PETROLEUM MUSEUM
MIDLAND, TEXAS

LEGO BricQ Motion Essential

LEGO Education BricQ Motion Essential will give your elementary students an understanding of forces and motion as they plan and conduct investigations. In the curriculum unit Train to Win, lower elementary students will work towards determining whether design solutions work as they were intended to change the speed or direction of an object with a push or a pull. In the curriculum unit Winning with Science, upper elementary students will investigate the patterns in an object's motion, developing and sharpening their ability to predict future motion.

All supplies needed for the lessons are provided in the trunk.

BricQ Motion Essential: Train to Win

TEKS:

§110.2. English Language Arts and Reading, Kindergarten, Adopted 2017.

(b) Knowledge and skills.

(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking--oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:

(A) listen actively and ask questions to understand information and answer questions using multi-word responses;

(D) work collaboratively with others by following agreed-upon rules for discussion, including taking turns;

§113.11. Social Studies, Kindergarten, Adopted 2018.

(b) Knowledge and skills.

(15) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others. The student is expected to use problem-solving and decision making processes to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution.

§112.3. Science, Grade 1, Adopted 2021.

(b) Knowledge and skills.

(7) Force, motion, and energy. The student knows that forces cause changes in motion and position in everyday life. The student is expected to:

(A) explain how pushes and pulls can start, stop, or change the speed or direction of an object's motion; and

(B) plan and conduct a descriptive investigation that predicts how pushes and pulls can start, stop, or change the speed or direction of an object's motion.

§110.3. English Language Arts and Reading, Grade 1, Adopted 2017

(b) Knowledge and skills.

(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking--oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:

(A) listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses;

(D) work collaboratively with others by following agreed-upon rules for discussion, including listening to others, speaking when recognized, and making appropriate contributions;

§113.12. Social Studies, Grade 1, Adopted 2018.

(b) Knowledge and skills.

(18) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others. The student is expected to use problem-solving and decision making processes to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution.

§112.4. Science, Grade 2, Adopted 2021.

(b) Knowledge and skills.

(7) Force, motion, and energy. The student knows that forces cause changes in motion and position in everyday life. The student is expected to:

(A) explain how objects push on each other and may change shape when they touch or collide; and

(B) plan and conduct a descriptive investigation to demonstrate how the strength of a push and pull changes an object's motion.

§110.4. English Language Arts and Reading, Grade 2, Adopted 2017

(b) Knowledge and skills.

(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking--oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:

(A) listen actively, ask relevant questions to clarify information, and answer questions using multi-word responses;

(D) work collaboratively with others by following agreed-upon rules for discussion, including listening to others, speaking when recognized, making appropriate contributions, and building on the ideas of others;

§113.13. Social Studies, Grade 2, Adopted 2018.

(b) Knowledge and skills.

(17) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others. The student is expected to use problem-solving and decision making processes to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution.

National Standards Alignment Grades K-2:

Next Generation Science Standards

K-PS2-1: Motion and Stability: Forces and Interactions

Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.

K-PS2-2: Motion and Stability: Forces and Interactions

Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.

K-2-ETS1-1: Engineering and Design

Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.

K-2_ETS1-2: Engineering Design

Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.

ISTE Standards

7c: Contribute constructively to project teams.

Common Core State Standards

ELA-Literacy.SL.1.2: Ask and answer questions about key details in a text read aloud or information presented orally or through other media.

BricQ Motion Prime: Winning with Science
National Standards Alignment Grades: 3-5:

Next Generation Science Standards

3-PS2-2: Motion and Stability: Forces and Interactions
Make observations and/or measurements of an objects motion to provide evidence that a pattern can be used to predict future motion.

3-5-ETS1-1: Engineering and Design
Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

ISTE Standards

4c: Develop, test, and refine prototypes as part of a cyclical design process.

Common Core State Standards

ELA-LITERACY.SL.3.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

TEKS

§112.5. Science, Grade 3, Adopted 2021.

(b) Knowledge and skills.
(1) Scientific and engineering practices. The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:
(G) develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.
(7) Force, motion, and energy. The student knows the nature of forces and the patterns of their interactions. The student is expected to:
(A) demonstrate and describe forces acting on an object in contact or at a distance, including magnetism, gravity, and pushes and pulls;

§110.5. English Language Arts and Reading, Grade 3, Adopted 2017.

(b) Knowledge and skills.
(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking--oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:
(A) listen actively, ask relevant questions to clarify information, and make pertinent comments;
(B) follow, restate, and give oral instructions that involve a series of related sequences of action;

(C) speak coherently about the topic under discussion, employing eye contact, speaking rate, volume, enunciation, and the conventions of language to communicate ideas effectively;
(D) work collaboratively with others by following agreed-upon rules, norms, and protocols; and
(E) develop social communication such as conversing politely in all situations.

§113.14. Social Studies, Grade 3, Adopted 2018.

(b) Knowledge and skills.

(16) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others. The student is expected to use problem-solving and decision making processes to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution.

§112.6. Science, Grade 4, Adopted 2021.

(b) Knowledge and skills.

(1) Scientific and engineering practices. The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:

(G) develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.

(7) Force, motion, and energy. The student knows the nature of forces and the patterns of their interactions. The student is expected to plan and conduct descriptive investigations to explore the patterns of forces such as gravity, friction, or magnetism in contact or at a distance on an object.

§110.6. English Language Arts and Reading, Grade 4, Adopted 2017.

(b) Knowledge and skills.

(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking--oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:

(A) listen actively, ask relevant questions to clarify information, and make pertinent comments;
(B) follow, restate, and give oral instructions that involve a series of related sequences of action;
(C) express an opinion supported by accurate information, employing eye contact, speaking rate, volume, enunciation, and the conventions of language to communicate ideas effectively; and
(D) work collaboratively with others to develop a plan of shared responsibilities.

§113.15. Social Studies, Grade 4, Adopted 2018.

(b) Knowledge and skills.

(22) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others. The student is expected to use problem-solving and decision making processes to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution.

§112.7. Science, Grade 5, Adopted 2021.

(b) Knowledge and skills.

(1) Scientific and engineering practices. The student asks questions, identifies problems, and plans and safely conducts classroom, laboratory, and field investigations to answer questions, explain phenomena, or design solutions using appropriate tools and models. The student is expected to:

(G) develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.

(7) Force, motion, and energy. The student knows the nature of forces and the patterns of their interactions. The student is expected to:

(A) investigate and explain how equal and unequal forces acting on an object cause patterns of motion and transfer of energy;

§110.7. English Language Arts and Reading, Grade 5, Adopted 2017.

(b) Knowledge and skills.

(1) Developing and sustaining foundational language skills: listening, speaking, discussion, and thinking--oral language. The student develops oral language through listening, speaking, and discussion. The student is expected to:

(A) listen actively to interpret verbal and non-verbal messages, ask relevant questions, and make pertinent comments;

(B) follow, restate, and give oral instructions that include multiple action steps;

(C) give an organized presentation employing eye contact, speaking rate, volume, enunciation, natural gestures, and conventions of language to communicate ideas effectively; and

(D) work collaboratively with others to develop a plan of shared responsibilities.

§113.16. Social Studies, Grade 5, Adopted 2018.

(b) Knowledge and skills.

(26) Social studies skills. The student uses problem-solving and decision-making skills, working independently and with others. The student is expected to use problem-solving and decision making processes to identify a problem, gather information, list and consider options, consider advantages and disadvantages, choose and implement a solution, and evaluate the effectiveness of the solution.

(7) Force, motion, and energy. The student knows the nature of forces and the patterns of their interactions. The student is expected to:

(A) demonstrate and describe forces acting on an object in contact or at a distance, including magnetism, gravity, and pushes and pulls;