**Course Overview:**
The more that I learn about the complexity of life, the more I am in awe of it. To say that Biology is the study of living organisms does not even seem to do it justice. From the tiniest bacteria to the largest organisms, living organisms are stunning, bewildering, surprising and amazingly complex. There is so much going on in biological systems that we could easily spend a full year on any one of our units. My hope is that biology class will provide students with many opportunities for better understanding the world surrounding them and the many challenges that society faces today. Biology brings me joy and fills me with fascination. I can’t wait to learn with you and from you this year.

**Units and Activities: What will we be learning about and doing in this course?**

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<tr>
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**Long Term Target:**
I can craft an argument that analyzes global health threats and possible responses to them.

**What will we study?**
- Bacteria and viruses
- Immune System
- Cell structure
- Cell membranes and transport
- Cell division

**What will we study?**
- Enzymes
- Macromolecules
- Energy in biological systems
- Cellular respiration
- Photosynthesis

**Long Term Target:**
I can investigate and explain how organisms obtain energy from food.

**What will we study?**
- DNA
- Central Dogma
- Proteins
- Mutations
- Genetics
- Biotechnology
- Genetic Modification

**Long Term Targets:**
I can explain the role of DNA, chromosomes and proteins in passing on traits from one generation to the next. I can craft an argument about whether or not the benefits of genetic modification outweigh the risks in our society.

**Long Term Target:**
I can analyze how species have changed over time.

**What will we study?**
- History of Life on Earth
- Evolution
- Natural Selection
- Body Systems
- Homeostasis

**Standards: What knowledge and skills will I gain by the end of this course?**

**Anchor Standards:**

**INVESTIGATING** - Planning and carrying out investigations
ANALYZING - Analyzing and Interpreting data

EXPLAINING - Constructing explanations and, in engineering, designing solutions

ARGUING - Engaging in arguments from evidence

Content Standards: This course builds student knowledge using the Next Generation Science Standards. The content standards for Biology are:

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NGSS MS-LS1-2 (Review from 7th Grade) Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. NGSS HS-LS1-2 Students will develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. NGSS HS-LS1-4 Using a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms. NGSS HS-ETS1-1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

NGSS HS-LS1-7 Students will use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy. NGSS HS-LS1-6 Students will construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules. **NGSS HS-LS2-3 Construct and revise an explanation based on evidence for the cycling of matter and flow of energy in aerobic and anaerobic conditions. NGSS HS-LS1-5 Students will use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

NGSS HS-LS3-1 Asking questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

NGSS HS-LS3-3 Applying concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

NGSS HS-LS1-7 Students will use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. **NGSS HS-LS3-2 Making and defending a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

NGSS HS-LS4-1 Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. **NGSS HS-LS4-2 Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

NGSS HS-LS4-3 Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

NGSS HS-LS4-4 Construct an explanation based on evidence for how natural selection leads to adaptation of populations. NGSS HS-LS1-3 Students will plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.
Assessment of Learning:
For information about assessment types, scoring, and overall grade calculation: click here.

Communication:
How Do I Access Work from Home, and What Should I Expect?
- All work will be posted in Google Classroom.
- The work will be explained during our in-person meetings and/or by video posted to Google Classroom.
- The work will also be explained in our Class Planner posted to Google Classroom.
- If you have any questions, email your teacher.

How Do I Know What My Grades Are?
- On Summative Assessments, teachers will provide both a 4-point grade and a letter grade.
- You can monitor your progress in the following ways:
  - By reading feedback and scoring returned to students on summative assessments.
  - By monitoring the scores and Overall Course Mastery Grade in the Parent/Student portal on JumpRope. Reminders to check grades will be sent from the school.
  - Communicating with your teacher if you are unclear.

Where Can I Find This Syllabus during the School Year?
- This syllabus will be available on the school website in each subject’s department tab once the school year is up and running. It will also be available in our Google Classroom.

How Do I See What’s Due?
- Assignment and summative assessment due dates with handouts are posted in Google Classroom, with connection to Google Calendar, for student access.

How Do I See What’s Past Due?
- If a student is missing a grade on an assessment, it will be listed in the red “Missing Assessment” section of the JumpRope Parent/Student Portal along with any attachments. Please contact your teacher if you have any questions.

Materials:
A three ring binder is recommended for storing notes and handouts.

Schoolwide Procedures:
Please see the Student Handbook for Procedures and Policies related to: Due dates and deadlines, extra credit, retaking assessments, and turnaround time for grade entry.

Personal Mobile Devices: This class will follow the procedures outlined in the student handbook.
Classroom Expectations:

**WORK HARD** - All of us will be expected to participate and be active and engaged learners on a daily basis.

**BE NICE** - Respect and kindness must be the basis for all of our interactions. It takes courage to share our work and ideas openly. The classroom must be a safe space for dialogue, sharing and risk taking.

**GET SMART** - We are not born smart. We are all rough drafts. We get smart by practicing our skills and persevering through difficult tasks.

**WE ARE CREW, NOT PASSENGERS** - Passengers sit back and wait to be told where to go and what to do, they are passive. Crew actively contribute to the learning community by leading discussions, giving feedback and shaping the direction of class.