Please type your responses below the questions/prompts. Be sure to use another color, preferably red, to separate your responses from the questions. Be careful to make sure the numbers stay the same. It can be easy to get them off track when adding responses. Keeping the question numbers straight will make it much easier for me to grade—and to score/enter them more quickly.

1. The terms force, work, and power, are used in many different contexts. Off the top of your head, without putting too much thought into it, write a sentence using each of the three words (three sentences).

2. Rank the following pictures in order from the one showing the greatest amount of work to the one showing the least amount of work? No need to look it up. Just do it at-a-glance.

| Student writing a paper | Girl pitching a softball | Man pushing a giant boulder that is not moving | Men carrying a couch up the stairs |

Justify your reasoning:

3. Yusef is shown pushing the spring down several times and letting it bounce back up. They do not address it in this part of the video, but what can one specifically say about the heat energy in this situation. Explain.

4. Approximate 8:00
The scientist says that if you push down on the spring, it compresses the material. It then wants to return to its original shape by pushing back. “Bent into a new shape and has given it some energy-so it pushes back- and it will give him SOME of the energy back.” Where does the rest of it go? Explain using proper terminology.
5. Approximately 14:30 – Dr. Peter Weyand
He says, “if a force is applied to an object, but the object doesn’t move, then it isn’t doing any work?” How can you justify that in the context of energy?

6. 18:45
What would you say if you were trying to explain the relationship between the relationship between force and energy to someone with little to no science background?

7. Why does a compressed spring supposedly have potential energy?

8. Creating and pasting/entering an illustration:
   a. Dr. Sally Salunas gives a really good verbal explanation and visual demonstration when talking about compressing and letting go of the spring. Create an illustration/model that further explains her spring discussion as she pushes the spring down and then lets go. Use the appropriate labels and terminology. (feel free to draw, scan and enter or draw, take a digital photo, and enter…just make sure it’s easy to read—see below)

   b. Make a second drawing pretending that she pushes the spring down TWICE as far. What are the differences? What does pushing it down twice as far do to the energy? (you can do both a & b in one illustration, side-by-side, if you’d like)

9. Approximately 22:00
One of the people in the video says, “not all of the energy stored in a system is always used to do work.” Why would it be almost impossible to capture the lost energy in the arrow/target example?

10. Approximately 23:30
Liza is surprised to notice that the nails get so hot while she is hammering them. Create a diagram that shows the complexities of the SYSTEM that is only composed of the hammer, the nail, the wood, and the surrounding air). Be sure to use all necessary terminology you feel are needed. Paste your picture/scanned image below:

11. Approximately 27:00
Ian and Angel drop two squeezeballs from above different heights onto the table. What happens to kinetic energy the balls were receiving before they hit the floor...after they hit the floor?
12. Approximately 28:00
The clip of the first graders shows a class that is younger than what most of us will be teaching. I think it makes a good point for a lot of different reasons, though. One of my favorite teaching phrases someone told me a long time ago was, “Experience first, terminology (jargon) after.” How is this pedagogical concept exemplified in the first grade ball/ramp/energy clip?

13. Approximately 31:00 – 36:30 or so
William and Andres…this is a really nice sequence. Notice how their ideas change as the actual interview and the hands-on things they are allowed to try progress. How could you relate this sequence to the following aspects of the Nature of Science (NOS):

   Observations & Inferences

   Science is Empirical

   Science is tentative (but durable)

   Scientific creativity

14. Approximately 41:00
The wheel in your electric motor spins rapidly when you use a lot of electrical power. It moves much more slowly when you use a little.

The power company bills you in kilowatt-hours because it wants to bill you for the total amount of ____________ you’ve used since the last bill. Pick the correct choice and explain why:

a.  Power  
b.  Energy  
c.  Force

   Explain your answer

15. Approximately 44:36 - Dr. Jaci VanHeest
During the interview/demo, she says she “must transfer energy at a faster rate—she must generate more power—must spin the crank faster…”

   -How can this hand-crank demo be used for a good explanation for the concepts of work, power, and energy? Briefly discuss the three.

16. Approximately the 47/48:00 minute mark:
The teacher is having a pretty tough time getting the students to think about the concepts she wants them to learn about. At times, it simply looks like glorified playtime—not necessarily any science learning going on (although it’s a great interactive museum exhibit opportunity). What
should she do in that situation to make sure the students are more involved and more accountable for their learning?

17. How does the higher water level result in more electrical output? Be sure to use the best possible terminology.

18. Approximately 50:20
   The plastic water wheel analogy for lighting up the dollhouse is pretty effective. Explain, in detail, how you could use the toy hand crank to make a better analogy than the water wheel to get across the same concepts and use the same terminology.
   (the toy hand cranks are easier to find)

19. Look back at question #1. Did you use the terms in more “everyday-speak” or did you create sentences that were more scientifically oriented? (no need to write…just think about it)

20. Looking back at Question #2. Do you feel correct about any of your choices? Is there anything you’d change? Just a couple short sentences will suffice.