Science Education International
30(4), 373-382
https://doi.org/10.33828/sei.v30.i4.15

APPENDIX A

Content Assessment Items

Questions

1. A boy and a girl are sledding down a hill. The boy and the girl weigh the same, and they are using sleds that weigh the same. If the boy and girl are sledding at the same speed, which child has more kinetic energy?

a) The boy has more motion energy

b) The girl has more motion energy

c) Both of them have the same amount of motion energy[1]

d) Neither the boy nor the girl has any motion energy

2. Object 1 and Object 2 are traveling at the same speed, but the motion energy (kinetic energy) of Object 1 is greater than the motion energy of Object 2. Does Object 1 weigh more than, less than, or the same as Object 2?

a) Object 1 weights more than Object 2

b) Object 1 weights less than Object 2

c) Object 1 weights the same as Object 2

d) More information is needed to compare the weights of the objects

3. A girl is sitting and not moving in a chair and throws a ball. After she throws the ball, she remains still and watches the ball move through the air. While the ball is moving through the air, does the girl or the ball have more motion energy (kinetic energy), and why?

a) The girl has more motion energy because she is alive, and the ball is not

b) The girl has more motion energy because she weighs more than the ball

c) The ball has more motion energy because it is moving, and the girl is not

d) The ball has more motion energy because it is higher off the ground than the girl

4. A student places two books on a table. One book weighs less than the other book. Which book has less gravitational potential energy? (Consider the reference point to be the floor.)

a) The book that weighs less has less gravitational potential energy

b) The book that weighs more has less gravitational potential energy

c) Both books have the same amount of gravitational potential energy

d) Neither book has any gravitational potential energy

5. A girl and a boy are each holding a ball. The girl throws her ball, and the boy drops his ball. Which statement describes the motion energy (kinetic energy) of the balls while they are moving through the air?

a) Both the ball that was thrown and the ball that was dropped have motion energy

b) The ball that was thrown has motion energy, but the ball that was dropped does not

c) The ball that was dropped has motion energy, but the ball that was thrown does not

d) Neither the ball that was thrown nor the ball that was dropped has motion energy

6. Is energy transformed while a rock is falling from a cliff? Explain

a) Yes, motion energy (kinetic energy) is transformed into gravitational potential energy as the rock falls

b) Yes, gravitational potential energy is transformed into motion energy (kinetic energy) as the rock falls

c) No, because the rock lost all of its gravitational potential energy once it started to move

d) No, because one form of energy cannot be transformed into another form of energy

7. A student compresses a spring. How does the elastic energy of the spring change when the student compresses it?

a) The elastic energy of the spring increases when the student compresses it

b) The elastic energy of the spring decreases when the student compresses it

c) The elastic energy of the spring does not change when the student compresses it

d) More information is needed to tell how elastic energy changes

[1]Correct selection in italics