

Answer #148

The answer is (b): the temperature of the probe will fall, as seen in the photograph at the right below. This is compared with the case with no source (left) and the burning match (center).



All objects in thermal equilibrium are both *absorbing* and *emitting* various frequencies of electromagnetic radiation. This is true for both the temperature probe and the LN cooled copper cylinder. In this case the copper cylinder is absorbing a lot more radiation than it is emitting. Radiation that is transferred between the foci of the two mirrors with the match burning results in a net energy increase of the thermal probe, whereas the temperature probe experiences a net energy loss when the cold copper block is there.

[Archive 8](#)

[Question of the Week](#)

[Outreach Index Page](#)

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