

Unit 8.1

Contact Forces

**Why do things sometimes get damaged
when they hit each other?**

STUDENT WORKBOOK

SAMPLE



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Name: _____

Date: _____

Initial Model: Objects During Collisions

What two objects collided? _____ and _____

Is this a scenario from A, B, or C? _____

Was there damage in this collision? _____

Imagine you had special glasses that could stop time and let you watch both objects. Describe what you think you would see happening at these two points in time:

Time point 1: What would you see the materials they were made of doing if you could stop time the moment they first touch?

Time point 2: What would you see the materials they were made of doing if you could stop time a split second later?

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Name: _____

Date: _____

Object Interactions During A Collision

Changes we could see: Now think about what you would see happening in between time point 1 and time point 2. Would you see any changes happening in each of the objects? How does that help explain why the object was damaged or not damaged?

Interactions we cannot see: Now think about the interactions between time point 1 and time point 2 that you cannot see happening. What interactions would be happening? How does that help explain why the object was damaged or not damaged?

- If you picked a collision with no damage, how would the interactions between the same objects have to change to cause damage in a collision?
- If you picked a collision that caused damage, how would the interactions between the same objects have to change to not cause damage in a collision?

Exploring Horizontal Collisions

Our investigation question:

The two colliding objects	Object 1 (part of cart subsystem 1)		Object 2 (part of cart subsystem 2)	
	Was there a change in motion? (yes / no) If yes , did its direction, speed, or both change?	Did the shape of the object change? (yes / no) If yes , when did you see it happening? (during the collision, after the collision, or both)	Was there a change in motion? (yes / no) If yes , did its direction, speed, or both change?	Did the shape of the object change? (yes / no) If yes , when did you see it happening? (during the collision, after the collision, or both)

Claim and Observations Organizer

My initial claim		
All solid objects _____ bend or change shape when pushed in a collision.		
Data source	Observations	Does this support or refute your claim?
Slow-moving car colliding with a stationary car		
Moving golf club colliding with a stationary golf ball		
Moving baseball colliding with a stationary bat		

SAMPLE