Science 8 Forces, Fluids and Density Unit

Big Idea: **Are we all dense?**

Outcome:

FD8.1 Investigate and represent the density of solids, liquids, and gases based on the

 particle theory of matter.

Understandings:

 The particle theory illustrates the relationship between mass, volume and density of solids,

 liquids and gases.

 Different substances have different densities and we can find density experimentally.

 The density of a substance can change if the temperature changes.

Accuracy is increased through proper instrument use.

Examining relationships on graphs can help us determine variables.(Math connection)

Density changes can occur naturally or intentionally.

Essential questions:

1. How does the particle theory illustrate the relationship between mass, volume and density of solids, liquids and gases?
2. How can we calculate the density of substances?
3. How does a change in temperature affect the density of a substance?
4. How can I be more accurate?
5. How can graphs help to determine variables?
6. When do density changes occur in the world and how does this happen?

Students need to know: (essential questions they are related to are in brackets)

* Vocabulary/Concepts: mass, volume, density, solid, liquid, gas, displacement, regular, irregular, data, mass, tabular form, graphically, accuracy, precision, interpolate, extrapolate, formula, particle, matter
* Formula: d=m/v
* Units: g/mL, g/cm3
* Examples of density changes: lava cooling, water “turning over” mirages, how air balloon, churned cream

And be able to: (essential questions they are related to are in brackets)

 - Illustrate the relationship between mass, volume and density using the particle theory. (1)

- Design and carry out experiments to determine the density of various materials. (2)

- Calculate and compare the densities of common substances to water. (2)

- Identify the effects of changes in temperature on the density of solids, liquids and gases. (3)

-Use instruments safely, accurately and effectively

-Measure mass and volume.

-Record data in tabular form and graph.

-Interpolate and extrapolate graphs to calculate variables.

-Describe density changes in real life.