

Name: \_\_\_\_\_

Class Period: \_\_\_\_\_

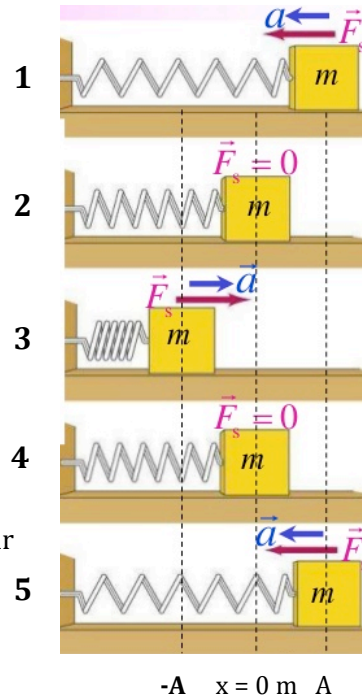
**Physics: SHM**  
**Energy of a Spring Homework**

**Conceptual Questions:**

1. On the image provided to the right label frames 1 – 5 with the kind or kinds of energy represented.
2. What does it mean that energy is conserved?

**Mathematical Questions**

3. A spring has a spring constant of 256 N/m. How far must it be stretched to give it an elastic potential energy of 48.0 J?



4. A 20 kg box is attached to a compressed spring that has a spring constant of 300 N/m. The box is resting on a frictionless surface and the spring is compressed 30 cm.
  - A. Draw a sketch of the spring and mass in the space below.
  - B. If the spring and box have not been released yet, what kind or kinds of energy will the system have?
  - C. How many joules of this kind of energy will there be?
  - D. What kind of energy will the spring have once the spring expands back to its natural length?
  - E. How many joules of energy will there be at the location described in D?
  - F. What will be the velocity of the spring at this location?

**\*See back for last question**

5. A spring ( $k = 29.4 \text{ N/m}$ ) is placed horizontally on a table with a  $0.450 \text{ kg}$  mass attached. The spring is compressed by  $0.18 \text{ m}$  and then released, allowing the mass to oscillate back and forth.
- A. What is the amplitude of this spring's motion?
  - B. What is the maximum amount of elastic potential energy of the system?
  - C. What is the maximum velocity of the mass?
  - D. Where during the spring's motion does this maximum velocity occur?