Physics – Energy

**UNIT VII: WS 3b Quantitative Bar Graphs and Problems**

For each situation shown below:

1. In the energy flow diagram show the system you choose to analyze. *Assume the systems to be frictionless unless stated otherwise.*

2. Complete the energy bar graph QUANTITATIVELY (numerically accurate).

3. In the space below each diagram use conservation of energy equations to solve for the quantity called for in the question.

2. Determine final velocity of the cart, assuming that 10% of the energy is dissipated by friction.

**Energy Flow**

**Diagram**

**0**

**EK**

**Eel**

**Initial**

**Eg**

**0**

**Final**

**EK**

**Eg**

**Eel**

**Eint**

**5**

**0**

**height (m)**

**v = 0**

**v = ?**

**m = 20 kg**

Chemistry – Compounds & Law of Definite Proportions

Chemistry – Unit 4 Worksheet 3

Use the following information about the masses of elements in each pair of compounds to help you suggest formulas that account for these ratios.

**4. Compounds of chlorine and iron**

Compound A: 56.0 g of Cl , 44.0 g of Fe

Compound B: 65.6 g of Cl , 34.4 g of Fe

a. Determine the value of the ratio  in each compound. A \_\_\_\_\_\_\_\_ B \_\_\_\_\_\_\_\_\_

b. How does the mass ratio for compound B compare to that in compound A?

c. For each hypothesis, sketch particle diagrams for the compounds of A and B that account for these mass ratios. Write the formula for the compound in each diagram.

**Hypothesis 1 Hypothesis 2**

|  |  |
| --- | --- |
| Atoms of Cl and Fe have the same mass | Atoms of Cl are heavier than Fe atoms by the ratio in compound A. |
| A | A |
| B | B |

Biology - Genetics – Dihybrid crosses

5. Suppose in a strain of soybeans, high oil (H) content in the seeds is dominant to low oil content and four seeds (E) in a pod is dominant to two seeds in a pod. A farmer crosses two soybean plants, both with high oil content and four seeds per pod. The resulting F1 offspring have a phenotypic ratio of 9:3:3:1 (High oil / four seeds : High oil / two seeds : Low oil / four seeds : Low oil / two seeds). What genotype were the parent plants?

Math & Astronomy

A piece of paper folded in half repeatedly four times reaches a thickness of 1 millimeter. How many times would you need to fold a piece of paper for its thickness to reach from Earth to the moon?

Your guess: \_\_\_\_\_\_\_\_\_\_

Now, solve for the actual answer. The Earth-moon distance is about 384,400 km.

How many times would you need to fold the paper in half to reach from the Earth to the sun? One astronomical unit is equal to 149,597,871 kilometers.