This module, Biology Module A: Homeostasis and Transport is a four week exploration of biology. The content and assignments are organized in a manner consistent with the Pennsylvania Keystone Biology blueprint. In Biology Module A, the theme of Homeostasis and Transport is explored through four big ideas. Students address the big ideas: The Basic Biological Principles, The Chemical Basis of Life, Bioenergetics, Homeostasis and Transport through the exploration of the Essential Questions:

- How do organisms live, grow, respond to their environment, and reproduce?
- How do the structures of organisms enable life's functions?
- How do organisms grow and develop?
- How and why do organisms interact with their environment and what are the effects of these interactions?
- How do organisms obtain and use the matter and energy they need to live and grow?

The resources in this module will enable students to reinforce the concepts within Homeostasis and Transport as well as resources for teachers to utilize in the classroom.

BIO A HOMEOSTASIS AND TRANSPORT

Module Title	Message	Assignment / Call to Action	Content Directions	Resource / URL	Info about the URL (published on the "i" button of a resource/url)	Notes
Section Overview: Homeostasis and Transport	Students investigate explanations for the structure and function of cell membranes and other organelles which work to maintain a stable internal cell environment and regulate materials in and out of the cell. Students will gain an understanding of the life-sustaining mechanism homeostasis. Students will develop their understanding through critical reading, using models, and conducting investigations. The crosscutting concepts of structure and function, matter and energy, and systems and system models in organisms are called out as organizing concepts.					
Section 1: Plasma Membrane Structure	Students examine the structure of the plasma membrane allowing it to function as a regulatory structure and/or protective barrier for a cell while comparing the mechanisms that transport materials across the plasma membrane as well as the organelles involved in the transport of materials within the cell. SAS Standards 3.1.B.A5, 3.1.B.A2, 3.1.B.A4, 3.1.B.A7, 3.2.C.A1, 3.2.P.B6					
		WATCH a Bozeman Science Video on Cellular Structure and Function.		http://www.bozemanscience.com/cell-membrane		
		CREATE a plasma membrane and take an interactive quiz.		https://www.wisc-online.com/learn/natural-science/life-science/ap1101/construction-of-the-cell-membrane		
		COMPLETE a worksheet as you construct the plasma membrane.		https://drive.google.com/open?id=0B99Um_mvTWdGeXVOaHlhY28xR3c	PDF - membrane structure online	

		CREATE a plasma membrane using the app Cell Defense.		https://itunes.apple.com/us/app/cell-defense-plasma-membrane/id590366812?mt=8		
		COMPLETE a worksheet on the Cell Defense.		https://drive.google.com/open?id=0B99Um_mvTWdGUmdwZ3dtdTBGSXM	PDF - cell defense worksheet	
		READ about the cell membrane.		http://www.biologycorner.com/APbiology/cellular/notes_cell_membrane.html		
		TAKE a quiz on the cell membrane structure.		http://www.sciencegeek.net/Biology/review/U1Membranes.htm		
		USE the Educreation App and DRAW the cell membrane and label all its parts.		https://itunes.apple.com/us/app/educreations-interactive-whiteboard/id478617061?mt=8		
Section 2: Transport Mechanisms	Students examine the structure of the plasma membrane allowing it to function as a regulatory structure and/or protective barrier for a cell while comparing the mechanisms that transport materials across the plasma membrane as well as the organelles involved in the transport of materials within the cell. SAS Standards 3.1.B.A5, 3.1.B.A2, 3.1.B.A4, 3.1.B.A7, 3.2.C.A1, 3.2.P.B6					

		READ the text on cellular transport Ch. 3 Sec. 3.		https://itunes.apple.com/us/book/ck-12-biology-interactive/id574071922?mt=13		
		WATCH Bozeman Science on transport across the cell membrane.		http://www.bozemanscience.com/016-transport-across-cell-membranes		
		COMPLETE the worksheet on the key points of Bozeman Science video.		https://drive.google.com/file/d/0B99Um_mvTWdGRm5PUktTaGhMc2s/view?usp=sharing	PDF - Transport Across Cell Membranes	
		REVIEW Biology Junction notes on Homeostasis and Transport.		http://www.biologyjunction.com/homeostasis_notes_bi.htm		
		WATCH Biology Crash Course explaining Membranes and Transport.		https://www.youtube.com/watch?v=dPKvHrD1eS4		
		WATCH Bozeman Science video on an Osmosis Demo.		http://www.bozemanscience.com/osmosis-demo		
		PRACTICE diffusion and Osmosis with this worksheet.		https://drive.google.com/open?id=0B99Um_mvTWdGZlAxQzVmSVBoX0E	PDF - Cell Transport Practice (former program)	

		APPLY knowledge of diffusion and osmosis with this worksheet.		https://drive.google.com/open?id=0B99Um_mvTWdGbEZoTG05aklNV2s	PDF - Membrane Practice u-tube	
		READ the case study on transport.		http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=619&id=619		
		EXPERIMENT online with Diffusion, Osmosis and Molecular Movement.		http://www.phschool.com/science/biology_place/labbench/lab1/intro.html		
		INTERACT with Cell Transport by completing this Webquest as you do the lab bench activity.		https://drive.google.com/open?id=0B99Um_mvTWdGNXZoN1k4Q1VMbVE	PDF - passive_transport_webquest	
		REVIEW power point on types of transport mechanisms.		https://drive.google.com/open?id=0B99Um_mvTWdGLUEwb0hxOE51QWM	PPT - traffic_regulation_of_molecules	
		WATCH Amoeba Sisters video on Osmosis.		https://www.youtube.com/watch?v=laZ8MtF3C6M		

		COMPLETE amoeba sisters worksheet as you watch the video.		https://drive.google.com/open?id=0B99Um_mvTWdGSXZOOHp0UE9KM1E	PDF - Amoeba Sisters: Video Recap	
		MAKE a foldable to show homeostasis in the cell		https://drive.google.com/open?id=0B99Um_mvTWdGU2YxTGt2TzYyb1E	Word - tonicity_foldable	
		TAKE quiz on Cell Transport.		http://www.quia.com/quiz/1610803.html?AP_rand=1277501264		
Section 3: Membrane Transport throughout the Cell	Students examine the structure of the plasma membrane allowing it to function as a regulatory structure and/or protective barrier for a cell while comparing the mechanisms that transport materials across the plasma membrane as well as the organelles involved in the transport of materials within the cell. SAS Standards 3.1.B.A5, 3.1.B.A2, 3.1.B.A4, 3.1.B.A7, 3.2.C.A1, 3.2.P.B6					
		REVIEW the organelles of the endomembrane system.		http://www.scienceprofonline.com/cell-biology/endomembrane-system-eukaryotic-cell.html		
		EXPLORE how a protein is transported within the cell by watching this video.		https://www.youtube.com/watch?v=rvfvRgk0MfA		

		QUIZ yourself on sections 1, 2, and 3.		http://www.quia.com/quiz/3967304.html?AP_rand=1287326702		
		REVIEW homeostasis and transport sections 1, 2, 3.		https://itunes.apple.com/us/book/ck-12-biology-workbook/id518270997?mt=11		
		MODEL the cell membrane.		https://drive.google.com/open?id=0B99Um_mvTWdGcUxveXFFc05NUTg	Word - modeling-the-cell-membrane-worksheet	
		EXPLORE Structure and Function of the Cell membrane.		https://drive.google.com/open?id=0B99Um_mvTWdGVm9JblhMakdmc2M	Word - cell membrane coloring worksheet	
Section 4: Maintaining Homeostasis	Students examine the ways in which organisms maintain homeostasis. SAS Standards 3.1.B.A8, 3.1.B.A5, 4.5.4.D, 4.2.4.C					
		WATCH a Bozeman Science video on Homeostatic Evolution.		http://www.bozemanscience.com/021-homeostatic-evolution		

		COMPLETE the concept map as you watch the Bozeman Science video.		https://drive.google.com/open?id=0B99Um_mvTWdGWEx2WFZHR0s1Nzg	PDF - AP Bio-021 Homeostatic Mechanisms Reflect	
		READ the article on how much water can kill you.		http://www.scientificamerican.com/article/strange-but-true-drinking-too-much-water-can-kill/		
		READ the case study on Thermoregulation.		http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=450&id=450		
		READ the case study on Negative Feedback Systems: Muscleman		http://sciencecases.lib.buffalo.edu/cs/collection/detail.asp?case_id=621&id=621		
		WATCH amoeba sisters video Homeostasis and the Cell Membrane		https://www.youtube.com/watch?v=6fhbbFd4icY		
Section 5: Review Homeostasis and Transport	Students will review the importance of homeostasis and transport.					

		STUDY the review guide on Homeostasis.		https://drive.google.com/open?id=0B99Um_mvTWdGUEJMdktJS3M4S0E	Word - Topic 3 Quick Facts(1)	
		WATCH podcast reviewing Homeostasis and Transport.		Podcast - CRSD Videocast 3.appleuniversal		
		COMPLETE viewing guide while watching podcast.		https://drive.google.com/open?id=0B99Um_mvTWdGUUhydFlYT0lNLUk	Word - Topic 3 Viewing Guide	
		TAKE a quiz.		http://www.crsd.org/Page/32656		
		COMPLETE review sheet on Transport.		https://drive.google.com/open?id=0B99Um_mvTWdGT1pVTk9IRWxqVEk	Word - Cell Transport Review Worksheet	