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Workbook: STEM with Apple Intelligence

In this workbook, you'll follow a single STEM project through each stage of the 5E Model.

Framework: 5E Model

The 5E Model structures learning around curiosity and discovery. In education, that means guiding students through a process that builds on what they already know, invites investigation, and deepens understanding over time. The process moves through five stages:

ENGAGE	EXPLORE	EXPLAIN	ELABORATE	EVALUATE
Cultivate student interest and activate prior knowledge by sparking curiosity through questions, discussions, or activities.	Give students the opportunity to investigate and make connections before formal instruction begins.	Guide students through lesson content, clearing up misconceptions and providing the technical knowledge they need to move forward.	Give students the chance to apply their new knowledge through hands-on, creative problem-solving.	Give students time to reflect on and refine their understanding through assessment and discussion.

At each stage, you will encounter three paths: one that uses no technology, one that uses digital tools, and one that integrates Apple Intelligence features. No path is inherently better than another, and in some cases, a combination of several paths may be the best choice for your classroom context. As you consider each path, ask what this specific moment in the inquiry process needs:

- Where does the learning happen: in the struggle, the tool, or the output?
- What might be gained if a tool supports this step?
- What would be lost?

The point of this workbook is not to outline a "right" path, but to strengthen your professional judgment around selecting instructional tools that best serve the inquiry process.

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Inquiry Integrity Check

At each stage, reflect on how the paths may serve the inquiry process:

- **Are students still leading the inquiry?** *The driving questions and curiosities that fuel an investigation should come from students, not from tech or AI.*
- **Is the productive struggle intact?** *Not all struggles in a classroom are the same. Productive struggle happens when students are challenged just beyond what they already know. If tech or AI is used to smooth over moments of uncertainty and confusion that naturally arise, it removes the conditions that make inquiry meaningful.*
- **Who owns the understanding?** *Can students explain what they found, why it matters, and how they know? If the answer is no, it's important to examine where in the process the thinking was handed off.*

Please note that there's no single right answer. Your judgment and expertise as an educator are essential. The best path forward depends on your context, goals, and students.

Using the Workbook

Consider different options for engaging with this workbook.

- **Solo:** Use the workbook on your own as a thought experiment.
- **With colleagues:** Discuss trade-offs with your team.
- **Return later:** Revisit after trying Apple Intelligence in your own work.

Meet Teacher X

Teacher X is a middle school science teacher. Over the next several weeks, Teacher X's class will investigate what happens to a falling object at the moment of impact, then use that understanding to design a protective capsule for a raw egg dropped from height. Teacher X's students are familiar with the egg drop challenge, and they're excited for their chance to try it. Teacher X wants to ensure that students have fun building something that works while prioritizing their understanding of *why* it works. This workbook will ask you to step into Teacher X's shoes.

Step 1: Engage

In the E**ngage** stage, you capture student interest and activate prior knowledge. This is where curiosity is sparked: through a hands-on moment, a surprising question, or a real-world artifact that draws students in and sets the stage for what's ahead.

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Scenario: Teacher X

It's day one, and Teacher X knows that most students have heard of the egg drop challenge. This familiarity is both an asset and a potential challenge. Students who think they already know how to do it will stop wondering before the unit has even begun. Teacher X wants to get students excited and spark genuine curiosity while disrupting some prior assumptions they may already have about the learning. What do students actually believe about why things break when they fall? What assumptions are they carrying in, and how can Teacher X surface those assumptions?

Take a few moments to draft your ideas before reading the paths below.

Considering next steps, explore three paths Teacher X could take:		
Path A: Teacher X drops two eggs at the front of the room. One is bare, and one is loosely wrapped in a single sheet of paper. Both eggs break. Without explanation, Teacher X asks: *What did you notice? Why didn't the paper work?* Students write a wonder statement on index cards, which are then sorted into the unit's driving questions on the whiteboard.	**Path B:** Teacher X plays a short compilation of egg drop attempts that features successes and spectacular failures. Teacher X pauses to ask: *What was that team trying to do? Why didn't it work?* Students respond on a shared **Freeform** board with observations, sketches, and questions. The board stays visible throughout the unit as a record of how thinking evolves.	**Path C:** Teacher X drops the same two eggs (one with no protection and one wrapped in a sheet of paper) and asks students to record their live observations using **audio recording** in the Notes app, then review the automatic transcripts. Students generate and use **key points** in **Writing Tools** to generate a list of their observations.

What path do you think Teacher X should take, and why?	
Which path do you think best serves the inquiry process?	

Inquiry Integrity Check:

Are students still leading the inquiry?	
Is the productive struggle intact?	
Who owns the understanding?	

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Step 2: Explore

In the Explore stage, students investigate and make connections before formal instruction begins. The goal is a productive struggle. Students encounter real phenomena, collect evidence, and surface questions that instruction will later address. This phase should feel a little messy.

Scenario: Teacher X

Before students touch a single building material, Teacher X wants them to investigate what actually happens when a falling object hits a surface. What changes when you drop something heavier? From higher up? Onto something soft versus hard? Students don't need the vocabulary here yet; they need the experience of noticing, testing, and wondering. Teacher X's tension is a familiar one: give students enough structure to investigate meaningfully, but not so much that the exploration becomes a recipe to follow rather than a question to pursue.

Take a few moments to draft your ideas before reading the paths below.

Considering next steps, explore three paths Teacher X could take:		
Path A: Teams drop objects of different masses onto a flour-filled bag from different heights, then write what they notice about the impact impressions by hand in their lab notebooks. Findings are shared in a gallery walk where teams leave sticky-note questions for each other. Teacher X circulates and asks questions without answering them.	**Path B:** Teams run the same investigation but document observations in a shared slide deck with photos and measurements. A shared spreadsheet aggregates recorded measurement results across teams in real time, letting students begin to spot patterns as data comes in from around the room.	**Path C:** Teams run the same investigation and take photographs of their impact impressions. They use a shared **Pages** file to upload their photos and record observation notes. Overnight, Teacher X reviews using **Writing Tools** to **summarize** key observations before the next session.

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Step 3: Explain

In the Explain stage, the teacher guides students through the formal content, clearing up misconceptions, introducing vocabulary, and providing the scientific framework students need to make sense of what they observed.

Scenario: Teacher X

Students have dropped things, made marks in flour, and built real questions. Now Teacher X needs to help them put words and concepts to what they experienced. How do forces work on a falling object? Why does impact time matter? Why does the structure of a container mean the difference between a surviving egg and a broken one? Teacher X also has to address the misconceptions that surfaced during the Explore phase.

Take a few moments to draft your ideas before reading the paths below.

Considering next steps, explore three paths Teacher X could take:		
Path A: Teacher X delivers direct instruction using a whiteboard and physical demonstrations, connecting force diagrams directly to the flour-bag data that students collected. Students annotate printed readings by hand, underlining confusing passages and writing questions in the margins. Three think-pair-share pauses let Teacher X address misconceptions in real time. The lesson ends with students returning to their original wonder card and writing a revised version.	**Path B:** Teacher X uses a **Keynote** presentation with embedded slow-motion video of objects impacting surfaces, including students' own videos of eggs from the earlier step. Students annotate digital readings, and a shared document captures live misconceptions that Teacher X addresses on the spot. Students submit an exit ticket via a short digital survey at the end of class.	**Path C:** Teacher X prepares for the lesson by using **Writing Tools** in **Pages** to build a structured vocabulary workbook for students. Drawing on key terms for the unit — force, impact, momentum, and air resistance — Teacher X drafts definition prompts and sentence frames that scaffold student thinking. **Proofreading** with **Writing Tools** helps review spelling and grammar. Students use the workbook throughout direct instruction to write their own definitions, record questions, and make connections to what they experienced in the flour-and-egg investigation.

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Step 4: Elaborate

In the Elaborate stage, students apply their knowledge through hands-on, creative problem-solving. This is where understanding gets tested against reality. Mistakes are part of the process.

Scenario: Teacher X

Now students build. The challenge: Design a protective capsule for a raw egg using only an approved list of materials. The capsule must survive a drop from a designated height, and each team must also submit a written explanation of why their design should work, grounded in science they've learned. That rationale is the evidence that students actually understand the physics of their design approach. Teacher X's role shifts from instructor to coach: asking questions rather than providing answers, and pressing teams on the science behind every decision.

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Take a few moments to draft your ideas before reading the paths below.

Considering next steps, explore three paths Teacher X could take:		
Path A: Teams sketch at least two distinct designs by hand before touching any materials, annotating each with a simple explanation of the force principle it uses. Prototyping is physical and iterative, documented in a handwritten journal.	**Path B:** Teams sketch their egg-drop prototype, annotating each with key terms and scientific rationale from the unit. Students then use **audio recording** in the **Notes** app to record their argument for which prototype they feel most confident in.	**Path C:** Students sketch an egg-drop prototype using **Apple Pencil** in the **Notes** app, labeling key design features such as a parachute, padding, frame, or landing legs. Using **Image Wand**, students generate creative visuals for specific aspects of their designs. Teams then annotate their digital model with their scientific rational.

What path do you think Teacher X should take, and why?	
Which path do you think best serves the inquiry process?	

Inquiry Integrity Check:

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Step 5: Evaluate

In the Evaluate stage, students reflect on and demonstrate their understanding through the egg drop itself, a post-drop debrief, and individual reflection. This is where learning consolidates and students reflect on what they have learned. Teacher X learns what to teach differently next time.

Scenario: Teacher X

Drop day has arrived. Some eggs have survived, some have not. Teacher X wants students to walk away with something more than a result. A team whose egg broke can still demonstrate deep scientific understanding. Students must be able to explain what the evidence from their drop tells them about the science behind their design. Individually, students reflect on how their thinking has evolved across the lessons. Teacher X reflects on where the genuine inquiry happened and how their teaching facilitated the process.

Take a few moments to draft your ideas before reading the paths below.

Considering next steps, explore three paths Teacher X could take:

Path A: Teams present their post-drop analysis using their physical capsule and design journal. The presentation covers the science behind the design, what the result revealed, and what they would change in the next iteration. Peer reviewers use a printed rubric focused on the quality of the scientific reasoning. Students handwrite an individual "I used to think... Now I think... I still wonder..." reflection, returning to the wonder card from the first lesson. Teacher X provides individual narrative feedback within one week.	**Path B:** Teams present using their updated digital brief, with a post-drop analysis slide that includes photos from drop day annotated with force diagrams. Individual reflections are submitted via a digital survey connecting specific design decisions to specific science principles. Teacher X leaves digital feedback and reviews aggregate responses to identify which concepts landed and which need reinforcement.	**Path C:** Teams create final **Keynote** presentations that summarize their observations, findings, and scientific explanations. Teacher X takes notes on all the presentations, using **Writing Tools** to **summarize** themes across the class and build a shared synthesis for the final debrief.

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What path do you think Teacher X should take, and why?	
Which path do you think best serves the inquiry process?	

Inquiry Integrity Check:

Are students still driving the inquiry?	
Is the productive struggle intact?	
Who owns the understanding?	

Reflections

Before you close this workbook, take a few minutes to reflect and write your answers to the following questions:

- Was there one pathway you found yourself gravitating toward, and why?
- Based on the pathways you selected, what role did technology play in supporting the inquiry process?
- If you were to run this unit with your students next month, which path would you choose for each stage? Would it be the same throughout, or would you mix them?

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