

Pacing Guide

The *Pacing Guide* below is designed so that you have the option to complete the first eight chapters of *Active Physics* during the school year. The *Plan A Pacing Guide* allows the students to complete all the *Investigates*. If you are a new teacher, or unfamiliar with the program, you may have difficulty adhering to *Pacing Guide A*. *Pacing Guide B* suggests places where either time or equipment may be saved if it becomes necessary to complete the chapter in

the allotted time. To reach this goal, many of the investigations are whole-class *Investigates* rather than small-group *Investigates*. This will save time and require less equipment than the optimal inquiry-based instruction that the curriculum is intended to provide. In order to choose which plan is best for you, please consult the *Implementation Chart* following this guide.

Note: Each “day” assumes a 45-minute class period, or one half of a 90-minute block.

Day	Plan A (small-group <i>Investigates</i>)	Homework (for Plan A and Plan B)	Day	Plan B (combination of whole-class and small-group <i>Investigates</i>)	Plan B Equipment Reduction
1	<i>Scenario, Your Challenge, Criteria for Success, Scoring Rubric.</i> Section 1 Answer <i>What Do You See? What Do You Think?</i>	Look over local papers from the previous week and find any articles available of automobile crashes or safety to report to the class.	1	See Plan A.	
2	Carry out the <i>Investigate</i> with a class discussion of what constitutes a safety device. Discuss <i>Physics Talk</i> and how any of the safety devices listed might have helped in the accidents the students discovered in their homework. Answer <i>What Do You Think Now?</i> and <i>Reflecting on the Section and the Challenge</i> .	Read the <i>Physics Talk</i> and answer the <i>Checking Up</i> questions. Answer <i>Physics to Go</i> Questions 1-5.	2	See Plan A.	
3	Review <i>Checking Up</i> questions and <i>Physics to Go</i> . Section 2 Answer <i>What Do You See? What Do You Think?</i> Students should conduct <i>Investigate</i> Parts A and B.	Read the <i>Physics Talk</i> and answer the <i>Checking Up</i> questions.	3	See Plan A.	
4	Discuss <i>Section 2 Physics Talk</i> and review <i>Checking Up</i> questions. Complete <i>What Do You Think Now?</i> and <i>Reflecting on the Section and the Challenge</i> . If possible, show a portion of the PBS video from the Nova series “Escape” on car crashes, or some of the safety and car video online to illustrate the problems associated with car crashes.	Complete <i>Physics to Go</i> Questions 1-4, 6-8 and 10.	4	See Plan A.	

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5	Discuss <i>Physics to Go</i> . Section 3 Answer <i>What Do You See?</i> and <i>What Do You Think?</i> Students conduct <i>Investigate</i> Steps 1-7. Complete <i>Investigate</i> Step 8 as a demonstration using the students to throw the egg.	Read the <i>Physics Talk</i> sections on Energy and Work, Kinetic Energy and Work and Change in Kinetic Energy. Answer <i>Checking Up</i> Questions 1 and 2 and <i>Physics to Go</i> Questions 1-4.	5	See Plan A.	
6	Review results of previous day's <i>Investigate</i> . Review the <i>Checking Up</i> and <i>Physics to Go</i> questions. Discuss the <i>Physics Talk</i> on kinetic energy and work, and speed, kinetic energy and stopping distance. Review the numerical examples in the <i>Physics Talk</i> , and show why energy and work are expressed in the same units from the equations.	Read the remainder of the <i>Physics Talk</i> and answer <i>Checking Up</i> Questions 3 and 4 and <i>Physics to Go</i> Questions 5-8 and 10.	6	See Plan A.	
7	Review <i>Physics to Go</i> homework. Students complete the <i>Reflecting on the Section and the Challenge</i> and record their answers in their logs. Section 4 Answer <i>What Do You See?</i> and <i>What Do You Think?</i> Students complete <i>Investigate</i> Steps 1-7.	Read and summarize the <i>Physics Talk</i> in your logs. Answer <i>Checking Up</i> Questions 1-3.	7	Review <i>Physics to Go</i> homework. Students complete <i>Reflecting on the Section and the Challenge</i> and note their answers in their logs. Section 4 Answer <i>What Do You See?</i> and <i>What Do You Think?</i> Teacher does <i>Investigate</i> Steps 1-9 as a demonstration.	Requires two dynamics carts, one ramp, one pound of modeling clay, ringstand, crossarm, right angle clamp, scissors and file folders, masking tape, meterstick, weights and wire.
8	Review results of <i>Section 4 Investigate</i> Steps 1-7. Students complete <i>Investigate</i> Sections 8-9. Review the <i>Physics Talk</i> discussing how Newton's first and second laws influence whiplash. Answer <i>What Do You Think Now?</i> and <i>Reflecting on the Section and the Challenge</i> .	Answer <i>Physics to Go</i> Questions 1-7.	8	Review the <i>Physics Talk</i> discussing how Newton's first and second laws influence whiplash. Answer <i>What Do You Think Now?</i> and <i>Reflecting on the Section and the Challenge</i> . Discuss <i>Physics to Go</i> problems. Students begin working on the <i>Mini-Challenge</i> in their groups. Students will need to decide on the safety device they wish to construct and the type of vehicle that will have the safety device.	

Pacing Guide *(continued)*

Day	Plan A (small-group <i>Investigates</i>)	Homework (for Plan A and Plan B)	Day	Plan B (combination of whole-class and small-group <i>Investigates</i>)	Plan B Equipment Reduction
9	Discuss <i>Physics to Go</i> questions. As a review, have the students do the Whiplash quiz (<i>Physics to Go</i> Question 8). Students start work on the <i>Mini-Challenge</i> in their groups. Students will need to decide on the safety device they wish to construct and the type of vehicle that will have the safety device.	Conduct an Internet or other media search for any information on a similar safety device to yours already in use.	8	See Plan A.	
10	Students work in groups and compare notes on safety device search. Students discuss what is needed for a consensus first draft. Review the first draft, and aspects of the oral presentation the students will make.	Prepare a first draft of the written report to share with your group.	9	See Plan A.	
11	Student presentations of the <i>Mini-Challenge</i> . Section 5 Answer <i>What Do You See?</i> and <i>What Do You Think?</i>	Read the <i>Physics Talk</i> and write the answers to the <i>Checking Up</i> questions in your log books.	10	See Plan A.	
12	Students conduct the Investigate. Discuss the <i>Physics Talk</i> and review the <i>Checking Up</i> questions. Ask students <i>What Do You Think Now?</i> Students discuss with their groups <i>Reflecting on the Section and the Challenge</i> and record their answers in their logs.	Answer <i>Physics to Go</i> Questions 1–6 and 7 (<i>Preparing for the Chapter Challenge</i>).	11	See Plan A.	
13	Review the <i>Physics to Go</i> questions from the previous day. Section 6 Answer <i>What Do You See?</i> and <i>What Do You Think?</i> Students complete the <i>Investigate</i> Steps 1-3.	Read the <i>Physics Talk</i> and summarize in your logs, then record your answers to the <i>Checking Up</i> questions.	12	Review the <i>Physics to Go</i> questions from the previous day. Section 6 Answer <i>What Do You See?</i> and <i>What Do You Think?</i> Teacher conducts <i>Investigate</i> all steps as a class demonstration. Review the <i>Physics Talk</i> and discuss the numerical examples. Discuss the <i>Checking Up</i> questions.	Requires only two dynamics carts, 1 mass set, 1 velocity meter setup (stopwatch, ruler, tickertape timer, velocimeter or computer and motion detector), scale, masking tape and modeling clay.
14	Review the results of previous day's <i>Investigate</i> . Students conduct <i>Investigate</i> for collisions 4–6. Review the <i>Physics Talk</i> and discuss the numerical examples. Discuss the <i>Checking Up</i> questions.	Answer <i>Physics to Go</i> Questions 1–8.			

Day	Plan A (small-group <i>Investigates</i>)	Homework (for Plan A and Plan B)	Day	Plan B (combination of whole-class and small-group <i>Investigates</i>)	Plan B Equipment Reduction
15	Discuss previous day's <i>Physics to Go</i> . Discuss <i>Physics to Go</i> Question 11 with the class. Students should discuss <i>Preparing for the Chapter Challenge</i> with their groups. Answer <i>What Do You Think Now?</i> and <i>Reflecting on the Section and the Challenge</i> .	Answer <i>Physics to Go</i> Questions 9, 10, 13, 14.	13	See Plan A.	
16	Review the <i>Physics to Go</i> homework. Section 7 Answer <i>What Do You See?</i> and <i>What Do You Think?</i> Students conduct Part A of the <i>Investigate</i> .	Read <i>Physics Talk</i> sections up to "Work and Energy" or "Impulse and Momentum" and summarize in your logs, and answer the <i>Checking Up</i> questions.	14	Review the <i>Physics to Go</i> homework. Section 7 Answer <i>What Do You See?</i> and <i>What Do You Think?</i> Students conduct Part A of the <i>Investigate</i> , while you conduct Part B as a class demonstration. Start a discussion of the <i>Physics Talk</i> . Review the <i>Checking Up</i> questions.	Only requires one dynamics cart, computer interface and probes to measure the force and velocity, three sets of cushioning materials, ramp, ringstand, crossarm, right angle clamp, masking tape and index cards.
17	Review the results of Part A. Students conduct Part B of the <i>Investigate</i> . Start a discussion of the <i>Physics Talk</i> . Review the <i>Checking Up</i> questions.	Read the <i>Physics Talk</i> from "Work and Energy or Impulse and Momentum" to end. Students complete <i>Physics to Go</i> Questions 1–5.			
18	Finish discussion of the <i>Physics Talk</i> . Review the <i>Physics to Go</i> questions.	Answer <i>Physics to Go</i> Questions 6–10 and <i>Preparing for the Chapter Challenge</i> (Question 11).	15	See Plan A.	
19	Review the previous night's <i>Physics to Go</i> , and <i>Reflecting on the Section and the Challenge</i> . Show the students the materials available for their design of the safety system for the challenge. Students start work on the <i>Chapter Challenge</i> , designing and building the safety system.	Work on the <i>Chapter Challenge</i> written and oral report.	16	See Plan A.	
20	Students continue to work on the <i>Chapter Challenge</i> , comparing written reports for a consensus report, and completing construction and testing of safety device.	Prepare for class presentations of the <i>Chapter Challenge</i> .	17	See Plan A.	
21	<i>Chapter Challenge</i> presentations.	Study for <i>Physics Practice Test</i> .	18	See Plan A.	
22	<i>Physics Practice Test</i> .		19	See Plan A.	