

Title of Lesson: Heat Transfer

Theme: Physical Science

Unit Number: 2 Unit Title: Heat Transfer

Performance Standard(s) Covered (enter code):

S8P2

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Enduring Standards (objectives of activity):

Habits of Mind

- Asks questions
- Uses numbers to quantify
- Works in a group
- Uses tools to measure and view
- Looks at how parts of things are needed
- Describes and compares using physical attributes
- Observes using senses
- Draws and describes observations

Content (key terms and topics covered):

Terms: Convection, Radiation, and Conduction

Learning Activity (description in steps)

Abstract (limit 100 characters): This is a lab created to help students visually see how conduction, radiation, and convection work.

Details: I did the experiment myself since I was using matches as a source of fire. I started by asking the students what the three types of heat transfer were. I demonstrated radiation by having my student teacher place her hand close to the flames and then had her pull her hand away. I had the students tell me why the teacher's hand felt hotter closer to the light bulb than it was farther away. Next I showed them conduction, which I demonstrated by having the teacher hold a balloon filled with air over a match. The balloon popped and I had the students tell me why they think the balloon popped. Next I had her hold a balloon filled with water over a match, but this time the balloon didn't pop. I had the students tell me why the balloon didn't pop this time. I used this part to try to incorporate the states of matter and how they change. Finally I showed them convection, which I did by unraveling five regular tea bags and dumping out the tea. Then I stood the bags up on the table and had the students tell me what they think will happen when I lit them on fire. I lit the bags and then had the students tell me why this was convection (because once the tea bags burned down to a certain point the air in the room was happy to lift it). One thing to remember is to make sure there is no wind or A/C on in the room, otherwise the tea bags won't stand up properly. This demonstration took about 30 minutes depending on how many questions you ask and how long it takes to get set-up.

Materials Needed (type and quantity): Lamp with a light bulb, water balloons, matches, and tea bags

Notes and Tips (general changes, alternative methods, cautions): If you let the students do the experiment themselves then I suggest using bunsen burners instead of matches. Also, my students complained about the smoke (even though there wasn't much) you can do the experiment outside or in a lab with ventilation.

Sources/References:

- 1) <https://www.youtube.com/watch?v=GkkxXJ4db8> (convection)
- 2) <https://www.youtube.com/watch?v=4RyQM-7Ftvs> (conduction)
- 3) Click here to enter text.