PETROLEUM MUSEUM
MIDLAND, TEXAS

LEGO BricQ Motion Prime

LEGO Education BricQ Motion Prime will challenge your middle school students to apply their scientific inquiry skills to provide evidence of the change in an object's motion based on its force and mass. In the curriculum unit, Science of Sports, they'll apply Newton's three laws of motion as they design, develop, and optimize a solution involving the collision of two objects. Throughout the BricQ Motion Prime lessons, they'll strengthen their communication skills in collaborative discussions, presenting and analyzing their solutions.

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

BricQ Motion Prime: Science of Sports
National Standards Alignment Grades: 6-8

TEKS:

§112.26. Science, Grade 6, Adopted 2021.

(b) Knowledge and skills.

(1) Scientific and engineering practices. The student, for at least 40% of instructional time, 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:

(B) use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(A) develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and

(C) engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.

(7) Force, motion, and energy. The student knows the nature of forces and their role in systems that experience stability or change. The student is expected to:

(A) identify and explain how forces act on objects, including gravity, friction, magnetism, applied forces, and normal forces, using real-world applications;

§110.22. English Language Arts and Reading, Grade 6, 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:

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

(D) participate in student-led discussions by eliciting and considering suggestions from other group members, taking notes, and identifying points of agreement and disagreement.

§113.18. Social Studies, Grade 6, 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.

§112.27. Science, Grade 7, Adopted 2021.

(b) Knowledge and skills

(1) Scientific and engineering practices. The student, for at least 40% of instructional time, 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:

(B) use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(A) develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and

(C) engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.

(7) Force, motion, and energy. The student describes the cause-and-effect relationship between force and motion. The student is expected to:

(D) analyze the effect of balanced and unbalanced forces on the state of motion of an object using Newton's First Law of Motion.

§113.19. Social Studies, Grade 7, Adopted 2018.

(b) Knowledge and skills.

(23) 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.

§112.28. Science, Grade 8, Adopted 2021.

(b) Knowledge and skills.

(1) Scientific and engineering practices. The student, for at least 40% of instructional time, 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:

(B) use scientific practices to plan and conduct descriptive, comparative, and experimental investigations and use engineering practices to design solutions to problems;

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(A) develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories;

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and

(C) engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.

(7) Force, motion, and energy. The student understands the relationship between force and motion within systems. The student is expected to:

(A) calculate and analyze how the acceleration of an object is dependent upon the net force acting on the object and the mass of the object using Newton's Second Law of Motion;

§110.24. English Language Arts and Reading, Grade 8, 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:

(C) advocate a position using anecdotes, analogies, and/or illustrations employing eye contact, speaking rate, volume, enunciation, a variety of natural gestures, and conventions of language to communicate ideas effectively; and

(D) participate collaboratively in discussions, plan agendas with clear goals and deadlines, set time limits for speakers, take notes, and vote on key issues.

§113.20. Social Studies, Grade 8, Adopted 2018.

(b) Knowledge and skills.

(31) 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.

Next Generation Science Standards

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

Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

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

Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.

MS-ETS1-2: Engineering and Design

Evaluate competing design solutions using a systematic process to determine how ell they meet the criteria and constraints of the problem.

ISTE Standards

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

6c: Communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models, and simulations.

7c: Contribute constructively to project teams.

Common Core State Standards

ELA-LITERACY,SL6.4: Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

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