Card Sort Statements Answer Sheet – Cut each answer into a strip before handing to students.

1. Motion energy is called kinetic energy.

2. The total energy within a system changes only by the transfer of energy into or out of the system.

3. When the motion energy of an object changes, there is inevitably some other change in energy at the same time.

4. When two objects interact, each one exerts a force on the other that can cause energy to be transferred to or from the object.

5. Models can be used to represent systems and their interactions – such as inputs, processes, and outputs – and energy and matter flows within systems.

6. The motion of an object is determined by the sum of the forces acting on it; if the total force on the object is not zero, its motion will change.

7. The greater the mass of the object, the greater the force needed to achieve the same change in motion.

8. For any given object, a larger force causes a larger change in motion.

9. Buoyancy is the upward force exerted by a fluid that opposed the downward force of gravity on an object.

10. Humans cannot eliminate the hazards that result from natural processes (e.g., earthquakes, tsunamis, volcanic eruptions) but can take steps to reduce their impacts.

11. Testing a solution involves investigating how well it performs under a range of likely conditions.

12. Energy can be transferred in various ways and between objects.

13. Safely designing a solution to a problem involves the selection of the correct tools and resources.

14. The collection of data is used to inform the design and redesign of solutions to engineering challenges.

15. When designing a solution to a problem, it is important to continually redesign and make changes; however, it is necessary to document these changes.

16. Friction is a force that resists motion.

Statements 1, 2, 4, 7, 11, 14, and 15 are false on the student version (pp. 5-7)

*Instructor must cut each question into a separate strip prior to dispersing to students.

1. Motion energy is called potential energy.

2. The total energy within a system does not change by the transfer of energy into or out of the system.

3. When the motion energy of an object changes, there is inevitably some other change in energy at the same time.

4. When two objects interact, each one exerts a force on the other that can cause energy to be transferred from the object.

5. Models can be used to represent systems and their interactions – such as inputs, processes, and

outputs – and energy and matter flows within systems.

6. The motion of an object is determined by the sum of the forces acting on it.

7. The greater the mass of the object, the less force needed to achieve the same change in motion.

8. For any given object, a larger force causes a larger change in motion.

9. Buoyancy is the upward force exerted by a fluid that opposed the downward force of gravity on an object.

10. Humans cannot eliminate the hazards that result from natural processes (e.g., earthquakes,

tsunamis, volcanic eruptions), but can take steps to reduce their impacts.

11. Testing a solution involves investigating how well other think it will work.
12. Energy can be transferred in various ways and between objects.

13. Safely designing a solution to a problem involves the selection of the correct tools and resources.

14. The collection of data is never be used to inform the design and redesign of solutions to engineering challenges.

15. When designing a solution to a problem, it is important to continually redesign and make

changes; however, it is not necessary to document these changes.

16. Friction is a force that resists in motion.