

Course: IPC		
Curricular Unit: Force and Motion	Strand: Force	Duration: 3 weeks
Content (TEKS): Northside Independent School District incorporates big ideas, enduring understandings and skills of a discipline. The curriculum units provide clarity and are aligned to the Texas Essential Knowledge and Skills.		
Universal Concepts: Cause and Effect; Scale, Proportion and Quantity; Stability and Change		
Content Specific Concepts: Net Forces, Newton's Laws, Inertia, Gravity.		
English Language Proficiency Standards (ELPS): Classroom instruction must effectively integrate second language acquisition with quality content area instruction to ensure that ELLs acquire social and academic language proficiency, in English, learn the knowledge and skills in the TEKS, and reach their full academic potential.		
Understanding/Generalization:		
<ul style="list-style-type: none"> Forces are responsible for all motion. 		
Essential Questions: The student will be able to answer these questions...		
<ul style="list-style-type: none"> What causes an object to move? When is a time you would want to increase friction between two moving objects? When is a time you would want to decrease friction between two moving objects? In terms of the laws of motion, why are seatbelts important to wear in a moving vehicle? How would pulling an object with less mass object be different than pulling an object with more mass object? Does it take more force to cause a box to speed up or to push at a constant speed? What would happen to the gravitational force between the Earth and Moon if the Moon were to double in size? How would the Earth be different there was no moon? 		
Do: The student will be able to...		Know: The student will know...
4 The student knows concepts of force and motion evident in everyday life. The student is expected to: (C) investigate how an object's motion changes only when a net force is applied.	4(C)	<ul style="list-style-type: none"> a force is a push or a pull. net force is the combination of all forces. unbalanced forces result in motion. interpret net force diagrams. friction opposes motion. Newton's First Law (Inertia)- an object will remain at rest until acted upon by a net force. Newton's Third Law- Action Reaction= forces come in pairs they are equal and opposite in nature.
4 The student knows concepts of force and motion evident in everyday life. The student is expected to: (D) describe and calculate the relationship between force, mass and acceleration.	4(D)	<ul style="list-style-type: none"> Newton's Second Law- $F = ma$ the units associated with measurements in this strand.
4 The student knows concepts of force and motion evident in everyday life. The student is expected to: (F) describe the gravitational attraction between objects of different masses at different distances.	4(F)	<ul style="list-style-type: none"> outside forces include gravity, friction, and air resistance. terminal velocity is achieved when the force of air resistance is equal to force of gravity. relationship between mass and gravitational force between two objects (ie: more mass leads to more gravitational force). relationship between distance and gravitational force between two objects (ie: greater the distance leads to less gravitational force). the difference between weight and mass.
Process Standards		

(1) Scientific processes. The student, for at least 40% of instructional time, conducts laboratory and field investigations using safe, environmentally appropriate, and ethical practices. The student is expected to:

- (A) demonstrate safe practices during laboratory and field investigations, including the appropriate use of safety showers, eyewash fountains, safety goggles or chemical splash goggles, as appropriate, and fire extinguishers
- (B) know specific hazards of chemical substances such as flammability, corrosiveness, and radioactivity as summarized on the Safety Data Sheets (SDS); and
- (C) demonstrate an understanding of the use and conservation of resources and the proper disposal or recycling of materials.

(2) Scientific processes. The student uses scientific practices [methods] during laboratory and field investigations. The student is expected to:

- (A) know the definition of science and understand that it has limitations, as specified in subsection (b)(2) of this section;
- (B) plan and implement investigative procedures, including asking questions, formulating testable hypotheses, and selecting equipment and technology;**
- (C) collect data and make measurements with accuracy and precision;**
- (D) organize, analyze, evaluate, make inferences, and predict trends from data; and**
- (E) communicate valid conclusions supported by the data through methods such as lab reports, labeled drawings, graphs, journals, summaries, oral reports, and technology-based reports.**

(3) Scientific processes. The student uses critical thinking, scientific reasoning, and problem solving to make informed decisions within and outside the classroom. The student is expected to:

- (A) analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, so as to encourage critical thinking by the students
- (B) communicate and apply scientific information extracted from various sources such as current events, published journal articles, and marketing materials;
- (C) draw inferences based on data related to promotional materials for products and services;
- (D) evaluate the impact of scientific research on society and the environment;
- (E) evaluate models according to their limitations in representing biological objects or events; and
- (F) research and describe the history of biology and contributions of scientists.