**Name:**  
**Date:**  
**Grade Level:** 5th  
**Subject:** Science

<table>
<thead>
<tr>
<th>Lesson Topic/Concept: Heat transfer</th>
<th>EQ: What are some real world examples of conduction, convection, and radiation?</th>
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<tbody>
<tr>
<td>Standard: 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).</td>
<td>TLW: Demonstrate conduction, convection, and radiation. Distinguish real world examples of conduction, convection and radiation.</td>
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**“Inquiry” (students) What cooperative learning strategy can you use?**

**Teacher: (Inquiry)**
- Asks open-ended, or divergent questions (such as “What are you doing?” “Tell me about what you’re thinking?” and “What do you think would happen if...?”);
- Waits 5-7 seconds after asking questions, giving students time to think;
- Responds to students by repeating and paraphrasing what they have said without celebrating or criticizing (to encourage students to think for themselves and to discourage looking to the teacher for validation);
- Avoids telling students what to do, evaluating, rejecting, or discouraging student ideas and behaviors;
- Maintains a disciplined classroom.

**Begin lesson by review vocabulary to trigger prior knowledge: conduction, convection, and radiation. Students will Rally Robin to share real world examples of each type of heat transfer.**

**“I DO” (Teacher Input & Modeling)**

- The teacher will model and facilitate the completion of the popcorn lab activity assisting students as needed.

Conduction – Jiffy Pop on the stove top  
Convection – popcorn popper  
Radiation – microwavable popcorn

**All Students:**
Demonstrate active processing of new information by responding appropriately to teacher cues.

**“WE DO TOGETHER” (Shared Practice) - What cooperative learning strategy will you use?**

**Teacher:**
- Uses a variety of quick engagement and active participation strategies to practice new learning with students;
- Checks for understanding and provides immediate, specific, and abundant feedback.

**All Students:**
- Students will describe the physical properties of each type of popcorn on their lab sheet. They will rate the taste using a scale of 1 to 5. Students will also examine pros and cons of each type of heat transfer to cook popcorn.
Demonstrate initial understanding by responding appropriately to verbal and other cues.

<table>
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<th>Teacher:</th>
<th>All Students:</th>
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<td>• Predetermines teams based on identified student needs;</td>
<td>• Work together to develop deeper understanding of new learning;</td>
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<td>• Sets behavioral and procedural expectations for student interaction (i.e. student roles, time, outcomes);</td>
<td>• Can explain new learning with assistance as needed;</td>
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<tr>
<td>• Monitors, assesses, and provides immediate, specific, and abundant feedback to individuals and groups;</td>
<td>• Demonstrate an ability to utilize metacognitive strategies.</td>
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<td>• Meets with students to reteach as needed (use a different modality or intelligence to reteach).</td>
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**“CLOSEURE”**

Teacher: Informally assesses attainment of objective (i.e. ticket out the door, places check marks on student papers as students are completing assignment)

All Students: Can restate ways to apply objective; Can self-assess and reflect upon learning.

The students will complete a “ticket out the door” where they explain which method of heat transfer produces the best quality and best tasting popcorn.

**“YOU DO ALONE” (Independent Practice)**

Teacher: Monitors students working independently and checks for accurate understanding of the skill (if in class); Assesses student mastery of content; Intervenes with struggling students as needed through individual or small group instruction.

All Students: Work independently to apply new learning; Demonstrate mastery of new learning.

Comments:

Differentiation:

Homework / Assessment: