

Lesson Plan: "X in Free Fall" Mission

Subject/Year: Physics and Chemistry A/11th grade

Duration: 60 minutes

Theme: Falling bodies with appreciable air resistance

Methodology: Storytelling + digital tools and AI **Assignment:**

Group work (3–4 students)

Final product: Group digital science storytelling

1. What you'll learn

- Understand how air resistance affects falling bodies.
 - Identify what terminal velocity is.
 - Analyze data from a digital simulation.
 - Tell a digital science story that explains the phenomenon.
 - Work in a group and communicate creatively.
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2. "X in Free Fall" Mission

You'll choose a body X and imagine a story in which X is the main character.

Your goal is to use physics to predict what will happen during X's fall with appreciable air resistance.

3. Activity Steps

Stage 1 – Explore or Phenomenon (15 min)

1. Access one of the suggested simulations:
 - PhET – Forces and Motion: Air Resistance (<https://phet.colorado.edu>)
 - Cotton (<https://www.algodoo.com>)
2. Test different objects (feather, ball, skydiver).
3. Observe how the speed varies with and without air resistance.
4. It identifies the instant at which **terminal velocity is** reached.
5. Analyzes position, velocity, and acceleration graphs as a function of time
6. Records data or screenshots.

Step 2 – Create your science narrative (30 min)

"It tells the story of X, explaining what happens during his fall."

Your story should include:

- An introduction with the context of the fall;
- The problem (air resistance, speed, forces);
- A resolution with physical explanation and conclusion;

- Graphs (position-time, velocity-time, acceleration-time), images or simulations;
- A creative twist (humor, suspense, or science fiction).

Suggested tools:

- IA: ChatGPT, Copilot, Gemini, Canva Magic Write
- Criação digital: Canva, Genially, Powtoon, Adobe Express

Tip: Divide tasks in the group (screenwriter, physicist, designer, narrator).

Step 3 – Share the digital product

- PCE OneDrive folder

Stage 4 – Apresenta (15 min)

- Each group has 3 minutes to present their story.
- Shows the digital product on the screen.
- Gives feedback to another group (1 strength + 1 improvement suggestion).

4. Useful tools

- Simulação: PhET 'Forces and Motion: Air Resistance'
- Criação: Canva, Genially, Powtoon, Adobe Express
- IA: ChatGPT / Copilot / Gemini
- Sharing: OneDrive (PCE folder)

5. Evaluation (what will be valued)

1. Scientific understanding (clarity and correctness of the explanation of physical concepts)
2. Creativity and *storytelling* (coherence, originality)
3. Use of AI and digital tools
4. Group work (balanced participation)
5. Presentation and communication

6. Final tips

- **He thinks like a scientist and a storyteller.**
- **Use AI as a support, not a substitute for your reasoning.**

Physics is also explained with emotion and imagination!

Adapted using AI (MagicSchool, Gemini; ChatGPT)