**Scientific Reasoning Model**

**Worksheet 3**

1. The gravitational energy of an object is directly proportional to the weight and height of the object.
   1. Write one science relationship for the gravitational energy of an object.
   2. If the weight of the object remains the same but the height is tripled, how will the gravitational energy change?
   3. By what factor will an object’s gravitational energy change if the height is tripled and the weight reduced by half?
   4. By what factor will an object’s gravitational energy change if the height is reduced by half and the weight is doubled?
2. The test scores of college students are directly proportional to the square of number of hours they study and inversely proportional to the number of classes they skip.
   1. Write one science relationship for the test scores of college students.
   2. By what factor will a students’ test score change if the number of hours they study doubles and the number of classes they skip remains constant?
   3. By what factor will a students’ test score change if the number of classes they skip doubles and the number of hours they study remains the same?
   4. By what factor will a students’ test score change is the number of hours they study is reduced by half and the number of classes they skip triples?
3. The centripetal force, Fc, on an object moving in a circle is directly proportional to the object’s mass and the square of its velocity. It is also inversely proportional to the radius of the object.
   1. Write one relationship for the centripetal force of an object.
   2. By what factor will the force change if the velocity of the object doubles, while the mass and radius remain constant?
   3. By what factor will the force change if the mass and velocity remain constant, while the radius is tripled?
   4. By what factor will the force change if the mass is doubled and the radius is quadrupled, while the velocity remains constant?

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