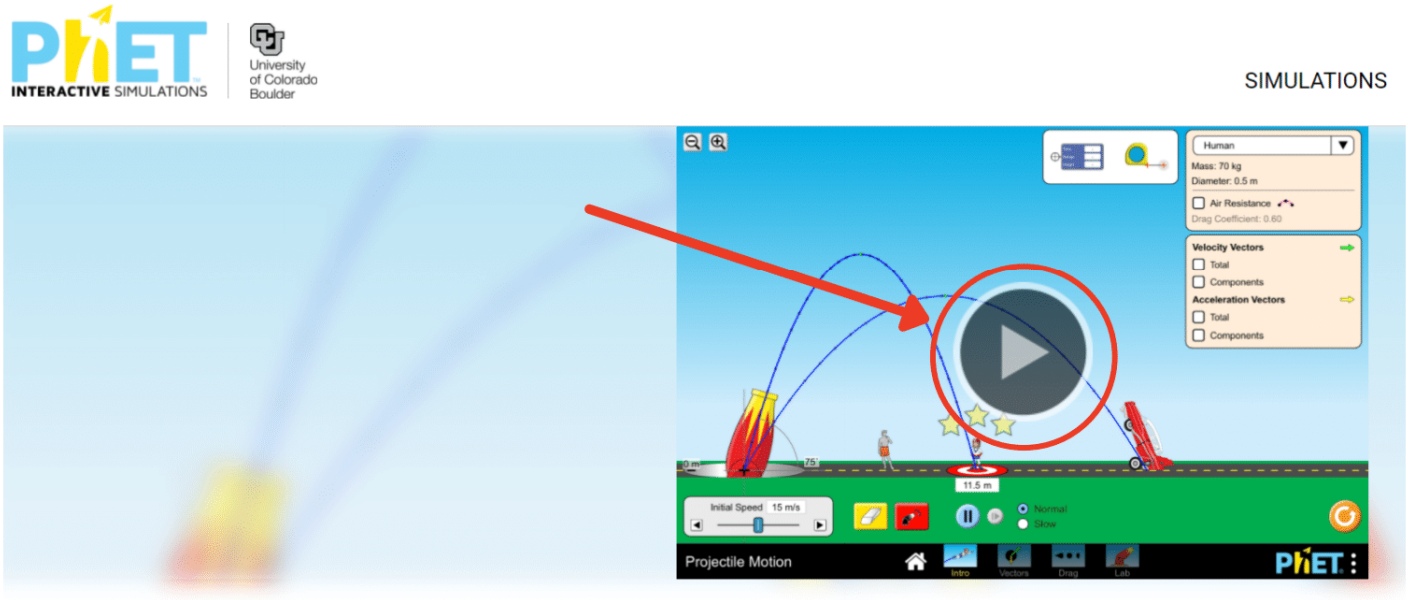
# Hit the target

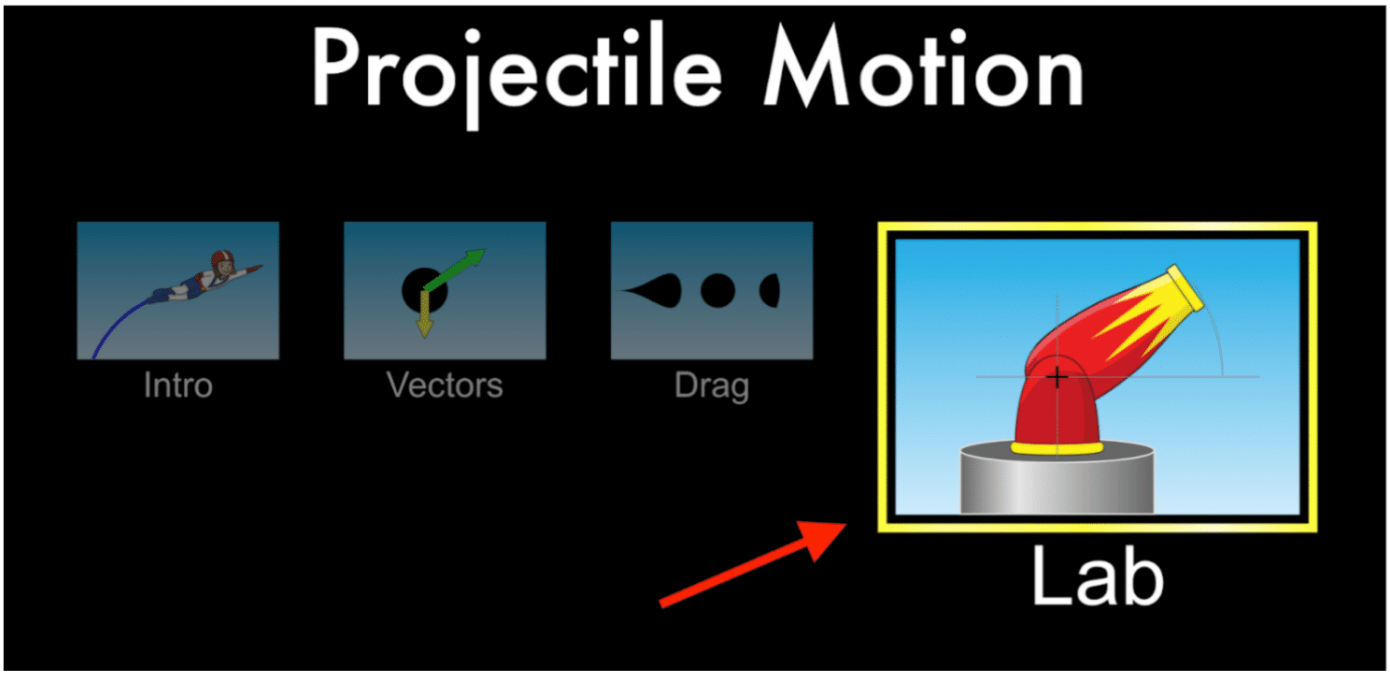
**USE YOUR NEW KNOWLEDGE ON AIR RESISTANCE TO DESIGN THE PERFECT LAUNCH**

**1** Go to this website **https://phet.colorado.edu/en/simulations/projectile-motion** and **hit the play button**




**Projectile Motion**

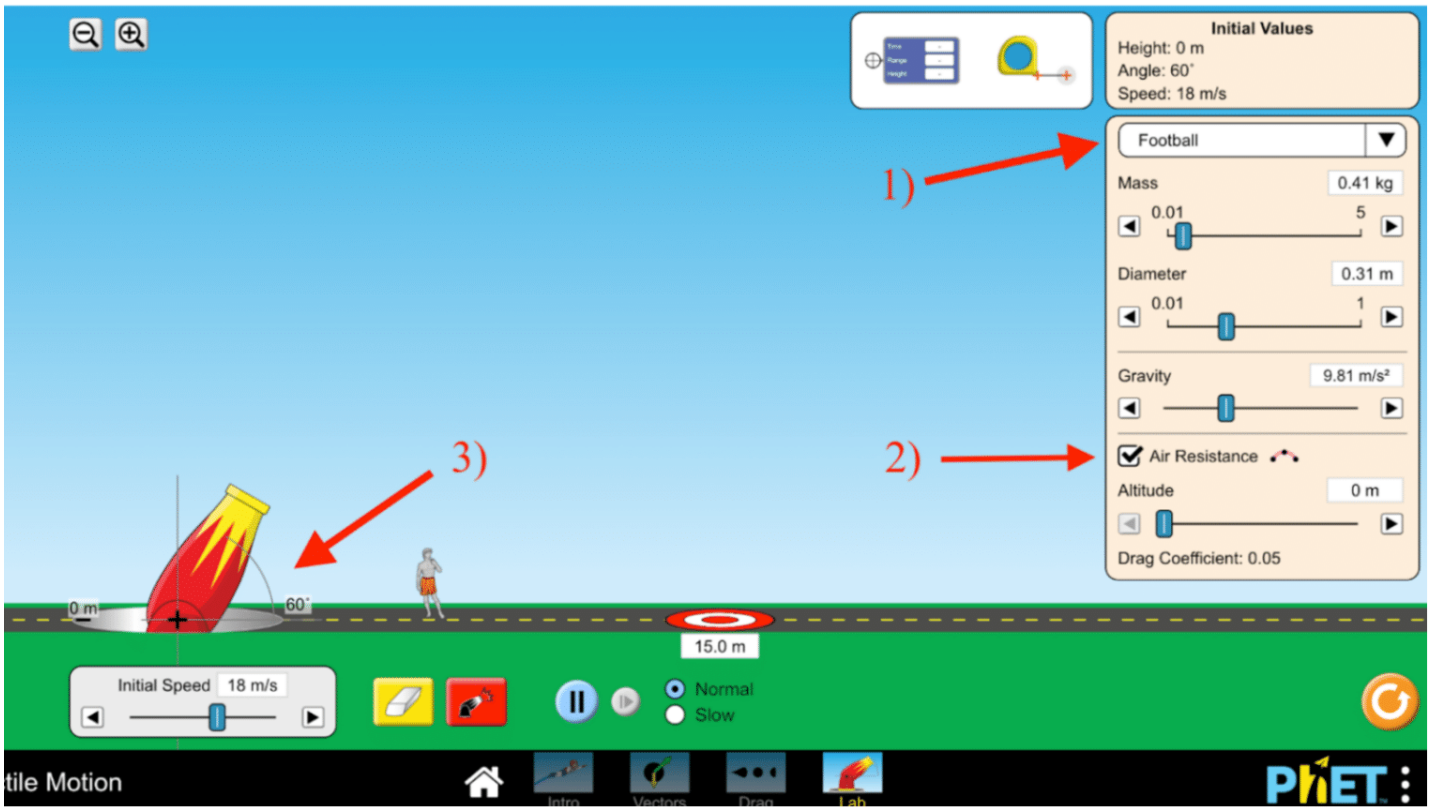
**2** Click on the option labeled as **lab**



# Challenge 1

- To start this challenge, make sure that you first change the object to a football, as indicated by **arrow 1)**.
- Then, turn on the air resistance where **arrow 2)** is pointing.
- Finally, change the angle at **arrow 3)** to 60°.

Objective: Find the diameter of the football such that it hits the target at its center! Press the red launch button to test your guess.

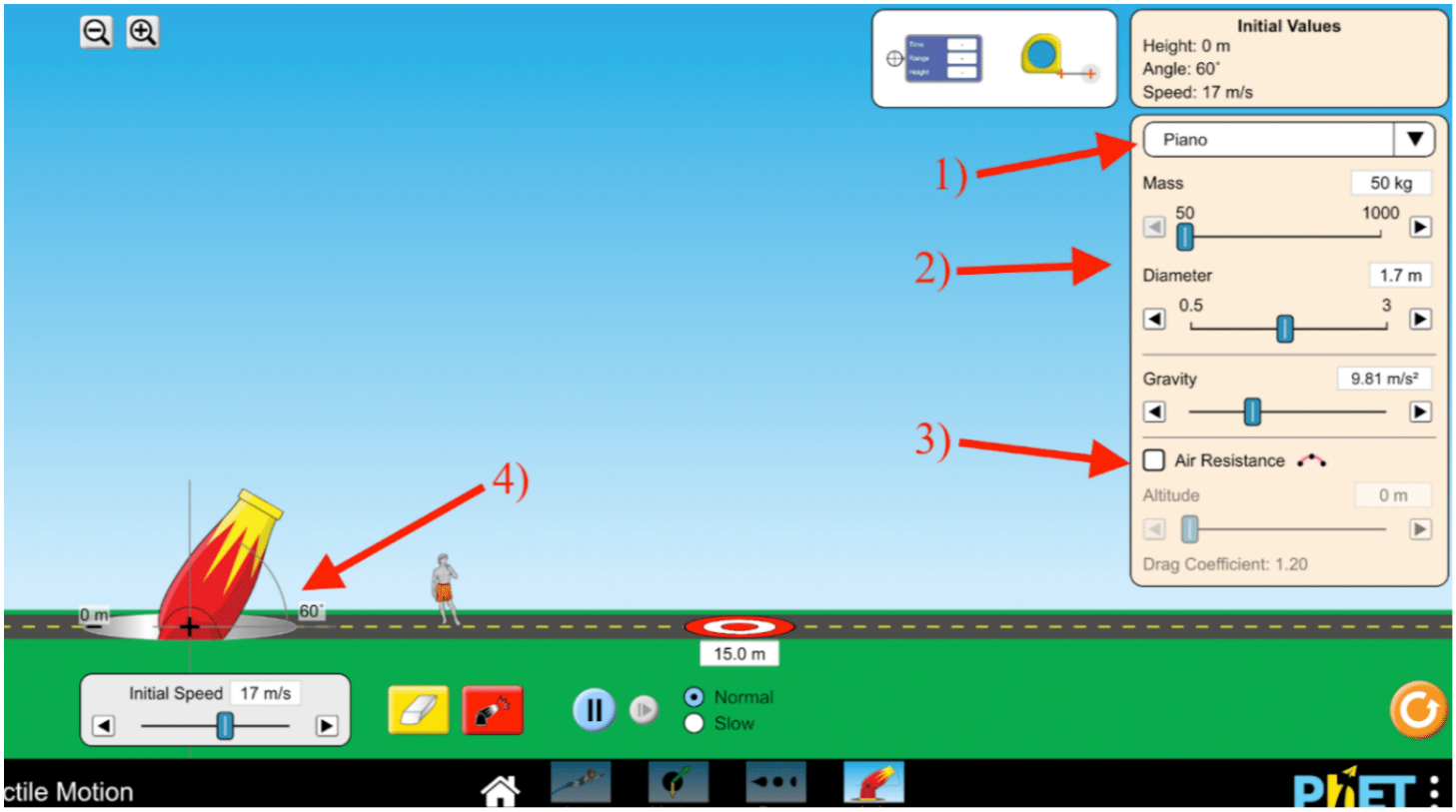



**Record your best guess here:**

# Challenge 2

- For this challenge, switch the object to the piano option **(arrow 1))**.
- Then change the mass to 50 kg and the diameter to 1.7 m at **arrow 2)**.
- Start with the air resistance off **(see arrow 3))** and
- Set the angle at **arrow 4)** to 60°.

Objective **a)**: With the air resistance off, find the perfect speed where the piano hits the target on the bullseye.
Objective **b)**: Turn the air resistance on, and find the speed where the piano hits the target now.




**Record your best guess here for a):**

**Record your new best guess here for b) (how did it change):**

If you have any issues, just email us with your questions to this email address:
**rsummerl@uoguelph.ca**
Here's a word search, have fun!

## Word Search

K A U P V X Y V V Z L T S P N
I I I Q U Q Y A D S S D H Y K
A T W R K O S G N M Y V A O Q
S L I A R T K K A H G V P E M
A S U Z Y E I B W T K Y E R V
K S R P V B S L N E A W M M U
I V P V I N P I P J H I A Z S
H S D E R B J C S W A L Y Q N
J D Y Y E F X O I T O Y G W N
Z E I C F D T B B C A T K U G
I N U Z J P I G Z Q K N X K B
F S I J E S M S W S B N C C D
W I R L G Q Q D S T F N T E I
J T C J O N J U P H Y S I C S
W Y G M R X H P H Q F Y I O C

air resistance physics density speed
shape

Thank you for watching our presentation