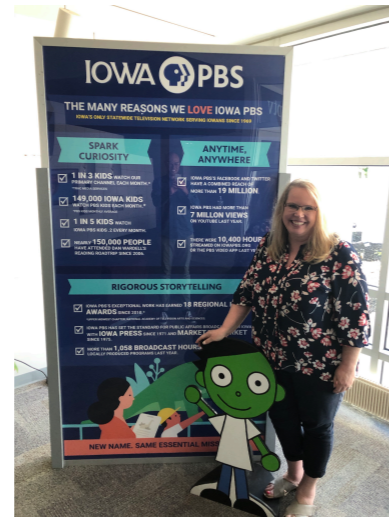


Iowa Science Phenomena



Karla St. John
9th Grade Physical Science teacher at
Prairieview School (Waukee)
2021 extern at Iowa PBS

Part I: Overview of Workplace

Iowa PBS educates, informs, enriches and inspires Iowans.

Iowa PBS is Iowa's statewide public broadcasting network. Iowa PBS provides quality, innovative media and services that educate, inform, enrich and inspire Iowans throughout the state.

Their noncommercial, public-service mission enables Iowa PBS to present an unequalled array of programs of lasting value to Iowans regardless of where they live or what they can afford. More than two million viewers each month turn to Iowa PBS for programming that reflects a range of interests for Iowans in all demographic categories.

They became Iowa PBS on January 1, 2020. Prior to this date, they operated as Iowa Public Television (IPTV).

Part II: Workplace Focus

The Education ‘wing’ of Iowa PBS creates many resources for Iowa teachers. The Iowa Science Phenomena website (<https://phenomena.iowapbs.org/>) is a project that allows Iowa organizations and teachers to collaborate and curate Iowa-specific phenomena that use locally-relevant and/or unique concepts in Iowa classrooms.

Potential phenomena is captured and submitted with a [template form](#) that provides detailed, supporting information. Submissions are reviewed by the Iowa PBS Education Team before publishing.

Part III: Introduce the Problem

Students will create and submit their own science phenomena based on a science topic learned in the Forces & Interactions Unit in Physical Science class. The phenomena can be within or outside of the classroom environment.

The phenomena will be submitted to Iowa PBS for review and possible publishing on the Iowa Science Phenomena website.

In addition to the phenomena, students will also create a follow-up resource to explain the phenomena that they have created in the context of the chosen standard. This will be a student resource to be used in future Physical Science classes.

Part IV: Standards, Driving and Essential Questions

Standards used in the Forces and Interactions Unit (9th grade Physical Science):

From NGSS:

Physical Science Standard(s):

- HS-PS2-1. Analyze data to support the claim that Newton's second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration.
- HS-PS2-2. Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system
- HS-PS2-3. Apply science and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collisions.

Classroom Learning Targets:

Students would choose from one of the following to anchor their phenomena:

- Identify action and reaction forces.
- Analyze how Newton's three laws apply to an object in motion
- Describe how momentum is conserved within a defined system.
- Use total momentum to determine velocity of an object after a collision.
- Design, test, and refine a device to minimize the force on an object during a collision.

Essential Questions:

- How do we protect ourselves from collisions?
- How do you design experiments to explain observations of natural events (including calculating momentum and demonstrating conservation of momentum)?
- How can automobile manufacturers use knowledge of motion to make cars safer?
- Is a concussion-proof football helmet attainable?

Part V: Extern Host Role

What is the role of your extern host in this learning unit?

The role of the extern host is to review phenomena submitted by the students and offer feedback and post on the Iowa Science Phenomena website.

Tiffany Morgan, Instructional Media Coordinator

Cody Smith, Media Integration Specialist

Ginger Peterson, Instructional Media Designer

Part VI: Student Learning

Do students have some level of voice and choice? Are there opportunities for revision? Are there opportunities for reflection along the way?

Yes, yes and yes on all three accounts.

Choice & Voice: Students would get to choose which standard/learning target they are finding phenomena for, as well as, what is the product they are submitting to Iowa PBS. The product could be (but not limited to): a picture, a video, a data table/chart or graph.

Additionally, students are required to complete a follow-up resource to explain the phenomena that they have created in the context of the chosen standard. This resource is also **not limited** to any one specific media. Students will have choice in how this resource is presented. These are student resources to be used in future Physical Science classes that will be housed within our Physical Science Classroom Canvas LMS (digital) or within the classroom (non-digital).

Opportunities for reflection/revision: As we move through the unit and learn about these Forces & Interactions concepts, students can capture phenomena inside or outside the classroom as it pertains to the standard or learning target they have chosen. And as the students move through completing the [phenomena template](#), there would be built in class time to reflect on their work and also receive feedback from their peers and teachers. This creates a natural in-house review process prior to submitting the phenomena to Iowa PBS for further review and publishing.