Earth Odyssey

NGSS:

**MS-ETS1-2**: Evaluate competing design solutions using a systemic process to determine how well they meet criteria and constraints of the problem.

**MS-ETS1-3**: Analyze data from tests to determine similarities and differences among several design solutions to identify best characteristics of each can be combined into a new solution to better meet the criteria for success.

CCS: (Common Core Standards)

**RST.6-8.1**: Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

**RST.6-8.7**: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed in words in a text with a version of that information expressed visually.

**MP.2**: Reason abstractly and quantitatively.

**WHST.6-8.7**: Conduct short research projects to answer a question including a self-generated question, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

**RST.6-8.3**: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

**RI.7.1**: Cite several pieces of textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text.

**ATMO (Atmosphere)**

NGSS:

**MS-PS1-3**: gather and make sense of information to describe that synthetic materials come from natural resources and impact society.

**MS-ESS2-5**: Collect data to provide evidence for how the motions and complex interaction of air masses results in changes in weather conditions.
**MS-ESS2-6**: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

**CCS:**

**RST.6-8.1**: Cite specific textual evidence to support analysis of science and technical text texts attending to the precise details of explanations or descriptions.

**SL.8.5**: Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

**RST.6-8.7**: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.

**MP.2**: Reason abstractly and quantitatively.

**RST.6-8.9**: Draw evidence from informational texts to support analysis, reflection and research.

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**Bio (Biology)**

**NGSS:**

**MS-LS1-6**: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.

**MS-ESS3-5**: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

**CCS:**

**RST.6-8.1**: Cite specific textual evidence to support analysis of science and technical text texts attending to the precise details of explanations or descriptions.

**SL.8.5**: Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

**RST.6-8.7**: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.

**MP.2**: Reason abstractly and quantitatively.

**RST.6-8.9**: Draw evidence from informational texts to support analysis, reflection, and research.
CRYO (Cryology)

NGSS:

**MS-PS3-3**: Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

**MS-ESS3-2**: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

**MS-ESS3-5**: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures in the past century.

CCS:

**RST.6-8.3**: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

**RST.6-8.1**: Cite specific textual evidence to support analysis of science and technical text texts attending to the precise details of explanations or descriptions.

**SL.8.5**: Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

**RST.6-8.7**: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.

**MP.2**: Reason abstractly and quantitatively.

**RST.6-8.9**: Draw evidence from informational texts to support analysis, reflection, and research.

NRG (Energy)

NGSS:

**MS-ESS1-1**: Develop and use model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

CCS:

**RST.6-8.1**: Cite specific textual evidence to support analysis of science and technical text texts attending to the precise details of explanations or descriptions.
GEO (Geology)

NGSS:

MS-PS3-3: Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer.

MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

CCS:

RST.6-8.3 Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

RST.6-8.7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.

MP.2: Reason abstractly and quantitatively.

RST.6-8.9: Draw evidence from informational texts to support analysis, reflection, and research.

SAT (Satellite)

NGSS:

MS-ETS1-2: Evaluate competing design solutions using a systemic process to determine how well they meet criteria and constraints of the problem.

MS-ETS1-3: Analyze data from tests to determine similarities and differences among several design solutions to identify best characteristics of each can be combined into a new solution to better meet the criteria for success.

CCS:

MP.2: Reason abstractly and quantitatively.

RST.6-8.1: Cite specific textual evidence to support analysis of science and technical text texts attending to the precise details of explanations or descriptions.

RST.6-8.9: Draw evidence from informational texts to support analysis, reflection, and research.
OCEAN

NGSS:

MS-ESS2-4: Develop a model to describe the cycling of water through the Earth’s systems driven by energy from the sun and the force of gravity.

MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures in the past century.

CCS:

RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.

MP.2: Reason abstractly and quantitatively.

RST.6-8.9: Draw evidence from informational texts to support analysis, reflection, and research.

SW (Space Weather)

NGSS:

MS-PS2-5: Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even through the objects are not in contact.

CCS:

WHST.6-8.7: Conduct short research projects to answer a question including a self-generated question, drawing on several sources and generating additional related and focused questions that allow for multiple avenues of exploration.

SL.8.5: Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.
**Pre-Mission Lessons**

**The Importance of the Sun:**

**NGSS:**

**MS-ESS1-1:** Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and the seasons.

**MS-ETS1-1:** 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 and the natural environment that may limit possible solutions.

**CCS:**

**RST.6-8.1:** Cite specific textual evidence to support analysis of science and technical texts.

**RST.6-8.7:** Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.

**MP.2:** Reason abstractly and quantitatively.

**WHST.6-8.7:** Conduct short research projects to answer a question including a self-generated question, drawing on several sources and generating additional related and focused questions that allow for multiple avenues of exploration.

**Earth’s Atmosphere & Carbon Dioxide**

**NGSS:**
MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures in the past century.

CCS:

6.EE.B.6: Use variables to represent numbers and write expressions when solving a real world or mathematical problem; understand that a variable can represent an unknown number, or depending on the purpose at hand, any number in a specified set.

RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.7: Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually.

MP.2: Reason abstractly and quantitatively.

The Water Cycle:

NGSS:

MS-ESS2-4: Develop a model to describe the cycling of water through the Earth’s systems driven by energy from the sun and the force of gravity.

MS-ESS2-6: Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.

MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused the rise in global temperatures in the past century.

CCS:

SL.8.5: Include multimedia components and visual displays in presentations to clarify claims and findings and emphasize salient points.

MP.2: Reason abstractly and quantitatively.

RST.6-8.1: Cite specific textual evidence to support analysis of science and technical texts.
Remote Sensing and Communications

NGSS

**MS-ESS2-4:** Develop a model to describe the cycling of water through the Earth’s systems driven by energy from the sun and the force of gravity.

**MS-ESS3-5:** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures in the past century.

CCS

**RST.6-8.1:** Cite specific textual evidence to support analysis of science and technical texts.

**WHST.6-8.1:** Write arguments focused on discipline content.

**WHST.6-8.9:** Draw evidence from informational texts to support analysis, reflection, and research.