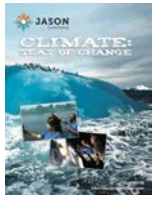


This document is meant to help administrators, educators and unit designers understand where JASON “fits” in under the NGSS domains of Earth, Life and the Physical Sciences with the integration of Engineering Design. JASON curricula engage students in the exploration of real-world phenomena through hands-on investigations and project-based challenges, articles, videos, digital games, simulations, and positive STEM role models. Each curriculum includes 3-5 missions (or chapters); each with 3-5 hands-on experiences, that can be used as core, supplemental, or enrichment. JASON includes suggested lesson plans, assessments, extensions, and interdisciplinary connections, along with a host of teacher resources, all housed digitally in our online JASON Mission Center (JMC). NGSS lesson planning tools and detailed alignments to the disciplinary core ideas, crosscutting concepts, and science and engineering practices can be found on our NGSS page at [www.jason.org/ngss](http://www.jason.org/ngss) , and are also searchable from within JASON’s gated mission center.

## **JASON’s Earth Science Curricula**

\* Also see Wetlands and Resilient Planet curricula under Life Science section; Infinite Potential under Physical Science section, and the Recycling Activities Collection.



### ***Climate: Seas of Change***

Students investigate and analyze the processes that shape and change climate from global surface currents and wind patterns to humans' role in the environment.

#### **Middle School (Grades 6-8)**

ESS2- Earth’s Systems (The Roles of Water in Earth’s Surface Processes, Weather and Climate)

ESS3- Earth and Human Activity (Global Climate Change)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **High School (Grades 9-12)**

ESS2- Earth’s Systems (Weather and Climate)

ESS3- Earth and Human Activity (Global Climate Change)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### ***Also supports:***

##### **Grade 4**

ESS2- Earth’s Systems (Plate Tectonics and Large-Scale System Interactions)

##### **Grade 5**

ESS2- Earth’s Systems (Earth’s Materials & Systems, The Roles of Water in Earth’s Surface Processes)



## ***Tectonic Fury***

Students investigate Earth’s past, present, and future to unlock its geologic mysteries and explore the constructive and destructive forces that have created the features we see today on land and underwater.

### **Middle School (Grades 6-8)**

LS4-Biological Evolution: Unity and Diversity (Evidence of Common Ancestry and Diversity)

ESS1- Earth’s Place in the Universe (History of Planet Earth)

ESS2- Earth’s Systems (History of Planet Earth, Earth’s Materials & Systems, The Roles of Water in Earth’s Surface Processes)

ESS3- Earth & Human Activity (Natural Resources, Natural Hazards)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **High School (Grades 9-12)**

ESS1- Earth’s Place in the Universe (History of Planet Earth, Plate Tectonics and Large-Scale System Interactions, Nuclear Processes)

ESS2- Earth’s Systems – (Earth Materials and Systems, Plate Tectonics and Large-Scale System Interactions)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

Also supports:

#### **Grade 4**

ESS1- Earth’s Place in the Universe (History of Planet Earth)

ESS2- Earth’s Systems – (Earth Materials and Systems) (Plate Tectonics and Large-Scale System Interactions)

ESS3- Earth & Human Activity (Natural Resources) (Natural Hazards)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 5**

ESS2- Earth’s Systems (Earth’s Materials & Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)



## **Monster Storms**

Students become weather forecasters, fly into the eye of a hurricane, and chase tornadoes through Tornado Alley, while exploring the use cutting-edge technology to reduce property damage and loss of life.

### **Middle School (Grades 6-8)**

PS3- Matter and Its Interactions (Definitions of Energy)

PS3- Energy (Conservation of Energy and Energy Transfer)

ESS2- Earth's Systems (The Roles of Water in the Earth's Surface Processes, Weather and Climate)

ESS3- Earth and Human Activity (Natural Hazards)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **High School (Grades 9-12)**

ESS2- Earth's Systems (Earth Materials and Systems, Weather and Climate, Biogeology)

ESS3- Earth and Human Activity (Weather and Climate, Natural Hazards)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **Also supports:**

#### **Grade 4**

ESS3- Earth & Human Activity (Natural Hazards)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 5**

ESS2- Earth's Systems (Earth's Materials & Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

## JASON's Life Science Curricula

\* Also see Tectonic Fury Curriculum under Earth Science section and the Recycling Activities Collection.



### **Resilient Planet**

Students are on a mission to investigate the health of our environment and discover how to protect our planet's ecosystems as they visit some of Earth's most diverse ecosystems to uncover the mysteries of our planet.

#### **Middle School (Grades 6-8):**

LS1- From Molecules to Organisms: Structures and Processes (Organization for Matter and Energy Flow in Organisms, Energy in Chemical Processes and Everyday Life)

LS2- Ecosystems: Interactions, Energy and Dynamics (Interdependent Relationships in Ecosystems, Cycle of Matter and Energy Transfer in Ecosystems, Ecosystem Dynamics, Functioning and Resilience, Biodiversity and Humans)

LS4-Biological Evolution: Unity and Diversity (Adaptation)

ESS3- Earth and Human Activity (Human Impacts on Earth Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **High School (Grades 9-12):**

LS1- From Molecules to Organisms: Structures and Processes (Organization for Matter and Energy Flow in Organisms)

LS2- Ecosystems: Interactions, Energy and Dynamics (Interdependent Relationships in Ecosystems, Cycle of Matter and Energy Transfer in Ecosystems, Ecosystem Dynamics, Functioning and Resilience, Biodiversity and Humans)

LS4-Biological Evolution: Unity and Diversity (Adaptation, Biodiversity and Humans)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Also supports:**

##### **Grade 4**

LS1- From Molecules to Organisms: Structures and Processes (Structure and Function)

ESS2- Earth's Systems (Biogeology)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

##### **Grade 5**

PS3 – Energy (Energy in Chemical Processes and Everyday Life)

LS2- Ecosystems: Interactions, Energy and Dynamics (Interdependent Relationships in Ecosystems, Cycle of Matter and Energy Transfer in Ecosystems)

ESS3- Earth & Human Activity (Human Impacts on Earth Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)



## **Wetlands**

Students investigate the ecology of wetland systems and the economic, environmental, and engineering challenges related to wetland health and restoration.

### **Middle School (Grades 6-8)**

ESS2- Earth's Systems (The Roles of Water in Earth's Surface Processes)

ESS3- Earth & Human Activity (Natural Resources, Human Impacts on Earth Systems)

LS2- Ecosystems: Interactions, Energy and Dynamics (Interdependent Relationships in Ecosystems, Cycle of Matter and Energy Transfer in Ecosystems, Ecosystem Dynamics, Functioning and Resilience)

LS4 – Biological Evolution: Unity and Diversity (Adaptation)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **High School (Grades 9-12)**

ESS2- Earth's Systems (Biogeology)

ESS3- Earth & Human Activity (Human Impacts on Earth Systems)

LS2- Ecosystems: Interactions, Energy and Dynamics (Interdependent Relationships in Ecosystems, Cycle of Matter and Energy Transfer in Ecosystems, Ecosystem Dynamics, Functioning and Resilience)

LS4-Biological Evolution: Unity and Diversity (Adaptation, Biodiversity and Humans)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### ***Also supports:***

#### **Grade 4**

LS1 – From Molecules to Organisms: Structures and Processes (Structure and Function)

ESS2- Earth's Systems (Biogeology)

ESS3 – Earth & Human Activity (Natural Hazards)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 5**

LS1 – From Molecules to Organisms: Structures and Processes (Organization for Matter and Energy Flow in Organisms)

LS2- Ecosystems: Interactions, Energy and Dynamics (Interdependent Relationships in Ecosystems, Cycle of Matter and Energy Transfer in Ecosystems)

ESS3- Earth & Human Activity (Human Impacts on Earth Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

## JASON's Physical Science Curricula

\* Also see Monster Storms curricula under Earth Science section, Resilient Planet Curriculum under the Life Science section, and the Recycling Activities Collection.



### ***Infinite Potential***

Students explore the way energy transfers and transforms, the technologies designed to meet the needs of an energy-hungry planet, and the environmental and economic tradeoffs inherent in our quest towards sustainability.

#### **Middle School (Grades 6-8)**

PS1- Matter and Its Interactions (Definitions of Energy)

PS2- Motion and Stability (Types of Interactions)

PS3- Energy (Definitions of Energy) (Conservation of Energy and Energy Transfer) (Relationship between Energy and Forces)

PS4- Waves and Their Applications in Technologies for Information Transfer (Wave Properties) (Electromagnetic Radiation)

ESS3- Earth and Human Activity (Global Climate Change)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **High School (Grades 9-12)**

PS2- Motion and Stability: Forces and Interactions (Definitions of Energy)

PS3- Energy (Definitions of Energy) (Conservation of Energy and Energy Transfer) (Energy in Chemical Processes)

PS4- Waves and Their Applications in Technologies for Information Transfer (Energy in Chemical Processes, Wave Properties, Electromagnetic Radiation, Information Technologies and Instrumentation)

ESS3- Earth and Human Activity (Natural Resources)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### ***Also supports:***

##### **Grade 4**

PS3- Energy (Definitions of Energy, Conservation of Energy and Energy Transfer, Relationship between Energy and Forces, Energy in Chemical Processes and Everyday Life)

PS4 - Waves and Their Applications in Technologies for Information Transfer (Electromagnetic Radiation)

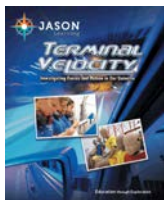
ESS3- Earth and Human Activity (Natural Resources)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

##### **Grade 5**

ESS3- Earth & Human Activity (Human Impacts on Earth Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)



## **Terminal Velocity**

Students investigate forces and motion and simple machines through measurements, car crashes, Mars exploration, and the Deep Horizon oil spill in the Gulf of Mexico.

### **Middle School (Grades 6-8)**

PS2- Motion and Stability: Forces and Interactions (Forces and Motion, Types of Interactions)

PS3- Energy (Definitions of Energy, Conservation of Energy and Energy Transfer, Relationship between Energy and Forces)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **High School (Grades 9-12)**

PS2- Motion and Stability: Forces and Interactions (Forces and Motion, Types of Interactions)

PS3 – Energy (Conservation of Energy and Energy Transfer)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **Also supports:**

#### **Grade 4**

PS3 – Energy (Relationship between Energy and Forces)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 5**

PS1 - Matter and Its Interactions (Structure and Properties of Matter)

PS2 – Motion and Stability: Forces and Interactions (Types of Interactions)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)



## **World of Waves**

Students build a deep, working understanding of the physics of waves and explore how sound, light and other electromagnetic waves are involved in engaging real-world phenomena, like surfing in the ocean, animal communication, and mobile networks.

### **Middle School (Grades 6-8)**

PS4 - Waves and Their Applications in Technologies for Information Transfer (Wave Properties, Electromagnetic Radiation, Information Technologies and Instrumentation)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **High School (Grades 9-12)**

PS4 - Waves and Their Applications in Technologies for Information Transfer (Wave Properties, Electromagnetic Radiation, Information Technologies and Instrumentation)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

### **Also supports:**

#### **Grade 4**

PS4 - Waves and Their Applications in Technologies for Information Transfer (Wave Properties)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 5**

PS2 – Motion and Stability: Forces and Interactions (Types of Interactions)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)



## JASON's Recycling Activities Collection



### ***Recycling Activities Collection (K-4; 5-8; 9-12)***

Designed in partnership with The Institute of Scrap Recycling Industries, students explore the benefits of and challenges to successful recycling through a variety of activities ranging from physics and chemistry to engineering and human impacts, while becoming informed citizens and careful consumers.

#### **Kindergarten**

ESS3 – Earth and Human Activity (Natural Resources, Human Impacts on Earth Systems)

#### **Grade 1**

LS1 – From Molecules to Organisms: Structures and Processes (Structure and Function)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 2**

PS1 – Matter and Its Interactions (Structure and Properties of Matter)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 3**

PS2 – Motion and Stability: Forces and Interactions (Forces and Motion)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 4**

ESS3 - Earth and Human Activity (Natural Resources)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

#### **Grade 5**

PS3 – Energy (Energy in Chemical Processes and Everyday Life)

LS2 – Ecosystems: Interactions, Energy and Dynamics (Cycles of Matter and Energy Transfer in Ecosystems)

ESS3 - Earth and Human Activity (Human Impacts on Earth Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

**Middle School (Grades 6-8)**

PS1 – Matter and Its Interactions (Structure and Properties of Matter, Chemical Reactions)

ESS3 – Earth and Human Activity (Natural Resources, Human Impacts on Earth Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)

**High School (Grades 9-12)**

PS1 – Matter and Its Interactions (Structure and Properties of Matter)

ESS3 – Earth and Human Activity (Human Impacts on Earth Systems)

ETS1 – Engineering Design (Defining and Delimiting Engineering Problems, Developing Possible Solutions, Optimizing the Design Solution)