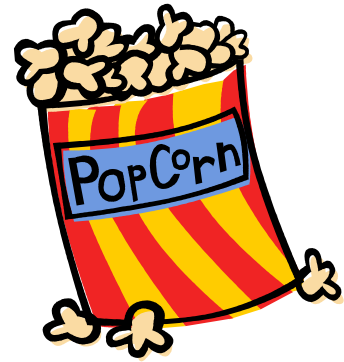


# Conduction, Convection and Radiation



Engage:

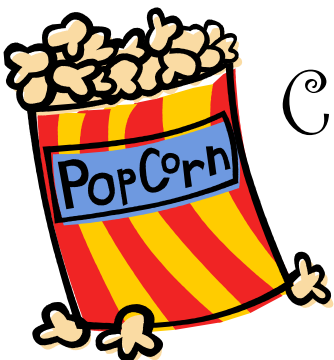
Start by preparing popcorn in 3 different ways.

- 1) Microwave a bag of popcorn
- 2) Use a burner to pop popcorn –place several kernels directing in beaker containing a small amount of oil on a hot plate
- 3) Have an air popper popping kernels

Questions for students:




- 1) Have students write down what they observe is happening.
- 2) How is the preparation of the popcorn different?
- 3) What is the commonality between all methods of popcorn preparation?

As a group go over students responses. Try to guide the discussion into heat as the commonality between all types of popping. For differences we should see direct contact, warming air around, and waves from the microwave.



# Conduction, Convection and Radiation

Please fill out the following table with your observations:

 <p>Microwave</p>	 <p>Burner</p>	 <p>Air popper</p>
<p><b>Radiation</b> No source directly touching the popcorn. It's invisible!</p>	<p><b>Conduction</b> Direct contact between the burner / pan / kernels</p>	<p><b>Convection</b> Hot air flowing through the popper to pop the popcorn.</p>

- How is the preparation of the popcorn different?
  - Microwave, Burner, Air popper.
  - The way it was heated up and popped.
  - Conduction, convection and radiation.
  - See above
- Is there something similar between the methods or preparing the popcorn?
  - See above
  - Heat is being transferred in order to pop the popcorn.