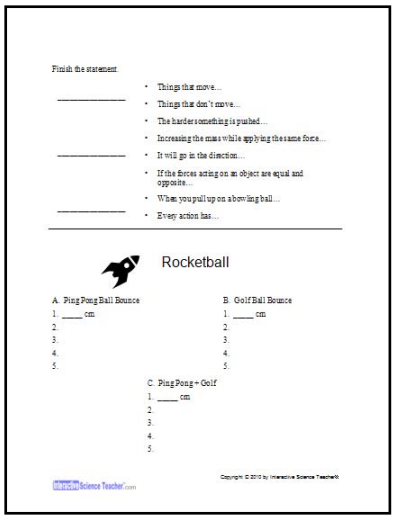
Newton's Laws And Rocketball


Finish the statement.

_____
- Things that move…
- Things that don't move…
- The harder something is pushed…

_____
- Increasing the mass while applying the same force…
- It will go in the direction…
- If the forces acting on an object are equal and opposite…

_____
- When you pull up on a bowling ball…
- Every action has…

Rocketball

A. Ping Pong Ball Bounce
1. ____ cm
2.
3.
4.
5.

B. Golf Ball Bounce
1. ____ cm
2.
3.
4.
5.

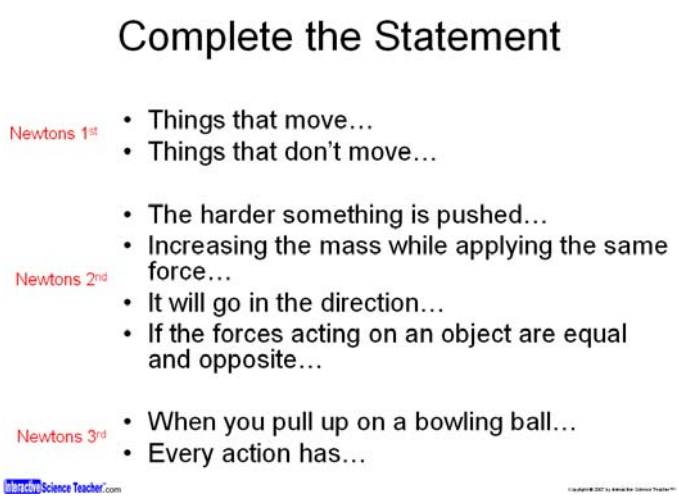
C. Ping Pong + Golf
1. ____ cm
2.
3.
4.
5.

In this lesson students won't have a chance to get scared of Newton's 3 laws. First, they will write a definition of each law in their own words. Then they'll get to observe Newton's 3 Laws of motion cause a ping pong ball to become like a rocket.

1. Warm students up by having them complete these 3 sets of statements. Give them the statements first, before telling them we're even talking about laws of motion. (This is available as a Student Handout- see last page.)

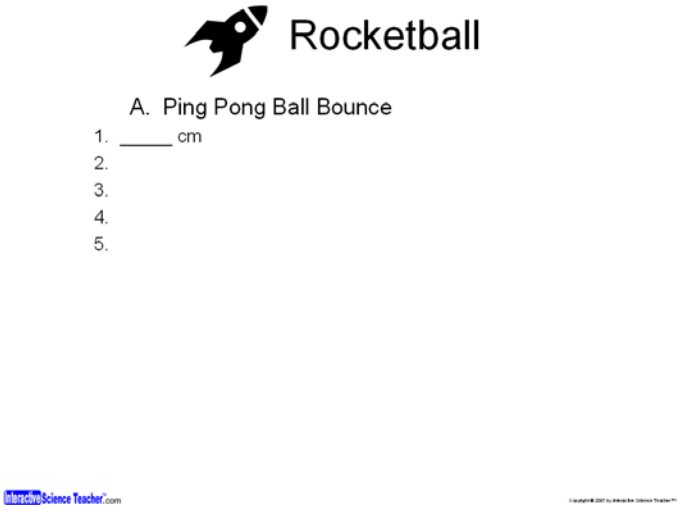
Newton's 1st	• Things that move… • Things that don't move…
Newton's 2nd	• The harder something is pushed… • Increasing the mass while applying the same force… • It will go in the direction… • If the forces acting on an object are equal and opposite…
Newton's 3rd	• When you pull up on a bowling ball… • Every action has…

This is also available as a PowerPoint (see last page)



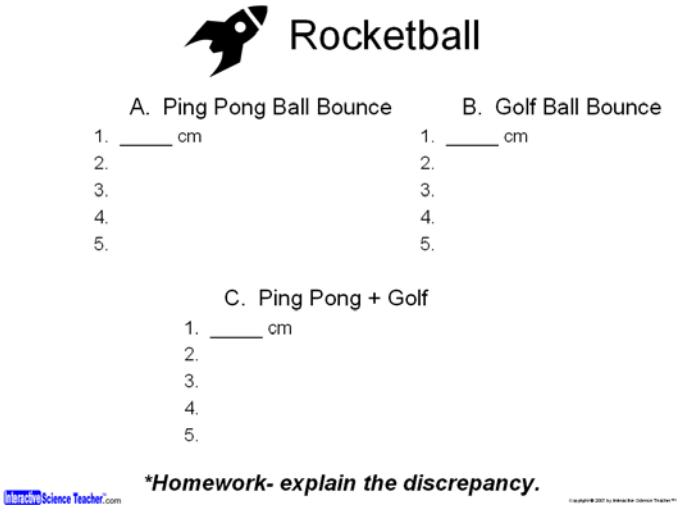
2. Next is a follow-up activity that demonstrates all 3 Newton's Laws in action. It also provides a puzzling discrepant event.

3. Give students in small groups a ping pong ball and a meter stick. Have them all drop the ping pong ball from a set distance (say, 50 cm) and record how far the ping pong ball bounces back to. Do at least 5 times, as shown.



4. Collect the ping pong balls from them and give each group a golf ball, and drop from 50 cm and record its rebound 5x or more.

5. Give them back the ping pong ball, with instructions to now drop them together with the ping pong ball on top of the golf ball. If dropped properly, when they hit the surface together, energy will transfer from the golf ball below to the ping pong ball on top, shooting it off like a rocket!



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6. The reason this occurs is because the golf ball is more massive, so it has more energy in it than the ping pong ball. Think of how much energy it takes to just hold a bowling ball. Now, a golf ball is not that massive, but it does take more energy to hold it in their air than the ping pong ball. So when the balls hit the table top, energy from the more massive object (golf ball) transfers to the less massive one (ping pong ball). It's like putting the engine of a high-performance car into a scooter.

Student Handout

Finish the statement.

_____
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