

Date: _____

What do these things do?

Dear Family Partner:

We are learning about ecosystems and how all of the animals in an ecosystem impact each other. I have worked with a partner to identify the role of an animal and what would occur if that type of animal were to become extinct for a new show on Animal Planet. This assignment is due _____.

Sincerely,

Student's Signature

Objective: The objective of this assignment is to allow your student the opportunity to use the science vocabulary for this part of the unit and to have another chance to present his or her proposal for the show. Together, we will then choose another animal and discuss what the world would be like if it was to become extinct.

Information: **Ecosystem** - all of the populations that live in an area and the environmental factors that influence these populations

Extinction - A condition in which there are no more living members of a species.

Materials: Pen/pencil, this worksheet.

Procedure:

1. Present your proposal to your family partner. While your family partner is listening, he or she should answer the following questions or ask them of you when you are finished:

A. What does the animal do? _____

B. What animals depend on your student's animal? _____

C. What one negative impact on humans would the extinction cause? _____

D. How would the extinction upset the balance of the ecosystem? _____

2. Together chose an animal that you have in your home or see on a daily basis and discuss how to complete the sentences (the student should fill these in).

A. The animal we chose is _____.

B. The animal's function is to (for example: a dog's function is to be a companion and it eats meat, or cockroaches eat trash) _____

_____.

C. How I would feel if the animal was gone _____

_____.

D. What I think would happen if this animal was to become extinct is _____

_____.

E. We think this would upset the balance of the ecosystem because _____

_____.

Conclusion: Together, answer this question:

Why is balance in an ecosystem important?

Home-to-School Communication:

Dear Family Partner,

Please give me your reactions to your student's work on this activity. Write YES or NO for each statement.

_____ 1. My student understood the homework and was able to complete it.

_____ 2. My student and I enjoyed the activity.

_____ 3. This assignment helped me know what my student is learning in science.

Any other comments: _____

Family Partner Signature: _____

We are: _____ & _____

We are in _____ period.

Research Checklist Day 1

Turn in this checklist stapled to a copy of what you have done today.

Function:

- The life of the organism
 - What does the organism eat?
 - What eats the organism?
 - What depends on it?
 - How does it reproduce?
 - How many babies does it have at one time?
 - Does it have to do anything to camouflage itself from predators?
 - Does it sleep?
 - How long does it live?
- It's ecosystem
 - Labeled visual of the ecosystem?
 - Used vocabulary to identify the different parts of the ecosystem
 - Where does your organism "fit in"
 - Where do humans fit in (if they do)?
- What's cool or interesting about your organism?
- How is this organism useful to humans?

Turn-in a completed research checklist and stapled copy of research.

We are: _____ & _____

We are in _____ period.

Research Checklist Day 1

Turn in this checklist stapled to a copy of what you have done today.

Function:

- The life of the organism
 - What does the organism eat?
 - What eats the organism?
 - What depends on it?
 - How does it reproduce?
 - How many babies does it have at one time?
 - Does it have to do anything to camouflage itself from predators?
 - Does it sleep?
 - How long does it live?
- It's ecosystem
 - Labeled visual of the ecosystem?
 - Used vocabulary to identify the different parts of the ecosystem
 - Where does your organism "fit in"
 - Where do humans fit in (if they do)?
- What's cool or interesting about your organism?
- How is this organism useful to humans?

Turn-in a completed research checklist and stapled copy of research.

We are: _____ & _____

We are in _____ period.

Research Checklist Day 2

Turn in this checklist stapled to a copy of what you have done today.

Extinction:

- What would happen
 - What happens first, second, third? (might use your ecosystem visual)
 - How does this affect the ecosystem overall?
 - What could cause an extinction event to your organism?
 - What if the organisms that ate your organism no longer had food?
 - Is your organism the main source of food for an organism? If so what?
 - Would those organisms die?
 - What would happen if those organisms died?
- Human Affects
 - How could this affect humans?
 - What steps would lead to a change in humans?

Turn-in a completed research checklist and stapled copy of research.

We are: _____ & _____

We are in _____ period.

Research Checklist Day 2

Turn in this checklist stapled to a copy of what you have done today.

Extinction:

- What would happen
 - What happens first, second, third? (might use your ecosystem visual)
 - How does this affect the ecosystem overall?
 - What could cause an extinction event to your organism?
 - What if the organisms that ate your organism no longer had food?
 - Is your organism the main source of food for an organism? If so what?
 - Would those organisms die?
 - What would happen if those organisms died?
- Human Affects
 - How could this affect humans?
 - What steps would lead to a change in humans?

Turn-in a completed research checklist and stapled copy of research.

We are: _____ & _____

We are in _____ period.

Research Checklist Day 3

Turn in this checklist stapled to a copy of what you have done today.

Presentation:

- Planning
 - Who is saying what?
 - The five minutes is equal on both sides?
 - You have a unique/creative presentation style?
- Presentation
 - You've made all of the visuals or you have a plan to finish them tonight
 - What happens if one of you is gone the following day?
 - You run through it and take no more than five minutes

Project:

- Turn-in Project
 - All of your research is put together
 - You know what you are turning in
 - Both of you have a copy in case one of you is absent.

Turn-in a completed research checklist and stapled copy of what you have accomplished today.

We are: _____ & _____

We are in _____ period.

Research Checklist Day 3

Turn in this checklist stapled to a copy of what you have done today.

Presentation:

- Planning
 - Who is saying what?
 - The five minutes is equal on both sides?
 - You have a unique/creative presentation style?
- Presentation
 - You've made all of the visuals or you have a plan to finish them tonight
 - What happens if one of you is gone the following day?
 - You run through it and take no more than five minutes

Project:

- Turn-in Project
 - All of your research is put together
 - You know what you are turning in
 - Both of you have a copy in case one of you is absent.

Turn-in a completed research checklist and stapled copy of what you have accomplished today.

Stage 3: Learning Activities

(Steps taken to get students to answer Stage 1 questions and complete performance task)

Day 1

- Introduce the Unit
 - EQ's
 - Discuss what we will be doing
 - Make an advanced organizer for the unit
- If time remains, start the material for Day 2

Day 2

- Reread Essential Question: *Why is balance in ecosystems important?*
- Introduce Ecosystem Vocabulary
 - Primary consumer, carrying capacity, limiting factor, mutualism, commensalism, parasitism, symbiosis, equilibrium, food web, and food chain
 - Do this with a story of an ecosystem – Instructor reads the story and the students will use context clues to define what the terms mean.
 - The definitions will then be written on flash cards, for ease of studying
 - We will give them envelopes to hold the cards and they can either take them or keep them in their notebooks.
- Create a food web (Cards prepared and draw in notebook)
- Create a food chain (Cards prepared and draw in notebook)

Day 3

- This is one of my days that I could possibly not have, but is to complete the activities from Day 1 & 2 or to move on to Day 4.

Day 4

- Introduce Project
 - Have students pair up, make sure everyone has a partner, and is sitting by him or her
 - Handout the assignment page
 - Go over the assignment and the grading rubric
 - Discuss interactive homework (student will give their presentation to their parents, due on Day 11)
 - Let students pick their organism
 - Have the laptops ready so that students may begin their project after they have chosen their organism
 - Give them ideas about brainstorming

Day 5

- Research (Laptops and perhaps use Alpha Smarts, so they can print out three copies for the next day [one for us and one for each partner])
 - In groups work on their proposals
 - By the end of the day they should have:
 - What ecosystem it belongs to (where it's found)
 - Function
 - Predators
 - Prey
 - mutualism, commensalism, parasitism, or symbiosis
 - how contributes to equilibrium
 - Ideas of what happens if they were to become extinct

- Prey would over populate?
- Predators would die?
- Equilibrium would be upset?
- Would another organism adapt to fulfill the function?
- How would this all negatively impact humans?

Day 6

- Research
 - In groups working on their proposals
 - By the end of the day they should have:
 - How they are going to present their proposals
 - Discussed how they are going to split up the presentation
 - Finished their presentation to at least the point that they can give their proposal
 - E-mailed a copy to me if they are doing PowerPoint and need to use the TV

Day 7

- If day 3 wasn't used, we could possibly take another day for research to finish up any piece they haven't already.
- Start presentations
 - Order chosen by random drawing
 - Students have a scoring rubric for the presentations (scores will be averaged to give the groups the presentation grade for their projects on their overall grading rubric)

Day 8

- Presentations Continued

Day 9

- Another day for catch-up. If not needed, we can do a short Vocab Game, take the quiz, and then introduce Genetics.
- Presentations Continued
- Vocabulary Game

Day 10

- Take Vocabulary Quiz
 - Primary consumer, carrying capacity, limiting factor, mutualism, commensalism, parasitism, symbiosis, equilibrium, food web, and food chain
- Have students look at EQ and see what they think about it.
 - Journal (might use as Warm-Up)
- Look at the advanced organizer and see where we are going to next: Genetics
- Reread Essential Question: *Can you predict what traits your children will have? (physical, intellectual, social, etc.). Your grandchildren? Your great grandchildren?*
- Introduce Ecosystem Vocabulary
 - Trait, allele, dominant, recessive, homozygous (purebred), heterozygous(hybrid), phenotype, genotype, Punnett square, probability
 - Hand out Mad libs style story. Each group of four gets one word. Wes and I each have one too (ten total).
 - Students will look up the one word they have, find the definition and write it down.
 - They will then decide which blank it fits in best.
 - Then we will popcorn to get the mad libs filled out

- Each group will explain their own term and everyone will make their own study cards. (different colored paper with 10 boxes on it [one page per student])
- We will give them envelopes to hold the cards and they can either take them or keep them in their notebooks.

Day 11

- Finish Day 10's Stuff
- Recap and do one Punnett Square with the students
- Do Lab stations for Punnett Squares
 - Set-up 4 different stations using Punnett Squares and have the students work the problems

Day 12

- Celebrity Cross Lab
 - 6 men
 - Include David Beckham, Usher, 50 Cent, Johnny Depp, Brad Pitt, and Mario Lopez
 - 6 women
 - Include Tyra Banks, Mariah Carey, Angelina Jolie, Jennifer Anniston, Jennifer Lopez, Mia Hamm
 - Students will predict the outcome of their offspring with the celebrity of their choosing based on the factors provided.

Day 13

- Traits are linked to DNA & how DNA is transferred
 - Overhead from Gateways
- Warm-Up Punnett Squares & Review what happened before Thanksgiving Holidays.
- Use student's prior knowledge to preface DNA information of the DNA Lab
- DNA Lab
- Maury Worksheet
- "What kind of job would this be?"

Day 14

- This is a blank day for whatever is not finished.
- The Vocab Quiz could be done on the 15th day instead

Day 15

- Take Vocabulary Quiz
 - Trait, allele, dominant, recessive, homozygous, heterozygous, phenotype, genotype, Punnett square, probability
- Have students look at EQ and see what they think about it.
 - Journal (might use as Warm-Up)
- Look at the Advanced Organizer and see where we are headed next: Impact (perhaps add connections from the stuff already covered to Genetics (creating a web)
- Reread Essential Questions:
 - *Which is more powerful – genes or the environment?*
 - *Are humans the heroes or the villains of the ecosystem?*
- Introduce Ecosystem Vocabulary
 - Adaptation, natural selection, evolution, extinction, speciation
 - Marzano's 5 vocab steps, for all 5.
 - We will provide all of the pieces, except the definition in their own words, which we will leave blank until later.

- We will also make flash cards for studying.
- We will give them envelopes to hold the cards and they can either take them or keep them in their notebooks.

Day 16

- Giraffes Lab
 - Discuss Adaptation and Evolution as is believed to have occurred with Giraffes
 - Wes has this in his binder

Day 17

- Toothpick Lab
 - Discuss how this is natural selection (survival of the fittest)
 - Wes has this in his binder

Day 18

- Blank day for making up what we need to

Day 19

- Look back at the advanced organizer and make the final connects to complete the Unit
- Review for test with a review sheet and numbered heads

Day 20

- Unit Test

Monday	Tuesday	Wednesday	Thursday	Friday
30 Introduction of Unit	31 Food Web, Food Chain, Intro Vocab	1 Ecosystem (Video) Introduction of Project	2 Research Function (Classroom)	3 Research Extinction (Library)
6 Research Presentation (Library)	7 Presentations F. assessment	8 Presentations F. assessment	9 Presentations & Vocab Game	10 Vocab Quiz & Introduction to Genetics
13 Punnett Squares & Interactive homework due	14 Sex Ed.	15 Sex. Ed	16 Sex Ed.	17 Celebrity Cross Lab
20 Holiday	21 Holiday	22 Holiday	23 Holiday	24 Holiday
27 Traits are linked to DNA & how DNA is transferred	28 Vocab Quiz	29 Introduction to Impact	30 Giraffes Lab (show evolution)	1 Toothpick Lab (show natural selection)
4 Blank	5 Review	6 Test	7	8

Introducing the Unit

Unit: Heredity and the Environment

Lesson: Introducing the Unit

Objectives:

- SWBAT identify the major themes of the unit.

TEKS:

- None: This is an introductory lesson, which will function to lay the groundwork for the unit.

Materials:

- Students will need their notebooks
- Essential questions on the wall
- The first layer of the Advanced Organizer will be on the wall
- Connectionless Advanced Organizer (one for each student, notebook size)

Introduction:

- Warm-Up: Journal, What makes me “me?”
- Have students share their thoughts
 - Eye color; hair; other traits?
 - Introduce the Essential Question: *Can you predict what traits your children will have? Your grandchildren? Your great grandchildren?*
 - Give students the first of the Advanced Organizer: Heredity → Genetics (Define heredity and genetics!)

Teaching New Material:

- Fear Factor:
 - Have students think of something that really bothers them in our ecosystem (bugs, arachnids, snakes, bears, etc.)
 - Brainstorm ideas that we could do to eliminate all of the things that bother them
 - Would this be a good thing?
 - Would humans be right taking the steps to eliminate those pesky items?
 - Discuss if one could move or change location, why certain things to don't live everywhere
- Introduce the Essential Question: *Why is balance in ecosystems important? & Are humans the heroes or the villains of the ecosystem?*
 - Give students the next piece of the advanced organizer: Heredity → Ecosystem (Define Ecosystem)
- Finally, introduce the Essential Question: *Which is more powerful – genes or the environment?*
 - Give students the final piece of the advanced organizer: Heredity → Impact (Define Impact)
- Hand out connectionless Advanced Organizer

Introducing the Unit

Guided Practice:

- Students will then brainstorm ideas of things they've heard and make a thinking map in their notebooks about what they've heard from genetics on TV and in their world.
 - Maybe do this first to find out what the students already know.

Independent Practice:

- None.

Assessment: Informal assessment of the thinking map.

Feedback: Take questions, answer questions, and help students to begin to think about what we are doing during this unit.

Ecosystems Vocabulary Introduction and Food Webs/Chains

Unit: Heredity and the Environment

Lesson: Ecosystems

Objectives:

- SWBAT understand the vocabulary terms: Primary consumer, carrying capacity, limiting factor, mutualism, commensalism, parasitism, symbiosis, equilibrium, food web, and food chain.
- SWBAT construct a food web given information about the organism's food.
- SWBAT identify a single food chain given a food web.

TEKS:

8.6 The student knows that interdependence occurs among living systems. The student is expected to:

C. Describe interactions within ecosystems.

Materials:

- Ecosystem Cards (one per group = 8 sets)
- Ecosystem Table (one per group = 8)
- Vocabulary Foldable (one per student) ← on green
- Handouts for Story (one per student)
- Envelopes (one per student)
- Warm-Up Overhead

Introduction:

- Warm-Up – Relationships in Ecosystems (identify which does not belong)
 - Use overhead for warm-up, student just need to write down which one does not belong
- Look at the Advanced Organizer and reference what we will be talking about when we are covering the Ecosystems section.

Teaching New Material:

- Introduce Ecosystem Vocabulary with a story of an ecosystem – Instructor reads the story and the students will use context clues to define the bolded terms.
 - Primary consumer, carrying capacity, limiting factor, mutualism, commensalism, parasitism, symbiosis, equilibrium, food web, and food chain
 - The definitions will then be written on their foldable (I will be filling out one on the overhead).
 - We will brainstorm an idea to allow students to keep them in their notebooks, but they are also free to take them home.

Guided Practice:

- Create a food web (Cards prepared and draw in notebook)
 - In a group of four, students will take the cards that were already prepared and, using the table provided, be able to construct a food web.
 - Once completed, the students will draw these in their notebook
- Food chain
 - Students will then be asked to identify one food chain within their food web and draw it separately.

Ecosystems Vocabulary Introduction and Food Webs/Chains

Independent Practice:

- Conclusion
 - Students will be asked to identify: Primary consumers, producers, and limitations to our model
 - Students will also be asked to identify what would occur if the sun were to be eliminated from the ecosystem
 - Phytoplankton would die, and then those that feed on them would die, all the way up the web to where the carnivores would eventually die.

Assessment:

Students will be informally assessed with walking around. The concept of mastering the vocabulary and understanding the ecosystem will be evident in their research projects.

Feedback:

If time remains, students will be asked to read some of their responses and feedback will be given to help the entire class understand why that was a correct or incorrect response.

Ecosystems Warm-Up

Decide which of each group of words does not belong:

- | | | | |
|---------------|-----------|-----------|-----------|
| 1. squirrel, | lobster, | grass, | rock |
| 2. carnivore, | producer, | omnivore, | herbivore |
| 3. tapeworm, | tick, | flea, | earthworm |
| 4. lion, | tiger, | antelope, | leopard |
| 5. mushroom, | potato, | bacteria, | mold |

If you finish early, try to figure out why they don't belong.



THE LION KING'S TIMON & PUMBAA on ECOSYSTEMS

Timon and Pumbaa were walking through the Serengeti. Both were rather upset because they had a few ticks.

Timon said, "It seems that the relationship, **symbiosis**, between us and these ticks is not working out."

Pumbaa responded, "How so?"

Timon stated, "These bugs just keep sucking our blood, but they do not benefit us! This is just such an uncomfortable symbiotic relationship called **parasitism**."

Pumbaa replied, "I understand what you mean, I wish we had a symbiotic relationship like the egrets and the water buffalo. The egrets eat the pesky parasites off of their skin and then the egrets get a meal out of it."

"**Mutualism** at its best!" Timon yelled.

Pumbaa continued, "Or even if the bugs would just come along for the ride and eat something other than me, like the barnacles on a whale. The barnacles attach to those whales and benefit from the water moving past it, while the whale is neither benefited nor harmed."

"Now that's **commensalism** in action," Timon commented.

"I guess it wouldn't be so bad if we weren't in the middle of the **food chain**," Pumbaa stated after a few moments. "I have to worry about my next meal and about something eating me."

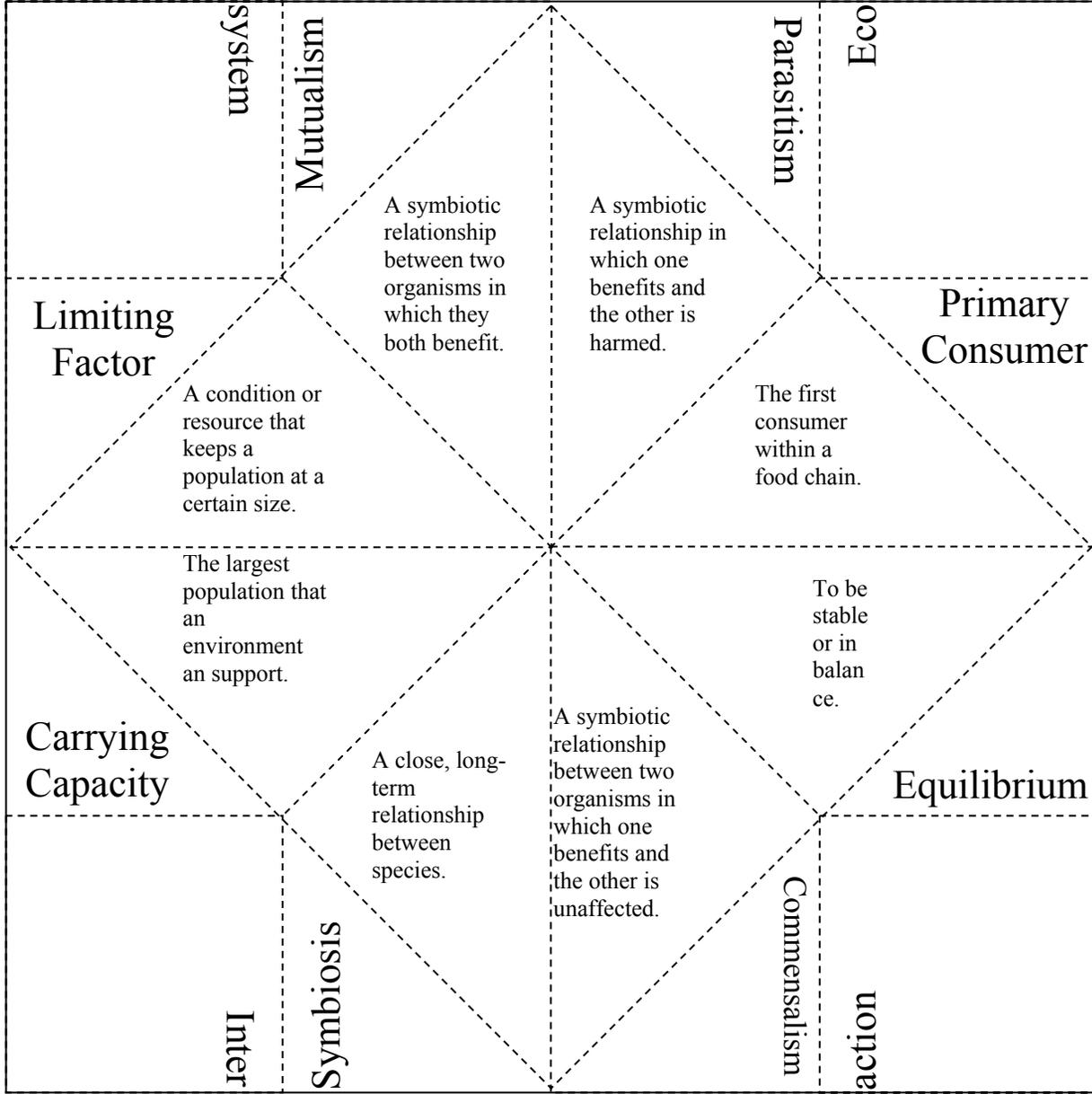
"You know it could be worse, we could think of this as a form of **food web**, with all of the possible things that could eat you, you just aren't safe," Timon added sarcastically.

"I think I have enough to worry about without thinking about that, Timon. Yet it is nice being the **primary consumer**, eating the plants before they get digested by other animals."

"From the looks of it, we need to get moving to the next grazing grounds, the **carrying capacity** for this area seems to be lower than your big appetite," Timon joked.

"Yes, the **limiting factor** to us being able to stay anywhere is always blamed on me, since I eat so much more than you, but I don't see you pushing away from the table, Timon."

"But remember Pumbaa, that with me, the **equilibrium** of an ecosystem is not changed very much, because wherever I go, I don't use too many of the resources, unlike you."



Students fill-in the definitions and pictures

Food Web in a Marine Ecosystem Chart

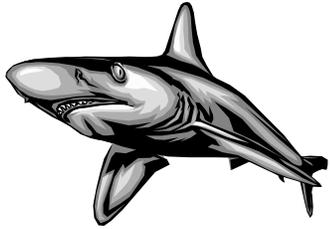
Use the information in the chart to construct the Marine Ecosystem Food Web from the cards provided by your teacher.

Marine Organism	Food or Energy Source
Phytoplankton	Uses sunlight energy to make food by photosynthesis
Water fleas	Plankton
Mollusks	Filter plankton and water fleas
Grouper	Small mollusks, perch
Crab	Water fleas, mullet
Mullet	Plankton, water fleas
Bluefish	Mullet, perch, water fleas
Perch	Mullet
Red Snapper	Mullet, bluefish
Mackerel	Mollusks, bluefish, perch
Swordfish	Bluefish, mackerel, red snapper, bluefish, grouper
Heron Bird	Mullet
Shark	Mackerel, red snapper, swordfish, grouper, sea lion
Sea Lion	Mollusks
Sun	It is the energy source!

Food Web in a Marine Ecosystem Chart

Use the information in the chart to construct the Marine Ecosystem Food Web from the cards provided by your teacher.

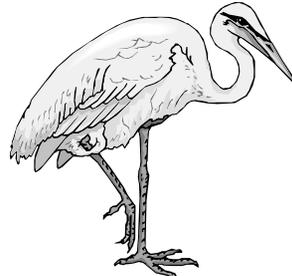
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Heron Bird	Mullet
Shark	Mackerel, red snapper, swordfish, grouper, sea lion
Sea Lion	Mollusks
Sun	It is the energy source!



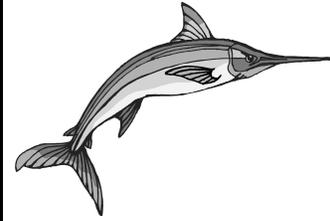
Shark



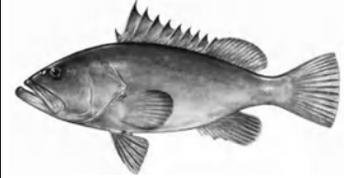
Sea Lion



Heron



Sword Fish



Grouper



Mackerel



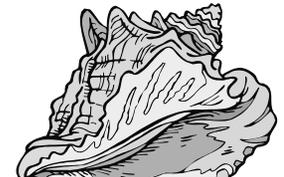
Bluefish



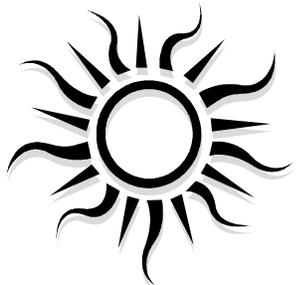
Perch



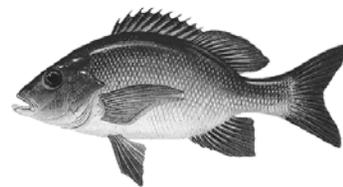
Crab



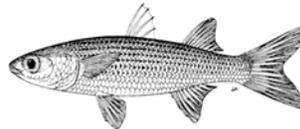
Mollusks



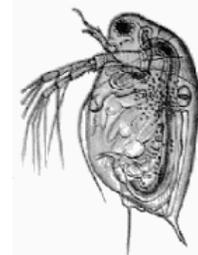
Sun



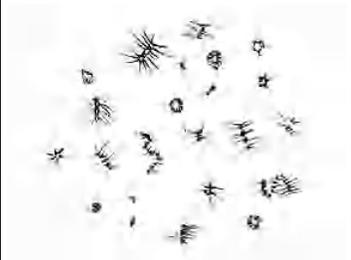
Red Snapper



Mullet



Water Fleas



Phytoplankton

What do these things do? – Performance Assessment

Unit: Heredity and the Environment

Lesson: Ecosystem Project

Objectives:

- SWBAT properly use the vocabulary with respect to their organism and its ecosystem.
- SWBAT predict the possible affects of their organism becoming extinct.

TEKS:

8.7 The student knows that interdependence occurs among living systems. The student is expected to:

C. Describe interactions within ecosystems.

Materials:

- Laptops (for research)
- Alpha Smarts (if not being used to print out the student's research)
- Warm-Up Overhead
- Presentation of the new show
- Example of a proposal
- Project Assignment sheet (copies for all students)
- All of the rubrics (copies for all students)
- Sign-up sheet for groups (one for each class)
- List of Organisms for Research

Introduction:

- Warm-Up – What would happen if the carnivores were to become extinct?
- Presentation about a new show called “What do these things do?” on Animal Planet
- Introduction of Project with an example used for the initial proposal

Teaching New Material:

- Introduce the project guidelines
- Go over all of the rubrics with the students and cover what is expected
- Have students brainstorm ideas of places that they could look for information about organisms

Guided Work:

- Students will pick their partner
- Students will pick their organisms
- Students will start their research

Independent Practice:

- Students will need to complete the questions before they leave the second day:
 - What ecosystem it belongs to (where it's found)
 - Function
 - Predators
 - Prey
 - mutualism, commensalism, parasitism, or symbiosis

What do these things do? – Performance Assessment

- how contributes to equilibrium
- any interesting facts
- Ideas of what happens if they were to become extinct
 - Prey would over populate?
 - Predators would die?
 - Equilibrium would be upset?
 - Would another organism adapt to fulfill the function?
 - How would this all negatively impact humans?
- Students should use the third day to prepare their presentation and finish up whatever needs to be done
- Students will use the fourth and fifth days to present their proposals for the show.

Assessment:

The project will count as three grades.

Further assessment will be completed during the vocabulary quiz to see if the students properly use their vocabulary terms and learned their correct usage during the project.

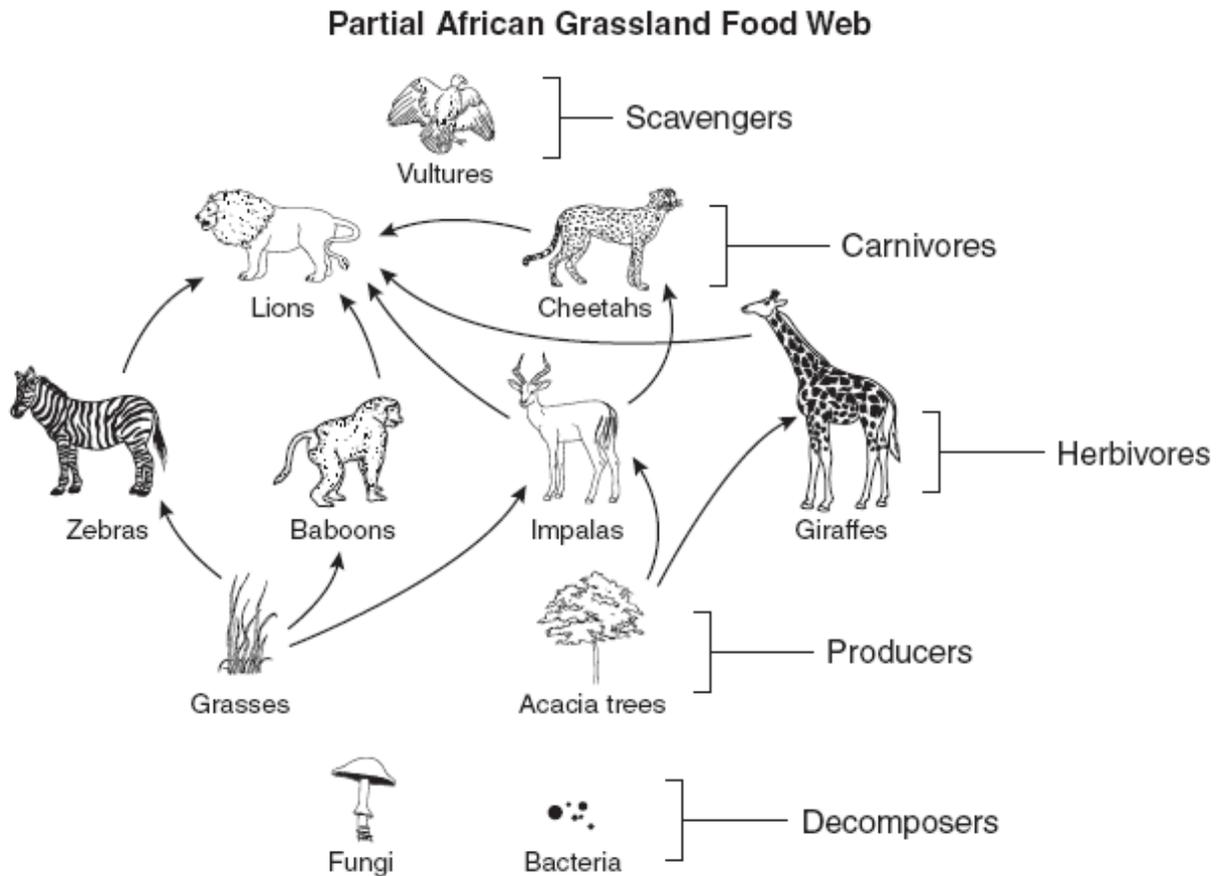
Feedback:

Students will be asked questions and discussion will be added if needed about the projects as they are presented to the class.

The students will assess the presentations; the teachers the research and the completion of the interactive homework. Feedback will be in the form of a grade and some written notes if needed.

Ecosystems Warm-Up

What would happen if the carnivores were to become extinct?



This grassland food web is made up of producers, consumers (herbivores, carnivores, and scavengers), and decomposers. Scavengers such as vultures feed on the remains of dead animals. Decomposers such as bacteria and fungi decompose dead organisms and their wastes.

What do these things do? – Performance Assessment
Organisms List

Scorpions

Spiders

Bees

Ants

Wasps

Mushrooms

Nitrogen Fixing Bacteria

Flies

Mosquitoes

Beetles

Cockroaches

Raccoons

Mice

Snakes

Squirrels

Whooping Cranes

Sea Turtles

The Weakest Link – Ecosystems Vocabulary Game

Unit: Heredity and the Environment

Lesson: Ecosystems Vocabulary Game

Objectives:

- SWBAT define the district vocabulary specific to ecosystems.

TEKS:

8.6 The student knows that interdependence occurs among living systems. The student is expected to:

C. Describe interactions within ecosystems.

Materials:

- Questions for the game
- Student desks need to form teams of 4 to answer questions
- Prizes: Stickers and homework passes.
 - Stickers need to say “I am EXTINCT! Because I didn’t benefit the Ecosystem”

Introduction:

- Welcome to group weakest link!

Teaching New Material:

- We will go around the room in pattern (give pattern).
- Students will listen to the question, provide an answer, and score accordingly.
- Students must bank for their total to be increasing.
- Talking from one group to another will result in the bank being set back to zero.
- We will play 3 rounds.
 - Maximum in the first round is 5,000 points (2 minutes).
 - Maximum in the second round is 25,000 points (1 minute 45 seconds).
 - Maximum in the third round is 70,000 points (1 minute 30 seconds).
 - Maximum in the fourth round is 200,000 points (1 minute 15 seconds).
 - Maximum in the fifth round is 300,000 points (1 minute).
 - Maximum in the sixth round is 400,000 points (45 seconds).
 - Sudden Death: Between two teams.
 - The quickest way is to create a chain that is not broken.
- We will be mixing up some of the information from their presentations and the vocabulary to help them recap what we have covered in the ecosystems section of the unit.
- At the end of each round, teams will vote to remove one of the teams (the weakest link). That team will become EXTINCT!

Guided Practice:

- Play the game in groups of 4.
 - Eliminated in Round 1 gets stickers.
 - Eliminated in Round 2 gets stickers.
 - Eliminated in Round 3 gets stickers.

The Weakest Link – Ecosystems Vocabulary Game

- Eliminated in Round 4 gets stickers.
- Eliminated in Round 5 gets stickers.
- Eliminated in Round 6 gets stickers.
- Eliminated in Sudden Death gets stickers.
- Winners of the whole thing get homework passes.

Independent Practice:

- None

Assessment: Exit slip (not graded) assessing how the students feel about what they know and how they are going to study.

Feedback: Grade on the vocabulary quiz.



I am Extinct! Because I did not
benefit the ecosystem!

DNA Lab

Unit: Heredity and the Environment

Lesson: Understanding DNA

Objectives:

- SWBAT link genetic information to DNA.
 - Students will be exposed to forensic methods of DNA analysis.
 - Students will be exposed to using DNA analysis to determine parentage.
- SWBAT discuss the genetic information (DNA) being a mixture from both parents, not just one.

TEKS:

8.11 The student knows that traits of species can change through generations and that the instructions for traits are contained in the genetic material of the organisms.

Clarifying statements: "...from the 2005 TAKS information booklet: 'Students need to understand that DNA contains all genetic information, but do not need to know details of DNA's molecular structure, which is taught in high school biology. Student should understand that the nucleus of the cell contains the chromosomes, which are composed of DNA, but that DNA can be inherited only through the sex cells (sperm and egg).'"

Materials:

- Lab Sheets (1 per student)
- DNA samples (1 per group)
- "Maury" Show worksheet (1 per student)
- Overhead of DNA link to Cell

Introduction:

- Warm-Up: Punnett Squares
- Since this is the first day after Thanksgiving, a short recap of what we've covered so far in the unit (student's help)
- Use student's prior knowledge of the cell to get to: nucleus, chromosomes, and DNA if they need that (from 7th grade).
- Start Lab: Question

Teaching New Material:

- Lab: Information (Discuss as they go through it)

Guided Practice:

- Finish Lab

Independent Practice:

- "Maury" Show worksheet

Concluding Remarks:

- "What kind of a job would do this kind of work?" "Pay?" "School?"

Assessment:

- Grade completion of "Jackson Forensic Crime Lab Report"

Feedback:

- Circulate around the room and provide help/information for students.

CSI: Forensic Files Lab

Question: How is DNA used to catch criminals?

Information:

DNA codes genetic information using four letters: A, T, C, and G. The letters can be put in any order/combination. When certain combinations occur, "DNA readers" (like enzymes) start, end, or continue processes.

Restriction enzymes bind to specific combinations and then cut the DNA at a specific place. For example, restriction enzyme *Apa* L1 recognizes the sequence GTGCAC and cuts between the first G and the T.

Once the DNA is cut, the pieces are then analyzed using separation techniques. The separation allows for the smaller pieces to move faster than the smaller ones. Then, a reader can count the number of bases.

This process is called DNA restriction analysis. DNA restriction analysis is a technique with applications in medicine, research, and forensics.

People's DNA is identical in every cell in their body. Thus, the skin cells found at the crime lab should have the same DNA as a hair sample on the guilty suspect.

Because people are unaware of the DNA samples they leave behind, forensic scientists generally find the samples with little searching. Thus, the perfect crime is much more difficult these days, than before DNA analyses.

Complete genomic sequencing is not fast with current technology. A species of *E. coli*, a much less complex organism than humans, has 4,639,221-base pairs (38% of the genome has no known function).

Hypothesis:

If we collect DNA from the crime scene and from possible suspects, then the DNA from our suspect analysis that matches the crime scene analysis is the most likely suspect. (Does this prove guilt? Or just that the person was present?)

Experiment:

Materials:

Scissors

DNA samples

Procedure:

- 1) Circle the *Apa* L1 restriction enzyme recognition sites (GTGCAC) on each DNA strip
- 2) Cut between the first G and the T of the recognition site
- 3) Count the number of "base pairs" in each of the fragments
- 4) Write them down in the order from lightest to heaviest
- 5) Determine which one matches the crime scene best
- 6) Fill out the Crime Lab Report

Safety: No Safety Concerns

DNA Samples

Suspect 1

ATGGCTGAACAGTGCCTCCTCAGGCTTTGTATTTGAGCAATATGCGGAAGTGCACGAAG
TACCGACTTGTCACGTGAGGAGTCCGAAACATAAACTCGTTATACGCCTTCACGTGCTTC

Suspect 2

AAAACCATGCACCGATAACACTGGAAAGTGCACGAACTTGCCAGTTTTGTCTCAGTTT
TTTTGGTACGTGGCTATGTGTGACCTTTCACGTGCTTGAACGGTCAAACAGGAGTCAA

Suspect 3

ATAGTGCACAGAACTCCAGAAGACATTGTGCACCCTACTAATGGGAGTGCACATCATTTT
TATCACGTGTCTTGAGGTCTTCTGTAACACGTGGGATGATTACCCTCACGTGTAGTAAAA

Suspect 4

CGGGAGATCATCCACGTGCACTCATCGACAGAAACGTGCACGCCACCCTGGAAAGCCAGA
GCCCTCTAGTAGGTGCACGTGAGTAGCTGTCTTTGCACGTGCGGTGGGACCTTTCGGTCT

Crime Scene

CGGGAGATCATCCACGTGCACTCATCGACAGAAACGTGCACGCCACCCTGGAAAGCCAGT
GCCCTCTAGTAGGTGCACGTGAGTAGCTGTCTTTGCACGTGCGGTGGGACCTTTCGGTCA

DNA Samples Key

Suspect 1

ATGGCTGAACA**GTGCAC**TCCTCAGGCTTTGTATTTGAGCAATATGCGGAA**GTGCAC**GAAG
TACCGACTTGT**CACGTG**AGGAGTCCGAAACATAAACTCGTTATACGCCTT**CACGTG**CTTC

Suspect 2

AAAACCATGCACCGATAACACTGGAA**GTGCAC**GAACTTGCCAGTTTTTGTCCCTCAGTTT
TTTTGGTACGTGGCTATGTGTGACCTTT**CACGTG**CCTTGAACGGTCAAACAGGAGTCAA

Suspect 3

ATAG**GTGCAC**CAGAACTCCAGAAGACATT**GTGCAC**CCTACTAATGGGAG**GTGCAC**ATCATTTT
TAT**CACGTG**TCTTGAGGTCTTCTGTAA**CACGTG**GGATGATTACCCT**CACGTG**TAGTAAAA

Suspect 4

CGGGAGATCATCCAC**GTGCAC**TCATCGACAGAAAC**GTGCAC**GCCACCCTGGAAAGCCAGA
GCCCTCTAGTAGGTG**CACGTG**AGTAGCTGTCTTTG**CACGTG**CGGTGGGACCTTTTCGGTCT

Crime Scene

CGGGAGATCATCCAC**GTGCAC**TCATCGACAGAAAC**GTGCAC**GCCACCCTGGAAAGCCAGT
GCCCTCTAGTAGGTG**CACGTG**AGTAGCTGTCTTTG**CACGTG**CGGTGGGACCTTTTCGGTCA

Data:

Suspect	Short Piece	Medium Piece	Long Piece	Extra Long Piece (if present)
1				
2				
3				
4				

Evidence	Short Piece	Medium Piece	Long Piece	Extra Long Piece (if present)
Crime Scene				

Data:

Suspect	Short Piece	Medium Piece	Long Piece	Extra Long Piece (if present)
1				
2				
3				
4				

Evidence	Short Piece	Medium Piece	Long Piece	Extra Long Piece (if present)
Crime Scene				

Data:

Suspect	Short Piece	Medium Piece	Long Piece	Extra Long Piece (if present)
1				
2				
3				
4				

Evidence	Short Piece	Medium Piece	Long Piece	Extra Long Piece (if present)
Crime Scene				

Jackson Forensic Crime Lab Report

Names of Investigators:

Date of DNA Analysis:

Which suspect's DNA matches the evidence?

Is that suspect guilty?

Explain how you came to this conclusion.

What should we do to make this conclusion better?

Signature of Investigator: _____

Date: _____

Jackson Forensic Crime Lab Report

Names of Investigators:

Date of DNA Analysis:

Which suspect's DNA matches the evidence?

Is that suspect guilty?

Explain how you came to this conclusion.

What should we do to make this conclusion better?

Signature of Investigator: _____

Date: _____

Maury

“I want to know who the parent of my child is!”

Shortened forms of the methods used in our lab are used in paternity and missing persons cases. Below you will find some actual data from different people at 9 different loci. Remember that each person gets one allele from their mother and one from their father. Also, in a paternity case, if the child and the possible father do not match at even one locus, then the father son relationship is false.

Situation 1

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	24	15,16	17,17	21,22	11,13	32,33	14,18	11,11	9,14	7,11
Father?	M	22	15,18	16,18	21,22	11,13	28,31	12,17	11,13	12,12	8,11
Baby	M	1	15,15	16,17	21,22	11,11	31,33	14,17	11,11	9,12	7,11

Do all of the baby's DNA pieces match with one parent or the other (“✓”)?

Mother Father

Is the man accused of being the father the parent? Why or why not?

Situation 2

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	18	15,16	16,18	22,26	13,14	29,33	14,14	11,12	12,13	7,8
Father?	M	19	15,15	17,17	21,22	13,15	31,32	13,18	9,11	10,14	9,11
Baby	F	6 mo.	15,16	17,18	20,26	13,14	31,33	14,18	11,11	11,12	7,9

Do all of the baby's DNA pieces match with one parent or the other (“✓”)?

Mother Father

Is the man accused of being the father the parent? Why or why not?

Situation 3

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	16	15,18	17,17	22,23	12,13	27,31	12,18	9,12	12,14	11,12
Father?	M	14	14,15	15,17	22,24	11,13	32,33	14,21	11,13	9,12	7,10
Baby	M	7 mo.	14,18	15,17	22,23	11,13	32,27	18,21	9,13	9,14	10,11

Do all of the baby's DNA pieces match with one parent or the other (“✓”)?

Mother Father

Is the man accused of being the father the parent? Why or why not?

Situation 4

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	17	17,17	17,18	21,21	11,15	28,30	15,15	10,11	12,14	8,10
Father?	M	18	16,18	16,16	21,24	14,14	29,30	12,13	9,12	10,14	8,8
Baby	F	2	16,17	16,18	21,24	14,15	27,30	12,15	10,12	10,14	8,10

Do all of the baby's DNA pieces match with one parent or the other ("✓")?

Mother

Father

Is the man accused of being the father the parent? Why or why not?

Situation 5

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	20	15,16	15,18	24,24	12,14	30,33	15,20	10,13	10,13	8,11
Father?	M	17	18,18	16,17	25,26	14,14	28,31	13,19	10,10	10,10	8,12
Baby	M	1	16,18	17,18	24,26	11,14	28,33	13,20	10,13	10,13	8,11

Do all of the baby's DNA pieces match with one parent or the other ("✓")?

Mother

Father

Is the man accused of being the father the parent? Why or why not?

Situation 6

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	23	14,18	17,18	23,25	13,13	29,32	19,19	11,13	11,14	7,10
Father?	M	18	16,16	16,16	20,26	13,15	30,30	20,21	10,13	11,12	7,9
Baby	M	3 mo.	16,18	16,17	23,26	13,13	29,30	19,21	10,13	11,14	7,9

Do all of the baby's DNA pieces match with one parent or the other ("✓")?

Mother

Father

Is the man accused of being the father the parent? Why or why not?

Questions from a view to you on the show:

Why is it that the baby's DNA is a 50:50 mixture from the mother and from the father (why does one number have to correspond to the father and one to the mother)?

In Situation 5, what would be a correct combination of the mother and possible father?

KEY

Maury

“I want to know who the parent of my child is!”

Shortened forms of the methods used in our lab are used in paternity and missing persons cases. Below you will find some actual data from different people at 9 different loci. Remember that each person gets one allele from their mother and one from their father. Also, in a paternity case, if the child and the possible father do not match at even one locus, then the father son relationship is false.

Situation 1

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	24	15,16	17,17	21,22	11,13	32,33	14,18	11,11	9,14	7,11
Father?	M	22	15,18	16,18	21,22	11,13	28,31	12,17	11,13	12,12	8,11
Baby	M	1	15,15	16,17	21,22	11,11	31,33	14,17	11,11	9,12	7,11

Do all of the baby's DNA pieces match with one parent or the other (“✓”)?

Mother

Father

Is the man accused of being the father the parent? Why or why not?

Yes, because there is a contribution from both M and F for all of the loci.

Situation 2

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	18	15,16	16,18	22,26	13,14	29,33	14,14	11,12	12,13	7,8
Father?	M	19	15,15	17,17	21,22	13,15	31,32	13,18	9,11	10,14	9,11
Baby	F	6 mo.	15,16	17,18	20,26	13,14	31,33	14,18	11,11	11,12	7,9

Do all of the baby's DNA pieces match with one parent or the other (“✓”)?

Mother

Father

Is the man accused of being the father the parent? Why or why not?

No, Loci 3 and 8 do not have contributions from the suspected father.

Situation 3

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	16	15,18	17,17	22,23	12,13	27,31	12,18	9,12	12,14	11,12
Father?	M	14	14,15	15,17	22,24	11,13	32,33	14,21	11,13	9,12	7,10
Baby	M	7 mo.	14,18	15,17	22,23	11,13	32,27	18,21	9,13	9,14	10,11

Do all of the baby's DNA pieces match with one parent or the other (“✓”)?

Mother

Father

Is the man accused of being the father the parent? Why or why not?

Yes, because there is a contribution from both M and F for all of the loci.

Situation 4

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	17	17,17	17,18	21,21	11,15	28,30	15,15	10,11	12,14	8,10
Father?	M	18	16,18	16,16	21,24	14,14	29,30	12,13	9,12	10,14	8,8
Baby	F	2	16,17	16,18	21,24	14,15	27,30	12,15	10,12	10,14	8,10

Do all of the baby's DNA pieces match with one parent or the other ("✓")?

Mother Father

Is the man accused of being the father the parent? Why or why not?

No, Locus 5 does not have a contribution from the suspected father.

Situation 5

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	20	15,16	15,18	24,24	12,14	30,33	15,20	10,13	10,13	8,11
Father?	M	17	18,18	16,17	25,26	14,14	28,31	13,19	10,10	10,10	8,12
Baby	M	1	16,18	17,18	24,26	11,14	28,33	13,20	10,13	10,13	8,11

Do all of the baby's DNA pieces match with one parent or the other ("✓")?

Mother Father

Is the man accused of being the father the parent? Why or why not?

No, Locus 4 does not have a contribution from the suspected father.

Situation 6

Personal Information			Locus								
Person	Sex	Age	1	2	3	4	5	6	7	8	9
Mother	F	23	14,18	17,18	23,25	13,13	29,32	19,19	11,13	11,14	7,10
Father?	M	18	16,16	16,16	20,26	13,15	30,30	20,21	10,13	11,12	7,9
Baby	M	3 mo.	16,18	16,17	23,26	13,13	29,30	19,21	10,13	11,14	7,9

Do all of the baby's DNA pieces match with one parent or the other ("✓")?

Mother Father

Is the man accused of being the father the parent? Why or why not?

Yes, because there is a contribution from both M and F for all of the loci.

Questions from a view to you on the show:

Why is it that the baby's DNA is a 50:50 mixture from the mother and from the father (why does one number have to correspond to the father and one to the mother)?

When the egg and sperm unite, half of the DNA is from the mother, and half is from the father, thus you cannot have DNA from only one parent (that would be cloning)

In Situation 5, what would be a correct combination of the mother and possible father?

This will vary! One possible combination:

Baby	M	1	16,18	17,18	24,26	14,14	28,33	13,20	10,13	10,13	8,11
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