

Lesson Plan Template

Grade: High School		Subject: Physics	
Materials: block of wood, blades, phone book covers, pennies, and sharpies.		Technology Needed: smart board and laptop	
Instructional Strategies: <input type="checkbox"/> Direct instruction <input type="checkbox"/> Guided practice <input type="checkbox"/> Socratic Seminar <input type="checkbox"/> Learning Centers <input type="checkbox"/> Lecture <input type="checkbox"/> Technology integration <input type="checkbox"/> Other (list)		Guided Practices and Concrete Application: <input type="checkbox"/> Large group activity <input type="checkbox"/> Independent activity <input type="checkbox"/> Pairing/collaboration <input type="checkbox"/> Simulations/Scenarios <input type="checkbox"/> Other (list) Explain: Students will be working in the lab together which involves lots of collaboration. This lab is very hands-on and recreating a scenario that was given to them.	
Standard(s) HS-PS2-1: Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.		Differentiation Below Proficiency: Have them partner with a person/group who might be able to understand the concepts and be able to explain it to them. Above Proficiency: Approaching/Emerging Proficiency: Modalities/Learning Preferences:	
Objective(s) Students will construct an apparatus to test the bullet theory. Students will assess their apparatus to see if it is working, and if it is proving the bullet theory. Students will interpret their results into words. Students will explain what is happening with their apparatus. Students will conclude their answers with reasons and their experience with their apparatus. Bloom's Taxonomy Cognitive Level: Understanding, Applying, Analyzing, Evaluating, and Creating		Behavior Expectations- (systems, strategies, procedures specific to the lesson, rules and expectations, etc.) Students are expected to behave in a safe matter with their lab rules and are expected to respect one another.	
Classroom Management- (grouping(s), movement/transitions, etc.) Students will come into class like normal and sit in their desks. Once I give them the explanation of what they are doing they will then break off into their desired groups. (If this becomes an issue I will then pair students up randomly together.) I will be constantly jumping from group to group to make sure they are doing what needs to be done and are understanding what they are doing.			
Minutes	Procedures		
	Set-up/Prep: Make sure the supplies are all available for the students and do the drawings on the board before the students come into the classroom.		
	Engage: (opening activity/ anticipatory Set – access prior learning / stimulate interest /generate questions, etc.) Bell Ringer: I want you all to take out a sheet of paper, on the first half of the paper I want you to copy the drawings I have on the board. After students are done copying the drawings, we then will figure out the amount of time that the ball drops in figure A. After we discuss how the ball drops down 5meters at 10m/s ² in 1 sec. Then I'll have them figure out how long it takes the ball to drop in Figure B. To the students: Okay after you have your answer down; I want you to put your piece of paper off to the side we are going to come back to it.		
	Explain: (concepts, procedures, vocabulary, etc.) Remember the videos that you watched on the myth busters, that the bullet shot, and the bullet dropped at the same height will drop at the same time? We are going to conduct our own experiment today, with our own constructed apparatus. You guys will be split up into groups (you can choose your partners) and remember when you are close together to keep your masks on at all times. You are going to take a block that is cut about 4 inches long and then use the hot glue to put on the blade. Make sure that the blade		

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	<p>is level with the block otherwise your apparatus will not work. Then you are going to glue the piece of phonebook cover to make a placement holder for your pennies. Once your glue is dry and your apparatus made then I will let you know the next step to do.</p> <p>Once your apparatus is made properly, we are going to test the theory that a bullet shot, and a bullet dropped at the same height will land at the same time. So, we are going to put pennies on both sides and simulate the bullet test. Pull back the blade and then launch the pennies and listen to the sound of the pennies dropping and watch if you can see them landing at the same time. Think about the different factors that could result in the pennies not landing at the same time. And while you are watching the pennies dropping think about what is happening and how this is possible.</p>
	<p>Explore: (independent, concrete practice/application with relevant learning task -connections from content to real-life experiences, reflective questions- probing or clarifying questions) Students will be launching their pennies to see if their apparatus is working, if they are finding their pennies landing at the same time, they can try it from different heights to see if it still works.</p>
	<p>Review (wrap up and transition to next activity): To have the students understand the lab they will write what is happening and why the pennies are able to fall at the same time. The students are to incorporate the words: independent, and velocity of x and y into their explanation. I will go to each group and discuss with them their answer and be able to help guide the students or to diminish misunderstandings of the project.</p> <p>I then will ask the class to revise their answer to Figure B and to see what they think the right answer is after they have a better understanding of the material.</p>
<p>Formative Assessment: (linked to objectives) Progress monitoring throughout lesson- clarifying questions, check-in strategies, etc.</p> <p>I am using a before the project what you know question and then a post what I learned question after the lesson. I am also having the students write on their apparatuses to put into works the concept that they have just proved. As we do the lab, I will be frequently asking questions and having them mull over questions as the experiment is being done.</p> <p>Consideration for Back-up Plan:</p> <p>If the students are too advanced and understand that the x and y velocities are independent of one another. Then I will have them perform their apparatus at different heights and have them explain it to someone who was not in the class as they learned the concept.</p> <p>If the concept is too difficult for their students, then I will have a bigger class activity and have the students work together to collaborate and to understand what is happening as the two pennies are falling.</p>	<p>Summative Assessment (linked back to objectives) End of lesson:</p> <p>If applicable- overall unit, chapter, concept, etc.:</p>
<p>Reflection (What went well? What did the students learn? How do you know? What changes would you make?): Students responded really well to this activity. They enjoyed getting to make something in class and once they were able to test their apparatus many concepts that were difficult to understand they were able to see happen. The students understand the bullet problem and know what is happening due to being able to explain and see why two of the same objects dropped from the same height regardless of their velocity will land at the same time. I would make a slight change where they can test from different heights and then have them figure out mathematically what is happening, to further their understanding of the scenario.</p>	