

**Activity 5: What is Transferred?**

Name \_\_\_\_\_

Date \_\_\_\_\_

Class \_\_\_\_\_

**Key Question**

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**We Think**

1. What do you think is transferred to the ball during the kick and stays with the ball after the foot is no longer touching it? Force, energy, neither, or both? Write your reasoning.

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**Explore Your Ideas****Part A: Motion of a Car during and after a Push**

1. Describe the motion of the low-friction car when you exert a *steady push*. Does it speed up or have a constant speed?

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2. How is the motion of the car different from its motion in Step 1?

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Complete *rows one and two* of the table below. (Friction and drag are so small that you can ignore them.)

Table: Motion of Car during and after a Push	
	Did the car speed up or have a constant speed?
1. During the constant push (Step 1)	
2. After the quick push was over (Step 2)	
3. During the constant push from simulator (simulator running and space bar pressed)	
4. After the quick push from the simulator was over (simulator running and space bar pressed then released)	

**Part B: Using a Simulator Push a Car**

3. Does the length of the red speed arrow *increase, decrease, or stay the same* while you are holding down the space bar? What does that indicate?

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4. Does the length of the red speed arrow *increase, decrease, or stay the same* after you let go of the space bar? What does that indicate?

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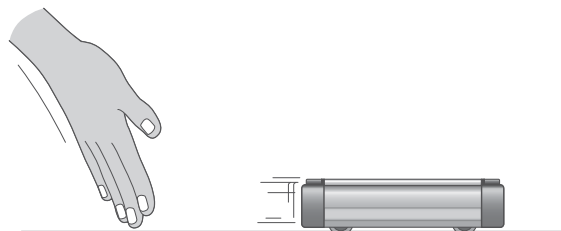
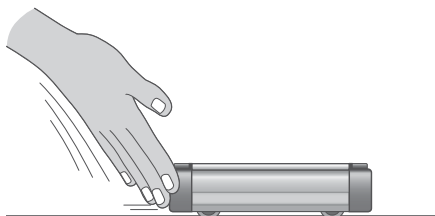
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Complete rows *three and four* of the table on the previous page.

5. Which of the two sketches below is best modeled by the simulator if you *press then release the space bar*? Circle it and explain why you chose that sketch.




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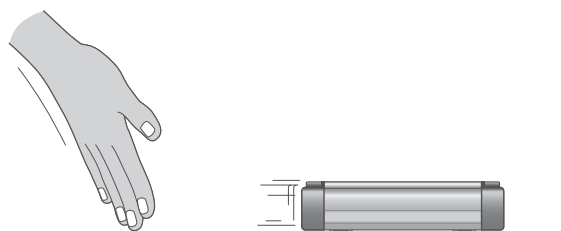
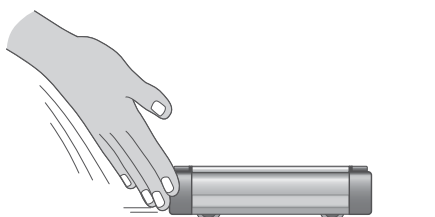


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6. Which of the two sketches below is best modeled by the simulator if you *press and hold down the space bar*? Circle it and explain why you chose that sketch.




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**Make Sense of Your Ideas**

1. Using the actual equipment and using the simulator, what happens to the car’s motion when there is a constant push on the car?

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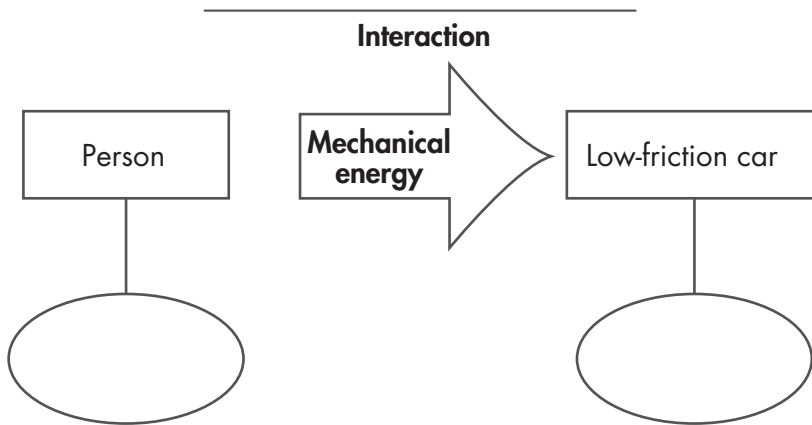


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2. Complete the energy diagram for the low-friction car while it is being pushed.



3. Based on the motion of the car, is there still a force from your hand being exerted on the car even after the car and your hand are no longer interacting?

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4. Based on the motion of the car, does the car have motion energy even after the car and your hand are no longer interacting?

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## Our Consensus Ideas

The key question for this activity is:



**What is given to an object during an interaction and stays with the object after the interaction is over?**

1. Write your answer to the key question.

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2. Write the class consensus ideas about the key question.

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