



Motion and Design



TEKS:

- 3.6 Force causes change.** The student is expected to:
- measure** and **record** changes in the position and direction of the motion of an object to which a force such as a push or pull has been applied.
- 4.1 Conduct field and laboratory investigations following home and school safety procedures and environmentally appropriate and ethical practices.** The student is expected to:
- demonstrate** safe practices during field and laboratory investigations
- 4.2 Use scientific inquiry methods during field and laboratory investigations.** The student is expected to:
- plan** and **implement** descriptive investigations including asking well-defined questions, formulating testable hypotheses, and selecting and using equipment and technology.
 - communicate** valid conclusions.
 - construct** simple graphs, tables, maps, and charts to organize, examine, and evaluate information.
- 4.3 Use critical thinking and scientific problem solving to make informed decisions.** The student is expected to:
- Analyze, review,** and **critique** scientific explanations, including hypotheses and theories, as to their strengths and weaknesses using scientific evidence and information.
- 4.4 Use a variety of tools and methods to conduct science inquiry.** The student is expected to:
- Demonstrate** that repeated investigations may increase the reliability of results.
- 4.7 Matter has physical properties.** The student is expected to:
- conduct tests, compare data, and draw conclusions about physical properties of matter including states of matter, conduction, density, and buoyancy.

**Motion and Design
22-25 Days (5 Weeks)**

Teaching Time Line

Day	Lesson Title (Investigations)	Thinking Map	Time	Instructional Method
1	Kits Arrive/Inventory and report missing materials	None	45 minutes	TEACHER PREP
2	Designing Vehicles: Getting Started	Circle/Tree	50 minutes	Whole Group
3	Using Drawing to Record and Build & Reading Selection (The Race that Wasn't Run)	Flow Map	50 minutes	Cooperative Groups
4	Pulling A Vehicle: Looking at Force	Flow/Tree	50 minutes	Cooperative Groups
5	Testing the Motion of Vehicles: Carrying a Load	Multi-Flow Map	50 minutes	Cooperative Groups
6	Designing Vehicles to Meet Requirements & Reading Selection (Lunar Rover: Making Tracks on the Moon)	Multi-Flow/Tree Map	50-60 minutes	Cooperative Groups
7	Evaluating Vehicle Design: Looking at Rubber Band Energy	Multi-Flow	50-60 minutes	Center/ Cooperative groups
8	Testing the Effects of Rubber Band Energy	Multi-Flow/Tree	60 minutes	Cooperative Groups
9	Evaluating Vehicle Design: Looking at Friction	Circle	50 minutes	Center/ Cooperative Groups
10	Designing and Building a Vehicle with a Sail & Self Assessment	Flow	60 minutes	Cooperative Groups/ Individual Assessment
11	Testing the Effects of Air Resistance on a Vehicle's Motion + Reading Selection (Shirley Muldowney-Drag racer)	Multi-Flow	60 minutes	Cooperative Groups
12	Building a Propeller Driven Vehicle	Flow	45-50 minutes	Cooperative Groups
13	Analyzing the Notion and Design of a Propeller Driven Vehicle	Multi-Flow	45 minutes	Cooperative Groups
14	Looking At Cost		45 minutes	Cooperative Groups
15-16	Planning Final Design Challenge & Reading Selection (Making the Switch from Kid's Stuff to engineering)	Circle Map	45 minutes For 2 Days	Cooperative Groups
17	Refining our Design		45 minutes	Cooperative Groups
18	Presenting our Final Design Challenge		60 minutes	Group presentations
19-20	Additional Assessments (Performance B & C) Self Assessment B			Small Group/Individual
21-22	Review, ASSESS , Reteach as Needed			Whole Group