Webinar:

Empower STEM Learning with Real-Time Data: Using DataSnap for Rapid Design and Engineering

CAREER & TECHNICAL EDUCATION
CTE

Realityworks®
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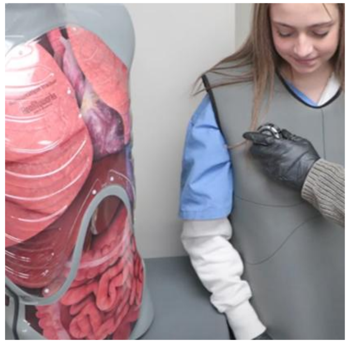
Who is Realityworks?



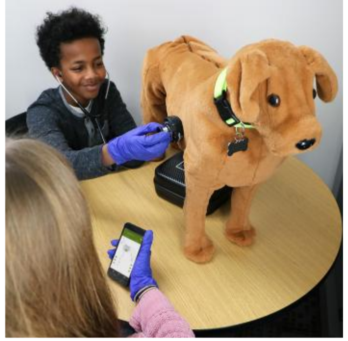


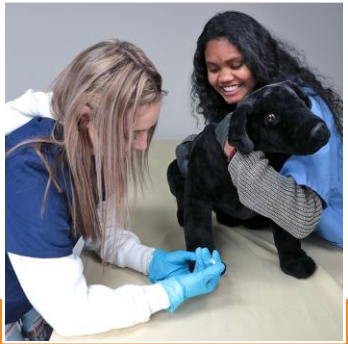




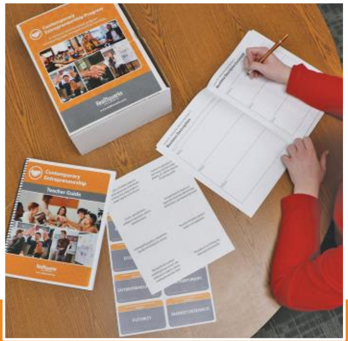












We partner with educators, administrators and industry leaders to ensure our offerings meet their needs and make lessons truly meaningful.

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Presented by

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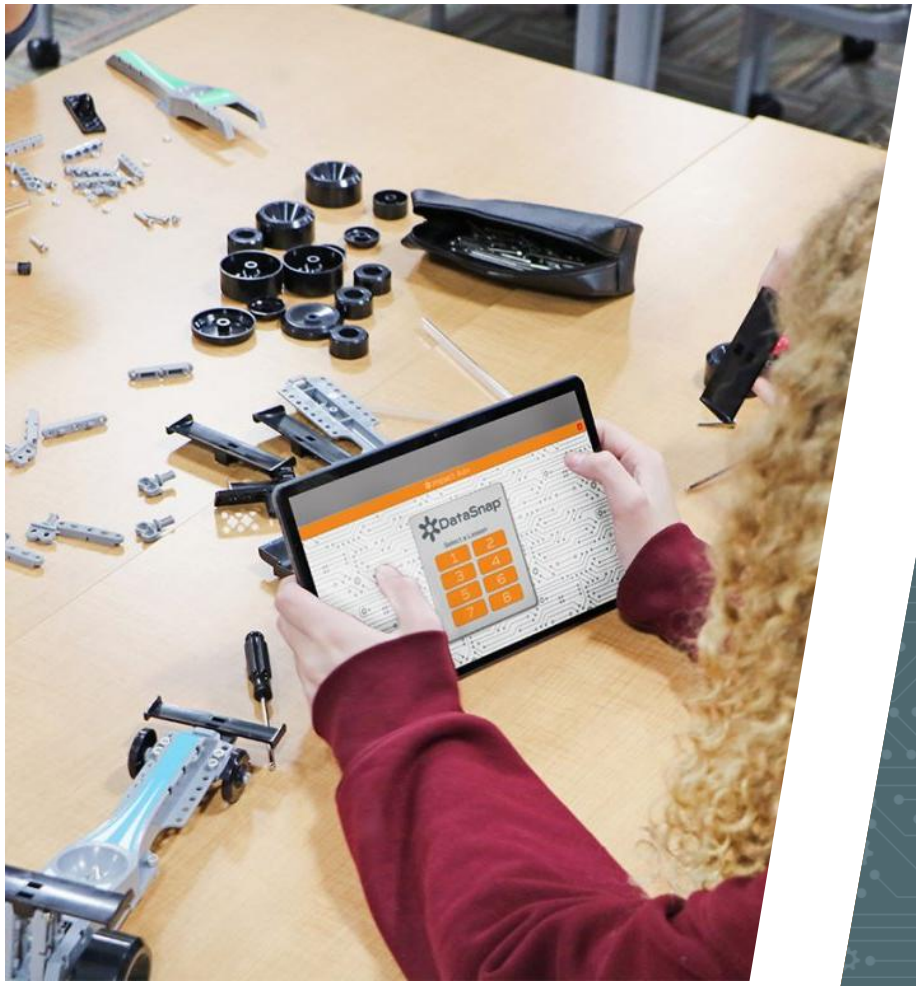
Educator Input: We need learning experiences that…

- Build data literacy skills.
- Are easy to implement in the classroom.
- Engage ALL students.
- Gets real data into students' hands.
- Drive rapid design & iteration cycles.



DataSnap™

“We need to teach AI!”

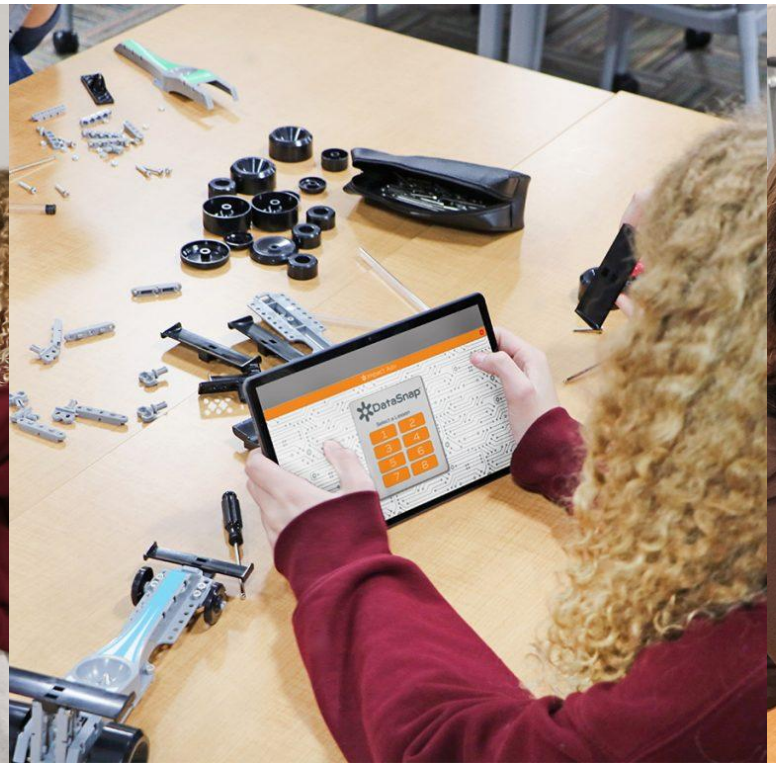
The foundation of AI education is Data Literacy.

How can we create an AI education entry point?

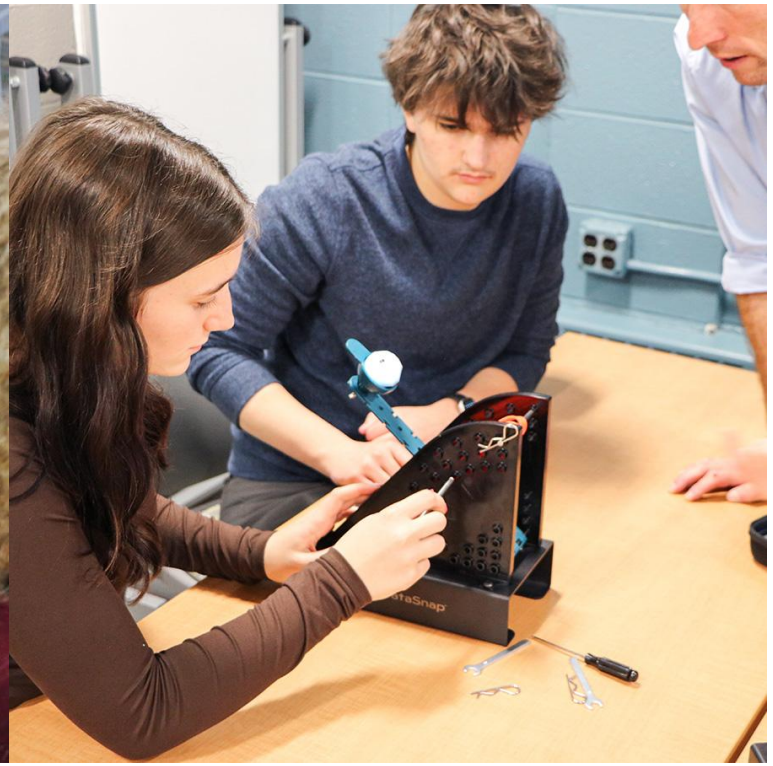
Universal STEM learning experiences:

Egg Drop

CO_2 Racer



Catapults



DataSnap™

- Classroom-Ready
- Heavy-Duty & Reusable
- Intuitive Use
- Hands-On
- High Engagement
- Engineering Design Process Ready
- Student-Driven Data Collection

NEW DataSnap Impact STEM Kit

63410100

This hands-on kit reimagines a classic classroom challenge with a cleaner, repeatable building platform. Students design and test protective structures, then analyze impact data to improve their design.

Includes: 30 Impact Ships and Exoskeletons, 2 DataSnap Motion Sensors with charger, printable student engineering workbooks, 8-lesson curriculum (6-12 teaching hours)

A modern take on the egg drop test

NEW DataSnap Projectile STEM Kit

63210100

Launch learning with this data-driven catapult project. Students explore velocity, acceleration, and predictive data analysis while building machine learning fundamentals.

Includes: 8 customizable catapults, 2 DataSnap Motion Sensors with charger, printable student engineering workbook, 6-lesson curriculum (6-12 teaching hours)

Encourages iteration, testing, and design thinking

NEW DataSnap Air Racer STEM Kit

63010100

This engaging, air-powered racer gives students a hands-on way to explore real-world STEM concepts like force, motion, and acceleration. With snap-together assembly and simple tools, it's easy to build, test, and refine designs.

Bring CO_2 race cars to the 21st century

Includes: 8 customizable cars and tools, Pneumatic Race System, 2 DataSnap Motion Sensors with charging case, printable student engineering workbook, 8-lesson curriculum (6-12 teaching hours)

NIH Grant Collaboration

IDL. INNOVATIVE DESIGN LABS

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CreXo™

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BIRDBRAIN TECHNOLOGIES

Strawbees.

DataSnap

TINKERING LABS Est. 2015

Improve Existing: Identify already existing learning experiences that we can modernize and improve.

Alignment with CTE skills, certifications, and career pathways where growth is projected.

Generalist Ready: Develop product packages that meet the need of generalist teachers who aren't industry experts.

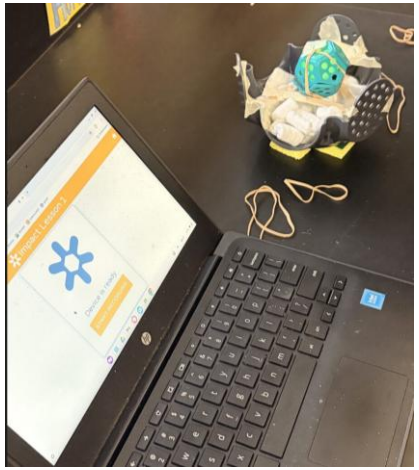
What is the DataSnap Motion Sensor?

- Compact, golf ball-sized motion sensor
- Durable shell for long-lasting use
- Wireless connectivity to deliver real-time data to any student device
- Collects thousands of data points per second for precise measurement
- Processes data into clear, actionable insights
- Helps students stay focused during activities
- Builds essential data fluency skills through hands-on experience

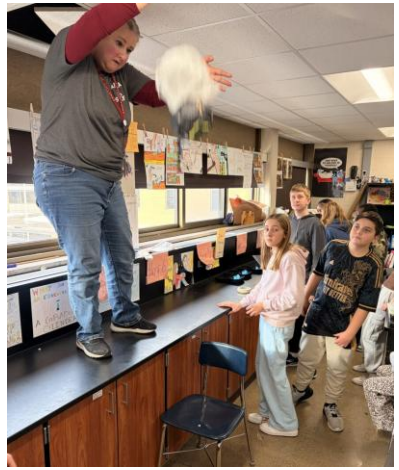
How does a student use the sensor?

Pair

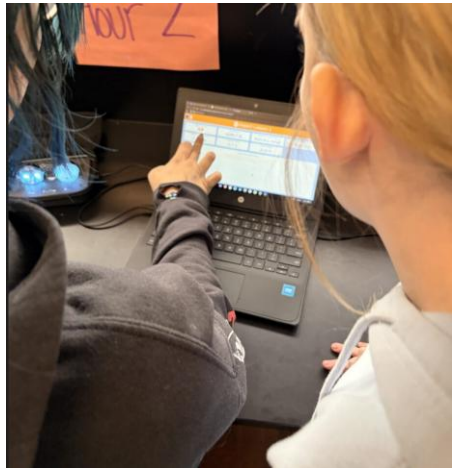
Mount



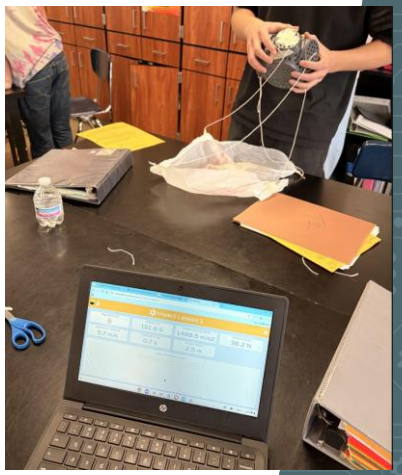
Test



View Data



Improve!



Enable students to test, refine, and improve engineering solutions quickly — just like professional engineers

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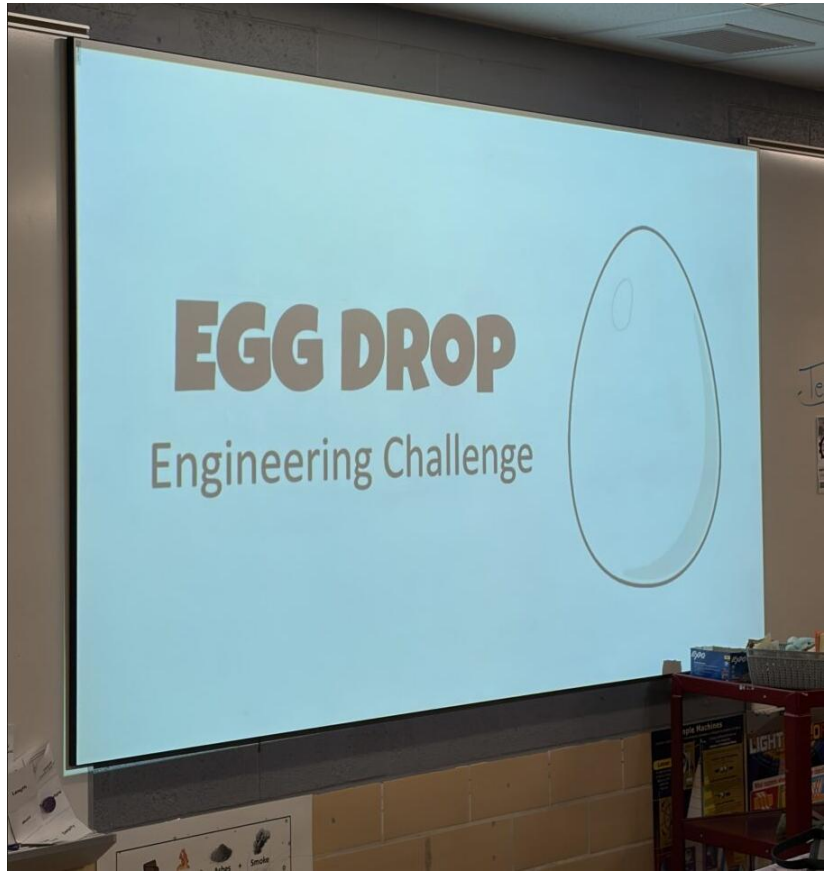
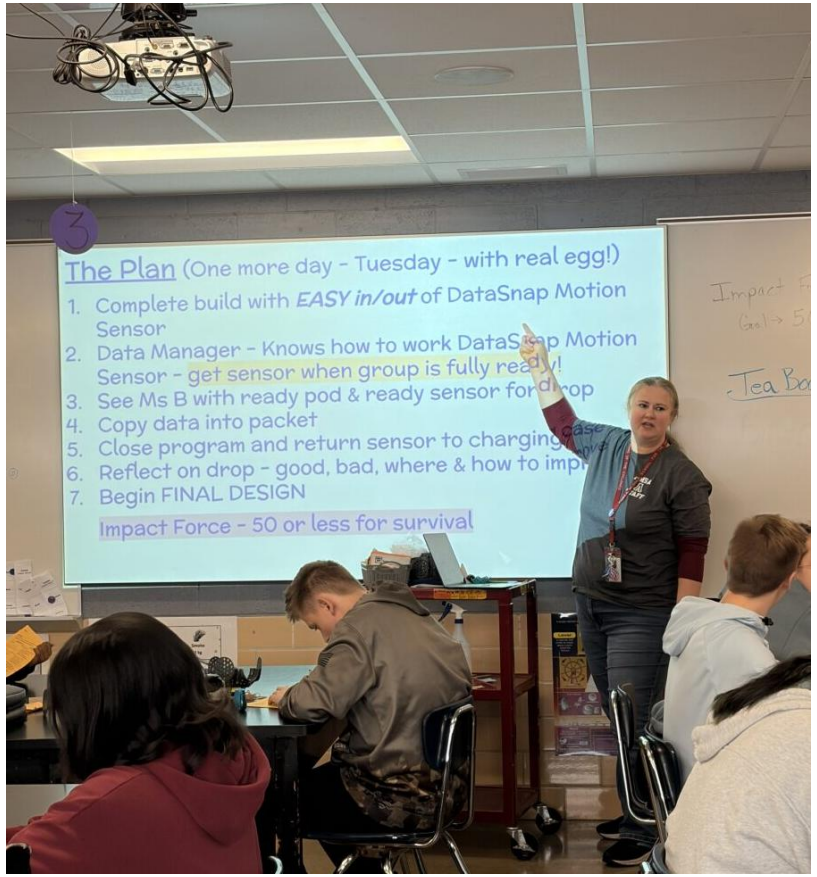
Egg Drop Pilot: Set Up





Egg Drop Pilot: Build

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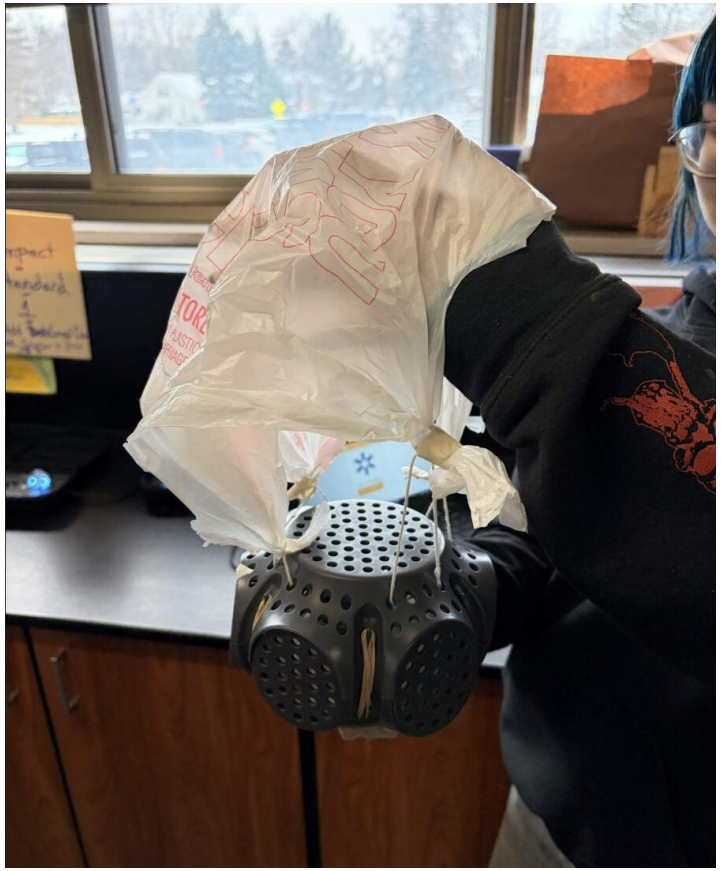

Egg Drop Pilot: Pair, Test, Review Data

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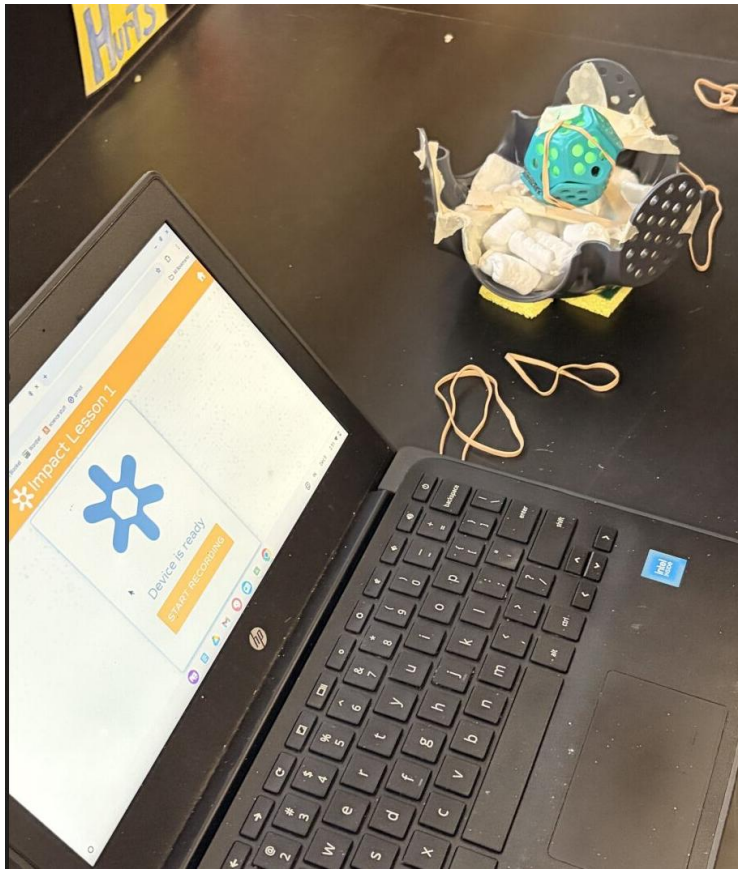
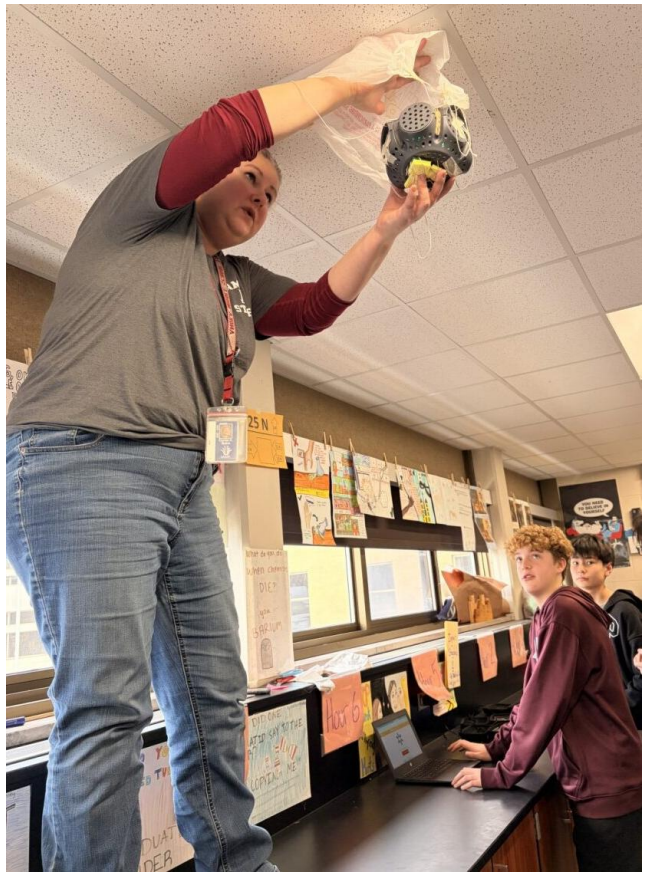
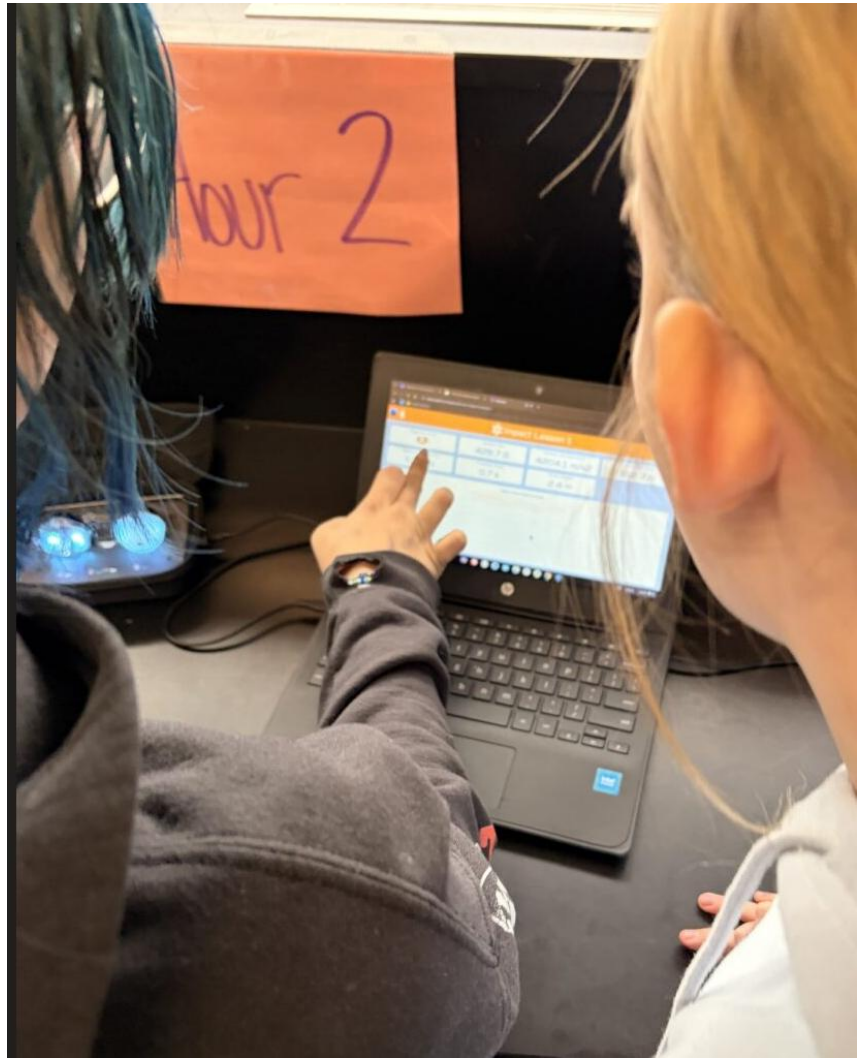




Egg Drop Pilot: Improve + Store For Tomorrow



Prepare The Sensor

Get to know the DataSnap Motion Sensor

- **What is it?**

A compact, durable, wireless sensor that streams real-time motion data directly to your devices using Bluetooth.

- **What does it do?**

It collects thousands of data points per second and processes that data into meaningful information for you.

- **Can I drop it?**

Yes. Using the sensor as directed in the lesson is perfectly acceptable.

- **Is it unbreakable?**

No. Using the sensor in other ways could break it.

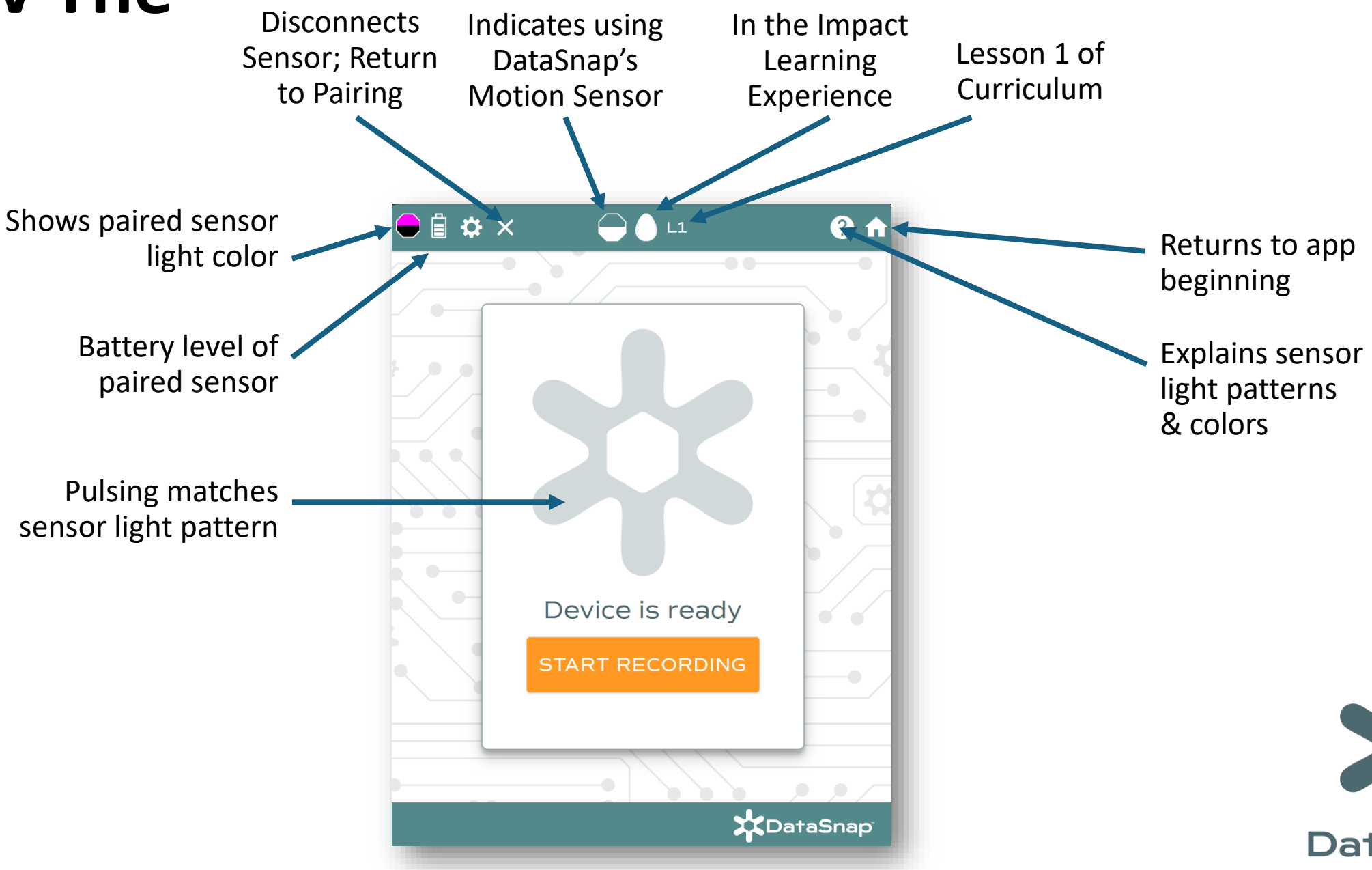
Accessing the Data

There are two ways to connect your device to the sensor:

1. Download the free **DataSnap App** from the Apple or Google Play App Stores.

2. Go to this site: www.crexo.com/datasnap to use the browser app in **Chrome or Edge**.

Know The App



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Engineering Challenge:
Egg Impact Safety

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Final Engineering Challenge

Step 1: Know the Challenge:

What is the **lowest landing impact force** your team can achieve when dropping the Impact Ship?

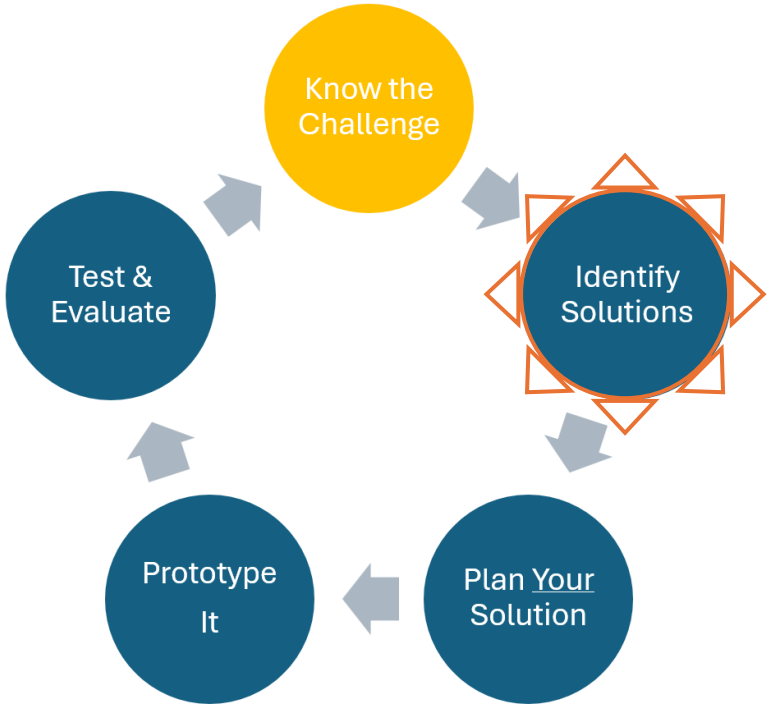
Engineering Constraints:

1. No human interference may occur during flight.
2. The DataSnap Motion Sensor must be easily installed and removed; just like a racer car driver or astronaut must be able to get into and out of a vehicle quickly.

Step 2: Identify Solutions

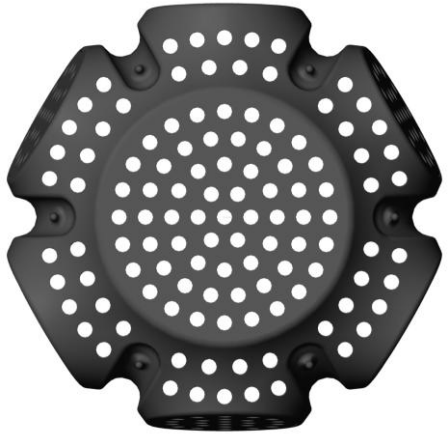
Discuss with your team and record design thinking in your Engineering Workbook:

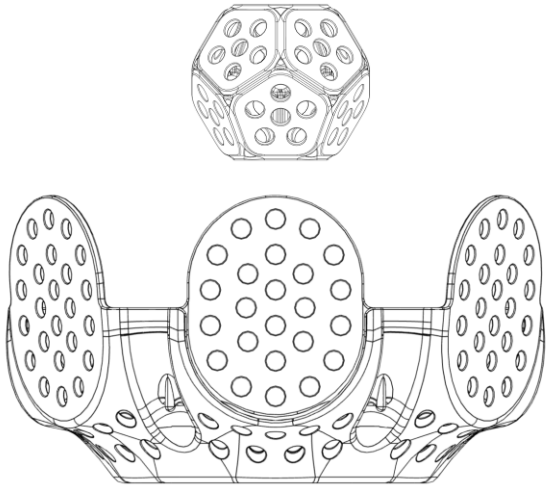
- What materials are available to use? *(Ask your teacher, look around the classroom, check the recycle bin at home, etc…)*
- What did you learn in Lessons 1 – 7 that will help you with this challenge?
- In the real world, what strategies are used to reduce the danger of collisions and impacts?



Step 3: Plan Your Solution

- **In your Engineering Workbook, sketch your design for your solution.**
- **Annotate (add words, labels, arrows, short sentences) to make your sketch explain the reasoning behind your decisions.**





Step 4: Prototype It

- Build it!
- As you build and make observations, your solution design may change.
- Record the changes you make to your solution in your Engineering Workbook.

Step 5: Test & Evaluate

- **Once you have completed Steps 1 – 4 and received approval from your teacher, install the DataSnap Sensor and safely conduct at least one projectile launch.**
- **Gather the challenge's necessary data.**
- **Record data in the table:**

Trial	Egg Survival	Drop Height (m)	Drop Time (s)	Maximum Velocity (m/s)	Drop Acceleration (m/s^2)	Impact Force (Newtons)	Impact Force (Gs)	Trial Observations
1								
2								
3								

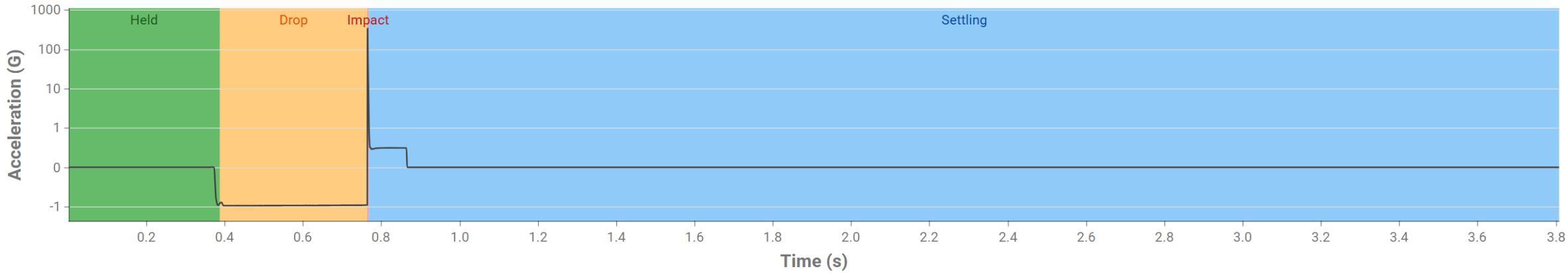
Adv L8

Egg Survival	Impact Gs	Impact Force	Maximum Velocity
	340 G	80.9 N	3.72 m/s

Drop Time	Drop Height
0.38 s	0.69 m

Select to Graph

ACCELERATION (G) | VELOCITY (M/S) | DISTANCE (M)



DOWNLOAD DATA

CLEAR AND RECORD NEW

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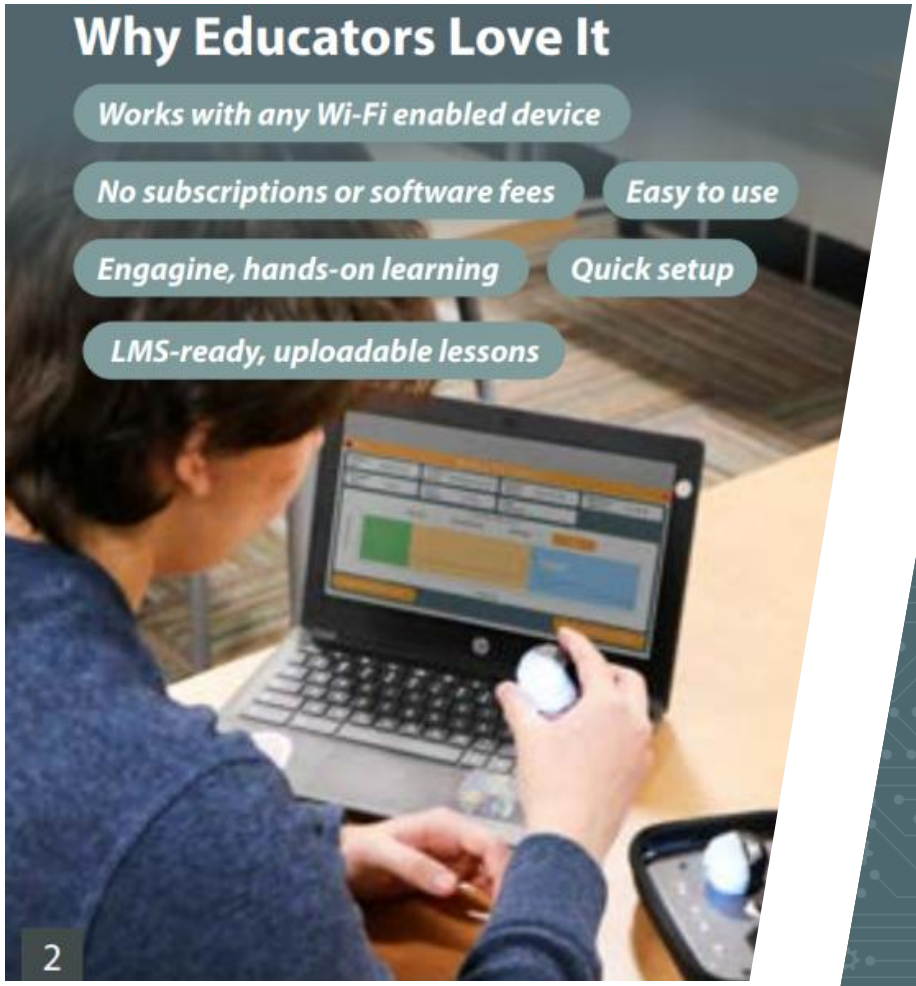
Step 5: Test & Evaluate

- Share your Landing Impact Force with the class and compare drop data.
- Evaluate your design's performance. Write a 3 – 5 sentence summarizing your Impact Ship's performance, using real data from your test and the other teams'. Include at least 3 ideas your team has that might explain why your ship did better or worse than the other teams.
- Reflecting on other teams' performance and learning from both yours and their prototype designs, what are 3 changes you could make to your ship to further reduce the impact force?
- If you have time, make these changes and test your improved ship again!

Advantages of DataSnap Motion Sensor

- Burly construction and rigorously tested
- All-In-One Motion Sensor: Save $ by not buying extra hubs/controllers/devices
- Wireless operation and charging = intuitive, easy, quick implementation in the classroom.
- Free Software
- Universal-device compatibility: Chromebooks, Tablets, Phones
- Student-first App Design
- Data is automatically processed and filtered so show only important data; keeps students independently operating and highly engaged.



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DataSnap Impact STEM Lab

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Standard and Advanced Curriculum

Lesson	Title	Approximate Time
1	Distance, Time, & Velocity	50 - 120 minutes
2	Gravitational Acceleration	50 - 80 minutes
3	Acceleration and Human Limits	50 - 80 minutes
4	Engineering Design Challenge: Protect The Astronaut	50 - 80 minutes
5	Forces, Newton's Laws, & Inertia	50 - 80 minutes
6	Impact Forces	50 - 80 minutes
7	Parachute Dynamics	50 - 80 minutes
8	Engineering Design Challenge: Egg Impact Safety	50 - 120 minutes

Level Up Everyone's Build & Rapidly Iterate through the Engineering Design Process.

DataSnap Air Racer STEM Lab

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Standard and Advanced Curriculum

Lesson	Title	Approximate Time
1	Building & Racing Basics	50 - 120 minutes
2	Newton's Laws of Motion	50 - 80 minutes
3	Pneumatic Power, Work, and Energy Transfer	50 - 80 minutes
4	Weight Distribution	50 - 80 minutes
5	Wheel and Axle Placement	50 - 80 minutes
6	Aerodynamics	50 - 80 minutes
7	Collision Dynamics	50 - 80 minutes
8	Final Engineering Design Challenges	50 - 120 minutes

Modifiable drag racers + DataSnap Motion Sensor drive home

Automotive Engineering concepts.

DataSnap Air Racer STEM Lab

Standard and Advanced Curriculum

Lesson	Title	Approximate Time
1	Building & Racing Basics	50 - 120 minutes
2	Newton's Laws of Motion	50 - 80 minutes
3	Pneumatic Power, Work, and Energy Transfer	50 - 80 minutes
4	Weight Distribution	50 - 80 minutes
5	Wheel and Axle Placement	50 - 80 minutes
6	Aerodynamics	50 - 80 minutes
7	Collision Dynamics	50 - 80 minutes
8	Final Engineering Design Challenges	50 - 120 minutes

Lesson Learning Pattern:

1. Introduce & Define
2. Explore: Collect Data
3. Challenge

Final Engineering Design Challenges:

- Highest Velocity
- Safest: Lowest Impact Force
- Most Stable

DataSnap Projectile STEM Lab

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Standard and Advanced Curriculum

Lesson	Title	Approximate Time
1	Making Your Catapult Data-Smart	50 - 120 minutes
2	Pull-Back Angle	50 - 80 minutes
3	Elastic Bands	50 - 80 minutes
4	Launch Arm Length	50 - 80 minutes
5	Launch Angle	50 - 80 minutes
6	Strategapult Game	50 - 80 minutes

Modifiable catapults + DataSnap Motion Sensor allow for quick data set collection and analysis;

building student's data literacy.

DataSnap Projectile STEM Lab

Standard and Advanced Curriculum

Lesson	Title	Approximate Time
1	Making Your Catapult Data-Smart	50 - 120 minutes
2	Pull-Back Angle	50 - 80 minutes
3	Elastic Bands	50 - 80 minutes
4	Launch Arm Length	50 - 80 minutes
5	Launch Angle	50 - 80 minutes
6	Strategapult Game	50 - 80 minutes

Lesson Learning Pattern:

1. **Introduce & Define**
   - Newton's Laws
   - Velocity & Momentum
   - Energy
   - Forces
2. **Explore: Collect Data**
3. **Data Analysis: Create a Predictive Model**
4. **Challenge: Test Model's Accuracy**

DataSnap STEM Labs All Include:

Standard Curriculum

Conceptual =
Do and See to Develop Understanding

Great for teachers who are:

- New to this learning experience
- Guidance with teaching STEM concepts
- Not comfortable with math
- Emphasizing positive, engaging, fun experience.

Advanced Curriculum

Additional STEM Content,
integrated with mathematics.

Students use the data to perform algebraic calculations; suitable for 7^{th} – 12^{th} grade.

Great for teachers who are:

- Looking to STEMify learning
- Need to hit specific Engineering, Science, Math standards.
- Course description requires math learning.

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DataSnap STEM Labs All Include:

- **LMS-Ready Student Slides**
- **Digital/Printable Student Engineering Workbook**
- **Teacher's Guide with Pre/Post Assessments and Keys**

Delivery Today = Teach Tomorrow

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DataSnap Drives Standards-Based Learning

- Supports NGSS Engineering Practices Through Iterative Design
- Reinforces NGSS Science & Engineering Practices (SEPs) Through Real Data Collection
- Provides Hands-On Experiences Tied to NGSS Physical Science Domains
- Embeds “Sense-Making” Over Memorization
- Ensures Full Curriculum Alignment for Teachers & CTE/STEM Programs: ITEEA, ISTE, ACTE

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