Clicker questions for Projectile Motion

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June 08

Download the lesson plan and student directions for the lab HERE

There are some screen shots included to illustrate answers, but it would be better to use the simulation during discussion.

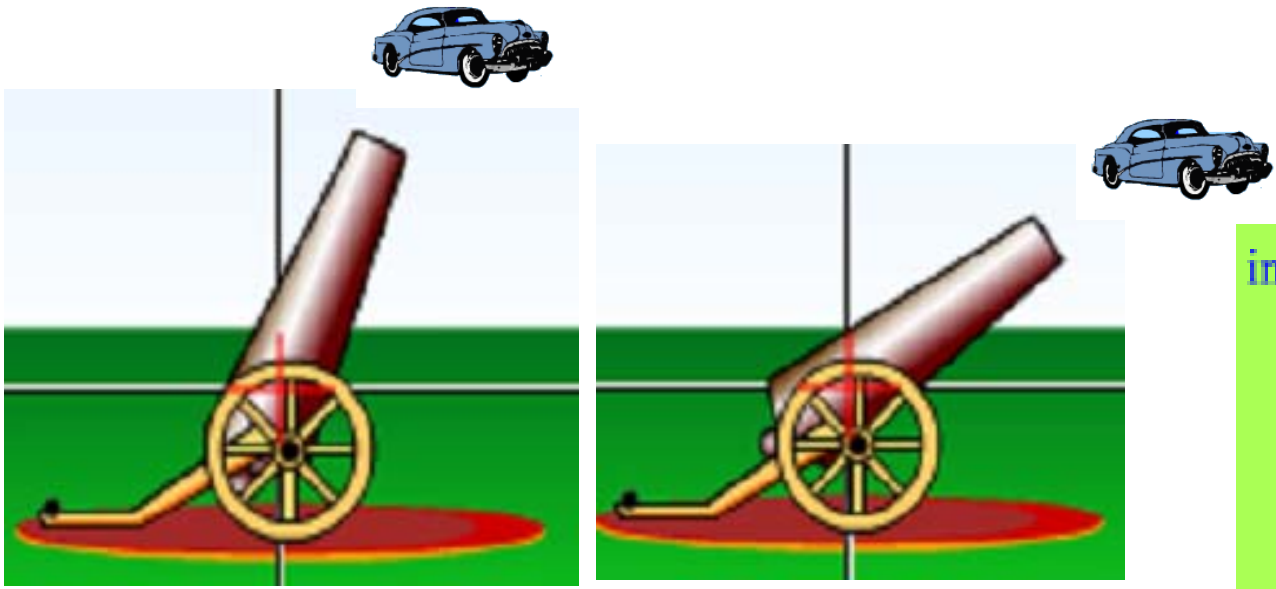
Learning Goals

- Predict how varying initial conditions effect a projectile path

These are part of the lesson, but not addressed in the clicker questions:

- Use reasoning to explain the predictions.
- Explain projectile motion terms in their own words.
- Describe why using the simulation is a good method for studying projectiles.

1. Which car will go farther?

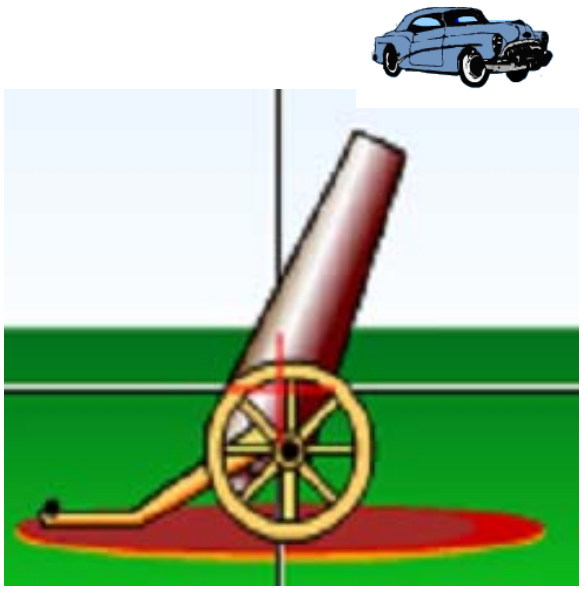


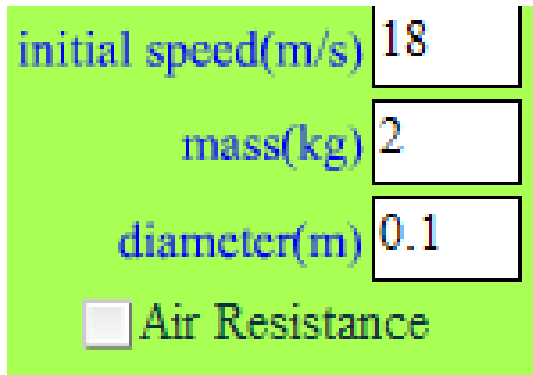
A

B

C They will go the same distance

2. Which will be in the air longer?



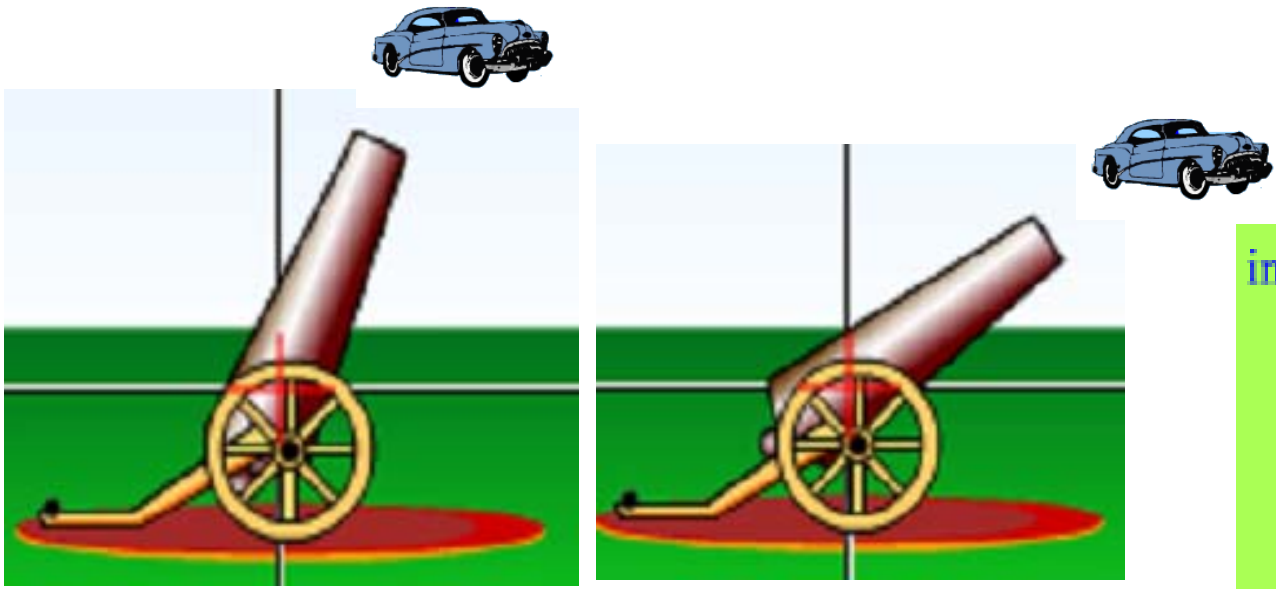


A

B

C same time in air

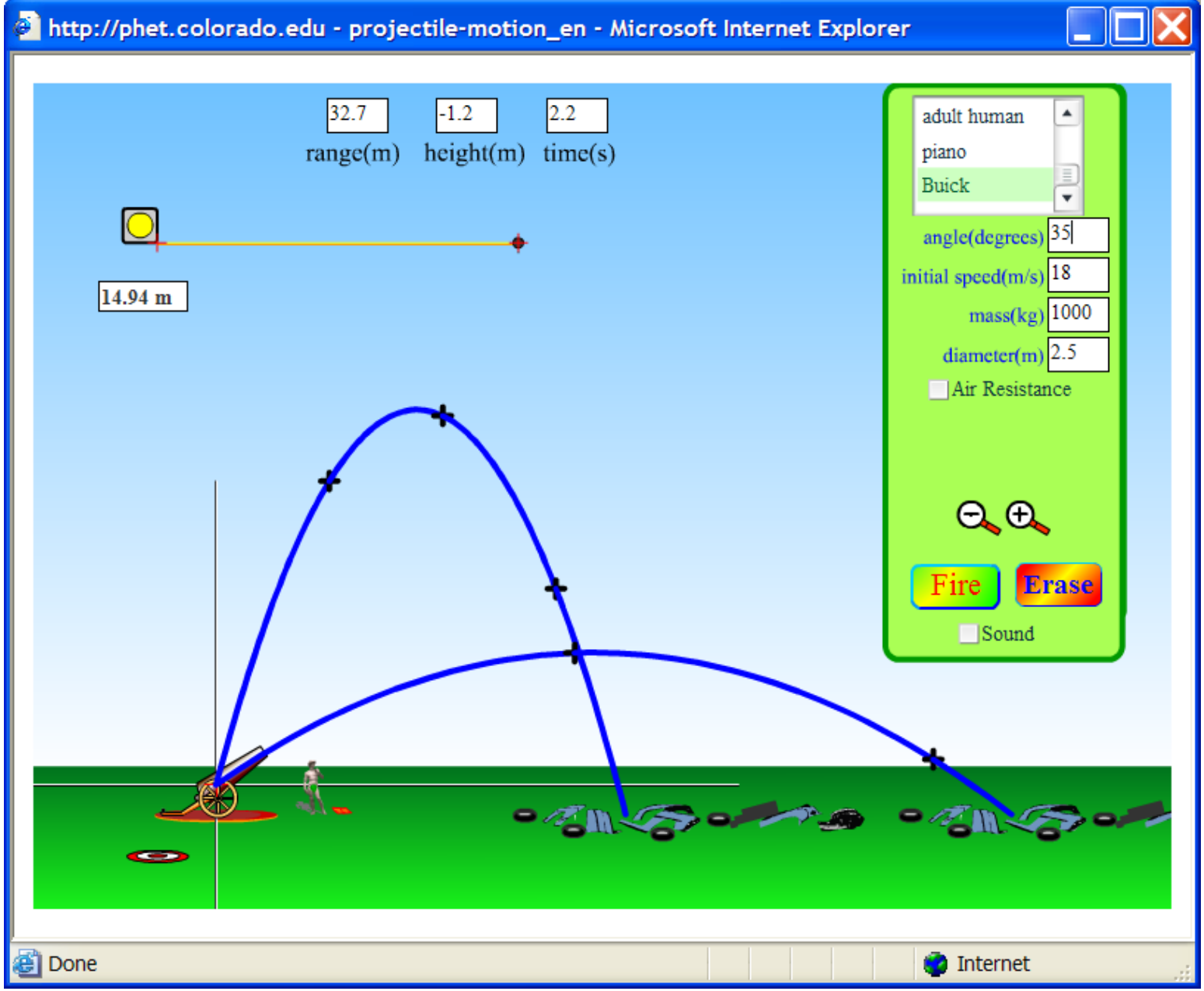
3. Which car will go higher?



A

B

C They will go the same height



Time for 75 degrees 3.6 s, 35 degrees 2.2

4. Which will go farther?

Buick	
angle(degrees)	75
initial speed(m/s)	18
mass(kg)	1000
diameter(m)	2.5
Air Resistance	

tankshell	
angle(degrees)	75
initial speed(m/s)	18
mass(kg)	150
diameter(m)	0.15
Air Resistance	

A

B

C They will go same distance

5. Which will go farther?

Buick

angle(degrees)	75
initial speed(m/s)	18
mass(kg)	1000
diameter(m)	2.5

√ Air Resistance

A

tankshell

angle(degrees)	75
initial speed(m/s)	18
mass(kg)	150
diameter(m)	0.15

√ Air Resistance

B

C They will go same distance

6. Which will go higher?

Buick

angle(degrees) 75

initial speed(m/s) 18

mass(kg) 1000

diameter(m) 2.5

√ Air Resistance

A

tankshell

angle(degrees) 75

initial speed(m/s) 18

mass(kg) 150

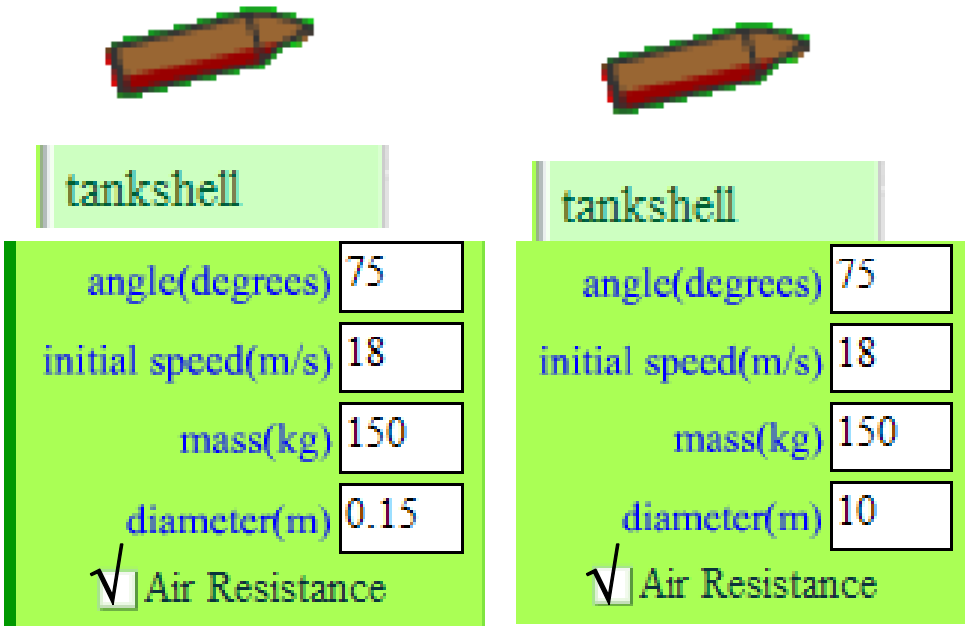
diameter(m) 0.15

√ Air Resistance

B

C They will go same height

7. Which will go farther?



A

B

C They will go same distance

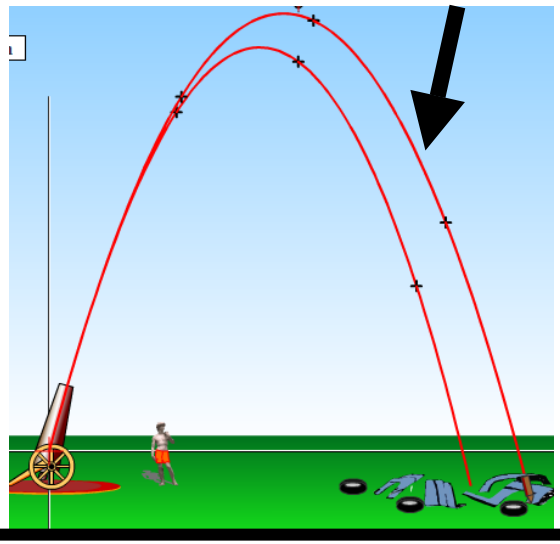
Results 4-7 Small vs large object
Red paths have air resistance

Without air resistance no difference

Shell drag .05

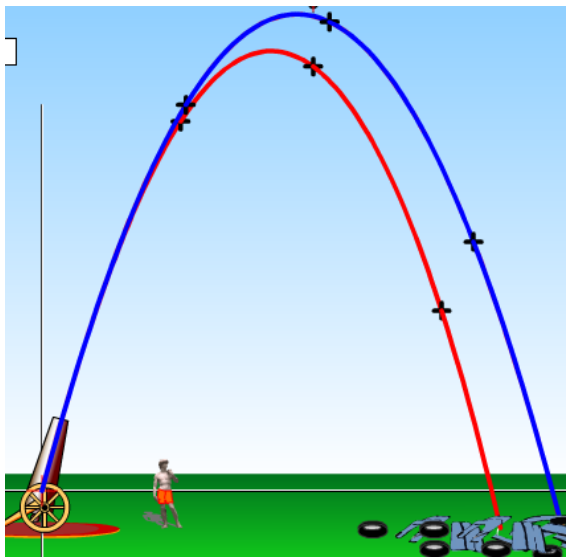
Buick drag 1.3

Shell



Buick shown

(Shell has identical paths)



Small Shell