

# **FORCE AND MOTION UNIT ORGANIZER**

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## **STANDARDS FOR ACHIEVEMENT AND PERFORMANCE:**

1. Calculate speed (speed = distance/time).
2. Understand Newton's three laws of motion.
3. Velocity is speed in a given direction.
4. Momentum is mass times speed.
5. Friction opposes motion.
6. Observe and explain buoyant forces
7. Learn Bernoulli's principle of fluids in motion.
8. Understand hydraulic systems.

## **ASSESSMENT:**

1. Walk in the Park activity.
2. Speed calculation worksheets.
3. Trajectory lab.
4. "Table Hockey" lab
5. Motion math worksheet.
6. Buoyancy lab
7. Bernoulli kites lab
8. Hydraulics/fluid forces worksheets.

## **CORE KNOWLEDGE SEQUENCE:**

1. Velocity and speed.
2. Average speed = total distance/time ( $S = D/T$ )
3. The concept of force: force as a push or pull that produces a change in the state of motion of an object.
4. Unbalanced forces cause changes in velocity.
5. When immersed in a fluid, all objects experience a buoyant force.
6. How to calculate density of regular and irregular solids from measurements of mass and volume.
7. How to predict whether an object will float or sink.

## **COLORADO STATE STANDARDS:**

1. Interpret graphs of position versus time and speed versus time for motion in a single direction.
2. Know that force has both direction and magnitude and when an object is subject to two or more forces at once, the effect is the cumulative effect of all the forces.
3. Know that when forces on an object are balanced, the motion of the object does not change; when the forces are unbalanced, the object will change its motion.