

INTERNATIONAL
STEM OLYMPIAD
GRAND FINAL GERMANY

GRADES 9-10-11

POPULAR SCIENCE

1 -



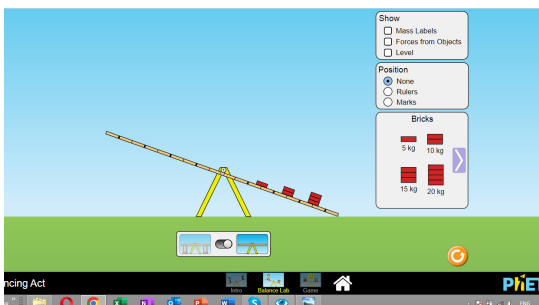
Water flows from the top down and always searches for the path of least resistance. Depending on the quality of a surface, water beads form thick streaks or spread. Many surfaces, like metals, for example, are hydrophilic (from the Greek “water-loving”). These surfaces are covered by a usually invisible film of water. A drop of water takes the form at most of a half-sphere. On hydrophobic surfaces (from the Greek “water fearing”) like Teflon or wax-coated materials, the contact angle of the water drop is greater than 90° . In this case, the forces of attraction of the water particles within the drop are stronger than that of the surface.

Decide which ones of the followings are incorrect according to the given text?

- I. On a raincoat, water flows from top to bottom and always seeks the path of high resistance.
- II. If you wear a wool jacket in the rain, the contact angle of water drops on it can be 40° .
- III. When you observe rain in your car, you see the water droplets on the car as a hemisphere.

A) B) C) D)

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Joe, Kyle, and Lou are brothers who weigh 40, 80, and 120 pounds, respectively. Joe is sitting 3 feet from the fulcrum of a seesaw, Kyle is 5 feet from the fulcrum, and Lou is 7 feet from the fulcrum. How far to the left of the fulcrum will their 200-pound father have to sit to balance the seesaw?

A) B) C) D)

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In the experiment, students try to understand the importance of thermal conductivity and how it changes according to the materials by touching objects made of different materials.

Which of the following statements about the experiment above are correct?

- I. Thermal conductivity of copper is greater than thermal conductivity of brass.
- II. Thermal conductivity of Aluminum is greater than thermal conductivity of brass.
- III. If we put equal amount of water into the containers made of Aluminum, Brass and copper materials, the water in all three containers will boil at the same time.
- IV. Heat transfer occurs from low temperature to high temperature.

A) B) C) D)

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Assuming two tops of different masses are spun with the same angular speed, which one will spin longer and why?

A) B) C) D)

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Which of the following is NOT correct about receptors on human skin?

A) B) C) D)