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Balanced and unbalanced forces worksheet middle school

Huawei fastboot mode frp lockThe Physics Classroom serves students, teachers and classrooms by providing classroom-ready resources that utilize an easy-to-understand language that makes learning interactive and multi-dimensional. The photos in that blog post are from the Balanced and Unbalanced Forces 5E Unit. We have two units for force and motion: Balanced and Unbalanced Forces and Patterns in Motion. Each unit follows the 5E Instructional Model, which has five components, Engage, Explore, Explain, Extend and Evaluate. Thus, we will pick one topic- balanced and unbalanced forces- Free body diagrams from the unit and do a lesson. During this whole unit, Newton's three laws of motion and other basic concepts are going to be used again and again. However, with each lesson, complexity of the word problems, labs, and projects is going to increase. General Lesson Plan Students will be able to demonstrate changes in motion caused by an unbalanced force through an organized activity. Students will be able to identify and explain the difference between a balanced and unbalanced force. Students will need to know the vocabulary terminology (balanced force, unbalanced force, net force, friction) and will be quizzed over the words in the pre-lesson. Students will need to know proper lab safety procedures - Students will need to know the standards from the previous grade (5th grade). Questions: What is force? (a push or pull) What are some other forces that can cause something to move? (gravity). Explain gravity. (The force of attraction between masses) What is a force that can cause and object to slow down or have little movement? (friction) Explain friction. (the force that opposes the relative motion or tendency of such motion of two surfaces in contact) Explain the difference between balanced and unbalanced force (balanced force is two forces acting in opposite directions on an object, and equal in size, unbalanced force is two forces acting on an object are not equal in size) How is an unbalanced force related to the motion experienced in a tug-of-war at a skating rink? - Pre-Lesson (prior knowledge)- Teacher will provide the students will the vocabulary terminology. - Teacher will show visual (photos) demonstrating balanced and unbalanced force - Teacher will review the proper lab procedures for how to conduct themselves in a lab. - Teacher will provide several grouping of student scenarios during the tug-of-war game. - Teacher will orally ask and lead students to correct answers. 1. Explain the difference between balanced and unbalanced force (balanced force is two forces acting in opposite directions on an object, and equal in size, unbalanced force is two forces acting on an object are not equal in size) 2. Provide one word that can describe balanced and unbalanced force. (equal/even and unequal/uneven) 3. Describe an example of balanced and unbalanced forced (Balanced force - 2 students on a see-saw leveled same weight and height. Unbalanced force - 2 students on a sea-saw, however 1 is high up and the other is low on the ground) -After each grouping scenario (description in formative assessment) during tug-of-war the teacher will ask the students (what force was just exerted, explain why that force was exerted) - Finally the students will fill out the lab sheet which includes the data chart and conclusion questions - Teacher will provide several grouping scenarios during the tug-of-war game and the students will have to determine which force was applied and explain their answer. - There will be 5 different scenarios: 1. The students will pick there own groups, equal amount of students on each side. 2. Next, the teacher will ask the students to find someone in the class that is about the same height and weight and go stand next to them (doesn't matter if its boy and girl, or girl/girl, boy/boy). Then the teacher will separate the pairs, hoping to make the weight even on both sides. 3. Normally the tall/ bigger students are in the back and the shorter/smaller students are in the front. The teacher will ask the students does it matter how you are positioned on each side? Then the students will move (tall/bigger in front of the rope and shorter/smaller students in back). 4. The teacher will ask does the surface material effect the outcome of the force exerted. The students will stay with their same groups, they can choose where they want to stand along the rope. The teacher will then place one group on the side walk and the other group will remain in the grass. Each side will have an opportunity on the different surface. 5. The teacher will place both groups on the side walk. - Students will define words and definitions. (attached in prior knowledge section) - Students will document an example of balanced and unbalanced force and discuss them in small groups - Students will fill out a lab worksheet Tug-Of-War.doc explaining the different forces that were exerted during the tug-of-war game - Students will answer conclusion questions on the lab worksheet. -The students will complete the Tug-Of-War lab sheet (data chart and conclusion questions). -The teacher and students will discuss the the conclusion questions after everyone has completed them and turned them in. -The teacher will grade the lab sheets and return the feedback the next day. Balanced and Unbalanced Forces Test.doc -Students will take a written summative assessment to determine if they can describe the difference between a balanced and unbalanced force. - The suggested grading rubric is the matching is work 7 points each and the short response is worth 10 each. Balanced and Unbalanced Forces Answer Key.doc - Pre-Lesson (Prior Knowledge)- Teacher will provide the students with the vocabulary terminology. Balanced and Unbalanced Force Vocabulary.doc Students will write and define the key terms from this document. Students will have a hand written quiz on the vocabulary to check for mastery. Force Vocabulary Quiz.doc (answer key included)- Teacher will have a group discussion with students to clarify any misunderstanding. - For example; Explain the difference between a balanced and unbalanced force? What is friction? -Guided Practice -Students will have to create an example (draw an illustration and then describe the illustration) of balanced and unbalanced force in their notebooks and discuss them in small groups. This will be assessed by walking around observing and monitoring the conversations and the examples written in their notebooks. - Teacher will provide several grouping scenarios during the tug-of-war game and the students will have to determine which force was applied and explain their answer. -Independent Practice - Students will fill out their data chart explaining what type of force was exerted and describe how this was proven. Also, the students will answer conclusion questions based out off of the data collected. Students will receive feedback during the teaching phase. The teacher will orally ask and lead students to the correct answers. These questions are attached in the Teaching Phase section. Students will receive oral feedback from the teacher when he/she is walking around observing their conversations with their small groups about the examples they have illustrated and described. Students will receive written feedback about their quiz the same day and the teacher discusses any misunderstandings and help guide them to correct answers. Students will receive oral feedback during the grouping scenarios making sure the students know which force was exerted and why. Students will receive written feedback on their lab sheets on how they answered their conclusion questions. Feedback to Students: - Students will receive feedback during the teaching phase. The teacher will orally ask and lead students to the correct answers. These questions are attached in the Teaching Phase section. - Students will receive oral feedback from the teacher when he/she is walking around observing their conversations with their small groups about the examples they have illustrated and described. - Students will receive oral feedback from the teacher when he/she is walking around observing their conversations with their small groups about the examples they have illustrated and described. Students will receive written feedback about their quiz the same day and the teacher discusses any misunderstandings and help guide them to correct answers. Summative Assessment: Balanced and Unbalanced Forces Test.doc-Students will take a written summative assessment to determine if they can describe the difference between a balanced and unbalanced force. - The suggested grading rubric is the matching is work 7 points each and the short response is worth 10 each.Balanced and Unbalanced Forces Answer Key.doc Low and high students into the same small groups to discuss their illustrated examples. A typed vocabulary list to students who have illegible handwriting or writes too slowly. Higher Students could answer the following essay questions: Why would creating balanced and unbalanced forces be important in society? What kind of jobs or situations would this be important for? The students would need to provide text based evidence. Suggested Technology: Computer for Presenter Special Materials Needed: Tug-of-war ropeProper Shoes (sneakers)Computer and projector (displaying photos and vocabulary)Lab worksheet By Author/Submitter - This lesson will provide a hands on learning experience for students to see how balanced and unbalanced force exerted- When separating the students into groups by height and size, remember to be sensitive because this could be an uncomfortable situation for some students. balanced and unbalanced forces worksheet middle school pdf

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