

Kinetic Carnival Leidenfrost effect



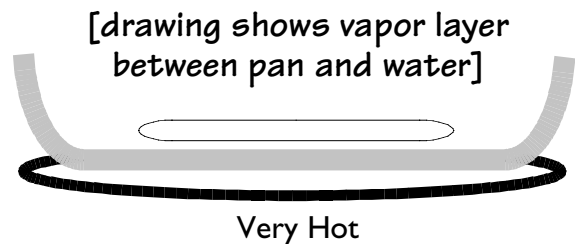
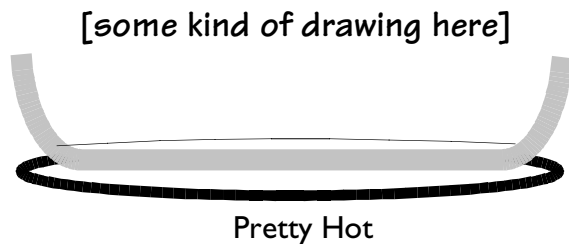
In which our hero proves his virility and masculinity by burning water, cooking a crêpe on his iron, dipping his finger into 1000°F molten lead, guzzling -200°C liquid nitrogen, holding the lit end of a cigarette, and debunking the “mind-over-matter” myth of firewalking.

DIAGRAM 1. What’s the difference between when the pan is pretty hot and when it’s very hot? Describe what happens to water on the pan in each case. Complete the diagrams below.

Water boils away in a short period of time

Water floats around in a blob; takes longer to boil away

Floats on a layer water vapor

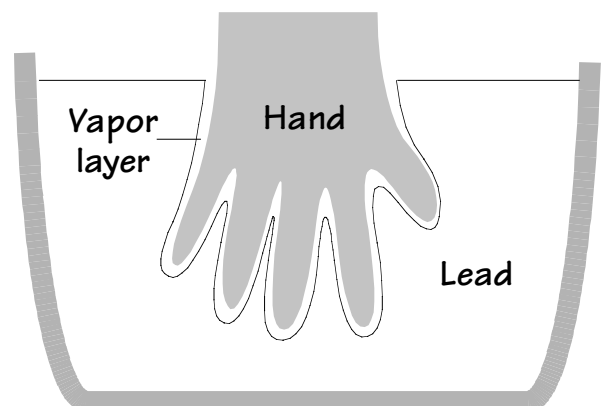


2 points

DIAGRAM 2. How does the Leidenfrost effect save Jearl’s hand when it goes into the 1000°F molten lead? Answer using words and complete the diagram below. Include labels in the diagram.

Water on hand is vaporized

Vapor layer protects hand



What are the dangers involved in this demonstration?

Burns to his hand
Spills lead on his pants
Lead solidifies on his hand

3 points

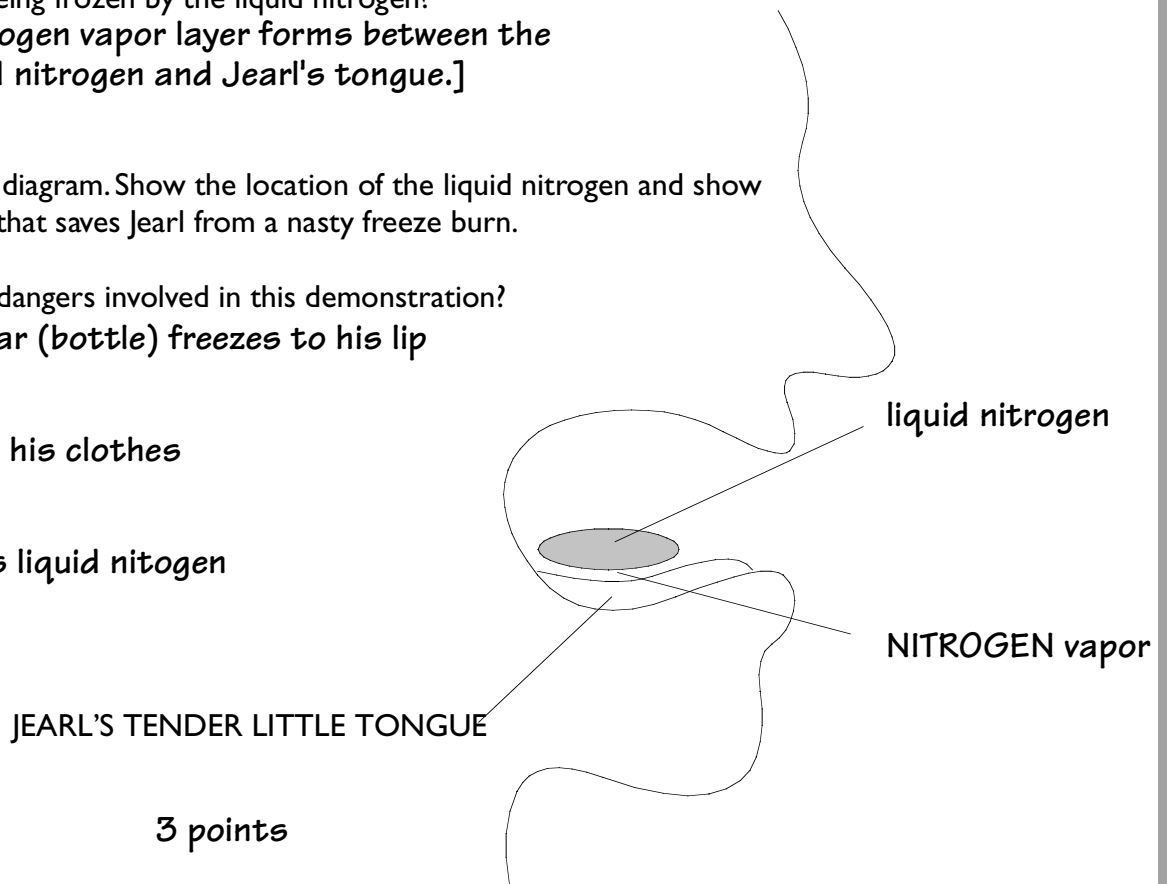
DIAGRAM 3. How does the Leidenfrost effect keep Jearl's mouth from being frozen by the liquid nitrogen?

[Nitrogen vapor layer forms between the liquid nitrogen and Jearl's tongue.]

Complete the diagram. Show the location of the liquid nitrogen and show whatever it is that saves Jearl from a nasty freeze burn.

What are the dangers involved in this demonstration?

- a. The Dewar (bottle) freezes to his lip
- b. spills on his clothes
- c. swallows liquid nitrogen



DIAGRAMS 4 & 5. Draw a diagram that shows why Jearl isn't burned by the cigarette. Draw a diagram that shows why Jearl isn't burned by the burning embers from the burned down bonfire. Label both diagrams.

