

# Science - USA

NGSS - GRADF 7

Experience Level: MIDDLE SCHOOL

Number of Classes: VARIABLE

Age Range: 11 - 12 YEARS

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## Matter and Energy in Organisms and Ecosystems Construct a scientific explanation based on evidence

Life Sciences

for the role of photosynthesis in the cycling of matter

matter moves through an organism.

- and flow of energy into and out of organisms. Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this
- Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
- Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
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#### evidence that changes to physical or biological components of an ecosystem affect populations. Interdependent Relationships in Ecosystems

Life Sciences (Contd.)

· Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. Evaluate competing design solutions for maintaining

biodiversity and ecosystem services.

Construct an argument supported by empirical

Earth and Space Systems History of Earth

Construct an explanation based on evidence for how

#### geoscience processes have changed Earth's surface at varying time and spatial scales. Analyze and interpret data on the distribution of fossils

- and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. Earth's Systems Develop a model to describe the cycling of Earth's
  - materials and the flow of energy that drives this process. · Construct a scientific explanation based on evidence
  - for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- Human Impacts Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the
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development of technologies to mitigate their effects.

**Physical Sciences** 

· Develop models to describe the atomic composition

that synthetic materials come from natural resources

 Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure

of simple molecules and extended structures.

· Gather and make sense of information to describe

· Structure and Properties of Matter

and impact society.

### Analyze and interpret data on the properties of substances before and after the substances interact to

Chemical Reactions

Engineering Design

success.

number of atoms does not change in a chemical reaction and thus mass is conserved. · Undertake a design project to construct, test, and

modify a device that either releases or absorbs

thermal energy by chemical processes.

Engineering, Technology, and

**Applications of Science** 

· Develop and use a model to describe how the total

- Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people
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systematic process to determine how well they meet the criteria and constraints of the problem.

Engineering, Technology, and

Applications of Science (Contd.)

Evaluate competing design solutions using a

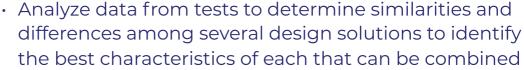
 Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

determine if a chemical reaction has occurred.

substance when thermal energy is added or removed.

03

and the natural environment that may limit possible solutions.



into a new solution to better meet the criteria for

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