

Westbury High School

Science Department Lesson Plan

A merger of Madeline Hunter's Lesson Cycle and the 5-E Method of Instruction

Teacher: C. Williams

Subject: Physics

Date: 11/10 -14/2014

Lesson: Vectors and Motion in two

Dimensions

Defining Success	LESSON OBJECTIVE: What will your students be able to do by the end of the class?	
	<i>Students will be able to <u>analyze</u> motion <u>using vectors and kinematic equations</u> for projectiles and objects moving in a circle.</i>	
	STANDARDS ADDRESSED: TEKS, ELPs and CCRS's.	MISCELLANEOUS INFORMATION Marzano's Strategies, key concepts or questions

	<p><i>READINESS AND SUPPORTING STANDARDS</i></p> <p>Ⓢ PHYS.4C Analyze and describe accelerated motion in two dimensions using equations including projectile and circular examples.</p> <p>Ⓢ PHYS.4F Identify and describe motion relative to different frames of reference.</p> <p><i>PROCESS SKILLS</i></p> <p>PHYS.2H Make measurements with accuracy and precision and record data using scientific notation and International System (SI) units.</p> <p>PHYS.2J Organize and evaluate data and make inferences from data including the use of tables, charts, and graphs.</p> <p>PHYS.2L Express and manipulate relationships among physical variables quantitatively including the use of graphs, charts, and equations.</p> <p>PHYS.3F Express and interpret relationships symbolically in accordance with accepted theories to make predictions and solve problems mathematically including problems requiring proportional reasoning and graphical vector addition.</p> <p><i>ENGLISH LANGUAGE PROFICIENCY STANDARDS</i></p> <p>* ELPS.C.1.c Use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary.</p> <p>* ELPS.C.4.a Learn relationships between sounds and letters of the English language and decode (sound out) words using a combination of skills such as recognizing sound-letter relationships and identifying cognates, affixes, roots, and base word.</p> <p>* ELPS.C.5.a Learn relationships between sounds and letters of the English language to represent sounds when writing in English.</p> <p><i>COLLEGE AND CAREER READINESS STANDARDS</i></p> <p>* CCRS.VIII.B.1 Understand how vectors are used to represent physical quantities.</p> <p>* CCRS.VIII.B.2 Demonstrate knowledge of vector mathematics using a graphical representation.</p> <p>* CCRS.VIII.B.3 Demonstrate knowledge of vector mathematics using a numerical representation.</p> <p>* CCRS.VIII.C.1 Understand the fundamental concepts of kinematics.</p>	<p>Collaborative Grouping</p> <p>Making hypothesizes</p> <p>How do I measure physical quantities to be able to calculate the distance traveled, displacement, speed and velocity of a moving object?</p>
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Lesson Cycle	ANTICIPATORY SET: (ENGAGE): A “hook” to get the students interest and attention. <i>(A question, picture, 2-3 minute long video clip, a demonstration).</i>	MATERIALS
	M/T: Do Now (Connected to previous homework - designed to engage incoming students quickly with today’s academic content.) W/Th: Do Now (Connected to previous homework - designed to engage incoming students quickly with today’s academic content.) Fr: Do Now (Connected to previous homework - designed to engage incoming students quickly with today’s academic content.)	SmartBoard™ Constant velocity cars (Tumble Buggies) Meter sticks
	TEACHING/INSTRUCTIONAL PROCESS: (EXPLORE/EXPLAIN): <i>Provide students with a common experience (Labs, hands on activities). Debrief activity, teach concept.</i>	Stopwatches Masking tape
	M/T: Activity - Students begin to explore essential question (In pairs, triads and quads, students debrief/teach concept facilitated by teacher) W/Th: Activity - Students begin to explore essential question (In pairs, triads and quads, students debrief/teach concept facilitated by teacher) Fr: Activity - Students begin to explore essential question (In pairs, triads and quads, students debrief/teach concept facilitated by teacher)	Graph paper Camera Tennis ball
	GUIDED PRACTICE AND MONITORING: (EXPLAIN). Interactive discussions between teacher and students. Guide/help students as they solve problems and/or answer questions. Clarify misconceptions and check for understanding.	Logger Pro™ PPT
	M/T: Mini Lesson – Interactive Teacher-Student <u>open discussion</u> (facilitated by multimedia, worksheets, and educational technology tools) that validates student knowledge and skill and uncovers and clarifies misconceptions and misunderstandings. (Prepares students to produce products) W/Th: Mini Lesson – Interactive Teacher-Student <u>open discussion</u> (facilitated by multimedia, worksheets, and educational technology tools) that validates student knowledge and skill and uncovers and clarifies misconceptions and misunderstandings. (Prepares students to produce products) Fr: Mini Lesson – Interactive Teacher-Student <u>open discussion</u> (facilitated by, multimedia. worksheets, and educational technology tools) that validates student knowledge and skill and uncovers and clarifies misconceptions and misunderstandings. (Prepares students to produce products)	Whiteboards Dry Erase Marker Launcher Water Balloons Tape Measure
	INDEPENDENT PRACTICE: (ELABORATE) Students apply the information learned in the Explain to answer questions or solve problems.	
	M/T: Student Product - Students apply knowledge and skills to an authentic task. (In pairs, triads and quads, students support each others learning – products are informally/formally assessed by teacher) W/Th: Student Product - Students apply knowledge and skills to an authentic task. (In pairs, triads and quads, students support each others learning – products are informally/formally assessed by teacher) Fr: Student Product - Students apply knowledge and skills to an authentic task. (In pairs, triads and quads, students support each others learning.	
	EVALUATE: Assess student mastery. (Quizzes, Lab Reports, Unit tests)	
	M/T: Assessment - Students products are assessed for mastery informally and	

	<div>formally by teacher (Completion of activity sheet, presentation, and/or exit ticket)</div> <div>W/Th: Assessment - Students products are assessed for mastery informally and formally by teacher (Completion of activity sheet, presentation, and/or exit ticket)</div> <div>Fr: Assessment - Students products are assessed for mastery informally and formally by teacher (Completion of activity sheet, presentation, and/or exit ticket)</div>	
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Teacher: C. Williams

Subject: Physics

Date: 11/17 -21/2014

Lesson: Momentum & Impulse

Defining Success	LESSON OBJECTIVE: What will your students be able to do by the end of the class?	
	<i>Students will be able to <u>calculate</u> momentum, power, mechanical energy, and <u>apply the impulse-momentum theorem</u> in physical systems.</i>	
	STANDARDS ADDRESSED: TEKS, ELPs and CCRS's.	MISCELLANEOUS INFORMATION Marzano's Strategies, key concepts or questions

	<p><i>READINESS AND SUPPORTING STANDARDS</i></p> <p>® PHYS.6C Calculate the mechanical energy of, power generated within, impulse applied to, and momentum of a physical system.</p> <p><i>PROCESS SKILLS</i></p> <p>PHYS.2E Design and implement investigative procedures including making observations, asking well-defined questions, formulating testable hypotheses, identifying variables, selecting appropriate equipment and technology, and evaluating numerical answers for reasonableness.</p> <p>PHYS.2H Make measurements with accuracy and precision and record data using scientific notation and International System (SI) units.</p> <p>PHYS.2J Organize and evaluate data and make inferences from data including the use of tables, charts, and graphs.</p> <p>PHYS.2K Communicate valid conclusions supported by the data through various methods such as lab reports, labeled drawings, graphic organizers, journals, summaries, oral reports, and technology-based reports.</p> <p>PHYS.2L Express and manipulate relationships among physical variables quantitatively including the use of graphs, charts, and equations.</p> <p>PHYS.3E Research and describe the connections between physics and future careers.</p> <p><i>ENGLISH LANGUAGE PROFICIENCY STANDARDS</i></p> <p>* ELPS C.1.b Monitor oral and written language production and employ self-corrective techniques or other resources.</p> <p>* ELPS C.4.e Read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned.</p> <p>* ELPS C.5.e Employ increasingly complex grammatical structures in content area writing commensurate with grade-level expectations, such as (i) using correct verbs, tenses, and pronouns/antecedents, (ii) using possessive case (apostrophe s) correctly, and (iii) using negatives and contractions correctly.</p> <p><i>COLLEGE AND CAREER READINESS STANDARDS</i></p> <p>* CCRS VIII.C.3 Understand the concept of momentum.</p>	<p>Collaborative Grouping</p> <p>Making hypothesizes</p> <p>How do I measure physical quantities to be able to calculate the distance traveled, displacement, speed and velocity of a moving object?</p>
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