

Robotics Bumper Cars Standards and Benchmarks, Grades 6-12:

Primary Subject(s)

Career and Technical Education

Standard 1

Career and Technical Education Standard 1 7-12 20

Career and Technical Education Standard 1 7-12 21

Career and Technical Education Standard 1 7-12 26

Secondary Subject(s)

Content of Science

Standard 1

Content of Science Standard 1 5-8 2

Content of Science Standard 1 5-8 2 i (6th Grade)

identify various types of energy (e.g., heat, light, mechanical, electrical, chemical, nuclear);

Content of Science Standard 1 5-8 2 iii (6th Grade)

know that there are many forms of energy transfer, but the total amount of energy is conserved (i.e., that energy is neither created nor destroyed);

Content of Science Standard 1 5-8 3

Content of Science Standard 1 5-8 3 viii (8th Grade)

understand and apply Newton's laws of motion: objects in motion will continue in motion, and objects at rest will remain at rest, unless acted upon by an unbalanced force (inertia). If a greater force is applied to an object, a proportionally greater acceleration will occur; if an object has more mass, the effect of an applied force is proportionally less.

Content of Science Standard 1 9-12 2

Content of Science Standard 1 9-12 2 i (9th-12th Grade)

identify different forms of energy, including kinetic, gravitational (potential), chemical, thermal, nuclear and electromagnetic;

Content of Science Standard 1 9-12 2 iii (9th-12th Grade)

understand that energy can change from one form to another (e.g., changes in kinetic and potential energy in a gravitational field, heats of reaction, hydroelectric dams) and know that energy is

conserved in these changes;

Content of Science Standard 1 9-12 2 vi (9th-12th Grade)

understand that the ability of energy to do something useful (work) tends to decrease (and never increases) as energy is converted from one form to another;

Science and Society

Standard 1

Science and Society Standard 1 9-12 1

Science and Society Standard 1 9-12 1 i (9th-12th Grade)

know how science enables technology but also constrains it, and describe the difference between real technology and science fiction (e.g., rockets vs. antigravity machines; nuclear reactors vs. perpetual-motion machines; medical x-rays vs. Star-Trek tricorders);

Science and Society Standard 1 9-12 1 ii (9th-12th Grade)

understand how advances in technology enable further advances in science (e.g., microscopes and cellular structure, telescopes and understanding of the universe);

Science and Society Standard 1 9-12 1 iii (9th-12th Grade)

evaluate the influences of technology on society (e.g., communications, petroleum, transportation, nuclear energy, computers, medicine, genetic engineering) including both desired and undesired effects and including some historical examples (e.g., the wheel, the plow, the printing press, the lightning rod);

Science and Society Standard 1 9-12 1 iv (9th-12th Grade)

understand the scientific foundations of common technologies (e.g., kitchen appliances, radio, television, aircraft, rockets, computers, medical x-rays, selective breeding, fertilizers and pesticides, agricultural equipment);

Science and Society Standard 1 9-12 1 vi (9th-12th Grade)

analyze the impact of digital technologies on the availability, creation and dissemination of information;

Science and Society Standard 1 9-12 1 xix (9th-12th Grade)

know that science plays a role in many different kinds of careers and activities (e.g., public service, volunteers, public office holders, researchers, teachers, doctors, nurses, technicians, farmers, ranchers).