### Module Brief descriptions of some activities

1. **Invention (Days 1–2)**
   - Invention warm-up activity, Digital Device Stand Design Challenge, gallery walk; evaluate whether the stands can help users with various needs
   - Introduce invention and the invention problem and brainstorm users whose needs are not met with standard lunch box
   - Choose users for the lunch box invention
   - HomeFun activity: Share inventions from your original areas
   - Form invention teams (groups of three) where the team members have diverse expertise, model how to work in teams
   - Ask students to bring shoe boxes to school for the invention project

2. **Thermal energy transfer (Days 3–6)**
   - Hands-on science labs and demonstrations that teach thermal energy and different types of heat transfer, e.g., the demonstration about convection as in Figure 1
   - Discuss problems and solutions related to thermal energy transfer in the context of food safety and transportation
   - Explore the design and materials of containers to keep food/drink cold in everyday life

3. **Thermal conductivity of materials (Days 7–9)**
   - Shortening Mitten lab to teach insulation and conduction
   - Watch a video and discuss how Emperor penguins minimize the amount of heat loss to cool ocean water
   - HomeFun activity: share traditional clothing that keep warm or cool in students’ original regions, areas, and cultures.
   - Thermal Resistance Efficiency lab to explore the thermal properties of various materials

4. **Lunch box prototyping (Days 10–11)**
   - Design, build, test, and revise a lunch box using shoe boxes that will keep cold food from warming up

5. **Peltier brainstorming (Days 12–13)**
   - Learn about heat island, thermoelectric effect, removing heat from the system, and Peltier tiles
   - Build a Peltier cooling unit that is made of a Peltier tile sandwiched between two heat sink fans
   - Brainstorm ways to use Peltier tiles in lunch boxes

   - Learn about what is patent and patent application
   - Create a poster that includes elements of patent application for lunch box inventions
   - Extend the invention experience to other everyday examples