Main Criteria: Forward Education
Secondary Criteria: Idaho Content Standards
Subjects: Mathematics, Science, Technology Education
Grades: 11, 12, Key Stage 4

Forward Education

Autonomous Electric Vehicles of the Future

Idaho Content Standards
Mathematics
Grade **11** - Adopted: **2022**

STANDARD / COURSE		Grades 9 – 12 Standards for Mathematical Practice
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.2.	Reason abstractly and quantitatively.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.4.	Model with mathematics.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.8.	Look for and express regularity in repeated reasoning.

STANDARD / COURSE	**A.**	**Grades 9 – 12 Algebra (A)**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**A.CED.**	**Creating Equations – A.CED**
GLE / BIG IDEA	**A.CED.A.**	**Create equations that describe numbers or relationships.**
OBJECTIVE	**A.CED.A.2.**	**Interpret the relationship between two or more quantities.**
OBJECTIVE	A.CED.A.2.a.	Define variables to represent the quantities and write equations to show the relationship.
OBJECTIVE	A.CED.A.2.b.	Use graphs to show a visual representation of the relationship while adhering to appropriate labels and scales.

STANDARD / COURSE	**A.**	**Grades 9 – 12 Algebra (A)**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**A.REI.**	**Reasoning with Equations and Inequalities – A.REI**
GLE / BIG IDEA	**A.REI.A.**	**Understand solving equations as a process of reasoning and explain the reasoning.**
OBJECTIVE	A.REI.A.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify or refute a solution method.

STANDARD / COURSE	**F.**	**Grades 9 – 12 Functions (F)**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**F.IF.**	**Interpreting Functions – F.IF**
GLE / BIG IDEA	**F.IF.C.**	**Analyze functions using different representations.**
OBJECTIVE	**F.IF.C.7.**	**Graph functions expressed symbolically and show key features of the graphs, by hand in simple cases and using technology for more complicated cases.**
OBJECTIVE	F.IF.C.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

STANDARD / COURSE	**F.**	**Grades 9 – 12 Functions (F)**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**F.LE.**	**Linear, Quadratic, and Exponential Models – F.LE**
GLE / BIG IDEA	**F.LE.A.**	**Construct and compare linear, quadratic, and exponential models and solve problems.**
OBJECTIVE	**F.LE.A.1.**	**Distinguish between situations that can be modeled with linear functions and with exponential functions.**
OBJECTIVE	F.LE.A.1.a.	Demonstrate that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

Idaho Content Standards

Mathematics

Grade **12** - Adopted: **2022**

STANDARD / COURSE		**Grades 9 – 12 Standards for Mathematical Practice**
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.1.	Make sense of problems and persevere in solving them.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.2.	Reason abstractly and quantitatively.

CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.3.	Construct viable arguments and critique the reasoning of others.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.4.	Model with mathematics.
CONTENT KNOWLEDGE AND SKILLS / GOAL	MP.8.	Look for and express regularity in repeated reasoning.
STANDARD / COURSE	**A.**	**Grades 9 – 12 Algebra (A)**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**A.CED.**	**Creating Equations – A.CED**
GLE / BIG IDEA	**A.CED.A.**	**Create equations that describe numbers or relationships.**
OBJECTIVE	**A.CED.A.2.**	**Interpret the relationship between two or more quantities.**
OBJECTIVE	A.CED.A.2.a.	Define variables to represent the quantities and write equations to show the relationship.
OBJECTIVE	A.CED.A.2.b.	Use graphs to show a visual representation of the relationship while adhering to appropriate labels and scales.
STANDARD / COURSE	**A.**	**Grades 9 – 12 Algebra (A)**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**A.REI.**	**Reasoning with Equations and Inequalities – A.REI**
GLE / BIG IDEA	**A.REI.A.**	**Understand solving equations as a process of reasoning and explain the reasoning.**
OBJECTIVE	A.REI.A.1.	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify or refute a solution method.
STANDARD / COURSE	**F.**	**Grades 9 – 12 Functions (F)**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**F.IF.**	**Interpreting Functions – F.IF**
GLE / BIG IDEA	**F.IF.C.**	**Analyze functions using different representations.**
OBJECTIVE	**F.IF.C.7.**	**Graph functions expressed symbolically and show key features of the graphs, by hand in simple cases and using technology for more complicated cases.**

OBJECTIVE	F.IF.C.7.a.	Graph linear and quadratic functions and show intercepts, maxima, and minima.

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Idaho Content Standards

Science

Grade **11** - Adopted: **2022**

STANDARD / COURSE	**HS-LS.**	**Life Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-LS-2.**	**Ecosystems: Interactions, Energy, and Dynamics**
GLE / BIG IDEA	HS-LS-2.6.	Design, evaluate, and/or refine practices used to manage a natural resource based on direct and indirect influences of human activities on biodiversity and ecosystem health.

STANDARD / COURSE	**HS-PSC.**	**Physical Science – Chemistry**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-PSC-2.**	**Chemical Reactions**
GLE / BIG IDEA	HS-PSC-2.2.	Develop a model to illustrate that the energy transferred during an exothermic or endothermic chemical reaction is based on the bond energy difference between bonds broken (absorption of energy) and bonds formed (release of energy).

STANDARD / COURSE	**HS-PSC.**	**Physical Science – Chemistry**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-PSC-3.**	**Energy**
GLE / BIG IDEA	HS-PSC-3.4.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

STANDARD / COURSE	**HS-PSP.**	**Physical Science – Physics**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-PSP-2.**	**Energy**

GLE / BIG IDEA	HS-PSP-2.3.	Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.
STANDARD / COURSE	**HS-PSP.**	**Physical Science – Physics**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-PSP-3.**	**Waves**
GLE / BIG IDEA	HS-PSP-3.2.	Evaluate questions about the advantages of using digital transmission and storage of information.
STANDARD / COURSE	**HS-ESS.**	**Earth and Space Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-ESS-2.**	**Earth's Systems**
GLE / BIG IDEA	HS-ESS-2.4.	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in variations in climate.
STANDARD / COURSE	**HS-ESS.**	**Earth and Space Science**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-ESS-3.**	**Earth and Human Activity**
GLE / BIG IDEA	HS-ESS-3.1.	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
GLE / BIG IDEA	HS-ESS-3.2.	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
GLE / BIG IDEA	HS-ESS-3.3.	Illustrate relationships among management of natural resources, the sustainability of human populations, and biodiversity.
GLE / BIG IDEA	HS-ESS-3.4.	Evaluate or refine a scientific or technological solution that mitigates or enhances human influences on natural systems.
GLE / BIG IDEA	HS-ESS-3.6.	Communicate how relationships among Earth systems are being influenced by human activity.

Idaho Content Standards

Science

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CONTENT KNOWLEDGE AND SKILLS / GOAL	**HS-LS-2.**	**Ecosystems: Interactions, Energy, and Dynamics**

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Idaho Content Standards

Technology Education

Grade **11** - Adopted: **2017**

STANDARD / COURSE	**ID.ICT.9-12.3.**	**STANDARD 3: KNOWLEDGE CONSTRUCTOR**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 3: Students critically curate a variety of resources using digital tools to construct knowledge, produce creative artifacts and make meaningful learning experiences for themselves and others.**
GLE / BIG IDEA	ICT.9-12.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

STANDARD / COURSE	**ID.ICT.9-12.4.**	**STANDARD 4: INNOVATIVE DESIGNER**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 4: Students use a variety of technologies within a design process to identify and solve problems by creating new, useful or imaginative solutions.**
GLE / BIG IDEA	ICT.9-12.4.b.	Students select and use digital tools to plan and manage a design process that considers design constraints and calculated risks.

STANDARD / COURSE	**ID.ICT.9-12.5.**	**STANDARD 5: COMPUTATIONAL THINKER**
CONTENT KNOWLEDGE AND SKILLS / GOAL		**Goal 5: Students develop and employ strategies for understanding and solving problems in ways that leverage the power of technological methods to develop and test solutions.**
GLE / BIG IDEA	ICT.9-12.5.a.	Students formulate problem definitions suited for technology-assisted methods such as data analysis, abstract models and algorithmic thinking in exploring and finding solutions.
GLE / BIG IDEA	ICT.9-12.5.b.	Students collect data or identify relevant data sets, use digital tools to analyze them, and represent data in various ways to facilitate problem-solving and decision-making.

GLE / BIG IDEA	ICT.9-12.5.c.	Students break problems into component parts, extract key information, and develop descriptive models to understand complex systems or facilitate problem-solving.
GLE / BIG IDEA	ICT.9-12.5.d.	Students understand how automation works and use algorithmic thinking to develop a sequence of steps to create and test automated solutions.

STANDARD / COURSE	**ID.CS.11-12.**	**COMPUTER SCIENCE**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**11-12.AP.**	**Algorithms and Programming (AP)**
GLE / BIG IDEA		**Communicating About Computing**
OBJECTIVE	11-12.AP.04.	Modify an existing program to add additional functionality and discus the positive and negative implications (e.g., breaking other functionality). (Grades 11-12)

STANDARD / COURSE	**ID.CS.11-12.**	**COMPUTER SCIENCE**
CONTENT KNOWLEDGE AND SKILLS / GOAL	**11-12.AP.**	**Algorithms and Programming (AP)**
GLE / BIG IDEA		**Developing and Using Abstractions**
OBJECTIVE	11-12.AP.07.	Critically examine algorithms and design an original algorithm (e.g. adapt, remix, improve). (Grades 11-12)
OBJECTIVE	11-12.AP.08.	Evaluate efficiency, correctness, and clarity of algorithms. (Grades 11-12)

Idaho Content Standards

Technology Education

Grade **12** - Adopted: **2017**

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GLE / BIG IDEA	ICT.9-12.3.d.	Students build knowledge by actively exploring real-world issues and problems, developing ideas and theories and pursuing answers and solutions.

STANDARD / COURSE	**ID.ICT.9-12.4.**	**STANDARD 4: INNOVATIVE DESIGNER**
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