

Name _____ Date: _____ Period: _____ Score: ____/10

Collisions and Conservation of Momentum

Visit the website [Conservation of Momentum](#) & complete the following:

1. What is the formula for momentum?
2. How much momentum does a stationary object have? Why?
3. Complete the tables:

Crash #1

| Head on Collision | Direction Before | Momentum before | Direction after | Momentum after |
|---------------------------------|------------------|-----------------------|-----------------|----------------------|
| Vehicle 1 1000 kg @ 50km/hr | → | | | |
| Vehicle 2 1000 kg @ 10 km/hr | ← | | | |
| | | Total Momentum Before | | Total Momentum After |

Number of Correct Predictions: 1 2 3 4

Make a diagram of the cars before the collision:

Make a diagram of the cars after the collision:

What happened to the momentum of Vehicle 1 after the collision? Why?

Crash #2

| Head on Collision | Direction Before | Momentum before | Direction after | Momentum after |
|--------------------------------|------------------|-----------------------|-----------------|----------------------|
| Vehicle 1 1000 kg @ 50km/hr | → | | | |
| Vehicle 2 1000 kg @ 0 km/hr | stationary | | | |
| | | Total Momentum Before | | Total Momentum After |

Number of Correct Predictions: 1 2 3 4

Make a diagram of the cars before the collision:

Make a diagram of the cars after the collision:

Crash #3

| Rear End Collision | Direction Before | Momentum before | Direction after | Momentum after |
|---------------------------------|------------------|-----------------------|-----------------|----------------------|
| Vehicle 1 1000 kg @ 50km/hr | → | | | |
| Vehicle 2 1000 kg @ 10 km/hr | → | | | |
| | | Total Momentum Before | | Total Momentum After |

Number of Correct Predictions: 1 2 3 4

Make a diagram of the cars before the collision:

Make a diagram of the cars after the collision:

Complete one more of your choosing!

Crash #4

| _____ Collision | Direction Before | Momentum before | Direction after | Momentum after |
|-------------------------------------|------------------|-----------------------|-----------------|----------------------|
| Vehicle 1 _____ kg @ 50km/hr | → | | | |
| Vehicle 2 _____ kg @ _____ km/hr | | | | |
| | | Total Momentum Before | | Total Momentum After |

Questions:

1. Type of collision where car 1 would slow down but still be going in the same direction:

| | | |
|------------------|--------------------|---------------------------------------|
| Vehicle 1 | 1000 Kg or 3000 Kg | 50 km/hr -> |
| Vehicle 2 | 1000 Kg or 3000 Kg | <- 10 km/hr 0 km/hr 10 km/hr -> |

2. 2 different collisions that would cause car 1 would change directions:

| | | |
|------------------|--------------------|---------------------------------------|
| Vehicle 1 | 1000 Kg or 3000 Kg | 50 km/hr -> |
| Vehicle 2 | 1000 Kg or 3000 Kg | <- 10 km/hr 0 km/hr 10 km/hr -> |

| | | |
|------------------|--------------------|---------------------------------------|
| Vehicle 1 | 1000 Kg or 3000 Kg | 50 km/hr -> |
| Vehicle 2 | 1000 Kg or 3000 Kg | <- 10 km/hr 0 km/hr 10 km/hr -> |

3. Type of collision where car 1 would stop:

| | | |
|------------------|--------------------|---------------------------------------|
| Vehicle 1 | 1000 Kg or 3000 Kg | 50 km/hr -> |
| Vehicle 2 | 1000 Kg or 3000 Kg | <- 10 km/hr 0 km/hr 10 km/hr -> |

4. Describe a collision where car 1 and car 2 would have the same speed after the collision

| | | |
|------------------|--------------------|---------------------------------------|
| Vehicle 1 | 1000 Kg or 3000 Kg | 50 km/hr -> |
| Vehicle 2 | 1000 Kg or 3000 Kg | <- 10 km/hr 0 km/hr 10 km/hr -> |

5. Is it possible to make car 1 speed up? Why or why not?

6. What type of collisions are shown in this simulation? Elastic or inelastic? How do you know?

7. Explain why momentum conserved.

