

## Forces Drop Test

We all know that heavier objects fall faster than lighter ones, right? Send this handout home with students for them to prove that that indeed is the case. And tomorrow, almost all will return with surprising results.

This lesson addresses a lot of the misunderstanding that exists in science today- people just aren't doing enough *thinking*. Your students have been told that all objects, regardless of mass, will fall at the same rate (not including air resistance). Yet most will confidently predict that the heavier object will fall faster. Oh well. That just means we can have some fun at their expense in this lesson.

\*Your homework- Forces move things. Gravity, the one we always forget about, is always active. But is it fair to all objects? At home tonight drop a heavy and lightweight unbreakable object at the same time from the same height, and record what happens. Don't forget to predict what you think will happen before starting.

My heavy object is a \_\_\_\_\_

My lightweight object is a \_\_\_\_\_

I predict that when both are dropped at the same time from the same height...

The heavy one will land first.  
 The light one will land first.  
 They will both land at the same time.  
 Other guess: \_\_\_\_\_

Results- check which hit first for each drop

	Heavy	Light	Tie
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

And the winner is \_\_\_\_\_

Comments, Thoughts- What are you thinking right now? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Apollo 13 hammer and feather drop on the moon: <http://www.youtube.com/watch?v=MJyUDpm9Kvk>

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Open the lesson:

“*Forces* move things. Gravity, the one we always forget about, is always active. But is it fair to all objects? At home tonight drop a heavy and lightweight unbreakable object at the same time from the same height, and record what happens. Don't forget to predict what you think will happen before starting.”

Have them take out a sheet of paper (if you're not using the Student Handout- see last page) and name the two objects, one heavy and one light, they will use. Next, have them predict which will hit the ground first when dropped together. They are to drop them 10 times (good science repeats experiments) and record the results. Below the results, ask them to write a few sentences describing their reaction to this drop test.

There is also a PowerPoint that would be helpful to use when explaining how to do the homework assignment (clarity is always good).

The next day, go over answers. Be ready for students who chose things that slowed because of air resistance (like tissue or a piece of paper). Go into inquiry mode when those come up- let students figure out themselves what's going on.

This YouTube video shows what happens when you drop a hammer and feather on the moon's surface- <http://www.youtube.com/watch?v=MJyUDpm9Kvk> . Show it after a rich discussion, when students finally see that all things fall at the same rate.

If you have a well-stocked science classroom, you might even have a vacuum tube that you can put a feather and other small object in to demonstrate this.

Come back and visit [InteractiveScienceTeacher.com](http://InteractiveScienceTeacher.com) to upgrade this lesson with:

## PowerPoint- lead your students through the answers click-by-click

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## Student Handout

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3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Add the winner is \_\_\_\_\_

Comments, Thoughts- What are you thinking right now?

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Apoll 13 hammer and feather drop on the moon: <http://www.nasa.gov/images/content/176412main13>

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**Unbreakable!** My heavy object is a **Ex.- baseball, book, piece of wood**  
My lightweight object is a **Ex.- paper clip, pencil**

I predict that when both are dropped at the same time from the same height...

- The heavy one will land first  
 The light one will land first  
 They will both land at the same time  
 Other guess: \_\_\_\_\_

Results- check which hit first for each drop

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7.			

Drop 10x

Check after each drop