Radiation as a Mechanism for Heat Transfer

Cody Petrie

Southern Utah University

Quiz

NO QUIZ TODAY

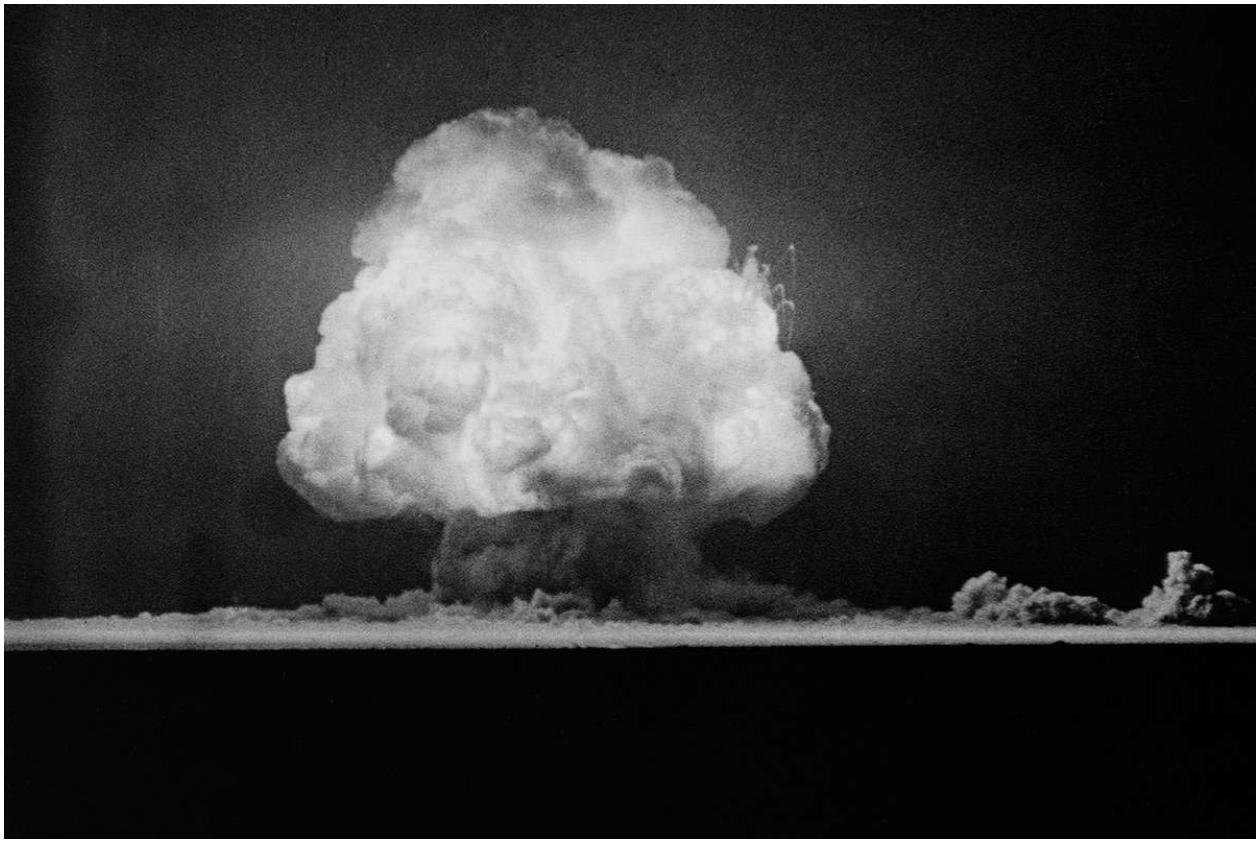
I was told that that my lesson can't have any effect on your grades

Radiation

What do you think of when you hear the word radiation?

Radiation

What do you think of when you hear the word radiation?



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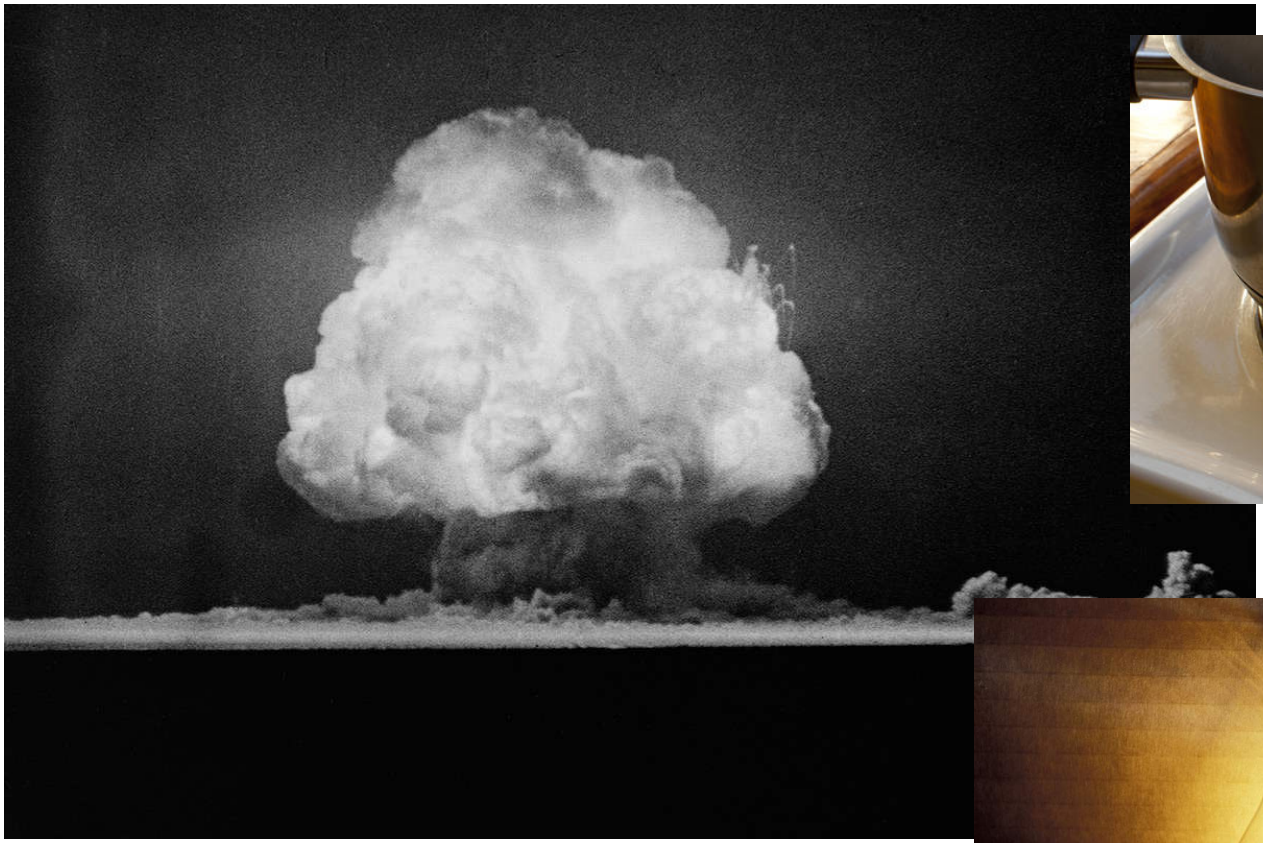

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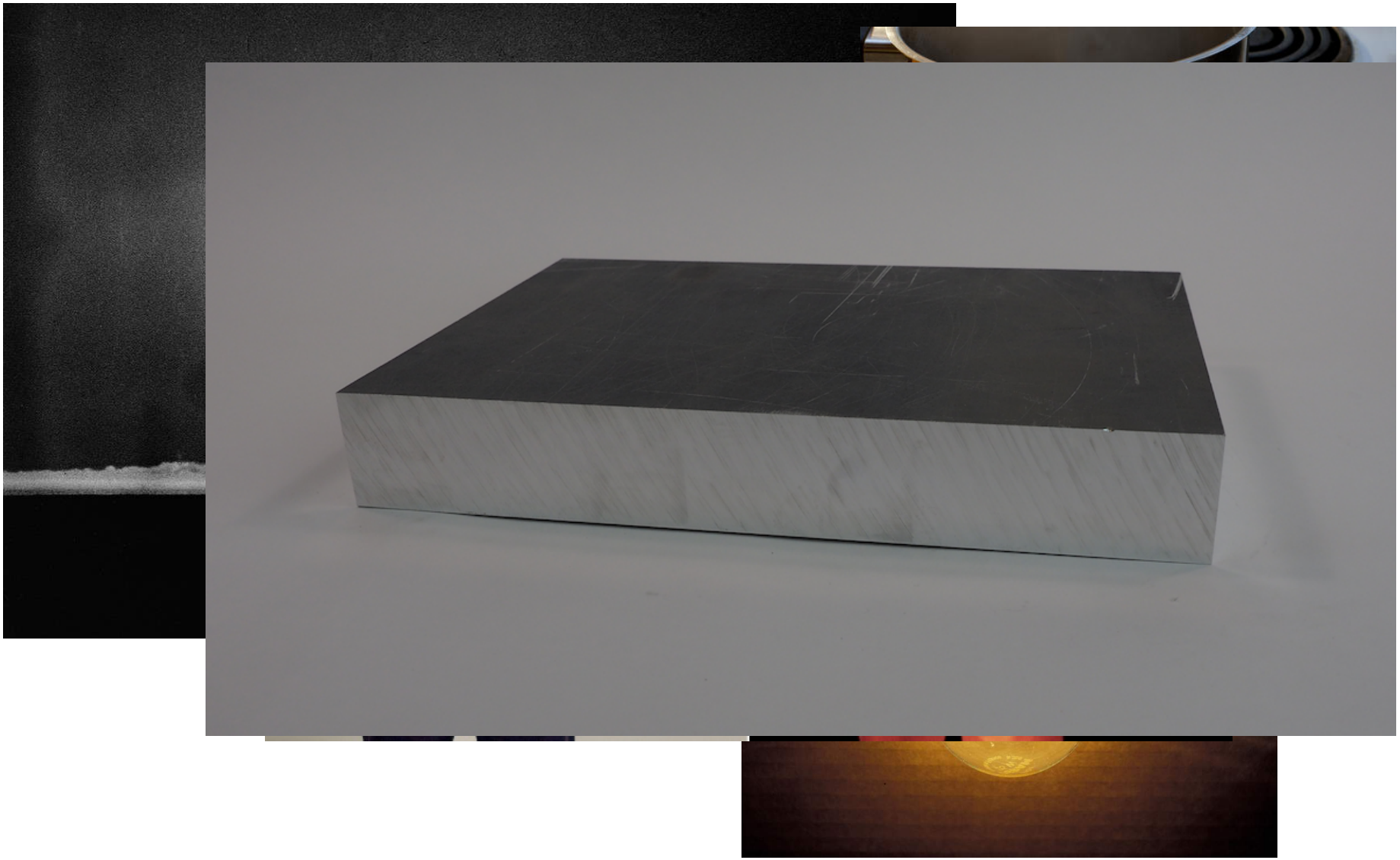

Review

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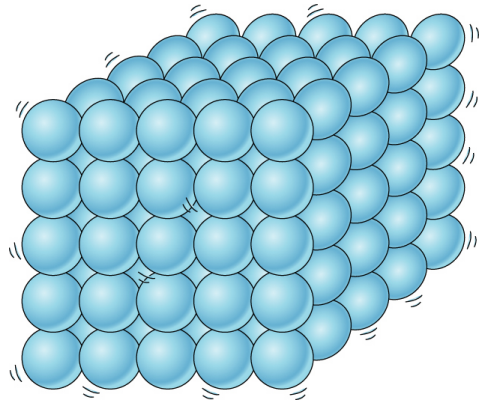
  - The energy of all of the internal pieces (atoms and molecules) of an object, as seen at rest.



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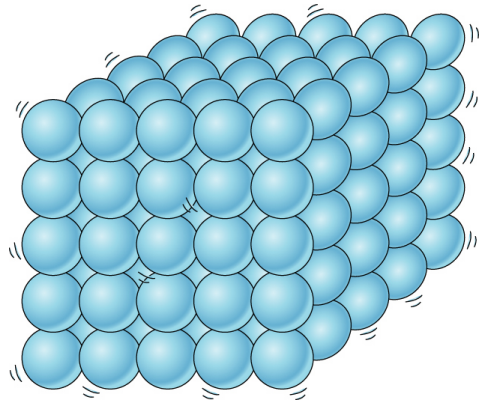

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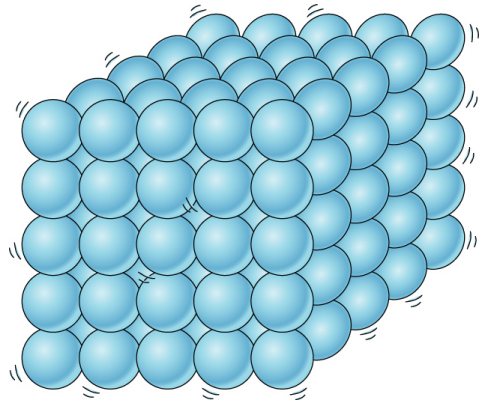

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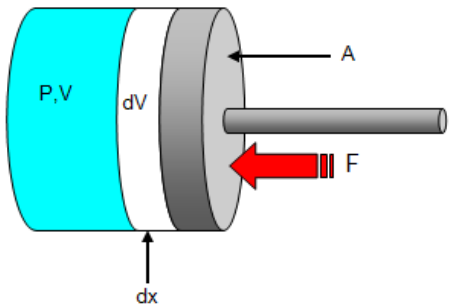

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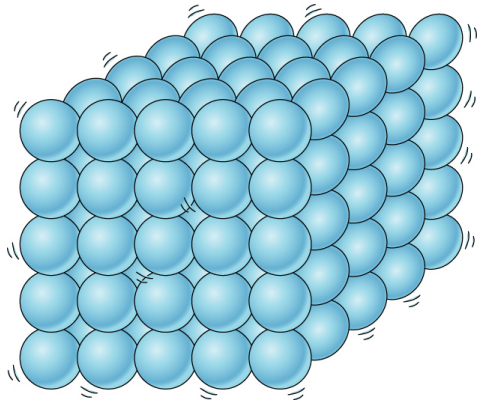

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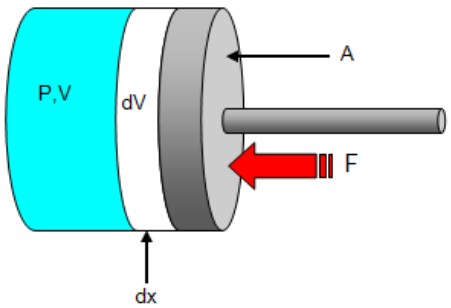
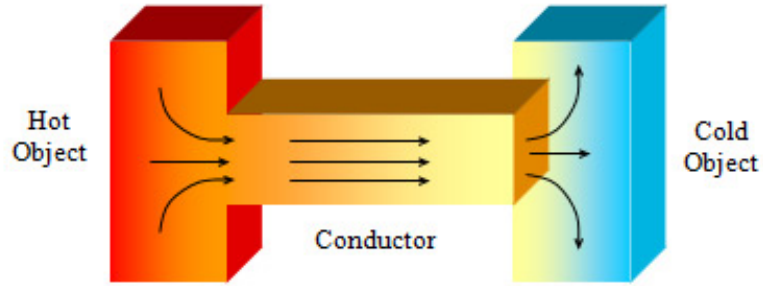
  - Heat is the flow of energy from one thing to another, usually because of a temperature difference.





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$$\Delta E_{\text{int}} = Q_{\text{added to}} + W_{\text{done on}}$$

Check for Understanding

I have a gas contained in a metal cylinder with a piston. I want to temporarily raise the energy of the gas contained in a cylinder. How should I do it and how much will it change the energy by?

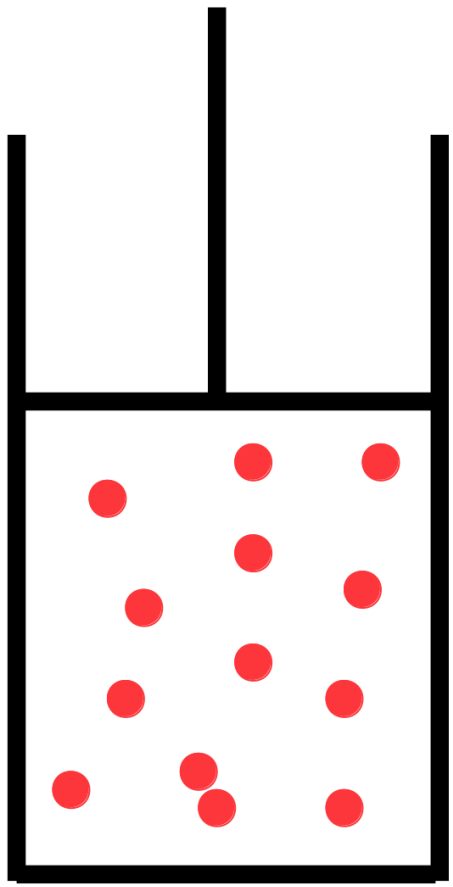
A. Push the piston down, $\Delta E\text{int} = \int_{V_i}^{V_f} PdV$

B. Push the piston down, $\Delta E\text{int} = -\int_{V_i}^{V_f} PdV$

C. Pull the piston up, $\Delta E\text{int} = \int_{V_i}^{V_f} PdV$

D. Pull the piston up, $\Delta E\text{int} = -\int_{V_i}^{V_f} PdV$

E. Quit and give up



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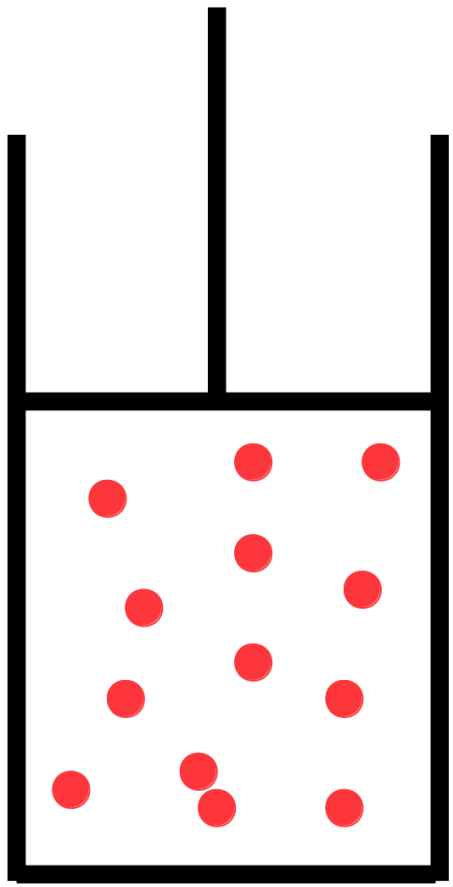


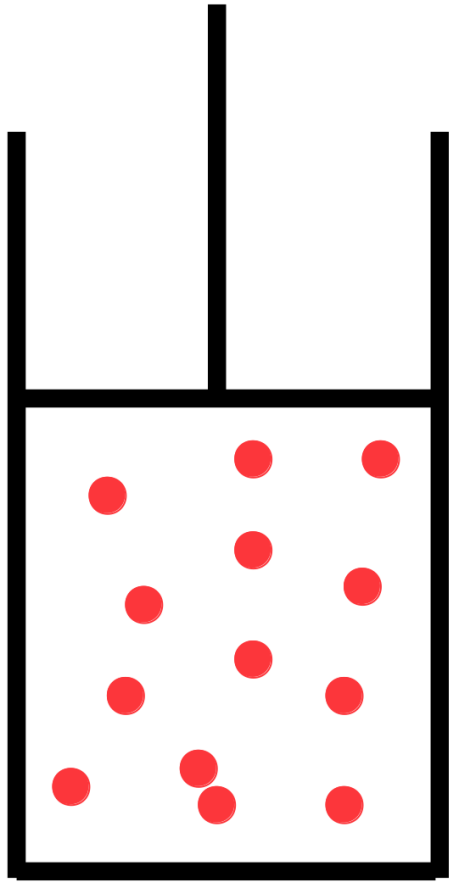
Check for Understanding - Again

Same situation, we want to add energy, but since we used a metal cylinder the piston rusted over. What should we do now to add energy?

A. Keep pushing on the piston

B. Wait for a really long time for something to happen

C. Give up, but give the container a good hard kick to make us feel better



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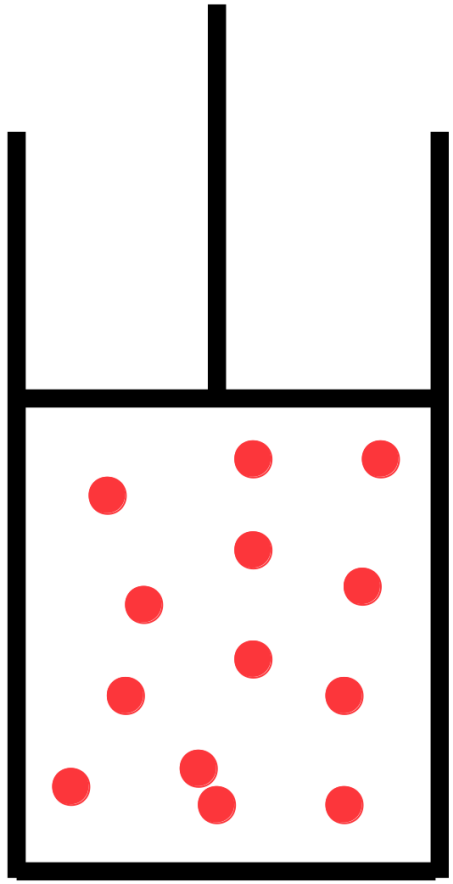

And this leads us into our next topic: heat transfer

Picture References

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