

N.R.G

*This workshop targets learning outcomes for Essential Standards **5.P.3: Explain how the properties of some materials change as a result of heating and cooling.***

SUMMARY:

In this class, children learn about the concepts of heat and heat transfer. The children will witness the practical side of heat-sensitivity while warming up their hands and a gravity defying candle lighting. Students observe melted and resolidified metal— a shift of states from solid to liquid right before their eyes— as well as effects and behavior of warm air and water. We will use dry ice to see a speedy heat transfer and a convection current begun with only the energy from their own bodies.

EDUCATIONAL VALUE:

This class introduces children to the physical facts on heat. Students will learn the physical explanation for the existence and sensation of heat, as well as its many characteristic properties. The instructor uses various tools like hand warmers to demonstrate how we use temperature sensitive equipment in our everyday lives. They will learn both how and why matter changes between the different states, and explore the concepts of conduction, convection and radiation. Children explore materials that transfer heat at different rates. They will take home a heat sensitive cup that allows them to see when heat is being drawn out of the cup.

TAKE-HOME MESSAGE:

- 1 Conduction is when heat moves between objects.
- 2 Convection is the movement of thermal energy in currents through liquids and gases
- 3 Radiation is the movement of energy by electromagnetic waves
- 4 Heating affects materials differently, and heat conduction varies between materials. This makes different things useful for keeping heat in or letting it spread out.



TAKE-HOME PRODUCT:

Thermo-Color Cup

NORTH CAROLINA ESSENTIAL STANDARDS:

- **5.P.3 Explain how the properties of some materials change as a result of heating and cooling. (see [Unpacking Essential Standards](#))**
- *5.P.3.1* Explain the effects of the transfer of heat (either by direct contact or at a distance) that occurs between objects at different temperatures. (conduction, convection or radiation) .
- *5.P.3.2* Explain how heating and cooling affect some materials and how this relates to their purpose and practical applications.