**Unit 1: Ecosystems; Interactions and Energy**

POWER STANDARD: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Standards:**

HS-LS2-1. Factors affecting population size & carrying capacity.

HS-LS2-2. Factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-4. Cycling of matter and flow of energy among organisms.

HS-LS2-8. Role of animal behavior on survival.

**Guiding Questions:**

* What factors affect population size?
* What are the threats to biodiversity and how can they be reduced?

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| Approximate # of days | ACTIVITY, CLASSWORK, & HOMEWORK ASSIGNMENTS | STANDARD | CONTENT |
| 3 | **Jaffrey City’s Problem** | **LS2-2 BIODIVERITY**  **LS2-4 CYCLING OF MATTER** | **SUSTAINABILITY, EUTROPHICATION, EVIDENCE, CORRELATIONAL & CAUSAL RELATIONSHIPS** |
|  | **PRE-ASSESSMENT: Ecosystem Dynamics** |  |  |
| 2 | **Ecosystems and Change** | **LS2-2 BIODIVERSITY** | **ECOLOGY, SUSTAINABILITY, ECOSYSTEM** |
| 2 | **Yeast Lab** | **LS2-1 CARRYING CAPACITY** | **CARRYING CAPACITY, LIMITED RESOURCES** |
| 1 | **Biomes** | **LS2-2 BIODIVERSITY** | **ABIOTIC FACTORS, USING EVIDENCE TO SUPPORT CLAIMS** |
| 3 | **Biodiversity and Sustainability Game** | **LS2-2 BIODIVERSITY** | **BIODIVERSITY, ECOSYSTEM SERVICES, SUSTAINABILITY** |
| 3 | **Ecosystems and Biodiversity Lab** | **LS2-2 BIODIVERSITY** | **TROPHIC STRUCTURE, RELTIVE ABUNDANCE, SPEIES RICHNESS, KEYSTONE SPECIES** |
| 1 | **Wolf Case Study: Intro and Research** | **LS2-2 BIODIVERSITY** | **POPULATION DENSITY, DISTRIBUTION, LEVELS OF DIVERSITY** |
| 1.5 | **Nitrogen Cycle Game** | **ls2-4 Cycling of matter** | **CARBON & NITROGEN (CHEMICAL FORMS AND CYCLE) DECOMPOSERS, NITROGEN FIXATION** |
| 1 | **The Web of Life** | **ls2-4 Cycling of matter** | **FOOD WEBS, TROPHIC LEVELS** |
| 1 | **Food Chain Game** | **ls2-4 Cycling of matter** | **BALANCE IN FOOD CHAINS, MOVEMENT OF ENERGY** |
| 1 | **Yellowstone Food Web** | **ls2-4 Cycling of matter** | **FOOD WEBS, FLOW OF ENERGY AND MATTER** |
| 1 | **Producers and Consumers Lab** | **ls2-4 Cycling of matter** | **BIOMASS, EFFECT OF PRODUCERS ON ECOSYSTEMS** |
| 1.5 | **Energy Flow Through an Ecosystem** | **ls2-4 Cycling of matter** | **FOOD WEB, TROPHIC LEVELS, ENERGY & MATTER FLOW, ECOLOGICAL PYRAMID** |
| 2 | **Spinning the Web of Life** | **ls2-4 Cycling of matter** | **FOOD WEBS, ENERGY AND MATTER FLOW** |
| 2 | **POGIL: Energy Transfer in Living Organisms** | **ls2-4 Cycling of matter** | **CONSERVATION OF ENERGY, ENERGY CONVERSION THROUGH FOOD WEB** |
|  | **STANDARD EXAM: Biodiversity & Cycling of Matter** |  |  |
| 3 | **Population Growth Lab** | **LS2-1 CARRYING CAPACITY** | **POPULATION, CARRYING CAPACTIY, POPUATIN SIZE** |
| 1 | **POGIL: Population Growth** | **LS2-1 CARRYING CAPACITY** | **POPULATION, CARRYING CAPACTIY, POPUATIN SIZE** |
| 1 | **Wolves in Yellowstone and Limiting Factors** | **LS2-1 CARRYING CAPACITY** | **COMPETITION, PREDATION, DENSITY DEPENDENT AND INDEPENDENT FACTORS** |
| 1 | **Symbiotic Relationships** | **LS2-8 Behavior** | **SYMBIOSIS, ECOLOGICAL INTRACTIONS** |
| 4 | **Explanation for Animal Behavior** | **LS2-8 Behavior** | **PROXIMATE MECHANISMS, INNATE BEHAVIOR, SOCIAL BEHAVIORS, REPRODUCTIVE BEHAVIORS** |
| 2 | **Case Study: Group Behavior** | **LS2-8 Behavior** | **MATHEMATICS AND COMPUTATIONAL THINKING, INTERPRET BEHAVIOR DATA** |
|  | **STANDARD EXAM: Population Dynamics** |  |  |