FLORIDA STATE UNIVERSITY

User ID

Welcome to Survey 1 of the Physics Playground Summer Camp! You should finish this survey before you play the game. Please enter the **User ID** that your camp counselor sent you in the box below:

Intro

Hello, campers!

We are going to ask you some questions about yourself and then show you 28 questions about physics. Answer them to the best of your ability. Please do not skip any questions. After the questions we will explain how to play the game, and then it will be time to play Physics Playground!

PP Demographics

First Name

Last Name

How old are you?

What is your sex?

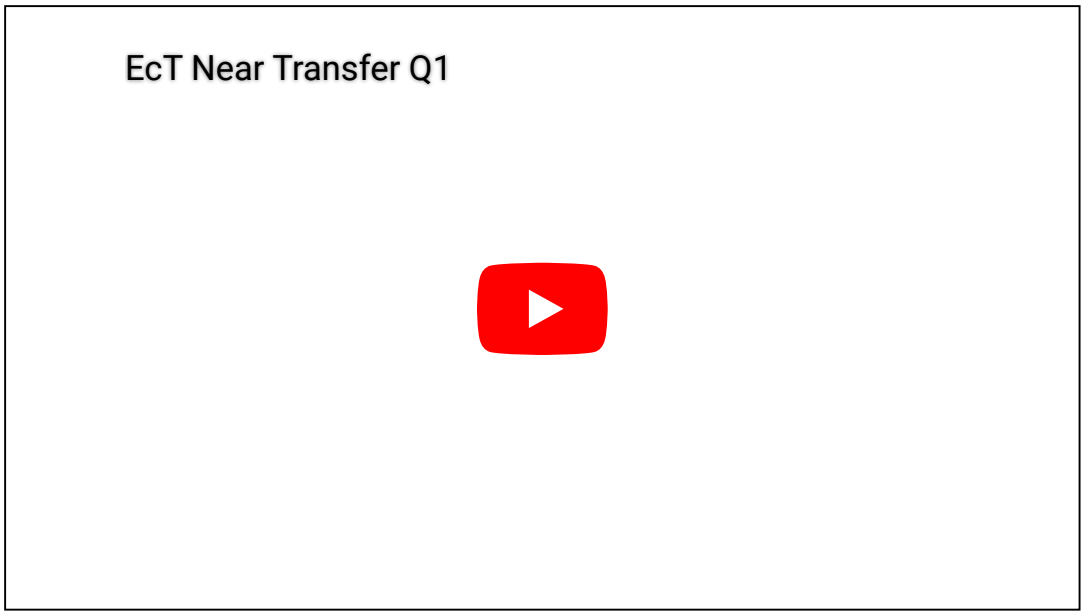
What is your ethnicity? Check all that apply

- [ ] American Indian or Alaska Native
- [ ] Asian
- [ ] Black or African American
- [ ] Hispanic
- [ ] Native Hawaiian or Pacific Islander
- [ ] White
- [ ] Other (enter)
- [ ] Prefer not to say

How often you play video games?

Have you studied force and motion in a science course before?

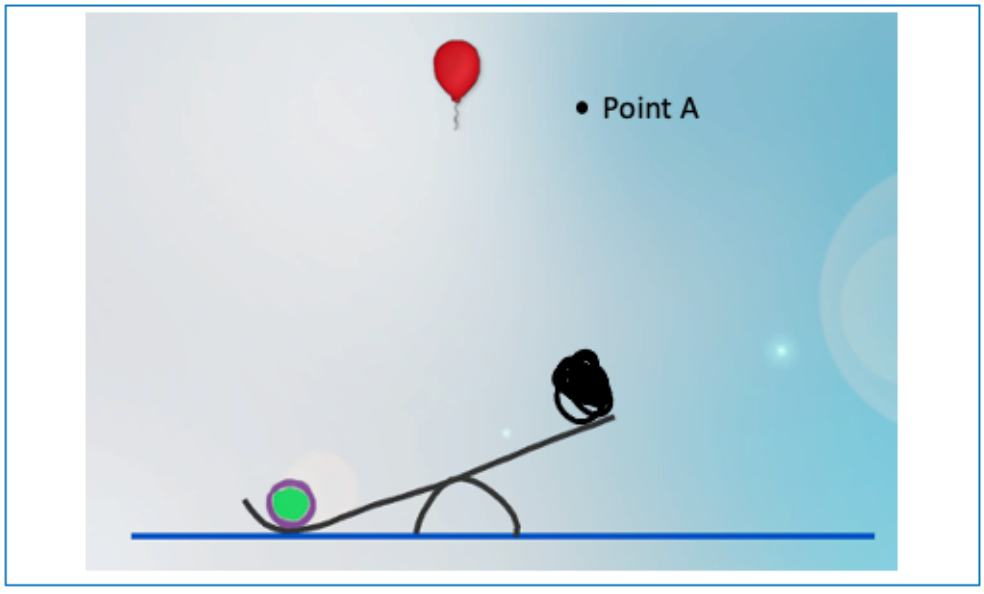
Near Q1 EcT Lever 1



In this video, a ball is drawn at Point A. What would you change to make the green ball hit the balloon?

- ◯ Draw an object with a larger mass
- ◯ Draw an object with a smaller mass
- ◯ Draw the object closer to the center of the lever
- ◯ None of the above would help

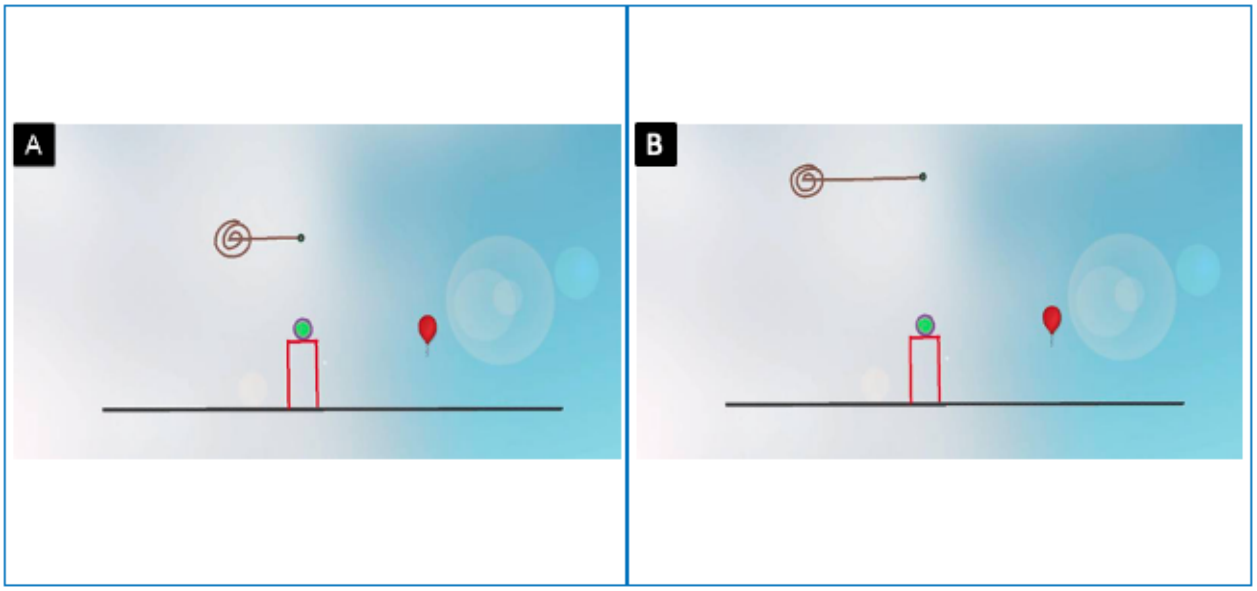
Near Q2 EcT-Lever 2



An object is drawn resting on the right-hand side of the lever. It's just heavy enough to lift the ball up. If the object is dropped from Point A, how much energy will it transfer to the ball?

- ◯ The same as before
- ◯ More than before
- ◯ Less than before
- ◯ Not enough information

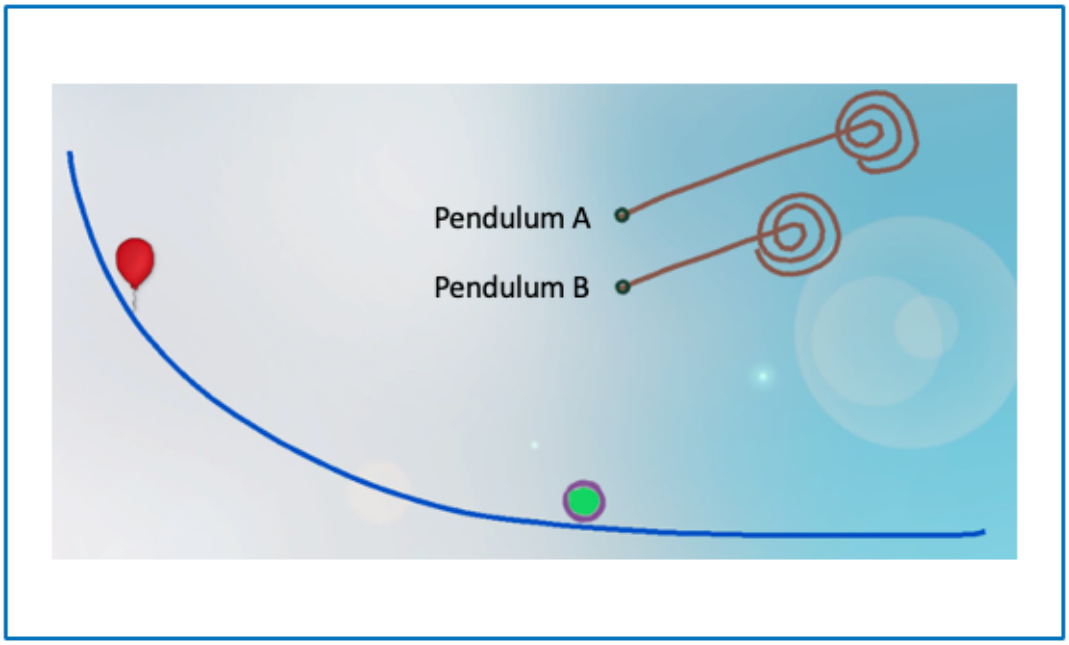
Near Q3 EcT-Pendulum 1



Both pendulums will hit the green ball. Which pendulum would you choose to solve this level?

- ◯ A
- ◯ B
- ◯ No difference
- ◯ Not enough information

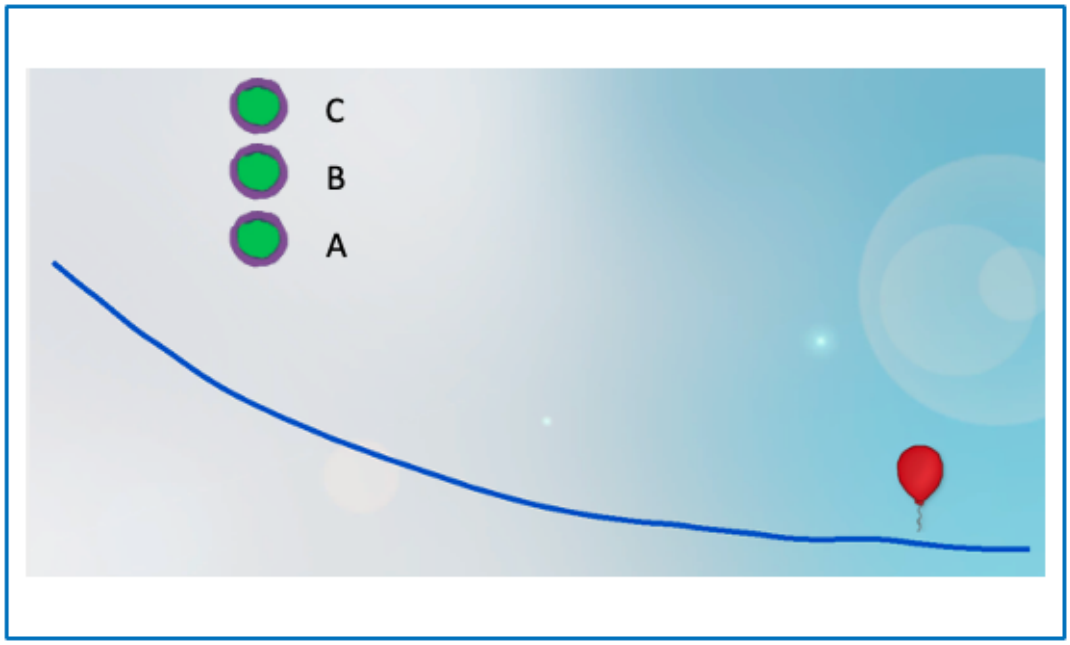
Near Q4 EcT-Pendulum 2



Both pendulums will hit the ball. Which pendulum is *more likely* to get the ball to the balloon?

- A
- B
- Both
- Neither of them

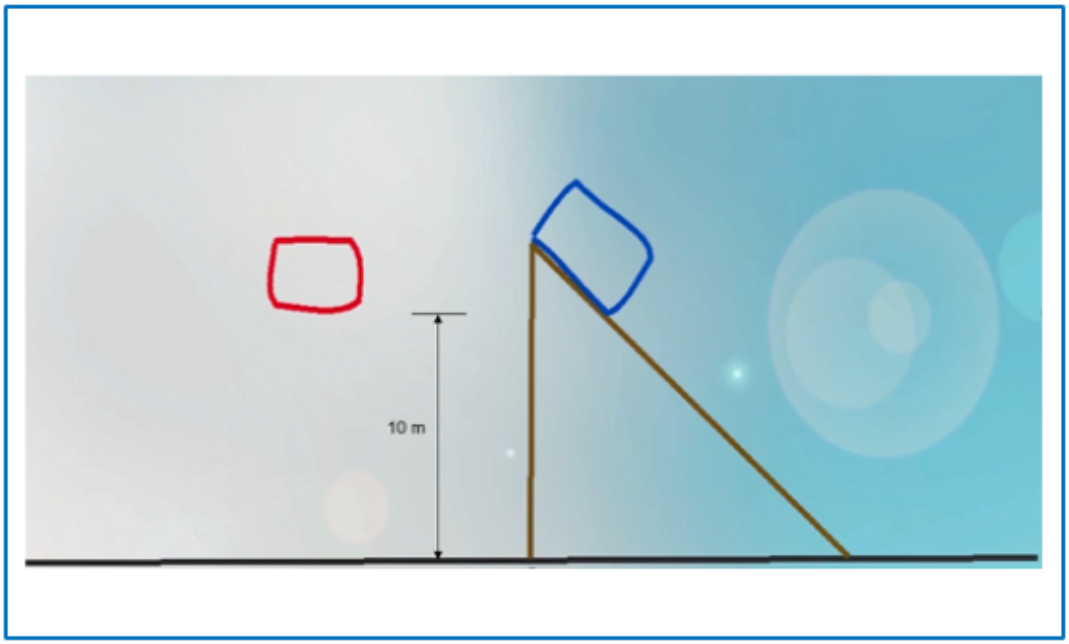
Near Q5 EcT-Ramp 1



A ball is dropped from each point shown above (A, B, C). When will the ball have the *fastest speed* as it hits the balloon?

- ◯ Dropped from point A
- ◯ Dropped from point B
- ◯ Dropped from point C
- ◯ No difference

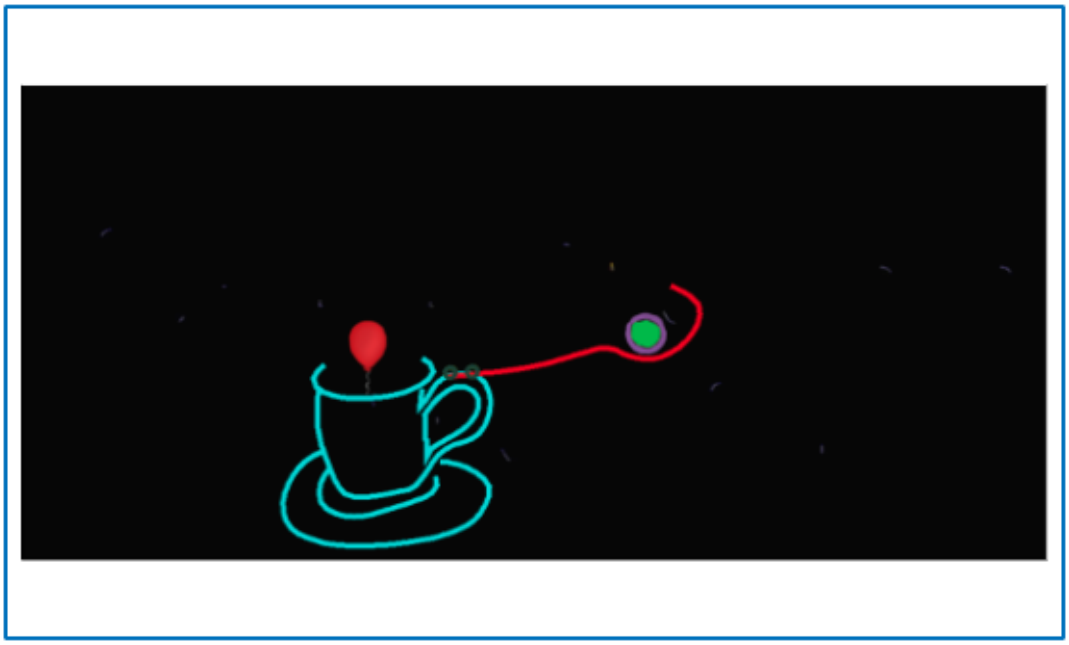
Near Q6 EcT- Ramp 2



The red and blue boxes start at the same height. Ignoring friction, which box is moving *faster* just before hitting the ground?

- ◯ The red box
- ◯ The blue box
- ◯ No difference
- ◯ Not enough information

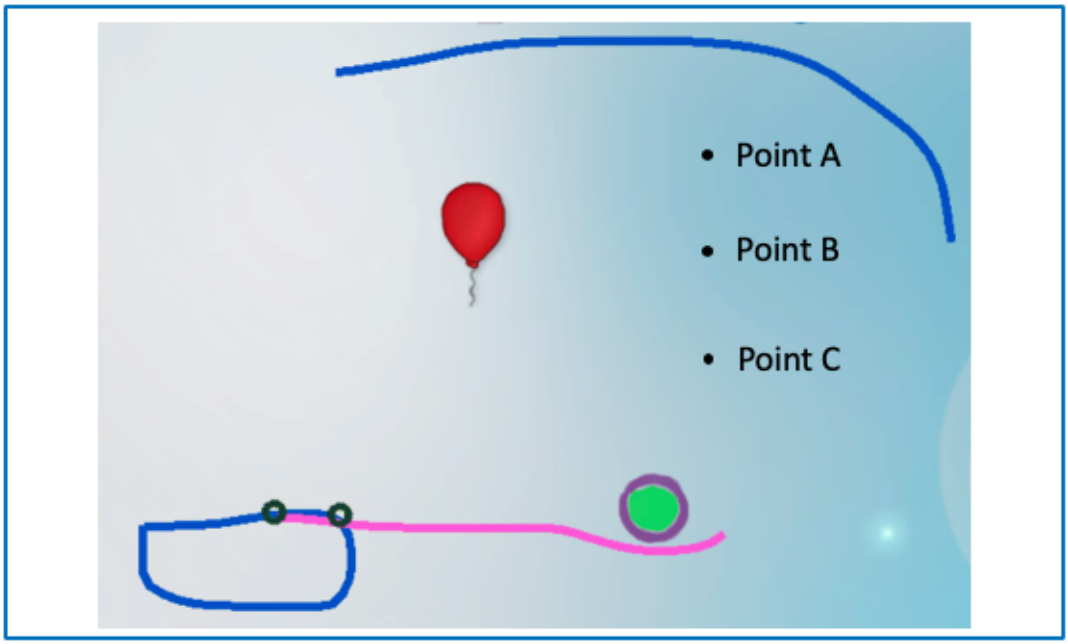
Near Q7 EcT-Springboard 1



Which method is *more likely* to make the ball hit the balloon?

- ◯ Attach a weight to the springboard
- ◯ Attach a weight to the springboard and then release
- ◯ Increase the mass of the ball
- ◯ None of the above

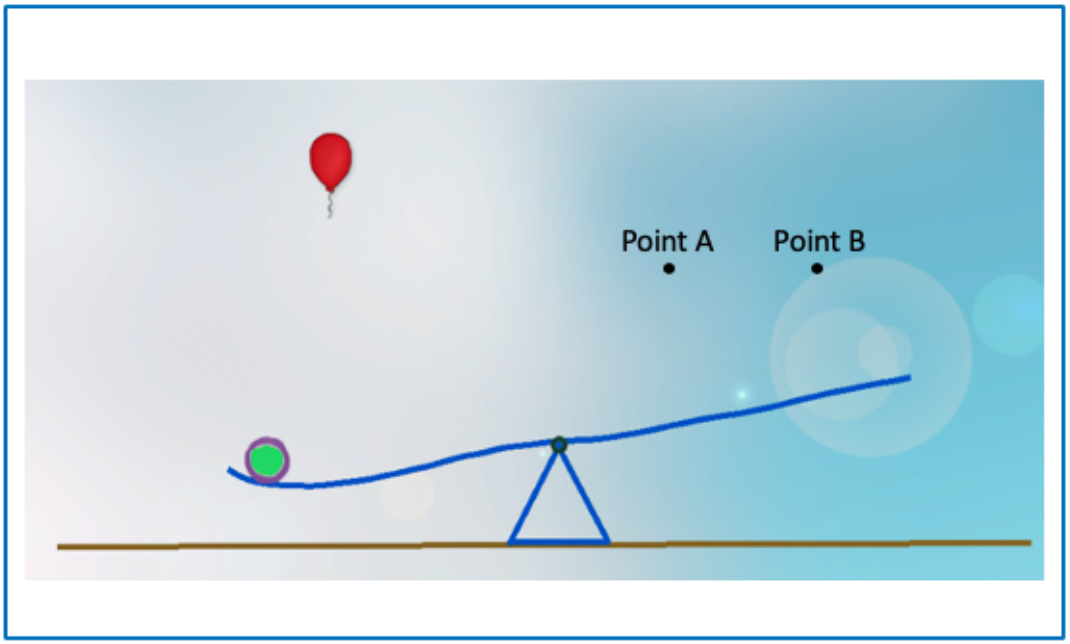
Near Q8 EcT-Springboard 2



If a mass is dropped from each point (A, B, C), what point will make the green ball hit the balloon with the *greatest energy*?

- A
- B
- C
- All points will have the same effect on the ball

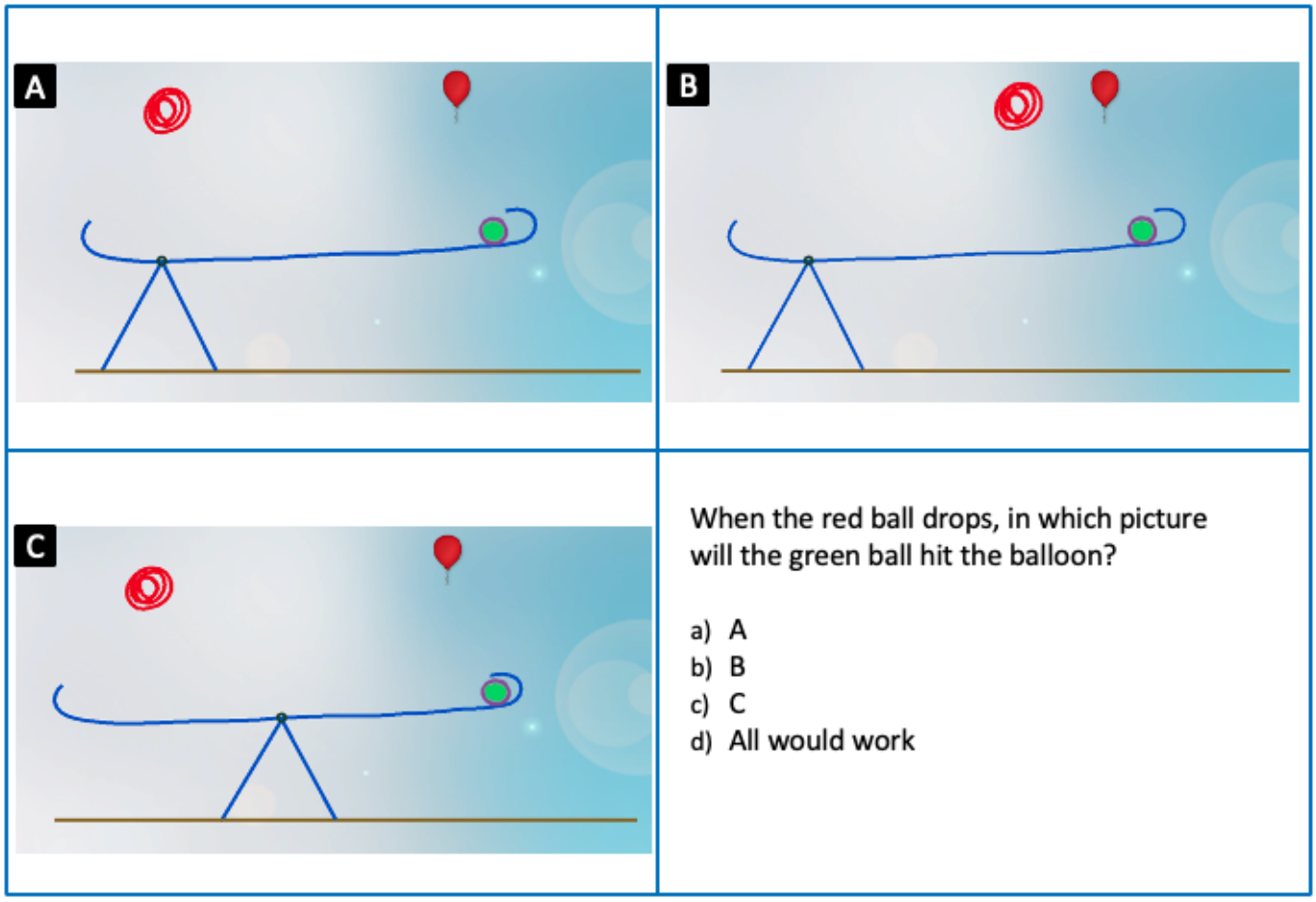
Near Q 9 PoT Lever-Distance 1



Where should you drop a weight so the green ball is *more likely* to reach the balloon?

- A
- B
- No difference
- Not enough information

Near Q10 PoT-Lever-Distance 2



When the red ball drops, in which picture will the green ball hit the balloon?

- A
- B
- C
- All would work

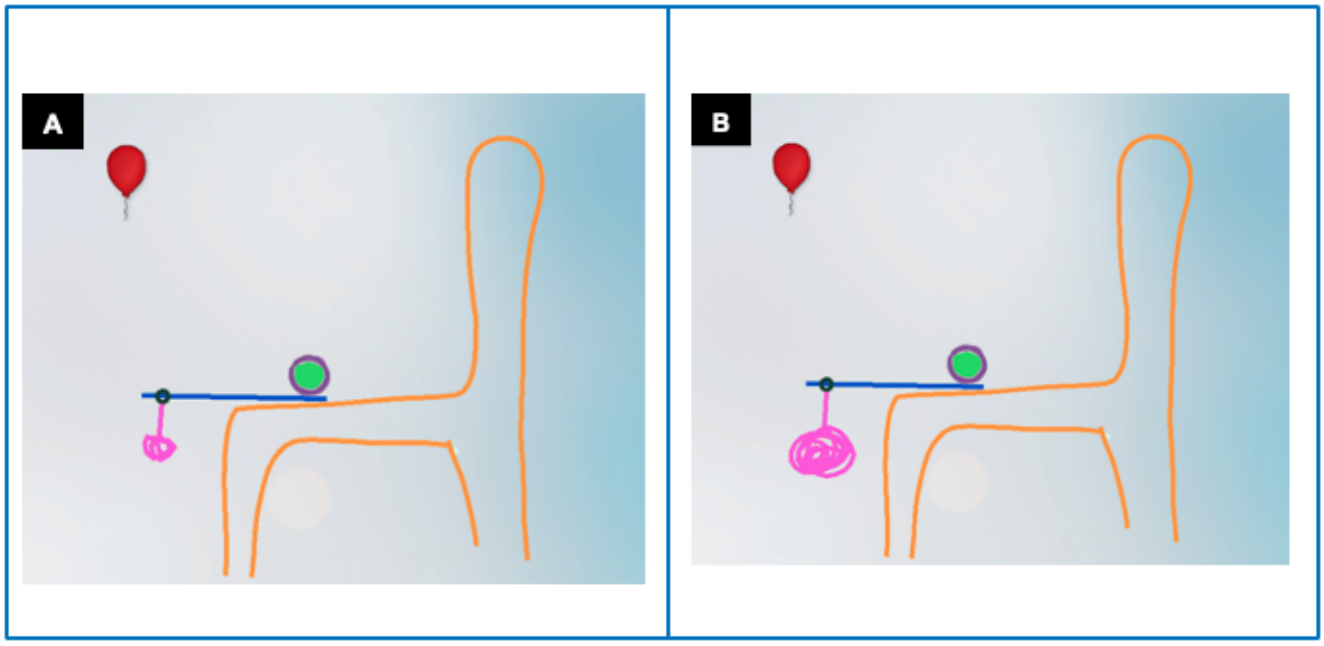
Near Q11 PoT-Lever-Mass 1

0:00

Watch the video. What would you change to solve this level?

- ◯ Increase green ball's mass
- ◯ Decrease green ball's mass
- ◯ Make the blue stick shorter
- ◯ Make the blue stick longer

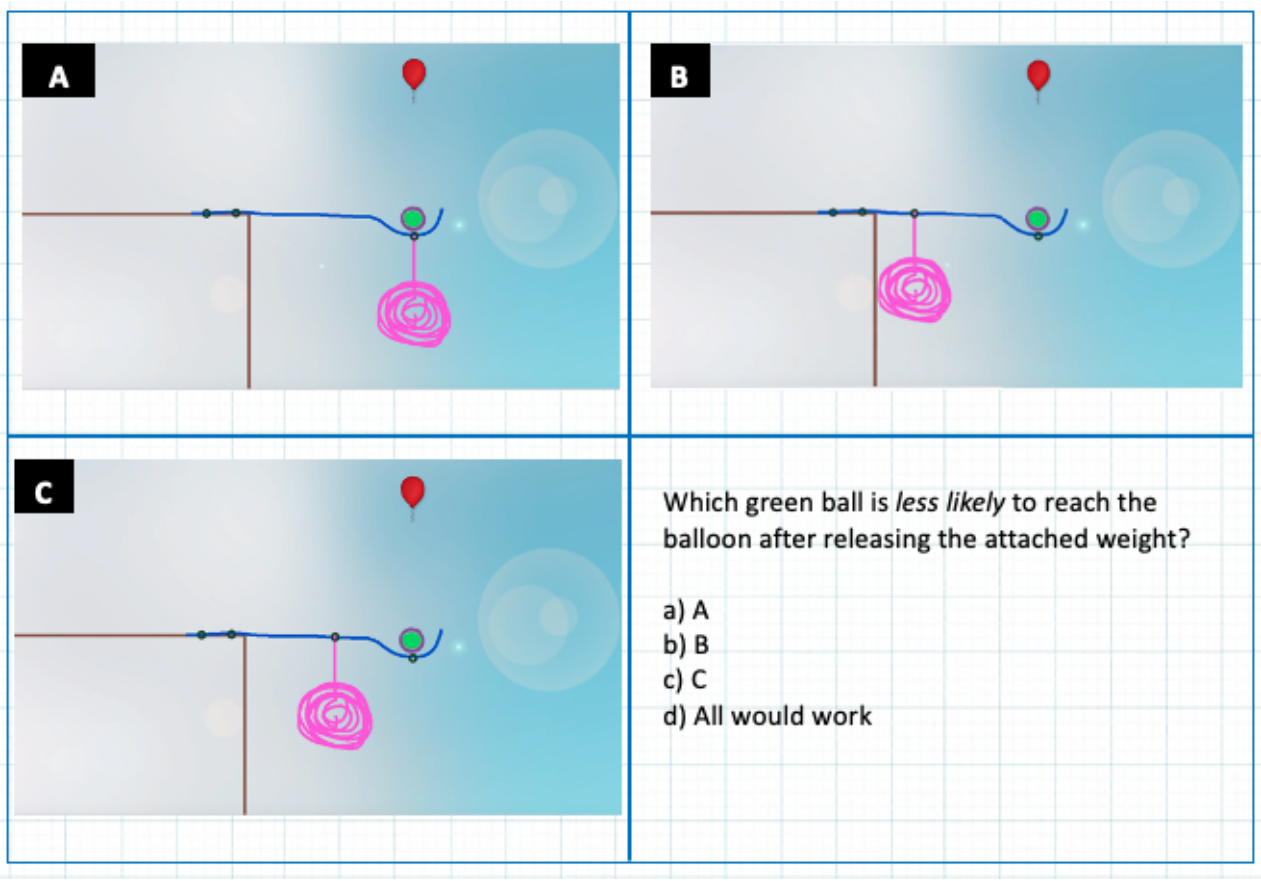
Near Q12 PoT-Lever-Mass 2



In which picture (A or B) will the green ball go higher?

- A
- B
- Both will reach the same height
- Not enough information

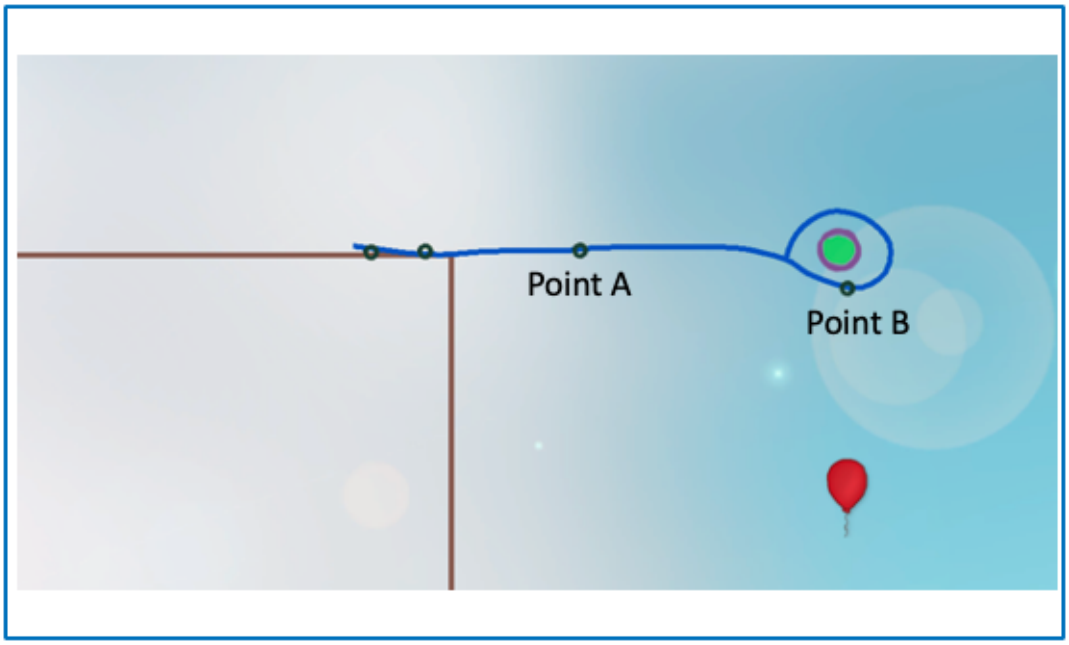
Near Q13 PoT-Springboard 1



Which green ball is *less likely* to reach the balloon after releasing the attached weight?

- A
- B
- C
- All would work

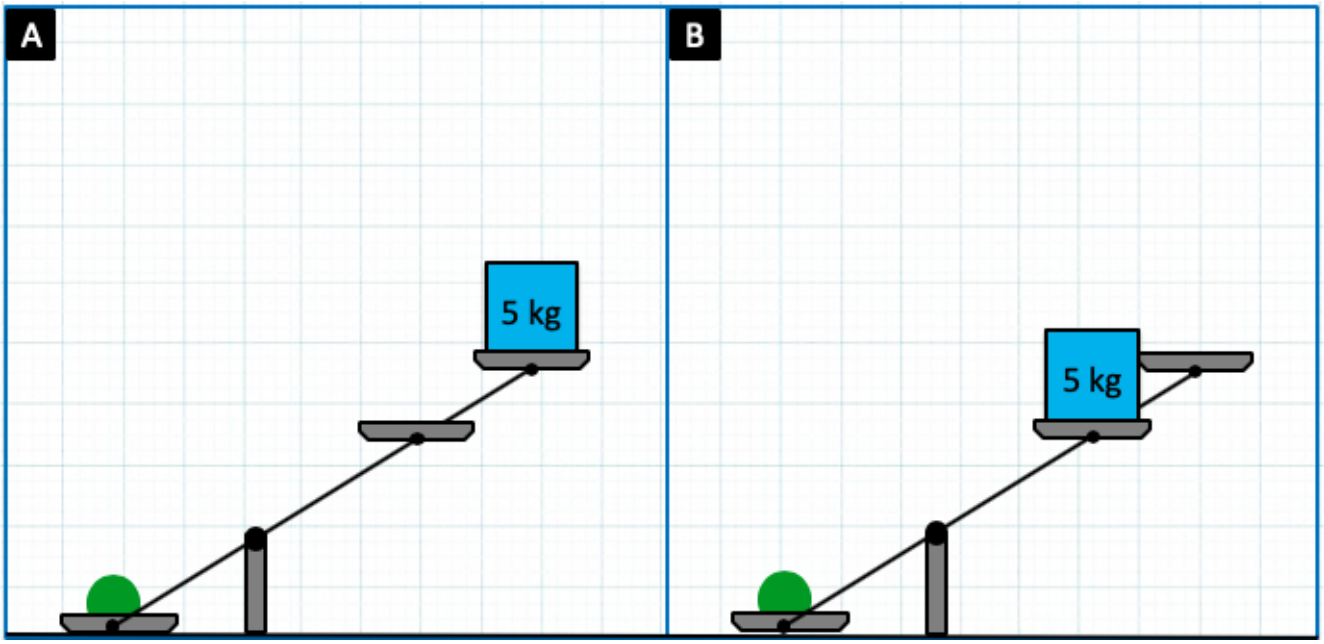
Near Q14 PoT-Springboard 2



Which one of the following solutions is *more likely* to make the ball reach the balloon?

- ◯ Attach a light weight on point B
- ◯ Attach a heavy weight on point B
- ◯ Attach a light weight on point A
- ◯ Attach a heavy weight on point A

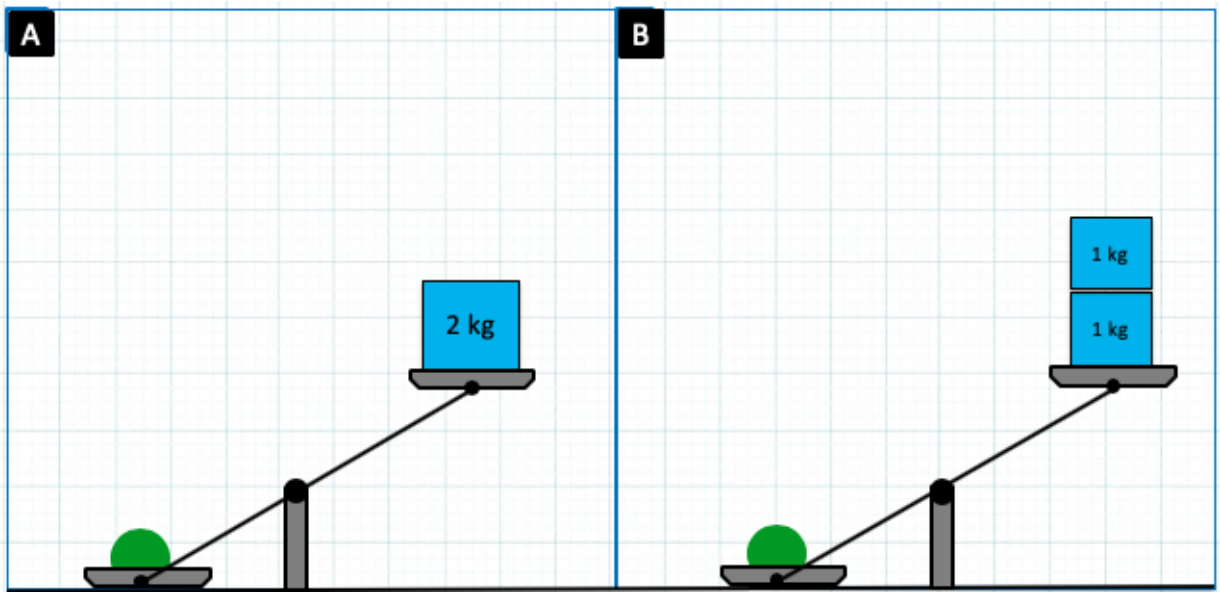
Far Q1 EcT-Lever 1



In Figures A and B, the two levers are identical. Which ball will be moving *faster* when it leaves the plate?

- ◯ The ball in picture A
- ◯ The ball in picture B
- ◯ The balls will move at the same speed
- ◯ More information is needed to answer the question

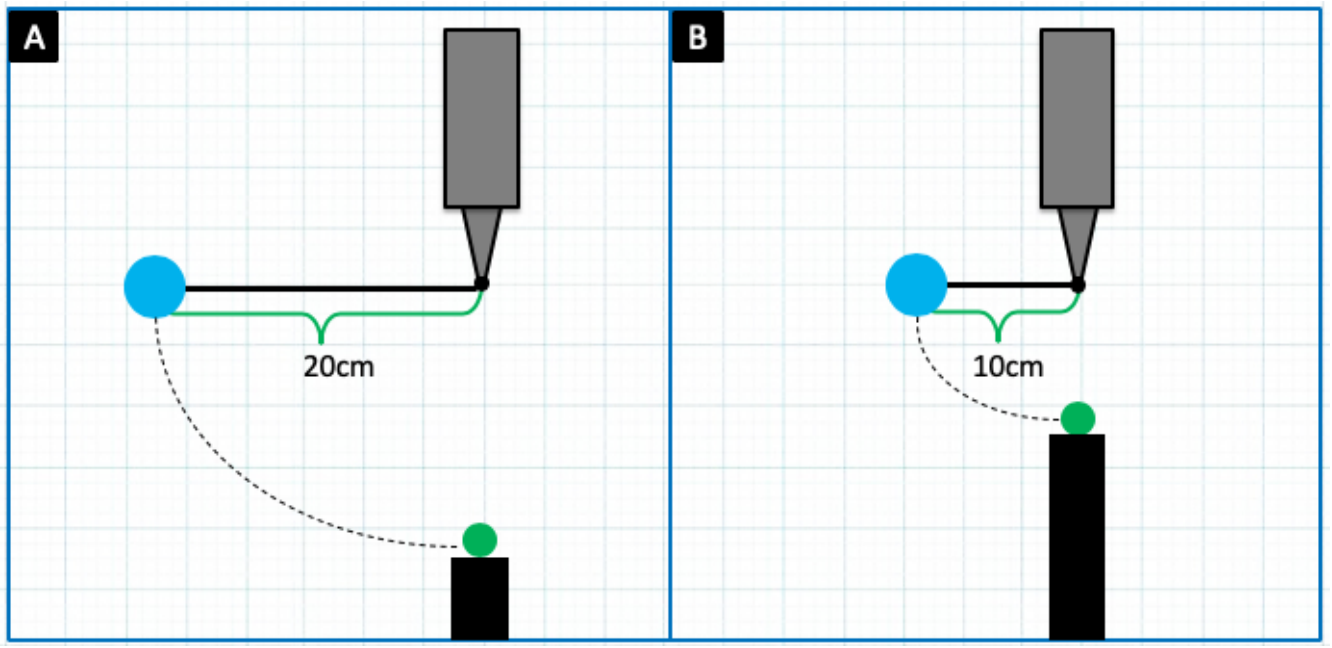
Far Q2 EcT-Lever 2



In Figures A and B, the two levers are identical. Two objects of different mass are placed at the same location. Which ball will be launched *higher*?

- A will be launched higher than B
- B will be launched higher than A
- A and B will be launched the same height because both masses start at the same height
- More information is needed to answer the question

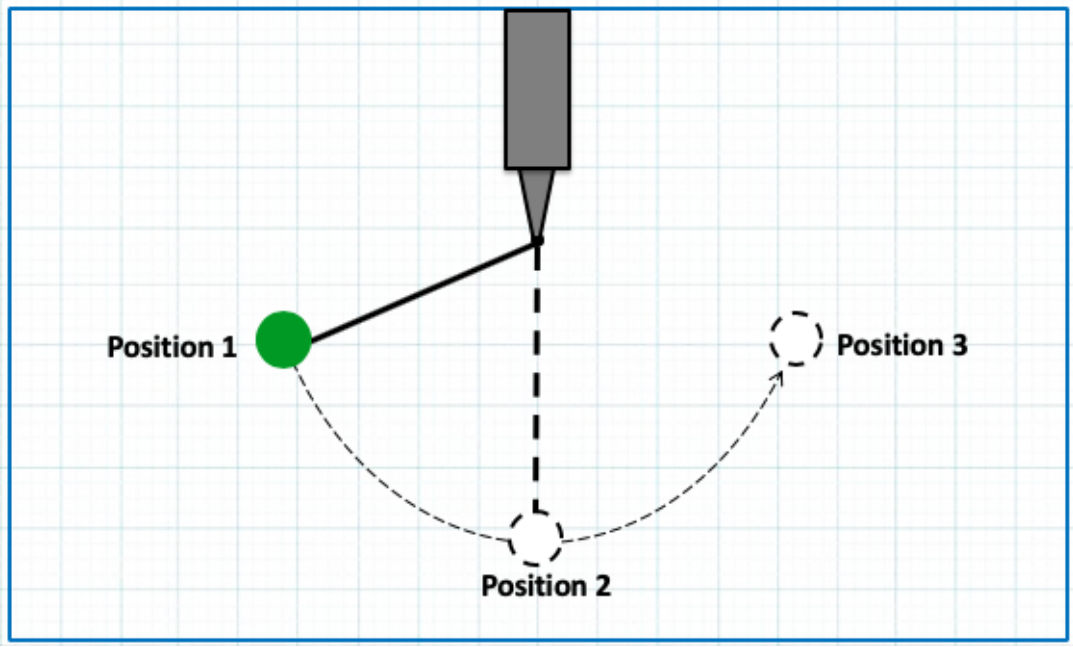
Far Q3 EcT-Pendulum 1



In Figures A and B, the pendulums have different lengths but the same mass. They are released at the same time. Which pendulum will travel faster *just before* it impacts the green ball?

- ◯ A and B will move at the same speed
- ◯ B will be faster than A
- ◯ A will be faster than B
- ◯ More information is needed to answer the question

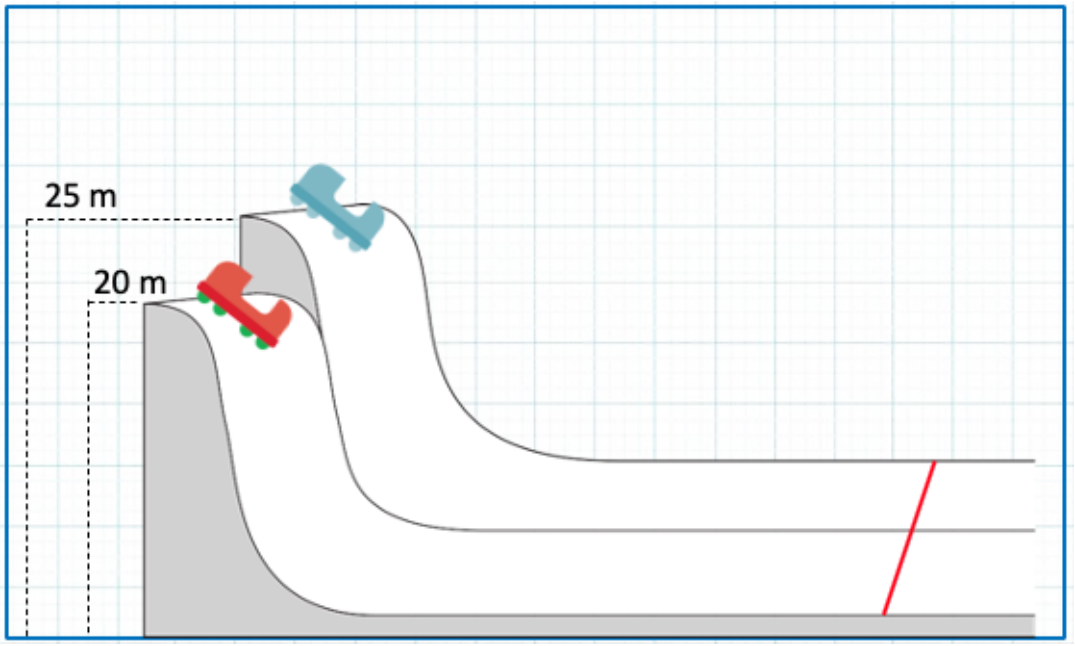
Far Q4 EcT-Pendulum 2



The pendulum swings from Position 1, passes Position 2, and arrives at Position 3. If we use a heavier ball, what is the *highest point* it will reach on its swing?

- Position 2
- Position 3
- Somewhere between Position 2 and Position 3
- Somewhere above Position 3

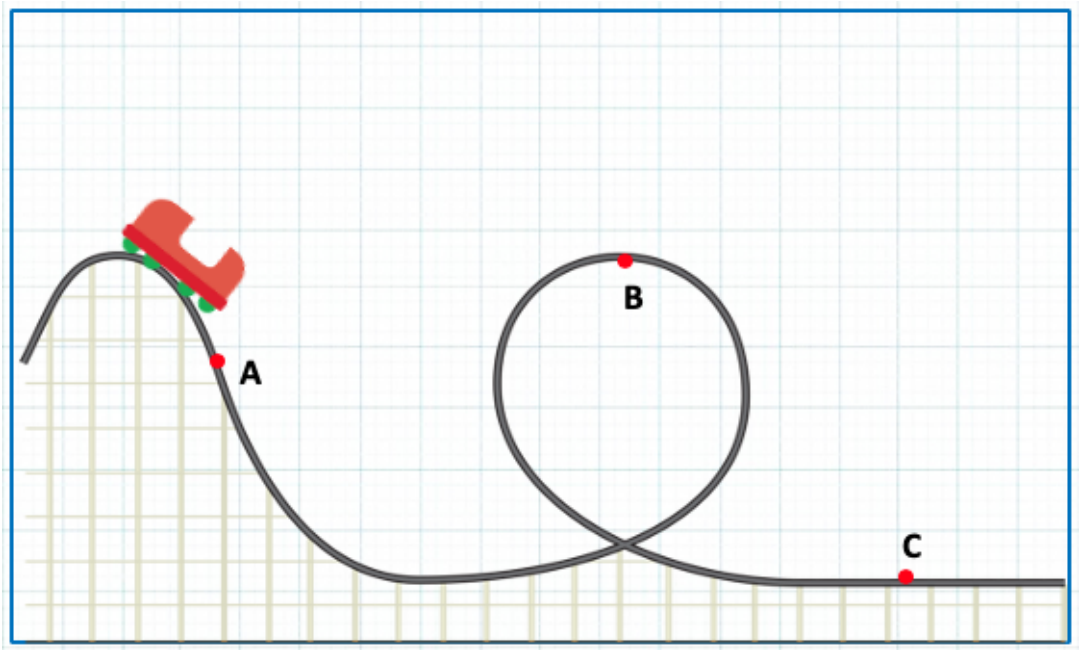
Far Q5 EcT-Ramp 1



Two identical carts are rolling down the ramp. Which cart will have *more speed* at the red line?

- ◯ The red cart
- ◯ The blue cart
- ◯ Both will have the same speed
- ◯ More information is needed

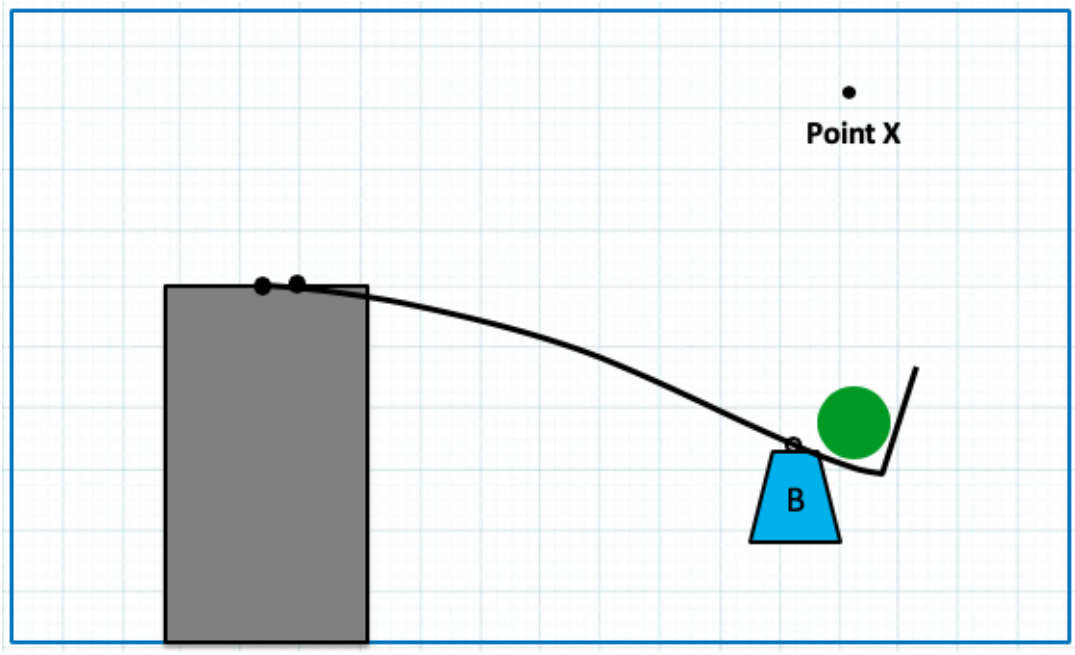
Far Q6 EcT-Ramp 2



The cart rolls down a frictionless rollercoaster. Its kinetic energy is _____.

- ◯ the least at A
- ◯ the least at B
- ◯ the least at C
- ◯ always constant

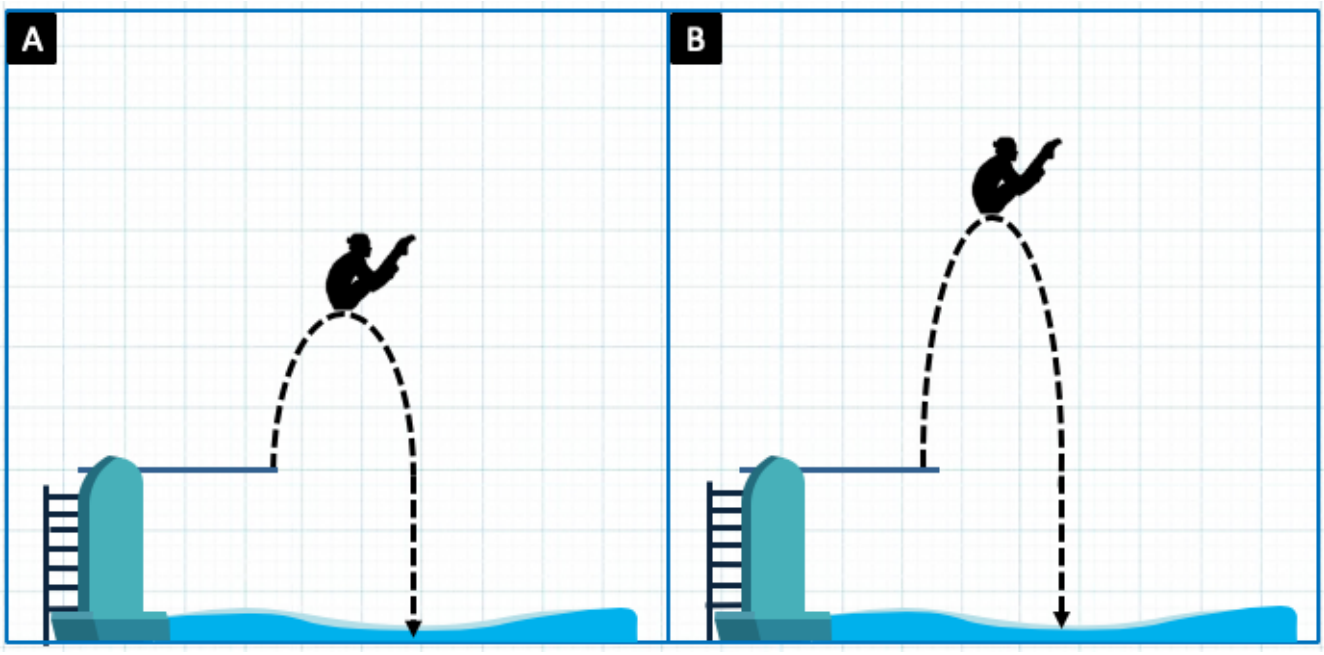
Far Q7 EcT-Springboard 1



A springboard is bent down by weight B. When the weight is released, the green ball flies up into the air to point X. What would make the green ball fly *lower* than point X?

- Increase the mass of the ball
- Decrease the mass of the ball
- Increase the mass of weight B
- More information is needed to answer the question

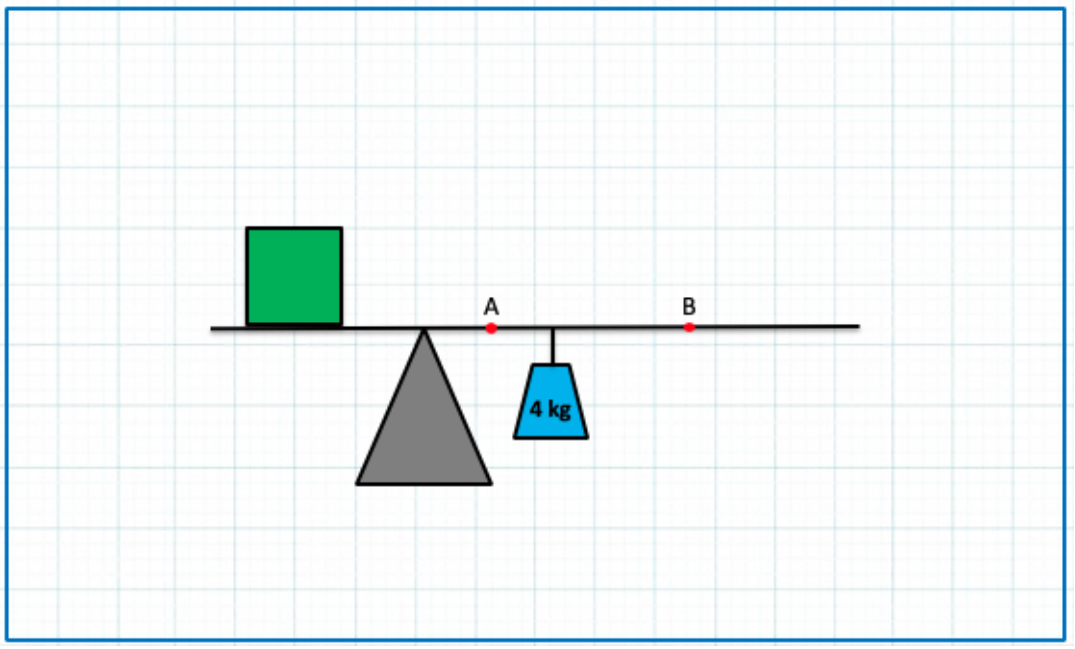
Far Q8 EcT-Springboard 2



Nicole dove twice from a springboard. In her second dive, she jumped higher than her first dive. Which dive bent the board *less*?

- Both dives bent the board the same amount
- The first dive bent the board less than the second dive
- The second dive bent the board less than the first dive
- We don't know because she already jumped

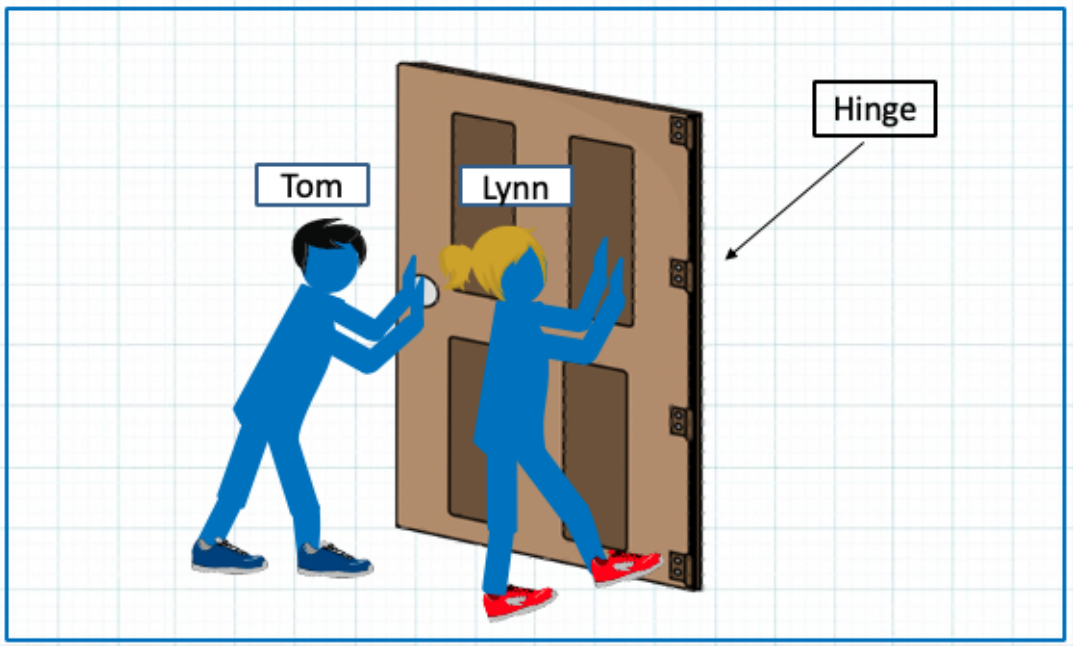
Far Q9 PoT-Lever-Distance



If the lever is balanced in the picture above, which of the following would cause the lever to go unbalanced?

- ◯ Replace 4 kg with 8 kg and move it to point A
- ◯ Replace 4 kg with 8 kg and move it to point B
- ◯ Both
- ◯ Neither

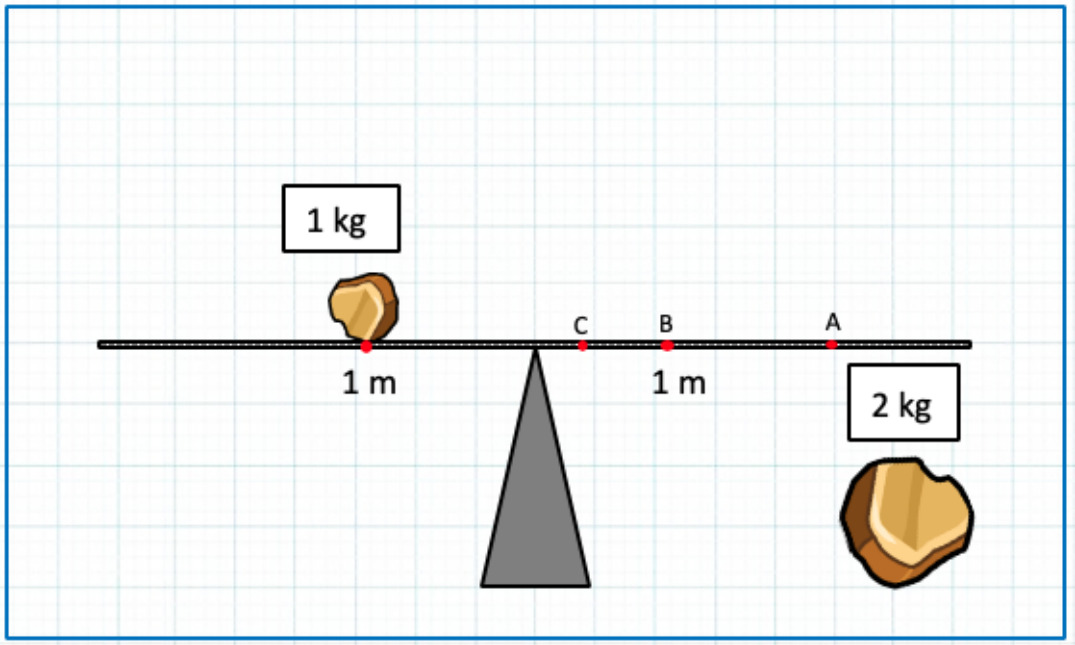
Far Q10 PoT-Lever-Distance 2



Tom and Lynn push a heavy door with the same force but at different positions. Who has the *least* effect on the movement of the door?

- Tom
- Lynn
- They both have an equal effect on the door's movement
- Not enough information

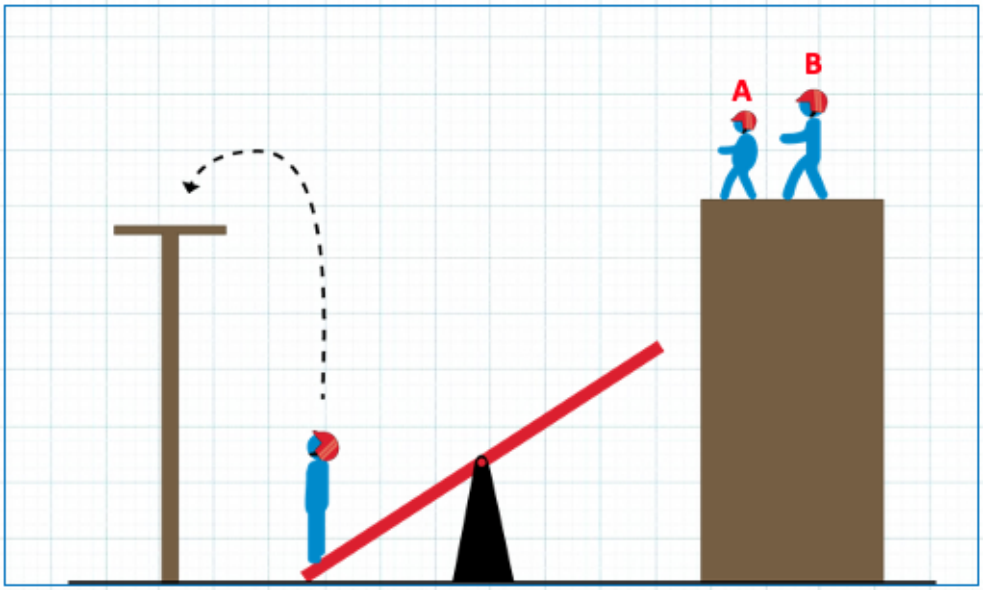
Far Q11 PoT-Lever-Mass



The 1 kg rock is 1 m from the fulcrum. The 2 kg rock is on the ground. How far should you place the 2 kg rock from the fulcrum for the lever to balance?

- Less than 1 m
- Greater than 1 m
- Equal to 1 m
- More information is needed to answer the question

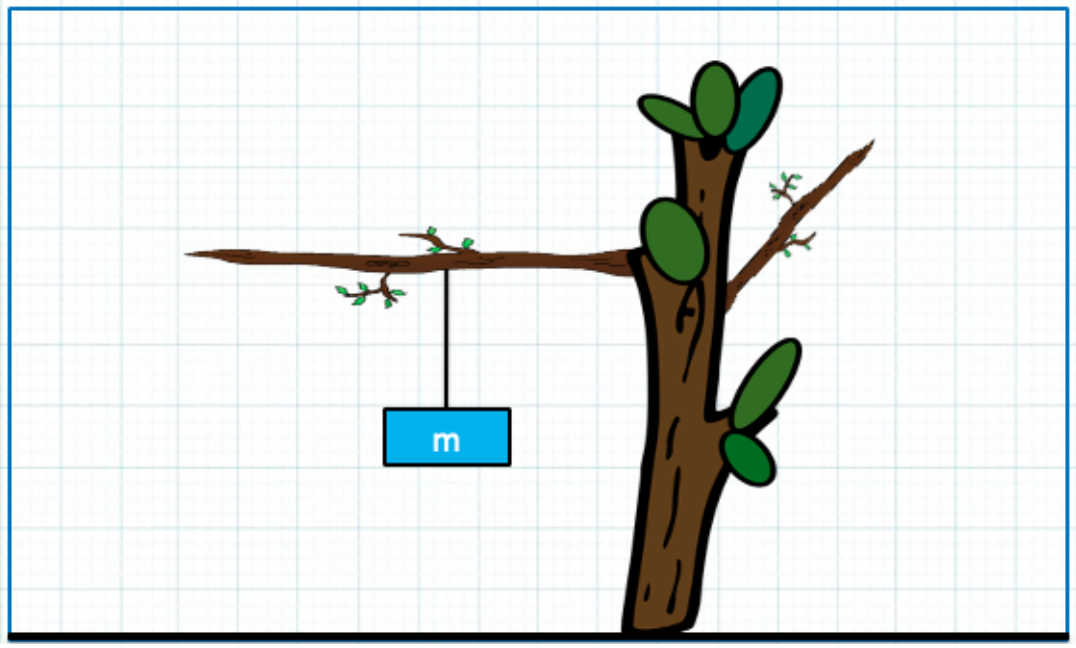
Far Q12 PoT-Lever-Mass 2



An acrobat needs to land on the platform above. At the top of another platform, two acrobats *of the same mass* are ready to land on the opposite side of the lever. Which acrobat (A or B) is *more likely* to launch the first acrobat onto the platform.

- A
- B
- Both will have the same effect on the acrobat
- Not enough information

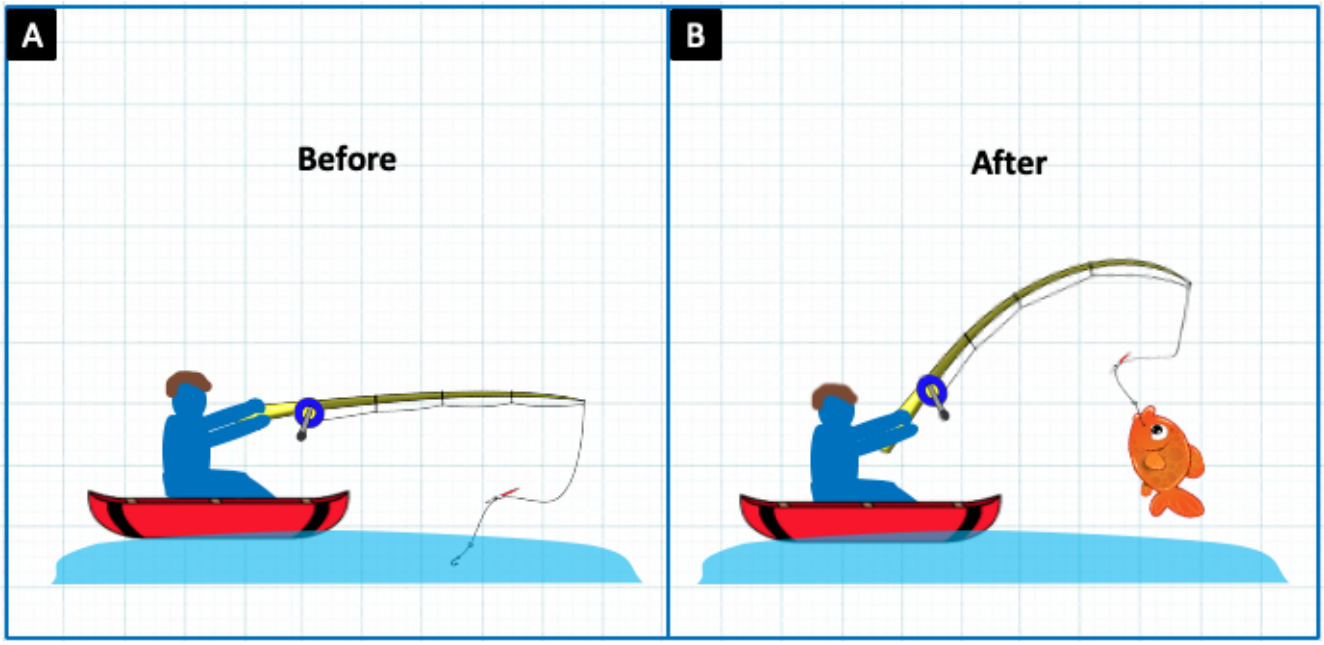
Far Q13 PoT-Springboard 1



An object is hanging on a tree branch. What would make the branch *less likely* to bend?

- By making the object heavier
- By moving the object farther from the tree trunk
- By moving the object closer to the tree trunk
- Moving the object won't make a difference

Far Q14 PoT-Springboard 2



A person is fishing in a stream. If the fishing pole was shorter, it would bend _____.

- more
- less
- the same
- more information is needed

Game Instructions Video

Game Link and instructions

You are done with the survey. Please go back to the Zoom meeting and wait for instructions on what to do next. We will start playing the game when everyone is done with this survey.