Invisible Forces

Name: _____
Date: _____

Unit Assessment
ANSWER KEY

Multiple Choice

1. Why is it hard to win a tug-of-war against a group of teachers?
   a. Teachers try really hard.
   b. Teachers have more legs than students.
   c. Teachers have a lot of friction.
   d. Teachers can push really hard.

2. The last rubber band caused the watermelon to burst because _____.
   a. it was stronger than the other rubber bands.
   b. it was thicker than the other rubber bands.
   c. it was the last rubber band in the bag.
   d. it created a force that was greater than the force of the watermelon rind.

3. Why was a suspension bridge a good design for the Golden Gate Bridge in San Francisco?
   a. Ships had to pass underneath the bridge.
   b. It has a lot of pillars underneath to support it.
   c. The distance the bridge had to cross wasn't very long.
   d. The water under the bridge was very shallow.

4. Sandpaper sliders don't slide very fast because _____.
   a. sand makes the slider too heavy.
   b. sandpaper creates a lot of friction.
   c. it didn't have enough pennies on it.
   d. the slide isn't long enough.

5. Magnets attract _____.
   a. objects that contain iron.
   b. only other magnets.
   c. anything made of metal.
   d. things that are not too heavy.

Short Response

1. Why do hoppers hop off the table?

A less sophisticated response is: *Hoppers hop off of the table because of the rubber band.*

A more sophisticated response is: *The rubber band is stretched when the hopper is flat. The stretched rubber band is pulling on the sides of the cardboard. When you let go, the rubber band contracts and pulls the sides together causing the cardboard to push off of the table. This push makes the hopper fly up in the air.*

2. Why are pillar bridges and arch bridges stronger than board bridges?

pillar bridge arch bridge board bridge

A less sophisticated response is: *Board bridges don't have anything underneath to support them.*

A more sophisticated response is: *The force of people and cars pushes down on bridges. The pillars and arches push up from below to balance the downward push force from the people and cars. The board bridge does not have anything to provide the push from underneath.*

3. If you wanted to go down a slide faster, what are some things you could do? Why would those things help?

A less sophisticated response is: *You could make the slide more slippery, you could wear slippery clothes, or you could ride on a slippery material.*

A more sophisticated response is: *You could make the slide more slippery, you could wear slippery clothes, or you could ride on a slippery material. All of those things would make the friction force less strong, so the pull of gravity would bring you down the slide faster.*

4. Are paper clips magnets? Explain.

A less sophisticated response is: *Paper clips are not magnets but they do stick to magnets.*

A more sophisticated response is: *Paper clips are not magnets but they can become magnetized by coming in contact with magnets. The paper clips that are touching magnets can pick up other things made of iron and will stay magnetized for a short time after the magnet is removed.*