RECORD SHEET

Activity 3: Following the Energy Changes

Name Date Class

Key Question

We Think

1. In a mechanical interaction (an applied, friction, drag, or elastic interaction), do you think the energy always changes in the source? If so, does it increase or decrease? Write your reasoning.

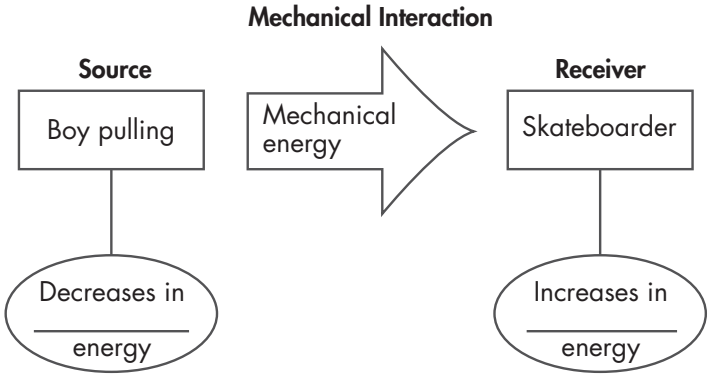
2. In a mechanical interaction, do you think the energy always changes in the receiver? If so, does it increase or decrease? Write your reasoning.

Explore Your Ideas

Part A: Energy Diagrams for Applied Interactions

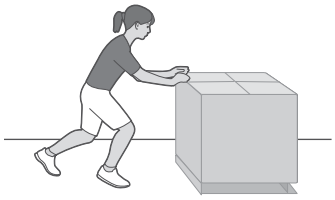
In an applied interaction, two non-stretchy objects push or pull on each other.

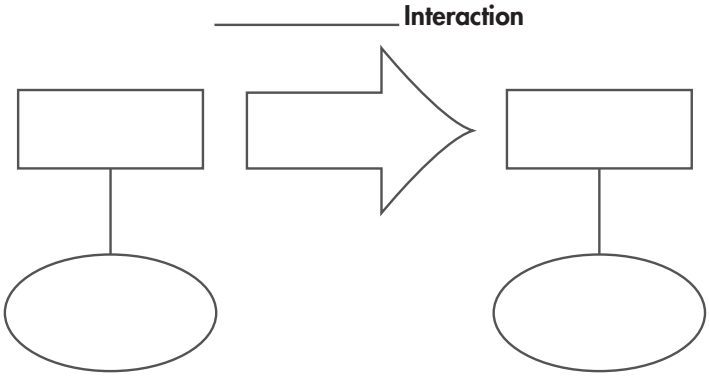
1. A boy pulls a skateboarder faster and faster. Complete the ovals in the energy diagram.



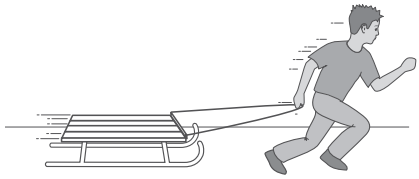
Complete energy diagrams to describe the following *applied* interactions.

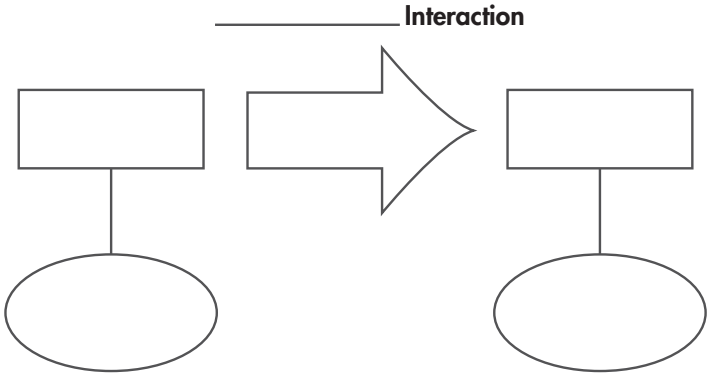
2. A person pushes a cart faster and faster.



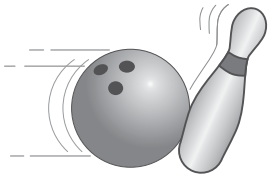


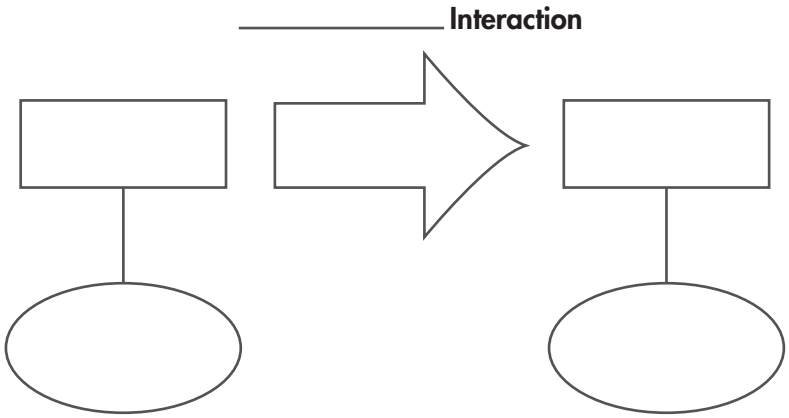
3. A person pulls a sled faster and faster.





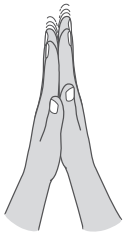
4. A bowling ball strikes a bowling pin.

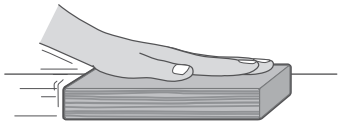




Part B: Energy Diagrams for Friction Interactions

In all friction interactions, two surfaces rub against each other.



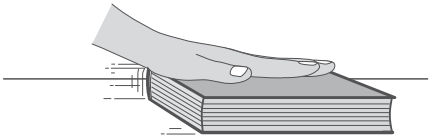


5. In both cases shown above, what was the evidence that a friction interaction had occurred?

Rubbing hands:

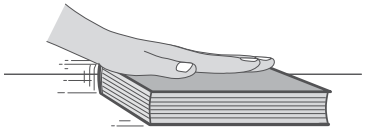
Wooden block rubbed along table:

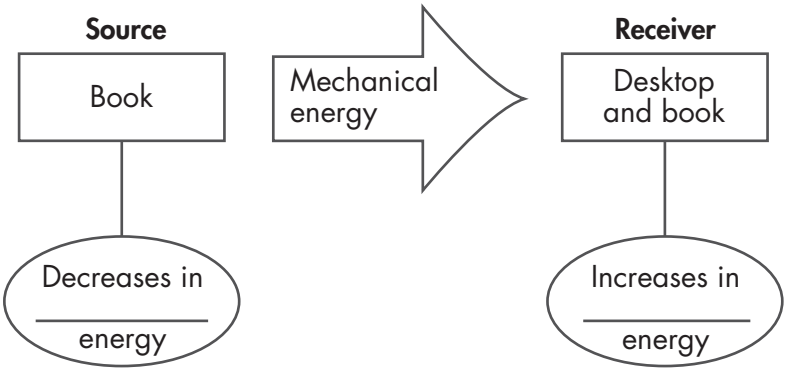
6. What is the evidence that a friction interaction is occurring when you rub your palms together?



7. What do you observe in the interaction shown between the book and desktop above?

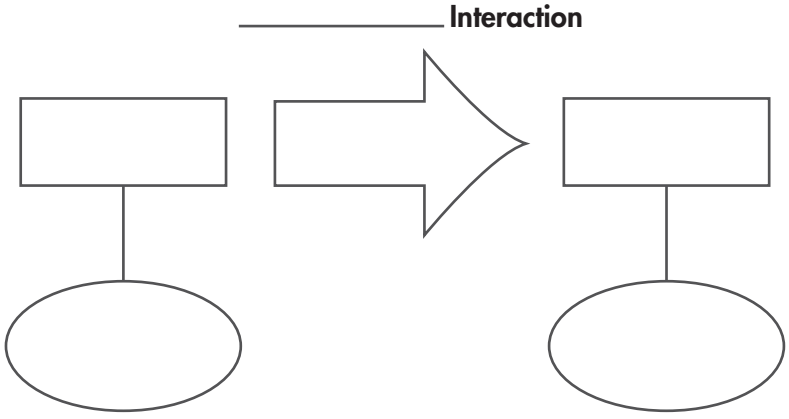
8. Complete the energy diagram for the book sliding across the table.



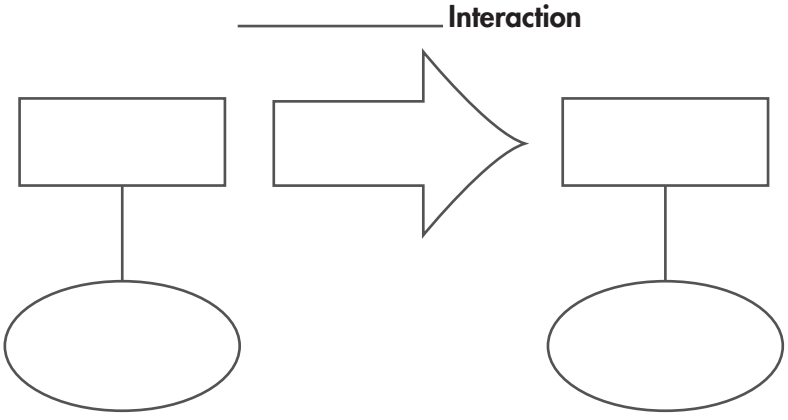


Draw energy diagrams to describe the following *friction* interactions.

9. A snow skier is slowing down.



10. A skateboard is slowing down on smooth pavement. A friction interaction occurs between the skateboard and the rubbing parts in the wheels.

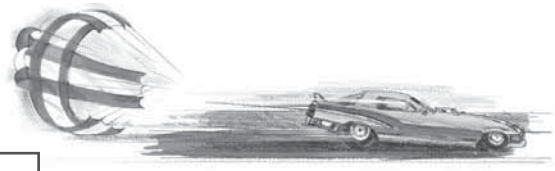


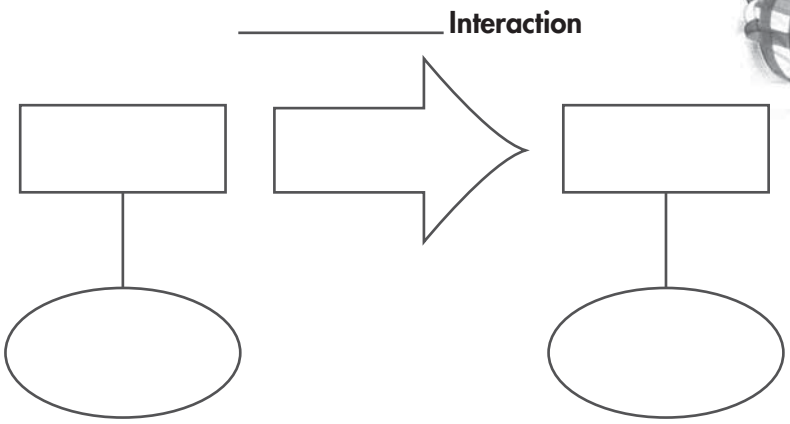
11. In general, what evidence is there that a friction interaction has occurred?

Part C: Energy Diagrams for Drag Interactions

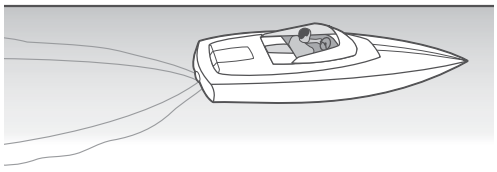
Draw energy diagrams to describe the following *drag* interactions.

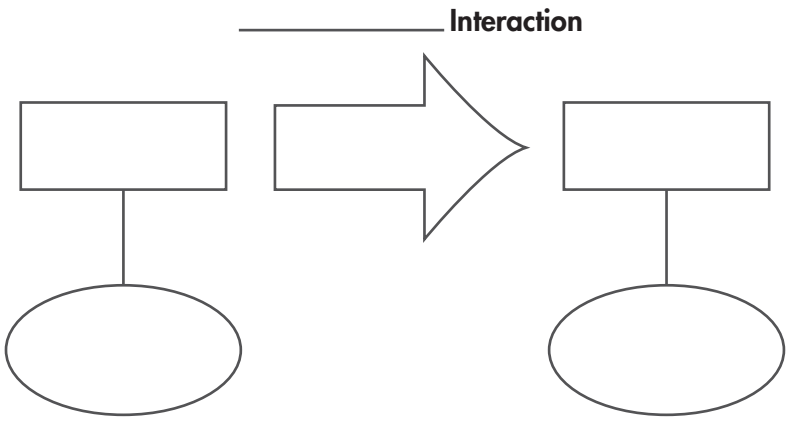
12. A racing car with a parachute is slowing down.



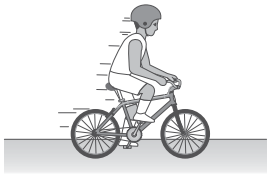


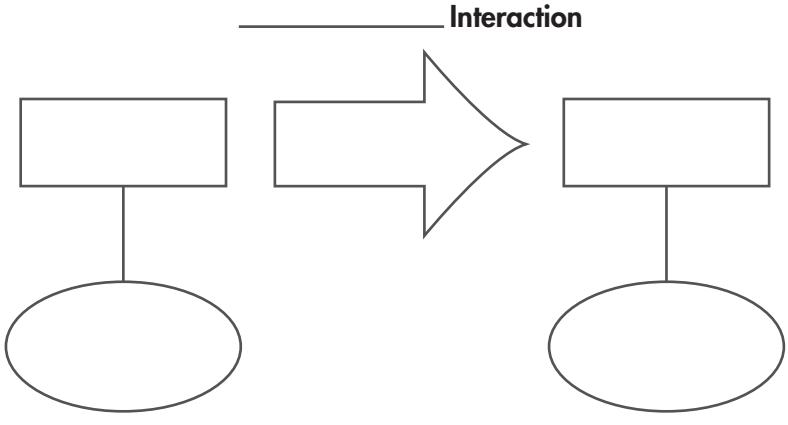
13. A boat in water is slowing down.





14. The air is slowing down a bike rider.





Make Sense of Your Ideas

1. In general, what evidence shows that an applied interaction has occurred?

2. In general, what evidence shows that a friction interaction has occurred?

3. In general, what evidence shows that a drag interaction has occurred?

Our Consensus Ideas

The key question for this activity is:

What happens to the energy in applied, friction, and drag interactions?

1. What happens to the energy in *applied mechanical interactions*?

2. What happens to the energy in a *friction mechanical interaction*?

3. What happens to the energy in a *drag mechanical interaction*?