

Bricks Challenge Syllabus

First Category - Amusement Park

Lesson Order	Model Name	Scientific Principle
1	Pirate Ship	An unstable structure in comparison to a stable structure.
2	The Lever Principal	The lever principle – fulcrum, effort arm, load arm, torque.
3	Industrial Mixer – Cake!	Gear Transmission.
4	Drumming Machine	Belt transmission, converting circular motion to linear motion.
5	Cable Car	Power increasing transmission (Belt).
6	Applauding Man	Aviation history, transmission of circular motion into linear motion.
7	Catapult	Kinetic energy, potential energy, elastic energy.
8	Ferris Wheel	Centrifugal force, centripetal force, anti-symmetry, vibration and stabilizing the ride.
9	Amusement Park Carousel 2	Centrifugal force and centripetal force in a linear motion.
10	Last Lesson	Implementation of subjects.

Second Category - Classic Mechanics

Lesson Order	Model Name	Scientific Principle
1	Conveyor Belt	Presentation of different motorized equipment, learning the terms: “transmission”, “transmission band”, “impeller” and “driven pulley”.
2	Windmill	Belt transmission, speed increasing transmission, power increasing transmission.
3	Manual Electric Beater – Ice Cream!	Gear transmission.
4	Laundry Machine	Centrifugal force, the washing machine's wringing operation, belt transmission.
5	Power Plant	Gear transmission and introduction to the subject of power increasing transmission.
6	Spinning Top Launcher	Angular momentum, conservation law and double speed increasing transmission.
7	Crane	Double power increasing transmission.
8	Lifting Using Pulleys	Saving power using multiple fulcrum points.
9	Elevator	Mass, gravity, Albert Einstein and Isaac Newton.
10	Last Lesson	Implementation of subjects.

Third Category – Transportation and Aviation

Lesson Order	Model Name	Scientific Principle
1	Racecar	Familiarization with the various kit parts.
2	Motorcycle	Angular momentum, conservation law and the law of inertia.
3	Balloon Car and Rocket Launch	Newton's third law - "Action-Reaction law".
4	Vehicle from the 20's	Chain transmission.
5	Towing Vehicle	Towing axle.
6	Railroad Barrier	Snail transmission.
7	Elastic Car	Types of Energy.
8	Rescue Helicopter	Lift force and how a helicopter operates.
9	Sand Buggy – Differential Mechanism	Differential and the cone gears.
10	Last Lesson	Implementation of subjects.

Holidays

Lesson Order	Model Name	Scientific Principle
1	Robot Rabbit	Idle gear, symmetry.
2	Sleigh	Sleds, snowmobiles, friction & contact area.

Additional Lessons

Lesson Order	Model Name	Scientific Principle
1	Flywheel	Flywheel and transforming from a circular motion to a linear motion.
2	Amusement Park Carousel (manual)	The centrifugal force in comparison to the centripetal force, crown gear and 90-degree angle transmission.
3	Wind Turbine	Turbine – green energy.
4	Steamroller	Symmetry, Asymmetry, Centrifugal force and Vibration.
5	Rescue Jeep-Winch	Double power increasing transmission and ratchet lock.
6	Plough	Speed decreasing transmission, learning basic agricultural terms and the use of a plough.
7	Android (Human Robot)	Idle gear, symmetry and anti-symmetry.
8	Bulls Eye	Hand-eye coordination.
9	Electric Drill	Triple power increasing transmission.
10	Flipping Car	Stability principles of a moving object and creative thinking.
11	Road Sweeper	Transmission housing.