The first step in any invention process is identifying a need or want for something—in this case it is an inexpensive and environmentally safe way to pasteurize water. One solution to that, the one you will be exploring in this activity, is to research and build a portable, inexpensive solar cooker that can heat water quickly. Use these steps to help guide your invention process.

**Step 1—Conduct Research:** Use print and Internet resources to investigate solar cookers, particularly the type you will be building, a passive solar cooker. There are primarily three types of passive cookers: box cookers, panel cookers, and parabolic cookers. From your research, come up with a list of solar cooker characteristics that will help you meet your criteria for success. Brainstorm a list of materials that you think may optimize the type of cooker you will be designing and building. Record what you have learned in your journal.

**Step 2—Develop a Plan:** As a team, choose the materials you want to use to design and build your solar cooker. As you think about which design you would like to use, consider how to most effectively use your materials to concentrate the sun’s energy to heat your water.

**Step 3—Design Your Model:** Develop a drawing of your design model. The drawing should indicate the cooker’s parts, dimensions, and materials to be used. Consider how you are going to use your thermometer to measure the temperature (if you have to keep opening your cooker to put in the thermometer, the temperature will drop). In your team journal, include a brief description about your design and materials.

**Step 4—Build Your Model:** Build your model. As you build it, make sure to include detailed notes in your journal about the final shapes, dimensions, and materials used to construct the actual cooker. These will help you later evaluate the cooker’s performance.

**Step 5—Test Your Model:** Record the initial temperature of the water and then record the temperature again every five minutes and note when you have reached 65°C.

**Step 6—Revise and Retest Your Model:** Identify the strengths and weaknesses of your current model. Make any modifications you think will improve the efficiency of your solar cooker. Note the changes you decided to make to your prototype on your original drawing and include in your team journal why you decided to make those changes. Retest your model, again recording the initial temperature and then the temperature every five minutes after that and noting when the water reaches 65°C.

**Step 7—Evaluate Your Invention:** Compare the efficiency of your first solar cooker to your second design. Then compare your design with those of other teams in your class. As a class, compare and discuss each team’s final design and effectiveness in meeting the criteria for success.