West Hempstead Union Free School District

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Program Description:

Dr Crean's Storylines for Biology is more than just a curriculum; it is a pedagogical method that increases student ownership over their learning by putting them in the driver's seat. By focusing on the coherence that leads students from lesson to lesson over just the instructional flow that was the focus of traditional classroom curricula, students see the motivation to move to the next lesson. It also integrates the overarching concepts of science within storyline units, unlike the fragmented and disconnected stand-alone units of the past. In addition to identifying essential questions and target vocabulary for each unit, this document provides suggested resources for all learners. Students are encouraged to think, collaborate, and use tools of the scientist. Teachers stimulate thought and problem solving through questioning and investigation. The curriculum map provides a sequence and timeline and defines the time spent on each assigned unit.

August 24, 2024

Pacing Guide

Department: STEM (Science) Course: Biology

September	October	November	December	January
Africa Storyline (Weeks 1-3)	**Africa Storyline (Weeks 4-7)**	**Homeostasis Storyline (Weeks 1-3)**	**Homeostasis Storyline (Weeks 4-6)**	**Melanin Storyline (Weeks 1-3)**
February	**March**	**April**	**May**	**June**
Melanin Storyline (Weeks 4-6)	**Disease Storyline (Weeks 1-4)**	**Disease Storyline (Weeks 5-6)**	**Finish Curriculum/ Review for New Regents (3 weeks)**	**New Regents (Early June)** ***Penguin Storyline as Enrichment***

Africa Storyline UNIT (Day to Day) TEACHER NARRATIVE **Part 1: LIONS** **Part 2: ELEPHANTS**	Essential Questions: **PART 1: LIONS:** Lesson 1: *Students created* Lesson 2: "Why were the Lions living in a group?" Lesson 3: "Why do the Buffalo live in a group?" Lesson 4: "Why do you think the Lions live in a group?" Lesson 5/6: "How do we know which lions are related to each other?" Lesson 8: "How do different organisms obtain their energy?" Lesson 9: "How do animals obtain their energy?" Lesson 10: "What is the primary source of energy for Lions?"	- Asking questions & defining problems - Developing & using models - Planning & carrying out investigations - Analyzing & interpreting data - Using mathematics & computational thinking - Constructing explanations & designing solutions - Engaging in argument from evidence - Obtaining, evaluating, & communicating information	Unit 1 Standards Master List - **HS-LS1-2.** - **HS-LS1-3.** - **HS-LS1-4.** - **HS-LS1-5.** - **HS-LS1-6.** - **HS-LS1-7.** - **HS-LS2-1.** - **HS-LS2-2.** - **HS-LS2-3.** - **HS-LS2-4.** - **HS-LS2-5.** - **HS-LS2-6.** - **HS-LS2-7.** - **HS-LS2-8.** - **HS-LS3-2.** - **HS-LS3-3.** - **HS-LS4-1.** - **HS-LS4-2.** - **HS-LS4-4.** - **HS-LS4-5.** - **HS-LS4-6.**	**Midpoint Assessment** (See assessment note below calendar) **Animal Nutrition Lab Assessment** (Differentiated Version is at the end of the ANL lab) **Assessment Part 1 (Individual Assessment)** **CSI Day 2 Wildlife Assessment** (See assessment note below this calendar) **Assessment Part II (provide students with Part I - Group Collaborative Assessment)** **Assessment Day 3 (Individual Assessment) (See assessment note below this calendar)**	**WEEK 1 RESOURCES:** Battle at Kruger video Questioning Form CCC cards Observation form* Self/Peer Eval - Group Norms Lions Life as a Hunter 2023 Kilocalorie Cash (performance assessment) Peer Evaluation Form: Individual Contributions to Group Work (Can be used in any group work in any storyline) LuLu the Lioness Video **WEEK 2 RESOURCES** Karyotype Assessment Grouping of students into populations Microsatellites & Mapping Activity Microsat Data for all Populations Sabi Sands CER Cytochrome b seq Lion Phylogeny activity SEP Cards Reflect & Review How is Energy Used in Organisms **WEEK3 RESOURCES** Gorilla Diet Phenomenon Model Diet - Gorilla Entrance Slip Animal Nutrition Lab Macromolecule Activity Elephant & Lion Macromolecules Experimental Design Lab Lab Test Results PPt **WEEK 4 RESOURCES** Enzymes: Making Things Happen (includes optional quick lactase lab) Animal Digestion Lab

	Lesson 11: How do animals get their energy from food?" Lesson 12: How do animals get the raw materials to make cells and body structures for themselves? Lesson 13: "Do Lions only eat Zebras?" **PART 2: ELEPHANTS** Lesson 1: *Students created* Lesson 2: "What factors impact elephant populations?" Lesson 3: "What threats do elephants face?" Lesson 4: "Why are elephants important?" Lesson 5: "Where do elephants live?" Lesson 6: "Do similar organisms eat the same things?"				Lion vs Elephant Animal digestion lab Food Pyramids & Food Chain (HHMI) Food web cards **WEEK 5 RESOURCES** these elephants Elephant Populations and Limiting Factors Tusklessness video Tusklessness data points Tusklessness Genetics Video (May watch outside of class) CSI Wildlife Pt I Tracking poachers CSI Click and Learn New findings! Tusklessness Genetics Finish CSI Wildlife Pt I CSI Click and Learn See Narrative Guide for Optional Gel Electrophoresis Lab Dominique Goncalves & the Women of Gorongosa (May watch outside of class) Elephant Value Lab Evaluate Solutions to Human **WEEK 6 RESOURCES** Elephant Census (Differentiated Activity) Landscape Printout & Support Materials Enlarged Landscape Image OR Digital Interactive Version (This version is a timesaver) Niche partitioning Niche partitioning - video clip Seed Dispersal Video (Lesson Phenomenon) Poop Lab Remove Teacher Notes before sharing with students

	Lesson 7: "What do elephants do for plants?" Lesson 8/10: "What do plants need to survive?" Lesson 9: "How have African plants adapted to the savanna?" Lessons 10-14: "How do organisms obtain energy?"				Poop Recipe Setting up experiment Mitosis lab **WEEK 7 RESOURCES** Quantitative data Class data collection & switching of sprouts to light Transpiration Lab African Plant Diversity Lab Plant Structure & Function lab How do plants get raw materials for new cells? **WEEK 8 RESOURCES** Energy Pyramids Lion/Elephant/Plants Cell Resp Data points Africa Summative Review Summative Self-eval **ELL/Special Ed Supports:** **Spanish ASSESSMENT** - Modeling thinking aloud. - Partner talk - Provide vocabulary support. - Provide sentence stems. - Repeat and clarify.

Homeostasis Storyline UNIT (Day to Day) TEACHER NARRATIVE **Part 1: COMMUNITY** - Food chain/Food web - Keystone spp **Part 2: POPULATION** - Sea otter population and fur trade - Sea otters and human impact - Purple urchin survival and relationship to evolution/natural selection **Part 3: ECOSYSTEMS** - Cycling of matter/Energy flow - Carbon cycle - Respiration - Photosynthesis **Part 4: ORGANISM** - Nutrient uptake from digestive to circulatory - Physiology lab - Dive response - Feedback mechanisms	Lesson 1: Student questioning on Phenomenon Lesson 2: What is Energy Flow? Lesson 3: What Limits Population? Lesson 4: What is Carrying Capacity Lesson 5: What happened to the Sea Urchin population? Lesson 7: What did you figure out about sea urchins last week? Lesson 8: What does kelp need? Lesson 9: What do urchins need? Lesson 10: What do otters need? Lesson 11: What are human Impacts on the ecosystem?	- Asking questions & defining problems - Developing & using models - Planning & carrying out investigations - Analyzing & interpreting data - Using mathematics & computational thinking - Constructing explanations & designing solutions - Engaging in argument from evidence - Obtaining, evaluating, & communicating information	**Standards Master Sheet**	**Homeostasis Storyline Assessments** 3-day Summative Assessment https://drive.google.com/open?id=1ugkEG6Py_AYOvinhL-hxXDjDDWfMMGD0	**REFER TO THE HOMEOSTASIS UNIT MAP**

Part 5: CELLS - Lactic acid levels during chase/dive - Metabolic rate comparisons **Part 6: MOLECULAR** - Cell Resp - Ties together the digestive system from the Africa Unit with the circulatory system	Lesson 12: What predictions do you make? Lesson 13: How do nutrients cycle in ecosystems? Lesson 15: How do these molecules get to the cells?				

Melanin Storyline UNIT (Day to Day) TEACHER NARRATIVE	Lesson 1: How do traits vary among individuals? Lesson 2/3: How does albinism happen? Do children get it from their parents? Lesson 4: How is albinism passed down from parents? How does each parent pass traits down to their children? How can children from the same parents be so different? Lesson 5: How does genotype affect phenotype? Lesson 6: Protein modeling Lesson 7: Did geography play a role in the evolution of different skin colors? Lesson 8: What causes differences in skin color? What is the role of the environment in the evolution of skin color?	- Asking questions & defining problems - Developing & using models - Planning & carrying out investigations - Analyzing & interpreting data - Using mathematics & computational thinking - Constructing explanations & designing solutions - Engaging in argument from evidence - Obtaining, evaluating, & communicating information	**- HS-LS1-1.** **- HS-LS3-1.** **- HS-LS3-3.** **- HS-LS4-1.** **- HS-LS4-2.** **- HS-LS4-3.** **- HS-LS4-4.** **- HS-LS2-7**	**Melanin Storyline Assessments** Summative Assessment - Melanin Unit Assessm… NEW! Summative Assessment Pt II - Melanin Unit Assessm… Additional/Optional Assessment Part I - Genetics Assessment 2… Additional/Optional Assessment Part II - Genetics Assessment 2…	**Melanin Storyline UNIT** ***REFER TO MELANIN STORYLINE UNIT******

	Lesson 9: What causes differences in skin color? What is the role of the environment? Lesson 10: question 9 continued Lesson 11: How are skin colors inherited? Lesson 12: How is melanin adaptive in other species? Lesson 13: Why is the rock pocket mouse population changing? Lesson 14: How has the population changed?				

DISEASE Storyline UNIT (Day to Day) TEACHER NARRATIVE	Lesson 1: Driving question board Lesson 2/3: How are cancer cells different from "normal" cells? Lesson 4: How do cells multiply for organisms' growth or repair in mitosis? Lesson 5: How does a cell know when to divide and when not to divide? Lesson 6: What happens when the cell is not properly regulated during cell division? Lesson 7: Why do cells need to die? Lesson 8: Where are the instructions that cells use to divide properly?	- Asking questions & defining problems - Developing & using models - Planning & carrying out investigations - Analyzing & interpreting data - Using mathematics & computational thinking - Constructing explanations & designing solutions - Engaging in argument from evidence - Obtaining, evaluating, & communicating information	**Standards Master Sheet**	**Disease Storyline Assessments** Summative Assessment - https://drive.google.com/open?id=1pXGom8q629sJY1Gele_PS_ZuKCJtFY6K	**REFER TO DISEASE STORYLINE UNIT**

	Lesson 9: How do existing cells pass the directions on to new cells? Lesson 10: What happens if there is a mistake in the DNA? Lesson 11: Why are cells dividing more/faster? Lesson 12: Why don't Henrietta's children have immortal cells? Lesson 13: How are mitosis and meiosis different? Lesson 14: Are there other ways to get cancer? Lesson 15: How is DNA used by viruses? Lesson 16: Are all viruses the same?				

Penguin Storyline Unit TEACHER NARRATIVE	Lesson 1: driving question board Lesson 2: Where do penguins live? Lesson 3: Species ID formative pdf Lesson 4: Who's your Daddy Lab? Lesson 5: How can different species of penguins live together and still be different species? Penguin isolation types. Lesson 6: How does beak shape determine prey type? Lesson 7: How do human actions affect species? Lesson 8: Shopping for Penguins	- Asking questions & defining problems - Developing & using models - Planning & carrying out investigations - Analyzing & interpreting data - Using mathematics & computational thinking - Constructing explanations & designing solutions - Engaging in argument from evidence - Obtaining, evaluating, & communicating information	**Standards Master Sheet**	**Penguin Storyline Assessments** Summative Assessment Part I - https://drive.google.com/open?id=1VE1vKrWJUpOL_52wegKsjaT29z5EWfLL Summative Assessment Part I - Color diagram supplements https://drive.google.com/open?id=1_XRwWEUwe_dZrf3xVmS3fNCFF0AquAqX Summative Assessment Part II - Penguin Assessme…	**REFER TO PENGUIN STORYLINE UNIT**

	Lesson 9: How do zoos help endangered animals? Lesson 10-14: Querying the database and advanced search.				