Gravity and Force

10/3/14

- ***Mass:*** A property of an object. A measure of the amount of "stuff" or matter contained in an object. Measured in slugs (English) or grams (metric)

- ***Weight:*** <u>The force due to gravity</u> on an object. The force with which an object is pulled to Earths' (or other planet/moon) surface. Measured in pounds (English) or Newtons (metric).

Weight

What weighs more?

A. heavier objects

B. lighter objects

C. they weigh the same

Gravity

Weight measures the force of gravity

Gravity pulls

A. Harder on heavier objects
B. Harder on lighter objects
C. The same on all objects

Gravity

- Gravity is a force that **pulls** downward
- *Weight* measures the force of gravity

Gravity pulls

A. Harder on heavier objects

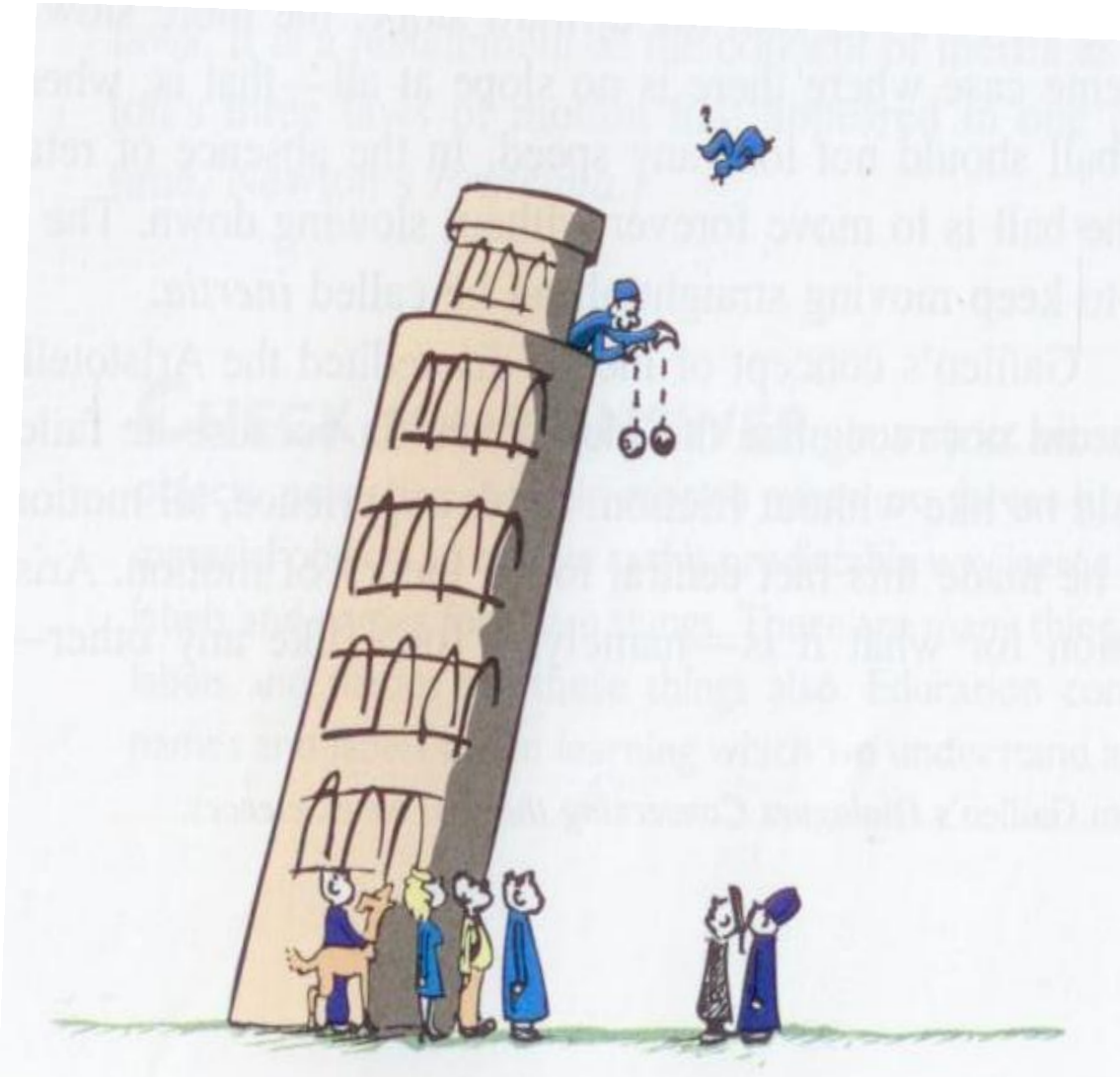
B. Harder on lighter objects

C. The same on all objects

Galileo's famous experiment

If a person drops two rocks, one very heavy and one very light, which hits the ground first?

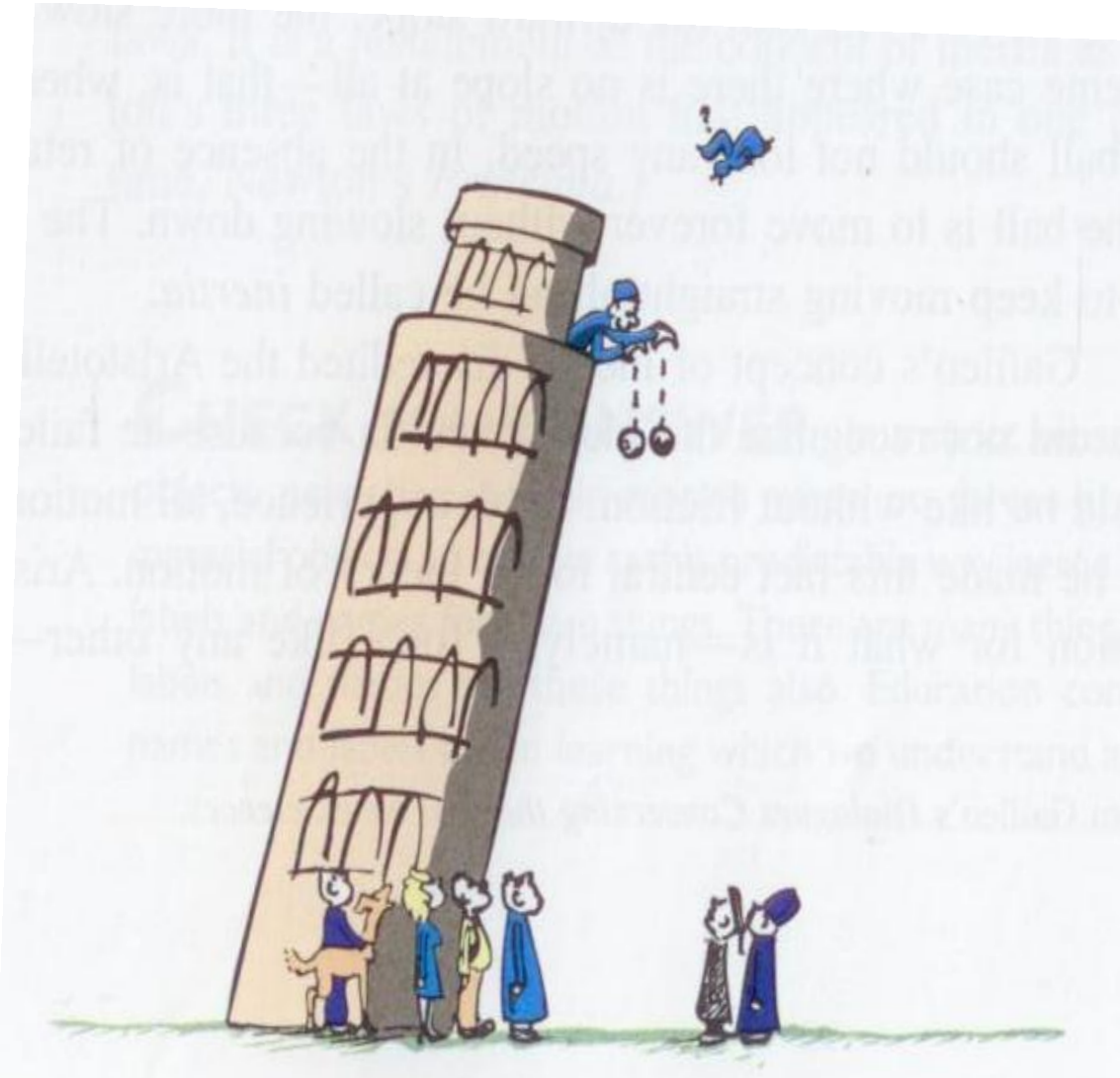
A. The heavy rock
B. The light rock
C. They hit the ground at the same time



Galileo's famous experiment

If a person drops two rocks, one very heavy and one very light, which hits the ground first?

A. The heavy rock
B. The light rock
C. They hit the ground at the same time



WAIT!

Gravity pulls harder on heavier objects

How do they hit the ground at the same time?

Terms from today:

Speed

Acceleration

Friction

Inertia

Natural Motion

Violent Motion

WAIT!

Gravity pulls harder on heavier objects

How do they hit the ground at the same time?

Terms from today:

Speed

Acceleration

Friction

Inertia

Natural Motion

Violent Motion

Inertia

- Harder to get heavier objects going.
  - Takes more force

At rest stays at rest

Gravity

- Works out perfectly.
- If more inertia then gravity supplies more force.

Always the same rate of speeding up

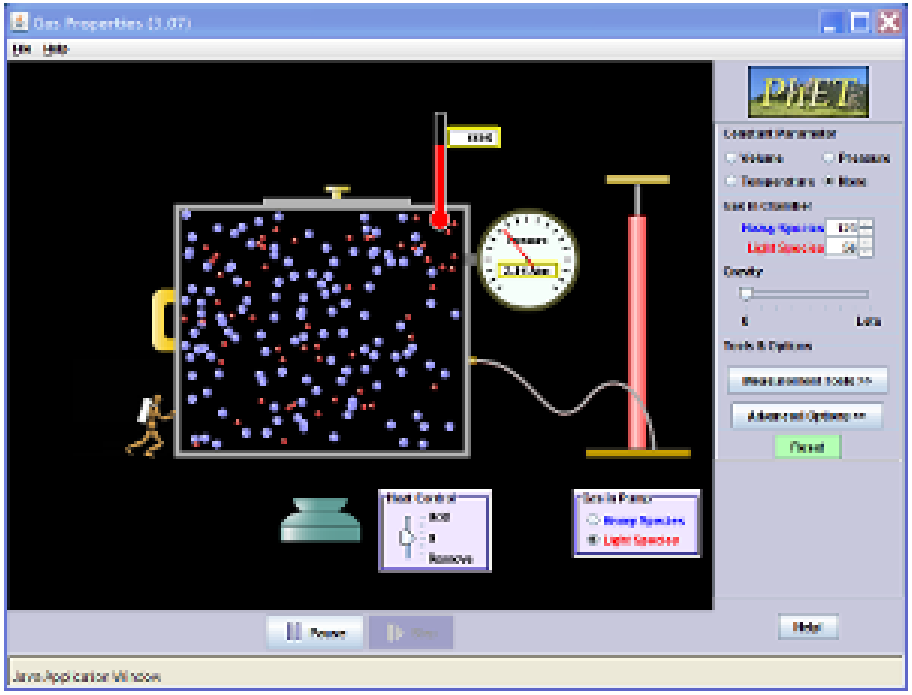
$9.8\ m/s^2$

This question is on the quiz

Hammer and Feather

Moon

- No air
- Not enough gravity to keep it on the moon.



Prediction

If I drop a rock and a piece of paper, which will hit the ground first?

A. Rock

B. Piece of Paper

C. They will hit at the same time.

Gravity

9.8 m/s^2 approximately **10 m/s^2**

Start at rest then speed equals

A. 0 m/s
B. 10 m/s
C. 20 m/s
D. 30 m/s
E. Anything since you're starting

Gravity

9.8 m/s^2 approximately **10 m/s^2**

Start at **rest** then speed equals

A. **0 m/s**
B. 10 m/s
C. 20 m/s
D. 30 m/s
E. Anything since you're starting

Gravity

10 m/s^2

Speed changes 10 m/s every second

1 second later then speed equals

A. 0 m/s
B. 10 m/s
C. 20 m/s
D. 30 m/s
E. Anything since you're starting

Gravity

10 m/s^2

Speed changes 10 m/s every second

1 second later then speed equals

A. 0 m/s
B. 10 m/s
C. 20 m/s
D. 30 m/s
E. Anything since you're starting

Gravity

10 m/s^2

Speed changes 10 m/s every second

2 seconds later then speed equals

A. 0 m/s
B. 10 m/s
C. 20 m/s
D. 30 m/s
E. Anything since you're starting

Gravity

10 m/s^2

Speed changes 10 m/s every second

2 seconds later then speed equals

A. 0 m/s
B. 10 m/s
C. 20 m/s
D. 30 m/s
E. Anything since you're starting

Motion Diagram

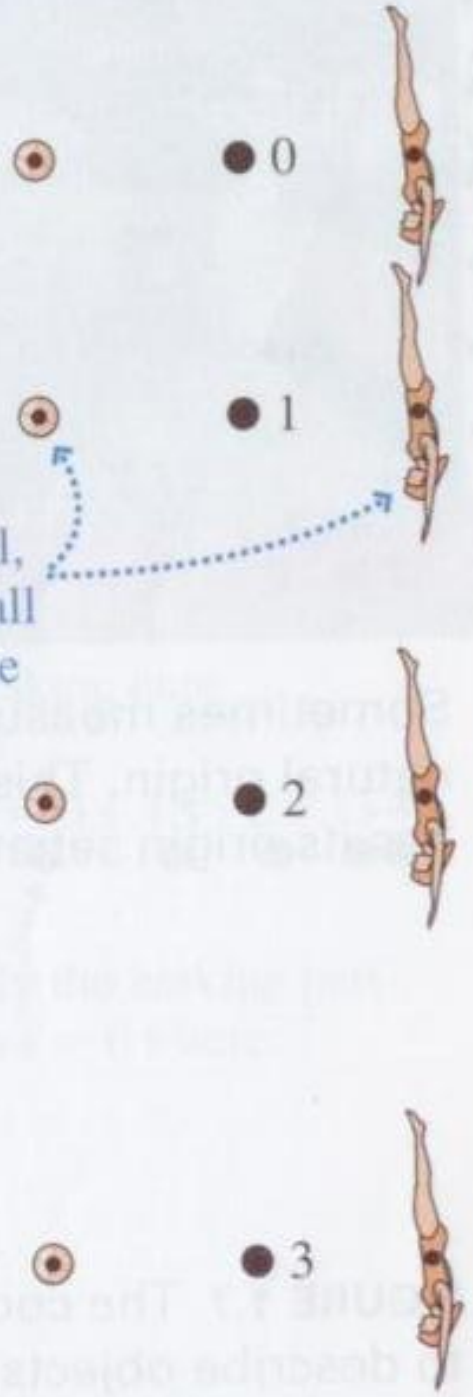
- Draw a motion diagram for a falling object

Gravity

10 m/s^2

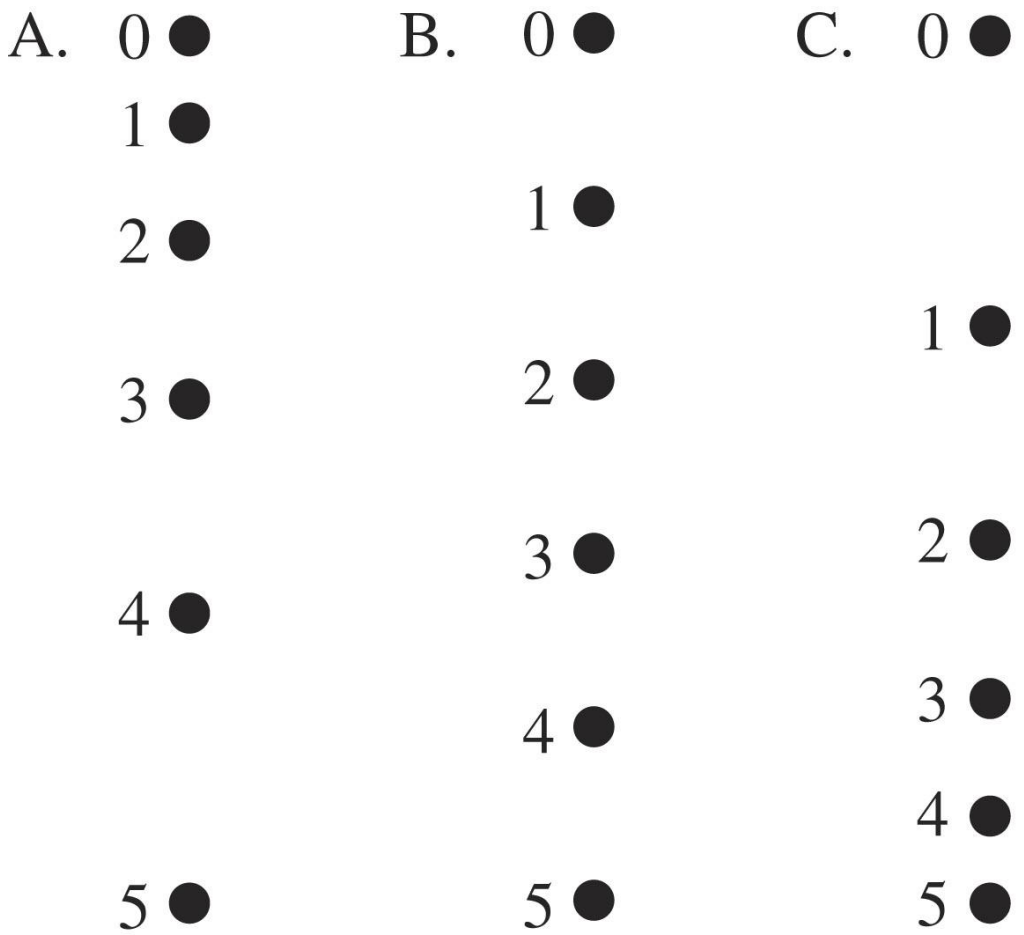
Speed changes 10 m/s every second

0 second	0 m/s
1 seconds	10 m/s
2 seconds	20 m/s
3 seconds	30 m/s



By using the particle model, we see that a falling baseball and a diver have exactly the same motion diagram.

Which could be a dust particle settling to the floor at constant speed?



© 2010 Pearson Education, Inc.