# Kinetic Energy, Mass, and Speed: Part 1

Kinetic energy is energy of motion. The kinetic energy of an object depends on its **mass** and **speed**.

Use the information in the tables to answer the questions below. The first one is done for you as an example.

1. Kenneth and Rachel are skating at the local ice rink. Fill in the blanks to compare the two skaters.

Ice Skater	Mass (kg)	Speed (m/s)	Kinetic Energy (J)
Kenneth	100	4	800
Rachel	50	4	400

a. Kenneth's mass is __2 times__ Rachel's mass.

b. Kenneth's speed is __equal to__ Rachel's speed.

c. Kenneth's kinetic energy is __2 times__ Rachel's kinetic energy.
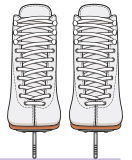
2. A wildebeest and a lion are running in the grassland. Fill in the blanks to compare the two mammals.

Mammal	Mass (kg)	Speed (m/s)	Kinetic Energy (kJ)
Wildebeest	250	20	50
Lion	125	20	25

a. The lion's mass is ___$\frac{1}{2}$___ the wildebeest's mass.

b. The lion's speed is __equal to__ the wildebeest's speed.

c. The lion's kinetic energy is ___$\frac{1}{2}$___ the wildebeest's kinetic energy.

3. A horse and her foal are galloping on the beach. Fill in the blanks to compare the two horses.

Horse	Mass (kg)	Speed (m/s)	Kinetic Energy (hJ)
Charlie	600	12	432
Spirit	200	12	144

a. Charlie's mass is __3 times__ Spirit's mass.

b. Charlie's speed is __equal to__ Spirit's speed.

c. Charlie's kinetic energy is __3 times__ Spirit's kinetic energy.

4. Two bowling balls are rolling down separate lanes in a bowling alley. Based on what you've learned about the relationship between kinetic energy and mass from the questions above, complete the table.

Bowling Ball	Mass (kg)	Speed (m/s)	Kinetic Energy (J)
Purple Ball	6	6	108
Orange Ball	3	6	54

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Keep going! Answer the questions below.

5. Mike and Drew are swimming in the pool at the Homestead Community Center. Fill in the blanks to compare the two swimmers.

Swimmer	Mass (kg)	Speed (m/s)	Kinetic Energy (J)
Mike	72	1	36
Drew	72	2	144

a. Drew's mass is __equal to__ Mike's mass.

b. Drew's speed is __2 times__ Mike's speed.

c. Drew's kinetic energy is __4 times__ Mike's kinetic energy.

6. Brianna takes her two dogs, Abby and Snoopy, to run around the dog park. Fill in the blanks to compare the two dogs.

Dog	Mass (kg)	Speed (m/s)	Kinetic Energy (J)
Abby	30	7	735
Snoopy	30	14	2,940

a. Abby's mass is __equal to__ Snoopy's mass.

b. Abby's speed is __$\frac{1}{2}$__ Snoopy's speed.

c. Abby's kinetic energy is __$\frac{1}{4}$__ Snoopy's kinetic energy.

7. Kati and Cambray are both running on the field during their soccer match. Fill in the blanks to compare the two soccer players.

Soccer Player	Mass (kg)	Speed (m/s)	Kinetic Energy (J)
Kati	54	6	972
Cambray	54	2	108

a. Kati's mass is __equal to__ Cambray's mass.

b. Kati's speed is __3 times__ Cambray's speed.

c. Kati's kinetic energy is __9 times__ Cambray's kinetic energy.

8. Karen and Jhanvi are riding bikes around their neighborhood. Based on what you've learned about the relationship between kinetic energy and speed from the questions above, complete the table.

Biker	Mass (kg)	Speed (m/s)	Kinetic Energy (J)
Karen	52	16	6,656
Jhanvi	52	8	__1,664__

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