Impact Experience Curriculum

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Table of Contents

Table of Contents 3
Authors 4
Curriculum Structure 4
Lesson Structure 5
Lesson One – Distance and Time 6
Lesson Two – Speed and Velocity 11
Lesson Three – Acceleration and Gravity 16
Lesson Four – Forces and Newton's Laws 21
Lesson Five – Engineering Challenge: Protect the Astronaut 27

The DataSnap™ Impact Experience modernizes the classic Egg Drop Engineering Design Challenge, bringing standards-aligned content to life through easily accessible data. Students learn, explore, and design solutions to engineering challenges by using the DataSnap Motion Sensor to conduct repeated test trials and evaluate their designs.

Authors

Dawn Trahan holds a Bachelor of Arts in Elementary Education and a Master of Education in Instructional Design. She brings more than 22 years of experience in education, including 19 years teaching primarily middle and high school science. The past three years, she has served as a science and technology instructional coach for upper elementary grades.

Throughout her career, Dawn has designed science curricula in two states, developed assessments, and coached teachers in effective, research-based instructional practices. She is passionate about science education and committed to providing students with engaging, high-quality experiences.

A lifelong learner, Dawn continually seeks opportunities for professional and personal growth. In addition to her work in education, she enjoys freelance curriculum development, reading, and traveling. Exploring new ideas and perspectives enriches both her teaching and personal life.

Curriculum Structure

The DataSnap Impact Experience Curriculum is composed of the following lessons. Approximate lesson times are included.

Lesson	Title	Approximate Time
One	Distance and Time	50-120 minutes
Two	Speed and Velocity	50-80 minutes
Three	Acceleration and Gravity	50-80 minutes
Four	Forces and Newton's Laws	50 minutes
Five	Protect the Astronaut	50-80 minutes
	Total	**4-7 hours**

Lesson Structure

Each lesson begins with a Lesson Overview, Lesson Objectives, and a Lesson at a Glance table, which lists lesson activities, materials required, suggested preparation steps, and approximate class time.

Lesson Components

Pre-Assessment: These are quick primers to get students focused and ready to engage. They are short-response questions that elicit prior-knowledge thinking and can serve as a good whole-class opening discussion or a quick LMS check-in.

Content and Learning Guide Slide Presentation: This curriculum is designed to give teachers the flexibility to implement instruction in ways that best meet their classroom needs. The slide presentations can support teacher-led, whole-class instruction, or they may be used by student teams for independent or collaborative learning. Many educators choose to upload the slides to their LMS, allowing for easy student access and flexible pacing.

Student Engineering Workbook: As students follow the guided lessons in the slide presentations they should complete the corresponding sections of their Student Engineering Workbook.

Post-Assessment: Similar to the pre-assessment, these are short-response questions that can be used as an exit ticket or implemented in whatever way best supports your instructional goals.

Lesson 1: Distance and Time

Lesson Overview

This lesson introduces students to foundational concepts of motion through hands-on exploration, real-world examples, and guided use of the DataSnap™ Motion Sensor. The lesson builds conceptual understanding of distance, time, and how objects move, while strengthening early engineering habits such as prediction, observation, and data recording.

Lesson Objectives

After completing this lesson, participants will be able to:

- Explain the concepts of motion, distance, and time and identify real-world examples that show how they relate to one another
- Use the DataSnap Motion Sensor and app to collect and view motion data following proper motion-trigger procedures
- Conduct a drop time investigation, gathering distance and time measurements from multiple trials
- Analyze and interpret data to identify patterns and describe how changes in distance affect the time it takes an object to fall

Lesson at a Glance

Activity	Materials	Preparation	Approximate Class Time
Pre-Assessment	• Distance and Time Pre-Assessment	1. Print/photocopy the pre-assessment (one per student) or load into your LMS.	5 minutes
Content and Learning Guide	• Lesson 1 slide presentation • DataSnap Motion Sensors • A ball that can be rolled into a wall for demonstration	1. Share slides with students. 2. Gather sensors.	40-110 minutes
Student Workbook	• Student Engineering Workbook • Student Engineering Workbook – Answer Key	1. Share workbooks with students. 2. Access the answer key.	
Post-Assessment	• Distance and Time Post-Assessment • Distance and Time Post-Assessment – Answer Key	1. Print/photocopy the post-assessment (one per student) or load into your LMS. 2. Access the answer key.	5 minutes

Lesson One – Distance and Time

50-120 minutes

Materials:

- DataSnap™ Motion Sensors
- Distance and Time Pre-Assessment
- Lesson 1 slide presentation
- Student Engineering Workbook
- Student Engineering Workbook – Answer Key
- Distance and Time Post-Assessment
- Distance and Time Post-Assessment – Answer Key

Facilitation Methods:

A. Whole Class: If there are limited DataSnap Sensors available, this lesson is a good one to complete as a whole class.

B. Teams: If multiple DataSnap Motion Sensors are available, each team can work independently through the lesson using their own sensor. This lesson's structure also works well if two teams share a sensor.

Facilitation Steps:

1. Provide students with the pre-assessment to complete. Use it in the way that best supports your instruction; many teachers utilize it to guide team or whole-class discussion.
2. Students should have access to the Lesson 1 slide presentation. These can be uploaded to your LMS for individual or group work, or you can work through the slides collectively as a whole class.
3. As students work through the slides, they should complete the corresponding Lesson 1 questions in their Student Engineering Workbook.
4. The DataSnap app can be accessed at datasnap.crexo.com.
5. Once students finish viewing the Lesson 1 slides and completing the corresponding workbook questions, provide time for them to check their work using the answer key. This can be done in a variety of ways, including:
    a. Post the printed answer key in the room for students to compare answers with.
    b. Go over the answers as a class.
    c. Have students exchange workbooks and complete a peer check.
6. Provide students with the post-assessment to complete. Use it in the way that best supports your instruction; many teachers have students self- or peer-grade, while others prefer to digitize the assessment through their LMS.

Name: _____ Class: _____

Distance and Time Pre-Assessment

1. How do you describe the concept of motion?

2. What is the difference between distance and time?

3. What are some different units used to describe distance, time, and velocity?

Name: _____ Class: _____

Distance and Time Post-Assessment

Instructions: Complete the following questions. Choose one answer per question.

1. What is the difference between distance and time?
   a. They are the same
   b. Distance is a measurement of how long the path of travel is, while time is a measurement of how long the action takes to complete
   c. Distance is a measurement of how far apart two things are, while time is a measurement of how long the path to travel between two things is
   d. Distance is a measure of time and direction, while time is a measure of seconds

2. Which of these is a unit used to describe distance?
   a. Milliseconds
   b. Meters per second
   c. Mph
   d. Kilometers

3. What is a good tool for measuring distance?
   a. String
   b. Measuring cup
   c. Balance
   d. Meter stick