NEXT-TIME QUESTION

You're a consultant for a cookware manufacturer who wishes to make a pan that will have two features:

1. absorb thermal energy from a flame as quickly as possible.
2. have a cooking surface that stays as hot as possible when heated.

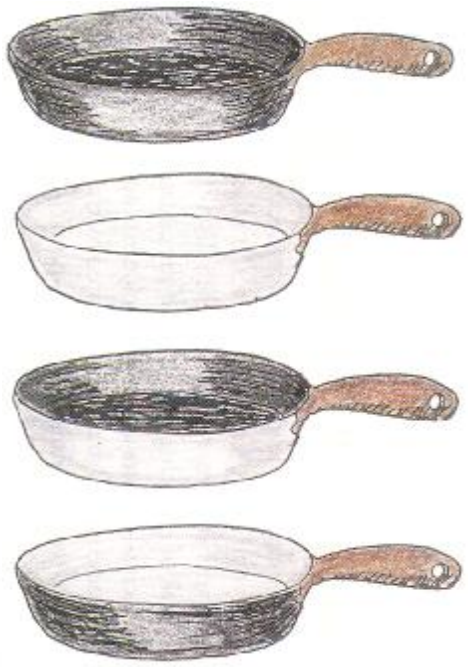
You should recommend a pan with the

a) outer and cooking surface black.

b) outer and cooking surface shiny.

c) outer surface shiny and cooking surface black.

d) outer surface black and cooking surface shiny.



thanx to Dean Baird

Hewitt Drew-it!

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Answer: d. outer surface black and cooking surface shiny
The color of cookware matters little to heat transfer by way of conduction and convection, which play significant roles. But for heat transfer by radiation, color is important. Surfaces that absorb more visible light are black, and the same is usually true for infrared radiant energy. Black surfaces absorb radiant energy better than do shiny metal surfaces. So choose black for the outer part of the pan.

For the inside of the pan you want a surface that stays hot—that emits radiant energy poorly. Since a good absorber is a good emitter, you rule against a black inner surface. Shiny surfaces are good reflectors and poor emitters, so the inner surface should be shiny.

The inner and outer surfaces of the pan are continually absorbing and emitting radiant energy. When in use, the outer surface is exposed to the hot flame and is a net absorber, while the inner surface is exposed to the cooler air above and is a net emitter.

Hewitt Drew-it!