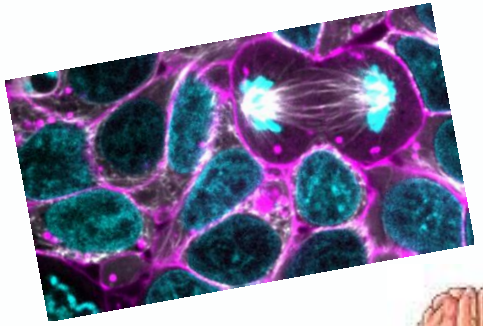
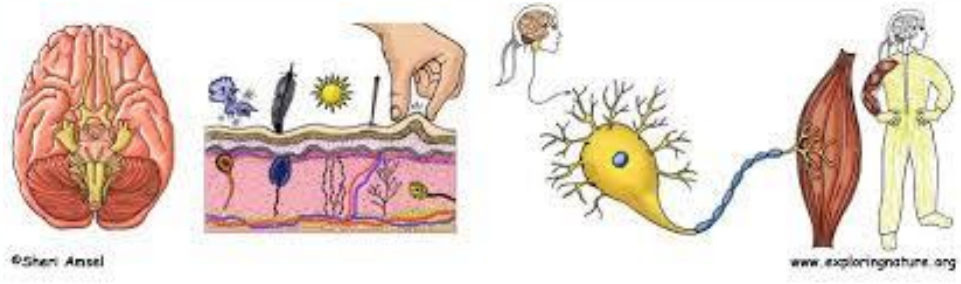
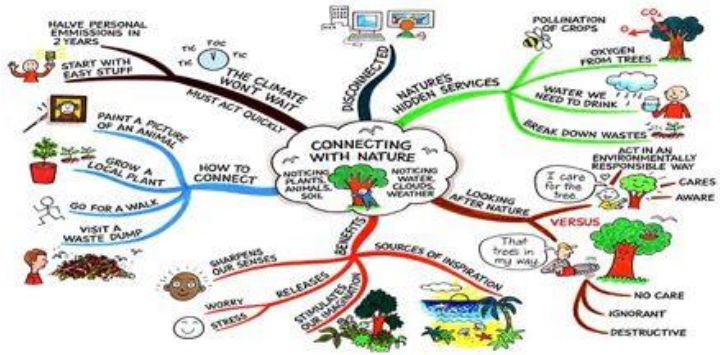


NGSS Biology

What you can expect





Outcomes

By the end of this session, we will:

- Explain the paradigm shifts in MCPS NGSS Biology,
- Explore the breadth and depth of content within the course,
- Discuss how this course prepares students for the MISA, AP/IB, college and career.

Sara Nemati, Emily Keller, Lydia Walker, Meaghan Stuckey

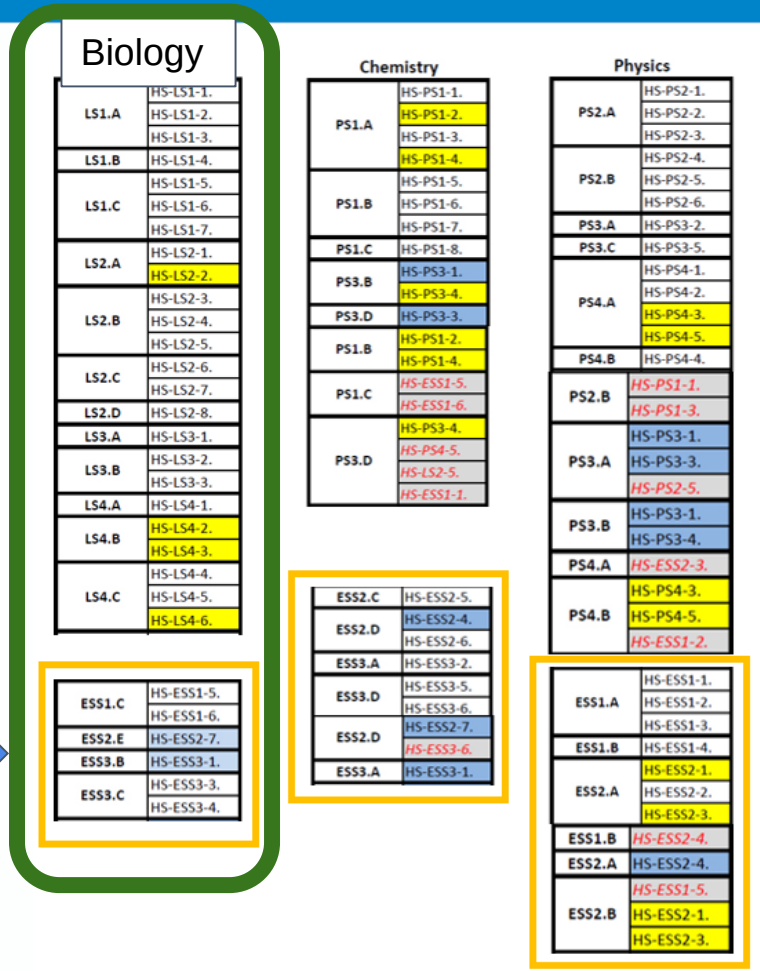
About Us

- Home instructional school
- Professional experience and teaching history
- NGSS experience
- Curriculum development experience

Integrated Science Curriculum

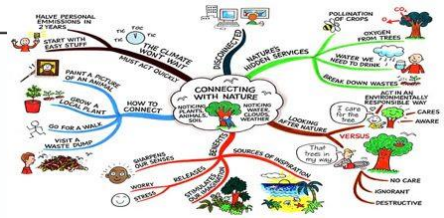
Includes Earth and Space Science through the lens of Biology

There are no co- or prerequisites for this course



What you will learn in Biology

	Three Dimensions of Science Learning		
Unit and Project Focus	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Crosscutting Concepts**
1: Interdependent Relationships in Ecosystems Project Focus: Advocate for the protection of a threatened or endangered species	• Using mathematical and computational thinking • Engaging in argument from evidence • Constructing explanations & designing solutions	• Interdependent relationships in ecosystems • Ecosystem dynamics, functioning and resilience • Social interactions & group behavior • Biodiversity & humans • Human impacts on Earth systems • Developing possible solutions	• Scale, proportion & quantity • Stability & change • Cause & effect

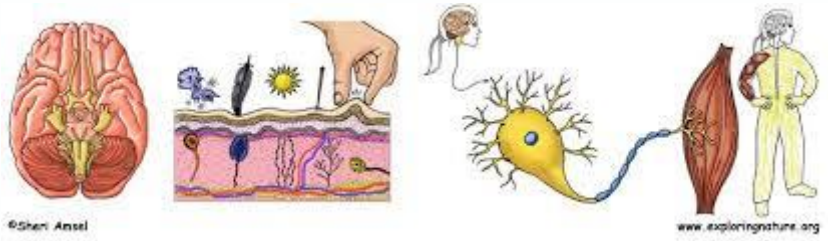


What you will learn in Biology

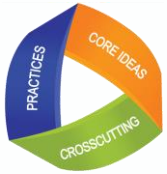
	Three Dimensions of Science Learning		
Unit and Project Focus	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Crosscutting Concepts**
2: Matter and Energy in Organisms and Ecosystems Project Focus: Design a sustainable city to minimize the impact of human activity on natural resources	• Developing and using models • Constructing explanations & designing solutions • Using mathematical and computational thinking • Engaging in argument from evidence	• Organization for matter and energy flow in organisms • Cycles of matter and energy transfer in ecosystems • Weather and climate • Biogeology • Natural resources • Natural hazards	• Energy & matter • Stability & change • Cause & effect

What you will learn in Biology

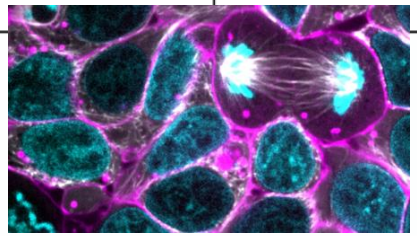
	Three Dimensions of Science Learning		
Unit and Project Focus	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Crosscutting Concepts**
3: Structure and Function Project Focus: Present the finding of a case study on injuries and illnesses that impact student athletes.	• Constructing explanations & designing solutions • Developing and using models • Planning and carrying out investigations	• Structure and function	• Structure & function • Systems & system models • Stability & change



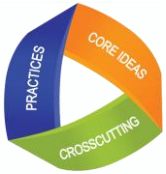
What you will learn in Biology



	Three Dimensions of Science Learning		
Unit and Project Focus	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Crosscutting Concepts**
4: Inheritance and Variation of Traits Project Focus: Create a comprehensive patient support campaign for a new cancer center.	• Constructing explanations & designing solutions • Developing and using models • Asking questions and defining problems • Engaging in argument from evidence • Analyzing & interpreting data	• Structure and function • Growth & development of organisms • Inheritance of traits • Variation of Traits	• Structure & function • Systems & system models • Cause & effect • Scale, proportion and quantity



What you will learn in Biology



	Three Dimensions of Science Learning		
Unit and Project Focus	**Science and Engineering Practices**	**Disciplinary Core Ideas**	**Crosscutting Concepts**
5: Natural Selection and Evolution Project Focus: Evaluate evidence to argue for or against the likelihood a species will evolve to survive climate-related changes in their environment.	• Obtaining, evaluating and communicating information • Constructing explanations & designing solutions • Engaging in argument from evidence • Analyzing & interpreting data	• The history of planet Earth • Weather & climate • Biogeology • Evidence of common ancestry & diversity • Natural selection • Adaptation	• Patterns • Cause & effect • Stability & change

Inquiry-Based Learning

Units and lesson sequences model *inquiry-based learning* to understand and explain *real-world phenomena*

Encourages acting like scientists:

- Questioning
- Exploration and experimentation
- Evaluation of evidence
- Discussion of possible solutions
- Making claims supported by data/evidence
- Constructing explanations
- Critical thinking

Biology MISA Released Item

S(**History of Flatfish**

4 Which

A Bo

C Al ot

D Al ot

5

The Phylogenetic Tree diagram can be used to show relatedness. Select the two fishes that are most closely related to each other.

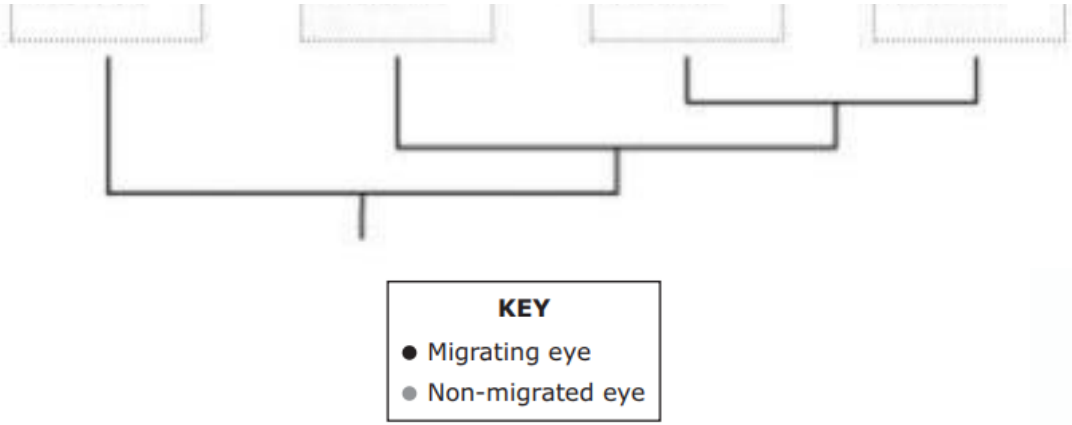
s table?

s of DNA.

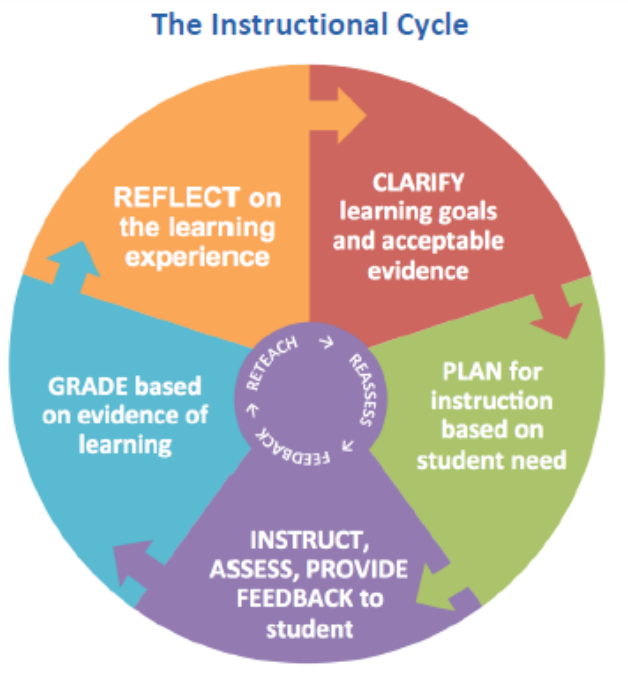
o each

ar to each

Describe evidence that supports a relationship between biological evolution and the common ancestry of flatfish.



Scientific Literacy for All Students



- ★ Demonstration of high expectations
- ★ Implementation of culturally relevant instruction
- ★ Establishment of caring relationships

CNN politics 45 CONGRESS SUPREME COURT FACTS FIRST 2020 ELECTION

Exclusive: DHS to start DNA testing to establish family relationships on the border


By Priscilla Alvarez and Geneva Sands, CNN

Updated 5:02 PM ET, Wed May 1, 2019

1. Annotate text
2. Create punnett squares.
3. DNA fingerprinting

Impact of road salt and sand on the environment and public health in Maryland

The 411 on Road Salt

Keeping Maryland moving during a winter weather event depends on the cooperation of many State and local government agencies. Treatment for ice and snow is a top priority in keeping our citizens safe and our roads clear for business.

In their own home and yards, homeowners are using salts and sand mixtures around homes, sidewalks and parking areas to combat ice and snow.

But what happens when the ice and snow melt?

With an increase in the usage of salts comes an increase of salt in our

Photo Credit: Maryland State Highway Administration

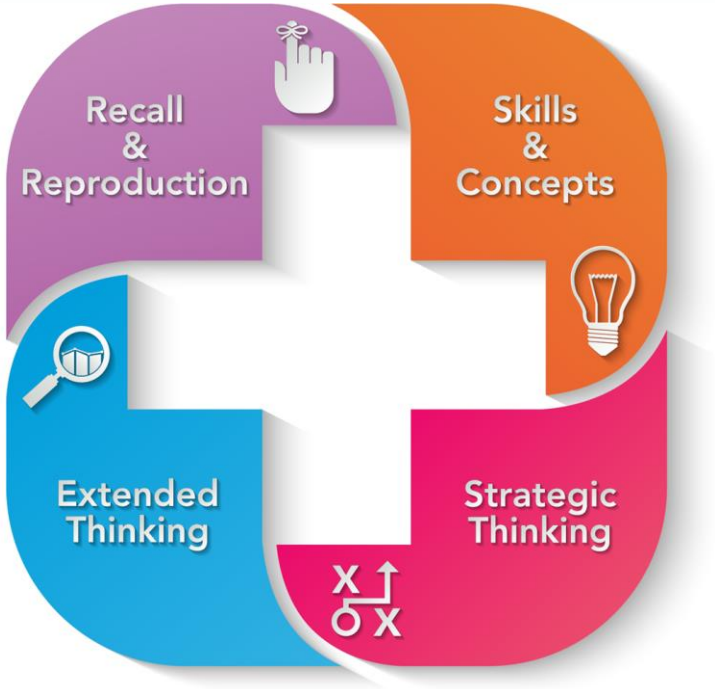
1. Osmosis

1. Discuss better alternatives

1. The effects on the environment

Honors Adaptations for Enriched Learning

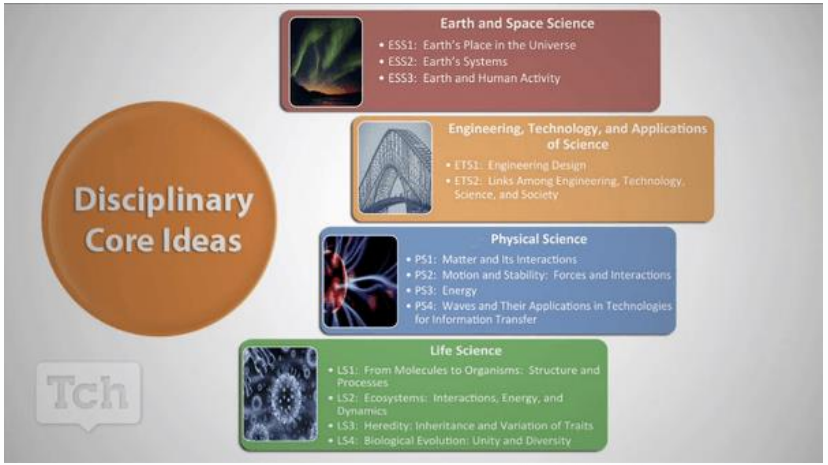
- Why can the knowledge be used?
- How else can the knowledge be used?



Preparation for AP/IB Science

Core NGSS courses prepare students for the cognitive demands of AP or IB science courses

- Science and engineering practices and crosscutting concepts add rigor
- Include what every student MUST know
- NGSS evaluated and aligned with AP and IB standards.



Questions?

Index Card:

please include your contact info

Online form:

Type the link in your browser or scan the QR code

For more information on <u>enrolling</u> your student in this course, please contact the Counselor and/or the Science Department Resource Teacher at your high school.

bit.ly/SciNight19