

Unit 10 Structure of Waves Determines Function

8.2.4 Use computational thinking to describe a simple model for waves that shows the pattern of wave amplitude being related to wave energy. Emphasize describing waves with both quantitative and qualitative thinking. Examples could include using graphs, charts, computer simulations, or physical models to demonstrate amplitude and energy correlation. (PS4.A)

8.2.5 Develop and use a model to describe the structure of waves and how they are reflected, absorbed, or transmitted through various materials. Emphasize both light and mechanical waves. Examples could include drawings, simulations, or written descriptions of light waves through a prism; mechanical waves through gas vs. liquids vs. solids; or sound waves through different mediums. (PS4.A, PS4.B)

	Learning Opportunities		Formative Assessments
Engage	● Phenomenon: ● Wave Phenomenon Stations: Stations where students make different types of waves and try to explain how they work. ● Wave Phenomenon Stations-Spanish ● Alternate Waves Phenomenon Station: For absent students to do with supplies from home. ● Alternate Waves Phenomenon Station-Spanish		Wave PreQuiz Pg1- This is the test review, students keep and then fix it as a review at the end of the unit. Wave PreQuiz-Spanish
	Teacher: Teacher provides items for the stations: water bowl & pennies or rocks, boomwhackers, glass goblets w/water, tuning fork, a string, black light & highlighter, cups with a string between them, metal pipe chimes, etc.	Student: Students investigate and try to explain how the wave is moving through the objects.	
Learning Goal: 8.2.4 Use computational thinking to describe a simple model for waves that shows the pattern of wave amplitude being related to wave energy.			
Explore	Wave Motion and Energy -change to tweaked one. - Alternate: Structure of Waves		
	Teacher:	Student: You should be able to do the following after completing this assignment:	

		● Explain why waves have the structure they do. ● Explain why energy has the effect on amplitude it does. ● Measure amplitude. ● Explain why energy has the effect on wavelength it does. ● Measure wavelength.	
Explain	Wave Model Class Discussion: Look at different wave simulations and have the students explain what we can learn from them Wave Model Class Discussion-Spanish Basics Waves Review Student Sheet Basics Waves Review Student Sheet-Spanish Practice and Peer review: Students can draw waves and trade with a partner and practice labeling and measuring wave parts then trade back and check.		Wave Measuring Practice : good exit ticket or beginning of class next day Wave Measuring Practice Spanish
	Teacher: Teacher instructions. Have the simulations up on the projector. Have the students lead the discussion by asking them: what do you notice is the difference between this wave and this wave (Change the type of wave, then change the amplitude, then change the wavelength,) Ask: what observations can you make? Which one has more energy?	Student: Students participate in the discussion where they identify the difference between amplitude, wavelength, transverse and longitudinal waves. We have them record the most important information in their science notebook. Information like: model of longitudinal vs transverse wave, how to measure amplitude and wavelength, ect.	
Elaborate	Wave Investigations Wave Investigations-Spanish Making Waves Lab - Videos for absent students and to show teacher how to do each part of the lab: - Rope Lab Video - Slinky Lab Video		
	Teacher:	Student:	

Evaluate	Wave Review (Pg 1) Wave Review - Spanish Wave Review Answer Key Wave Review Answer Key (<i>Spanish not available</i>) Wave review video: https://www.youtube.com/watch?v=vdUTV6ACWhw		Wave Comparisons Quiz Wave Comparisons Quiz
	Teacher:	Student:	

	Learning Opportunities		Formative Assessments
Engage	Phenomenon		Wave PreQuiz Pg 2 - This is the test review, students keep and then fix it as a review at the end of the unit. Wave Pre Quiz-Spanish
	Teacher:	Student:	
Learning Goal: 8.2.5 Develop and use a model to describe the structure of waves and how they are reflected, absorbed, or transmitted through various materials.			
Explore	Transmit, Reflect, Absorb Student Sheet Transmit, Reflect, Absorb Student Sheet-Spanish		
	Teacher:	Student:	

Explain	Discussion and Journal Entry - Use this journal entry prompt to lead a discussion and have the students explain to you how to draw a wave transmitting, reflecting and absorbing.		
	Discussion and Journal Entry-Spanish		
	Teacher:	Student:	
Elaborate	Laser Maze Lab Student Sheet - Link to the kits we use Laser Maze Lab Student Sheet- Spanish (OR) Alternate Laser Maze Lab Student Sheet Alternate Laser Maze Lab Student Sheet-Spanish Earthquake Waves Slideshow (Have the students identify how what they have learned about waves applies to earthquake waves) Student Earthquake Notebook - Notes from slideshow and Pasta houses engineering Challenge		
	Teacher:	Student:	
Evaluate	Wave Test Review (Pg 2) Wave Test Review-Spanish Wave Test Review - Answer Key <i>(Not available in Spanish)</i>		Wave test Covers learning goals 8.2.4 and 8.2.5 Wave Test-Spanish Wave Test Retake Wave Test Retake-Spanish
	Teacher:	Student:	