CCPS Science Unit Plan

Grade	10-12	**Subject**	Physics	**Unit #**	1
Unit Name	Mechanics in One Dimension		**Timeline**	4 Weeks	
How to use the Framework	This Framework should be used to implement daily science instruction. The resources and instructional strategies reflected in the Framework will provide a foundation for effective implementation and student mastery of standards. Please see the hyperlinked abbreviation document to ensure understanding all abbreviations used with this framework.				
Unit Overview	In this unit, students will seek to answer the question "How can we model motion and forces?" The modules in this unit each provide part of the answer to this question. • **Module 2:** Representing Motion - Students will learn that motion can be modeled by motion diagrams, particle models, vectors, graphs, and mathematical equations. • **Module 3:** Accelerated Motion - Students will expand their knowledge of modeling motion to include accelerated motion. • **Module 4:** Forces in One Dimension - Students will learn that forces can be modeled using free-body diagrams and that forces cause changes in motion, as described by Newton's laws of motion. ***Students and their parents must review, sign, and submit the following safety acknowledge form prior to the first lab.**				
Lesson Plan guidance document and template	Department of Science Guidance Document Lesson Plan Template Week View Physics Teacher Notes				

3Dimensional Instruction

GSE	Science and Engineering Practices	Crosscutting Concepts
SP1. Obtain, evaluate, and communicate information about the relationship between distance, displacement, speed, velocity, and acceleration as functions of time. a. Plan and carry out an investigation of one-dimensional motion to calculate average and instantaneous speed and velocity. • Analyze one-dimensional problems involving changes of direction, using algebraic signs to represent vector direction. • Apply one-dimensional kinematic equations to situations with no acceleration, and positive, or negative constant acceleration. b. Analyze and interpret data using created or obtained motion graphs to illustrate the relationships among position, velocity, and acceleration, as functions of time.	**Asking Questions and Defining Problems:** Asking questions and defining problems in 9–12 builds on K–8 experiences and progresses to formulating, refining, and evaluating empirically testable questions and design problems using models and simulations. **Planning and Carrying Out Investigations:** Planning and carrying out investigations in 9-12 builds on K-8 experiences and progresses to include investigations that provide evidence for	**Patterns**. Observed patterns of forms and events guide organization and classification, and they prompt questions about relationships and the factors that influence them. **Cause and effect:** Mechanism and explanation. Events have causes, sometimes simple, sometimes multifaceted. A major activity of science is investigating and explaining causal relationships and the mechanisms by which they are mediated. Such mechanisms can then be tested across given

	c. Ask questions to compare and contrast scalar and vector quantities. d. Analyze and interpret data of two-dimensional motion with constant acceleration. • Resolve position, velocity, or acceleration vectors into components (x and y, horizontal and vertical). • Add vectors graphically and mathematically by adding components. • Interpret problems to show that objects moving in two dimensions have independent motions along each coordinate axis. • Design an experiment to investigate the projectile motion of an object by collecting and analyzing data using kinematic equations. • Predict and describe how changes to initial conditions affect the resulting motion. • Calculate range and time in the air for a horizontally launched projectile.	and test conceptual, mathematical, physical, and empirical models. **Analyzing and Interpreting Data:** Analyzing data in 9–12 builds on K–8 experiences and progresses to introducing more detailed statistical analysis, the comparison of data sets for consistency, and the use of models to generate and analyze data.	contexts and used to predict and explain events in new contexts. **Systems and System Models** – A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.
NGSS Alignment	NGSS Alignment to Disciplinary Core Ideas		

Weekly Lesson Task

Week 1					
GSE: SP1a		**Focused Concept: A Physics Toolkit**			
Phenomenon: What tools and skills do physicists use?			**DQ: What do physicists study?**		
SEP: Asking Questions and Defining Problems, Planning and Carrying Out Investigations, Using Mathematics and Computational Thinking			**CCC:** Patterns, Cause & Effect, Scale Proportion & Quantity, Systems and System Models, Energy & Matter		
	Day 1 1.1	**Day 2 1.2**	**Day 3 1.3**	**Day 4 1.4**	**Day 5 CER**
Learning Target	**Students will explore the nature of science and the practices scientists use.**	**Students will explore some of the key mathematical concepts needed in physics,**	**Students will explore uncertainty, precision, and accuracy in measurement.**	**Students will explore how graphs are constructed and the types of relationships they reveal.**	**Students will culminate their learning of science practices, mathematical concepts, measurements,**

	Focus Question: What do physicists do?	**including SI units, dimension analysis, significant figures, and problem-solving strategies.** **Focus Question:** How is math helpful to physicists?	**Focus Question:** Why is it important to make careful measurements?	**Focus Question:** How do graphs help scientists analyze data?	**and graphs.**
Opening (Teacher: The Lesson Resource can`be launched or assigned with Know/Want to Know Activity on digital textbook platform)	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions. **What tools and skills do physicists use?** Revisit T**he Phenomenon (Claim, Evidence, Reasoning) TE Page 27** Students will create a CER based on the question and using information obtained from Days 1-4, present evidence and reasoning to support the claim.
Guided Practice/ Transition TTW, provide 15-20 minutes of direct instructions. PPT presentations are available for every section of every chapter in the online textbook resources.	**The Teacher Will:** Conduct a tool talk and discuss the expectations of the investigation, which is to discuss how physicists engage in experimental design in order to draw conclusions for the causes of physical phenomenon.	**The Teacher Will:** Review how prefixes are defined and how to do metric conversions utilizing the Mathematics and Physics presentation Review Prefixes in Math with students (pg 11).	**The Teacher Will:** Answer to the opening question lies in an investigation that requires the students to do all of the calculations as it relates to the speed of their respective constant velocity cars. (View Link below in	**The Teacher Will:** Instruct Students on how to format their Journals to record the evidence they collect as they complete the readings and activities in the lesson (Table 3 Pg 18). **Essential Vocabulary** *independent variable	**The Teacher Will:** Discuss with students the various career fields referenced on STEM at Work Page 25.

	Discuss with the students how you all plan to determine a general mathematical relationship between air resistance (drag) and terminal velocity. **Essential Vocabulary** *physics *scientific method *hypothesis *model *scientific theory *scientific law	Follow up review with 'Get It' Question (page 11). - Identify the prefix that would be used to express 2,000,000,000 bytes of computer memory. Segway into a discussion on significant figures and problem solving practices. **Essential Vocabulary** *dimensional analysis *significant figures	Independent Practice section for instructions). Teacher will demonstrate how to arrange the meter sticks on the floor and explain how to arrange the table/graph in a scientific journal. **Essential Vocabulary** *measurement *precision *accuracy	*dependent variable *line of best fit *linear relationship *quadratic relationship *inverse relationship	
Independent Practice (TTW, circulate to monitor student performance and will clarify instructions as needed.)	**Students will complete :** Air Resistance Investigation **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**Students will:** Work collaboratively on completing: Check your progress Pg. 13. Suggested Homework **Metric Conversion …** **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**Students will:** Figure out and design an experiment that will allow them to determine where approaching cars will "collide" or intercept on the floor. Note: Students need to base their prediction based on the average speeds of their respective cars prior to them actually placing the cars on the "track". **constantvelocityb…** **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**Students will:** Explore and answer questions (1-9), on page 19. Analyze and extrapolate data from data in Table 3 and Graph (Figure 15 pg. 19) **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**Students will:** "Choose one of the fields of physics that interests them. " Research their chosen field, and identify a related career, what a person does in that career, and the types of education and training required. Develop a presentation in which they are recruiting candidates for a job opening in that career. Use STEM careers link to reference a list of common career fields that they may not have thought could be reimaged using STEM. **TTW** circulate to monitor students' performance and will clarify instructions as needed.
Assessment Summary (Teachers should maximize the use of all the extended learning/assessment tasks if	**TE Page 9** **Task:** Students will write an outline for an experiment to learn which	**TE Page 13** **Task:** Progress Check Questions (Textbook or Online Science Notebook)	**TE Page 17** **Task:** Students will perform the Penny Water Test per teacher's	**TE Page 23** **Task:** Students will interpret and draw conclusions using "famous" graphs.	**TE Page 27** **Task:** Access the online additional resources for a pre-made Chapter/Module

time permits.)	substances break down faster in a landfill. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	**Extended:** >Access the online additional resources for a pre-made Lesson Check to assign students.	instructions. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	**Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	Test to assign students or customize your own..
Small Group Tasks (TBA)					

Week 2					
GSE: SP1a, SP1b	**Focused Concept: Representing Motion**				
Phenomenon: How does a GPS unit know where you are? (Video: Online Resource can be presented or assigned)			**DQ: How fast is fast?**		
SEP: Developing and Using Models, Planning and Carrying Out Investigations, Using Mathematics and Computational Thinking			**CCC:** Patterns, Cause & Effect, Systems and System Models		
	Day 6 2.1	**Day 7** 2.2	**Day 8** 2.3	**Day 9** 2.4	**Day 10** Lab
Learning Target	**Students will explore how motion diagrams and particle models can be used to represent motion.** **<u>Focus Question:</u>** How do you know that something is moving?	**Students will explore how coordinate systems, vectors, and scalars are used to describe motion.** **<u>Focus Question:</u>** What are some different ways of describing and representing motion?	**Students will explore how position-time graphs can be created and interpreted.** **<u>Focus Question:</u>** What can you learn from position-time graphs?	**Students will explore the difference between speed and velocity and how motion can be modeled using equations.** **<u>Focus Question:</u>** How do you describe how fast something is moving?	**Students will culminate their learning of motion representation, speed vs velocity, and related equations.**
Opening (Teacher: The Lesson Resource can`be launched or assigned with Know/Want to Know Activity on digital textbook platform)	• **Show students the <u>phenomenon card</u> and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to	• **Show students the <u>phenomenon card</u> and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to	• **Show students the <u>phenomenon card</u> and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to	• **Show students the <u>phenomenon card</u> and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to	• **Show students the <u>phenomenon card</u> and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to

	share observations and develop questions.	share observations and develop questions.	share observations and develop questions.	share observations and develop questions.	share observations and develop questions. **Explain why scientists have developed tiny atomic clocks for certain navigation systems.** Scientific Breakthroughs: In The Nick Of Time Pg 52
Guided Practice/Transition TTW, provide 15-20 minutes of direct instructions. PPT presentations are available for every section of every chapter in the online textbook resources.	**The Teacher will:** Describe: how the picture in Figure 1 (pg 32) would be different if the train were sitting still. Identify: two factors you must know to describe the motion of an object along a straight line. (Figure 2 pg. 33) Get it: how you would model the motion of the hiker at the beginning of this module. **Essential Vocabulary** *motion diagram *particle model	**The Teacher will:** Introduce the tenants of the case study. Suggestion: Read the case study aloud with students by assigning them a speaking part from the dialogue in the scenes of the case study. To Catch Mobster Case Study Assist students with creating a Know/Need to Know chart that will guide them in completing the assignments after each scene in the case study. **Essential Vocabulary** *coordinate system *origin *position *distance *magnitude *vector *scalar *time interval *displacement *resultant	**The Teacher Will:** The video to the class. Fast and Furious Following the viewing of the video; open the class discussion by inquiring to the class "what did you observe in the clip?" Guide students, through inquiry, how they can take their observations and quantify them in a position versus time graph. Show the video to the students a second time. This time pause the video at different time intervals and allow students to plot the position changes of the vehicles in the video. Once the graph is complete, discuss what was happening in the video at the different plot points in the graph with the students. **Essential Vocabulary** *position-time graph *instantaneous position	**The Teacher will:** Open up the lesson using the Picturing Motion Presentation Instructor will post the Khan Academy: Instantaneous Speed explanation in canvas for students to view as an additional resource. **Essential Vocabulary** *average velocity *average speed *instantaneous velocity	**The Teacher will:** Data Analysis Lab Pg 54 How can you rank velocity from a graph? CER: Analyze and interpret date pg 54
Independent Practice	**Students will**	**Students will**	**Students will**	**Students will**	**Students will**

(TTW, circulate to monitor student performance and will clarify instructions as needed.)	Engage in the CER activity (pg 31). Teacher will: Go online and play a video about how GPS works Students will: access their CER chart and explore resources that can help collect Evidence that will lead to their ability to support their reasoning, concerning the phenomenon they observed in the video. **TTW** circulate to monitor students' performance and will clarify instructions as needed.	Complete the assignments at the end of each scene in the case study. **TTW** circulate to monitor students' performance and will clarify instructions as needed.	Practice Problems (Additional Practice) pgs 42 & 44 **TTW** circulate to monitor students' performance and will clarify instructions as needed.	Access Gizmos through their rapid identity accounts Gizmo Distance vs Time **TTW** circulate to monitor students' performance and will clarify instructions as needed.	Conduct the Toy Car Race Lab, collect data and answer analysis questions. Toy Car Race **TTW** circulate to monitor students' performance and will clarify instructions as needed.
Assessment/Summary (Teachers should maximize the use of all the extended learning/assessment tasks if time permits.)	**TE Page 34** **Task:** Progress Check Questions (Textbook or Online Science Notebook) **Extended:** >Access the online additional resources for a pre-made Lesson Check to assign students.	**TE Page 39** **Task:** Students will describe the coordinate system and explain vector/scalar examples based on questions from Formative Assessment Check. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	**TE Page 44** **Task:** Students will create two motion diagrams based on scenarios presented in the Formative Assessment Check. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	**TE Page 50-51** **Task:** Students will create a motion diagram and make calculations based on the scenario presented in the Formative Assessment Check. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students. **Homework** Practice problems page 48 & 50	**TE Page 54** **Task:** Access the online additional resources for a pre-made Chapter/Module Test to assign students.
Small Group Tasks (TBA)					

Week 3					
GSE: SP1a, SP1b, SP1c		**Focused Concept: Accelerated Motion**			
Phenomenon: Why do sudden changes in the direction or speed of jet planes affect pilots? (Video: Online Resource can be presented or assigned)			**DQ: What makes objects move faster, and how?**		
SEP: Developing and Using Models, Using Mathematics and Computational Thinking			**CCC:** Cause & Effect, Systems and System Models		
	Day 11 3.1	**Day 12 3.2**	**Day 13 3.3**	**Day 14 Lab**	**Day 15 CER**
Learning Target	**Students will explore nonuniform motion diagrams, velocity-time graphs, average and instantaneous acceleration, and how to calculate acceleration.** **Focus Question:** What are two ways velocity can change?	**Students will explore how equations can be used to describe the position and velocity of an object with a constant acceleration.** **Focus Question:** How are position, velocity, acceleration, and time related?	**Students will explore how objects accelerate in free-fall.** **Focus Question:** How does an object's speed change as it falls?	**Students will explore how theme park designers make use of acceleration and gravitational forces through physics, engineering, and mathematics.** **Focus Question:** How do theme park designers use acceleration and gravitational forces to design fun? TE Page 80	**Students will culminate their learning of accelerated motion and free fall acceleration.** **Focus Question:** Why do sudden changes in the direction or speed of jet planes affect pilots?
Opening (Teacher: The Lesson Resource can`be launched or assigned with Know/Want to Know Activity on digital textbook platform)	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	(STEM at Work) **• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	Experiencing G Force **• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.

Guided Practice/Transition TTW, provide 15-20 minutes of direct instructions. PPT presentations are available for every section of every chapter in the online textbook resources. **Lab Prep needed for Day 14**	**The Teacher Will :** Introduce the (located in the interactive online content for Lesson 3 "Free Fall") regarding Galileo's exploration of gravitational forces and allow students to note the details of their observation in their Science journals while opening up the topic for discussion using Acceleration presentation. **Essential Vocabulary** *acceleration *velocity-time graph *average acceleration *instantaneous acceleration	**The Teacher Will:** Facilitate students reading the introduction, pose questions and share those questions with the class. Phet Student Exploration Doc **Essential Vocabulary** *masses *newtons	**The Teacher Will:** Facilitate the steps necessary for completing 1 and 2 step algebraic expressions to solve for changes in Acceleration Acceleration Manipulatives **Essential Vocabulary** *free fall *free fall acceleration	**The Teacher Will:** Read introduction of the ADI with the students and facilitate the transition among the steps of the Lab. Students can use annotation skills to help them navigate the introduction. ADI Lab #9 - Free Fall Motion **Essential Vocabulary** *theme park designer *computer-aided-design (CAD) Introduce the seven stages of ADI and provide a brief overview of each stage. Task: Introduce a phenomenon to figure out and the task to complete. Ideas: Highlight some ideas that can be used during the investigation. Plan: Create, share, and revise a plan for collecting and analyzing data. Do: Collect the data needed and make sense of it. Share: Create, share, critique, and revise evidence-based arguments. Reflect: Discuss ways to use core ideas and practices in the future. Report: Write, share, critique, and revise reports about what they figured.	**The Teacher Will:** Facilitate the CER and explain the rubric Go Further: How do free fall on Earth and Jupiter compare? Pg 82 Analyze and interpret Data: Page 82
Independent Practice	**TSW** work independently on practice questions page 63 & 64.	**TSW** use the instructions embedded in the document to navigate the interactive simulator.	**TSW** Practice questions on 78 **TTW** provide support to	**TSW** make a plan, collect data, analyze data, and make a claim.	**TSW** analyze data and support claim Pg 85. **TSW** use Science Journals

(TTW, circulate to monitor student performance and will clarify instructions as needed.)	**TTW** provide support to students by asking probing questions to guide student thinking while reteaching when necessary.	**TSW** record the outcomes of the lab in the Phet Student Exploration Doc **TSW c**reate an argument board and present their findings to the class. **TTW** circulate to monitor students' performance and will clarify instructions as needed.	students by asking probing questions to guide student thinking while reteaching when necessary.	ADI Lab #9 - Free Fall Motion **TTW** support students as they develop their plans for collecting and analyzing data.	to record evidence they collect as they complete the reading and activities in this lesson. **TTW** circulate to monitor students' performance and will clarify instructions as needed.
Assessment/Summary (Teachers should maximize the use of all the extended learning/assessment tasks if time permits.)	**TE Page 65** **Task:** Students will describe acceleration based on scenarios from Formative Assessment Check. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	**TE Page 73** **Task:** Students will identify acceleration on graphs and predict changes based on Figure 12 from Formative Assessment Check. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	**TE Page 79** **Task:** Students will conduct free-fall hands-on activity according to instructions from Formative Assessment Check. **Extended:** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	**Task:** Students will research the maximum acceleration a human body can withstand without blacking out and discuss how this impacts the design of three common entertainment or transportation devices. Extended: >Students can write an abbreviated report on their ADI findings, including predictions of common and future applications.	**TE Page 82** **Task:** Access the online additional resources for a pre-made Chapter/Module Test to assign students.
Small Group Tasks (TBA)					

Week 4	
GSE: SP2a	**Focused Concept: Forces In One Dimension**
Phenomenon: How do wing suits help BASE jumpers control their velocity? (Video: Online Resource can be presented or assigned)	**DQ: How do scientists launch rockets into space?**
SEP: Developing and Using Models, Analyzing and Interpreting Data, Using Mathematics and Computational Thinking	**CCC:** Cause & Effect, Scale Proportion & Quantity, Stability & Change

	Day 16 4.1	Day 17 4.2	Day 18 4.3	Day 19 Review	Day 20 Test
Learning Target	**Students will explore how forces cause changes in motion (including Newton's 1st and 2nd laws of motion) and practice representing forces with free-body diagrams.** **Focus Question:** What causes a change in motion?	**Students will explore weight, apparent weight, and drag forces.** **Focus Question:** How does the drag force change after a skydiver deploys their parachute?	**Students will explore Newton's third law and apply it, along with Newton's second law, to situations involving tension and normal forces.** **Focus Question:** If you push on a wall, what force does the wall exert on you?	**Students will explore the use of free-body diagrams to explain an observation while supporting Newton's laws of motion.** **Focus Question:** How would you explain these walking rocks?	**Students will culminate their learning for all of Unit 1.**
Opening (Teacher: The Lesson Resource can`be launched or assigned with Know/Want to Know Activity on digital textbook platform)	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions.	**• Show students the phenomenon card and/or embedded video** • Use the See-Think-Wonder protocol to guide student thinking. • Teachers should provide students opportunities to share observations and develop questions. Launch Learnsmart + Smartbook: Forces In One Dimension (Unit 1 Module 4 Learning Resource)
Guided Practice/Transition TTW, provide 15-20 minutes of direct instructions. PPT presentations are available for every section of every	**The Teacher will** Get It?: Explain: (pg 86) Explain contact forces are different from field forces. Compare: the direction of an	**The Teacher will** Example Problem 2 (pg. 96) TTW model the steps of solving Algebraic expression for 1 and 2 step problems.	**The Teacher will Investigate:** Newton's 3rd Law: Plan and carry out an investigation that applies Newton's Laws of motion to different systems. (pg 101)	**The Teacher will** **Nature of Science TE 107** After reading about the phenomena and research done to discover the cause, students will work with a team to draw a free body diagram of the forces	

chapter in the online textbook resources.	object's acceleration with the direction o of the unbalanced force exerted on the object, Describe: the relationship between applied net force and the acceleration. pg 89 Determine: how the forces exerted on an object must be challenged to reduce the object 's acceleration by half. **Essential Vocabulary** *force *system *free-body diagram *net force *Newton's second law *Newton's first law *inertia *equilibrium	**Essential Vocabulary** *weight *gravitational field *apparent weight *weightlessness *drag force *terminal velocity	Review the news: Obtain Information from a current news story about force and motion. TSW evaluate their source and communicate their findings. **Example problems 4 (pg 102)** **Essential Vocabulary** *interaction pairs *Newton's third law *tension *normal force	acting on a sliding rock in Racetrack Playa. Indicate the direction of the acceleration and of the net force. Next to the free-body diagram, make an illustration that uses a circle to designate the system. **Essential Vocabulary** *force *free-body diagram *Newton's laws of motion	
Independent Practice (TTW, circulate to monitor student performance and will clarify instructions as needed.)	**TSW** practice problems (pg 91) **TSW** conduct spring hands-on activity according to instructions from Formative Assessment Check (TE Page 94) **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**TSW** practice Problems Pg 96 **TSW** conduct ball launch hands-on activity according to instructions from the Formative Assessment Check (TE Page 99) **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**TSW** practice problems Pg 103 **TSW** conduct weighted car hands-on activity according to instructions from Formative Assessment Check. (TE Page 106) **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**TSW** complete Go Further Page 109 **TSW** complete the SEP and CER sections on page 109 to answer the question: How does weight change during a rocket launch? **TTW** circulate to monitor students' performance and will clarify instructions as needed.	**Unit 1 Test**
Assessment/Summary (Teachers should maximize the use of all the extended learning/assessment tasks if time permits.)	**TE Page 94** **Task:** Students will complete the Progress Check Questions (Textbook or Online Science Notebook) **Extended:** >Access the online additional	**Task:** Students will write a CER for weightlessness and/or terminal velocity. -AND- Students will	**TE Page 106** **Task:** Students will complete the Progress Check Questions (Textbook or Online Science Notebook) **Extended:**	**Task:** **TTW** select or create a set of review questions. (Kahoot, Quizizz, Blooket) **TSW** participates using the platform selected by the	**Unit 1 Test**

	resources for a pre-made Lesson Check to assign students.	complete the PHYSICS Challenge **Extended: TE Pg 99** >Progress Check Questions (Textbook or Online Science Notebook) >Access the online additional resources for a pre-made Lesson Check to assign students.	>Students will write a CER for Weighted Car Activity. >Access the online additional resources for a pre-made Lesson Check to assign students.	teacher. **TE Page 109** **Extended:** >Access the online additional resources for a pre-made Chapter/Module Test to assign students.	
Small Group Tasks (TBA)					

Assessment Prep

Prepare students for assessment by reviewing the following Assessment Prep concepts.

Labs / Investigations

Mandatory Labs	Explore Learning Gizmo	Pivot Interactives/Phet
ADI Lab #9 - Free Fall Motion	Free Fall Laboratory: https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=387 Golf Range: https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=26 Distance Time: https://www.explorelearning.com/index.cfm?method=cResource.dspDetail&ResourceID=260	**PhET: Graphing Lines** **PhET: Forces and Motion**

Additional Resources/Tasks

Supplemental Resources	☐ McGRAW ONLINE ☐ DRIVING QUESTIONS BOARD & SUMMARY TABLE (TE Page 28B) ☐ STEM UNIT PROJECT (TE Page 29) Build a Rocket ☐ LEARNSMART