



## Course Syllabus

**Course Title:** Physical Science AB

**School Year:** 2024-2025

**Semester(s):** 1 and 2

**Grade Level(s):** 9, 10, 11, 12 (Grade 9: Completion of Algebra 1 is preferred)

**Course Day(s) and Times:** Mondays and Wednesdays, 11:00 am - 12:00 pm PST

### Teacher Information

- **Name:** Ingrid Moon
- **Email:** [ingrid.moon@brancheslearning.org](mailto:ingrid.moon@brancheslearning.org)
- **Office Hours:** By appointment only
- **Branches Learning Main Office Number:** (323) 955-0114

### Class Materials

- Materials: <https://brancheslearning.org/product/physical-science/#Materials>
- Textbook: [CK-12 Interactive Physics for High School](#)

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### Course Description

This Physical Science course addresses overarching ideas of two branches of science, chemistry, and physics, per the Next Generation Science Standards (NGSS), which emphasize critical thinking and engineering practices. Students participate in labs and project-based learning. They will ask questions, form hypotheses, and investigate. They incorporate graphs and tables to represent their quantitative and qualitative data and use this evidence to support their claims. Upon completing the course, students will have foundational scientific knowledge of the laws and theories regarding matter and energy that encourage the application of science to real-life contexts.

### Course Units

#### Semester 1: Disaster Preparedness

Overarching Guiding Question

How can we prepare for and mitigate major disasters using general physics?

#### Unit 1- Forces and Motion

Project Theme: METEOROIDS

- Newton's Laws, Mass
- Conservation of Momentum

- Force, Work, Power
- Mechanical Energy

## **Unit 2 - Forces at a Distance**

Project Theme: ASTEROIDS

- Gravity
- Electrostatic Forces
- Orbital Motions

## **Unit 3 - Earth's History**

Project Theme: NATURAL DISASTERS

- Evidence of Plate Tectonics
- Evidence of Earth's History
- The Creation of Landforms
- Carbon Cycling in Earth's Systems

## **Semester 2: Sustainable Cities**

Overarching Guiding Question:

How can we harness the conversion of energy to build a more sustainable future?

## **Unit 4 - Chemistry**

Project Theme: BATTERIES

- General Atomic Structure
- Chemical Bonding and Matter
- Chemical Reactions
- Chemical Energy & Energy Conversion

## **Unit 5 - Waves & Electromagnetic Radiation**

Project Theme: SOLAR ENERGY

- Electric Currents & Magnetic Fields
- Oscillations
- Wave Properties
- Energy Change due to Interacting Fields

## **Unit 6 - Stars & Nuclear Energy**

Project Theme: NUCLEAR ENERGY

- Nuclear Fusion and the Sun's Energy
- Stellar Nucleosynthesis
- Nuclear Processes

## **Assignments and Projects**

Assignments and project descriptions will be provided for each unit on the web site and will be turned in on Google Classroom. Students will complete one guided experiment during the unit, and one creative project to present as evidence of learning at the end of each unit. Quizzes will



be administered to assess learning and identify areas for continued improvement. Weekly prompts and responses are participatory activities conducted during class. Points cannot be made up for missed classes or lack of participation, though there are more weeks than points, so it is possible to earn extra credit / bonus points by participating.

All experiments and projects are designed to be completed at home. **Adult supervision** is requested when the student chooses projects that require components with a safety risk (burners, electricity, etc.).

Unit	Deliverable	Points
1	Experiment and Report (Acceleration)	10
1	Engineering Project (Asteroid Redirection)	15
2	Experiment and Report (Using Phet Simulation)	10
2-3	Modeling Project (Disaster Plan)	15
all	Weekly Prompts & Responses (1 each)	20
all	Quizzes (5 each)	30
	<b>Total (Semester 1)</b>	<b>100</b>

Unit	Deliverable	Points
4	Experiment and Report (Chemical Reactions)	10
4	Energy Project (Energy Conversion)	15
5	Experiment and Report (EM Activity)	10
5-6	Modeling Project (Sustainable City Design)	15
all	Weekly Prompts & Responses (1 each)	20
all	Quizzes (5 each)	30
	<b>Total (Semester 2)</b>	<b>100</b>



## **Course Expectations**

- Always come to class prepared with prior assignments completed.
- Expect to have coursework and project work outside of class time.
- Keep your camera on; active cameras count toward participation.
- Submit work on time, and you will never fall behind.
- Treat others with respect; that includes remaining focused on screen and in the chat, as well as during group work in breakout rooms.
- The more you participate in class, the more your peers will respect you.
- Never feel afraid to ask for help - the only dumb question is the one never asked.
- Communicate with me as soon as possible if there is any issue, question, or need for additional support.

## **Grading Scale**

### **High School, Grades 9-12**

- A = 90% -100%
- B = 80%-89%
- C = 70%-79%
- D = 60%-69%
- F = 0%-59%

Final grades are determined by the quality and completion of assignments, attendance, and participation.

## **Important Branches Learning Policy Information**

### **Camera Policy**

Branches Learning requires students to keep their cameras on during live classes unless otherwise instructed by the teacher. Exceptions can be made in rare circumstances if the course teacher, supervising teacher (HST), and the parent all approve a camera waiver.

### **Headset Policy**

Students attending live classes from a shared space must have a headset with a microphone to ensure the class is not disrupted by background noise.

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### **Attendance Policy**

Absences must be reported to the course instructor via email or sent to [info@brancheslearning.org](mailto:info@brancheslearning.org). Class recordings are available upon requests.

Attendance and participation are part of the final grade. Students who miss more than 40% of live classes may fail the course. Exceptions may be made if a pre-approved plan is in place.

### **Late Work**

Assignments turned in after the due date will result in a lower grade unless pre-approved by the instructor.