



Coherence and Alignment Among Science Curriculum, Instruction, and Assessment (CASCIA) Project

Grade 8 Unit 1: Forces and Energy

Task 3 Prompt 4 Scored and Annotated Anchor Set

August 2024

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CASCIA Grade 8 EOU Assessment 1 Task 3: Roller Coaster Thrills

Prompt 4 Score Point 3

Prompt 4 Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 4	No aspect of the response is correct	Response includes one (1) of the three (3) aspects	Response includes two (2) of the three (3) aspects	Response includes the following aspects: Part A - Identifies Kingda Ka as the roller coaster with greater kinetic energy AND Part B - Provides comparison of KE using the data from Tables 1 & 2 - Provides evidence showing Kingda Ka has greater kinetic energy than Millennium Force	NA

Score Point 3 (3/3 aspects met)

- Part A
 - Identifies Kingda Ka as the roller coaster with greater kinetic energy.
- Part B
 - Provides a comparison of KE using the data from Tables 1 & 2.
 - Provides evidence showing Kingda Ka has greater kinetic energy than Millennium Force.

Part A.

Write a claim about which roller coaster, Kingda Ka OR Millennium Force, has the greater kinetic energy as it reaches the bottom of the tallest drop on the track. (Assume the mass of each empty roller coaster is the same.)

The Kingda Ka will have the greater kinetic energy at the bottom of the tallest drop of the track because velocity has a greater effect on KE than mass.

Part B.

Support your claim using:

- The relationship of kinetic energy to the mass of an object
- The relationship of kinetic energy to the speed of an object
- Data in Table 1 and Table 2

In data table 1 I observed that the greater the velocity of an object the higher the kinetic energy of that object. This means that since the velocity of Kingda Ka is greater the KE in turn will also be greater. Also in previous data table we saw $KE = \frac{1}{2}mv^2$ which shows us that velocity effects KE more than mass so, Kingda Ka will have a greater KE than Millennium Force because it has a higher velocity.

CASCIA Grade 8 EOU Assessment 1 Task 3: Roller Coaster Thrills

Prompt 4 Score Point 2

Prompt 4 Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 4	No aspect of the response is correct	Response includes one (1) of the three (3) aspects	Response includes two (2) of the three (3) aspects	Response includes the following aspects: Part A - Identifies Kingda Ka as the roller coaster with greater kinetic energy AND Part B - Provides comparison of KE using the data from Tables 1 & 2 - Provides evidence showing Kingda Ka has greater kinetic energy than Millennium Force	NA

Score Point 2 (2/3 aspects met)

- Part A
 - Identifies Kingda Ka as the roller coaster with greater kinetic energy.
- Part B
 - Does **NOT** provide a comparison of KE using the data from Tables 1 & 2.
 - Provides evidence showing Kingda Ka has greater kinetic energy than Millennium Force.

Part A.

Write a claim about which roller coaster, Kingda Ka OR Millennium Force, has the greater kinetic energy as it reaches the bottom of the tallest drop on the track. (Assume the mass of each empty roller coaster is the same.)

Kingda Ka will have a greater kinetic energy because it's the tallest and has more velocity.

Part B.

Support your claim using:

- The relationship of kinetic energy to the mass of an object
- The relationship of kinetic energy to the speed of an object
- Data in Table 1 and Table 2

The kinetic energy will be higher since there is more speed on the ride.

CASCIA Grade 8 EOU Assessment 1 Task 3: Roller Coaster Thrills

Prompt 4 Score Point 1

Prompt 4 Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 4	No aspect of the response is correct	Response includes one (1) of the three (3) aspects	Response includes two (2) of the three (3) aspects	Response includes the following aspects: Part A - Identifies Kingda Ka as the roller coaster with greater kinetic energy AND Part B - Provides comparison of KE using the data from Tables 1 & 2 - Provides evidence showing Kingda Ka has greater kinetic energy than Millennium Force	NA

Score Point 1 (1/3 aspects met)

- Part A
 - Identifies Kingda Ka as the roller coaster with greater kinetic energy.
- Part B
 - Does **NOT** provide a comparison of KE using the data from Tables 1 & 2.
 - Does **NOT** provide evidence showing Kingda Ka has greater kinetic energy than Millennium Force.

NOTE: The student response is restating the claim.

Part A.

Write a claim about which roller coaster, Kingda Ka OR Millennium Force, has the greater kinetic energy as it reaches the bottom of the tallest drop on the track. (Assume the mass of each **empty** roller coaster is the same.)

The Kingda Ka has a higher kinetic energy because they have more velocity.

Part B.

Support your claim using:

- The relationship of kinetic energy to the mass of an object
- ☒ The relationship of kinetic energy to the speed of an object
- Data in Table 1 and Table 2

the kinetic energy is gonna be higher if the speed is faster.

CASCIA Grade 8 EOU Assessment 1 Task 3: Roller Coaster Thrills

Prompt 4 Score Point 0

Prompt 4 Rubric

Prompt	Score Point 0	Score Point 1	Score Point 2	Score Point 3	Score Point 4
Prompt 4	No aspect of the response is correct	Response includes one (1) of the three (3) aspects	Response includes two (2) of the three (3) aspects	Response includes the following aspects: Part A - Identifies Kingda Ka as the roller coaster with greater kinetic energy AND Part B - Provides comparison of KE using the data from Tables 1 & 2 - Provides evidence showing Kingda Ka has greater kinetic energy than Millennium Force	NA

Score Point 0 (0/3 aspects met)

- Part A
 - Does **NOT** identify Kingda Ka as the roller coaster with greater kinetic energy.
- Part B
 - Does **NOT** provide a comparison of KE using the data from Tables 1 & 2.
 - Does **NOT** provide evidence showing Kingda Ka has greater kinetic energy than Millennium Force (i.e., The student states that mass has the greater effect on KE).

Part A. 30 ← 15

Write a claim about which roller coaster, Kingda Ka OR Millennium Force, has the greater kinetic energy as it reaches the bottom of the tallest drop on the track. (Assume the mass of each empty roller coaster is the same.)

The Millenium Force has the greater kinetic energy because the mass of the people increase the velocity.

Part B.

Support your claim using:

- The relationship of kinetic energy to the mass of an object
- The relationship of kinetic energy to the speed of an object
- Data in Table 1 and Table 2

The amount of kinetic energy because of the mass is much larger than the KE because of the speed. We saw how the more mass gives a greater impact then the more velocity with the roller coasters.