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https://phet.colorado.edu/sims/html/projectile-motion/latest/projectile-motion_en.html

PART 1
Click on "Intro"
The cannon height is set at 10m and the angle of the cannon is 0 degrees. The default projectile is a pumpkin but you may change it to any of the other objects in the dropdown menu on the upper right corner of the screen.

Without changing the angle of the cannon, determine the distance for each speed for the projectile. Use the 

tool to determine the distance travelled.
When the cross-hairs are on the projectile it will give you a range in meters. That is the number to record on the table. Repeat the procedure after moving the cannon down to 5 meters.

	10m high	5m high
Speed (m/s)	Distance (m)	Distance (m)
0	0	0
5	7.14	5.05
10	14.28	10.1
15	21.42	15
20	28.56	20.19
25	35.7	25.24
30	42.84	30

*for 25 or 30 m/s you may need to zoom out using the  tool in the upper left of the simulation screen.

Answer these questions.

1. What effect did increasing speed have on the distance the projectile travelled?

The increase of speed increased the distance the projectile travelled.

2. What effect did the cannon height have on the distance the projectile travelled?

The reduction in cannon height led to a reduction in distance travelled by the projectile.

3. Does the distance travelled change by about the same amount each time or by very different amounts each time?

For each increase in 5 m/s the distance increases 7.14 meters when fired from a height of 10 meters.
For each increase in 5 m/s the distance increases 5.05 meters when fired from a height of 5 meters.
So the distance travelled changes by about the same amount.

4. If the speed could be changed to 35 m/s, what distance would the projectile would have gone?

Since the distance travelled when fired from 10 m at 30 m/s was 42.84 and the distance increases 7.14 for each 5 m/s added the distance travelled for a 35 m/s shot would be 49.98.
Changing the height of fire to 5 m would produce a 35.05 m distance based the same idea as for 10 m.

5. What effect (if any) did the height of the cannon have on the distance travelled at each speed? Explain.

The height of the cannon affected the distance traveled by the projectile. The higher the height of the cannon the longer the distance travelled by the projectile. With the cannon set at 10 m the projectile traveled 7.14 m for every 5 m/s increase in speed. With the cannon height set at 5 m the projectile traveled 5.01 m for every 5 m/s in speed.

PART 2

Set height of cannon to 0 m
Set speed to 15m/s. The cannon angle can be changed by clicking and dragging on the end of the cannon. Measure the distance for each angle listed below.

Angle	Distance (m)	Angle	Distance (m)
25	17.57	50	22.59
30	19.86	55	21.55
35	21.55	60	19.86
40	22.59	65	17.57
45	22.94		

Answer these questions

1. What happened to the distance of the projectile as the angle increased from 25-45 degrees?

   As the angle was increased from 25-45 degrees the distance travelled by the projectile increased.

2. What happened to the distance of the projectile as the angle increased from 45-65 degrees?

   As the angle was increased from 45-65 the distance travelled by the projectile decreased.

3. What angle achieved the maximum distance?

   45 Degrees