

Step-By-Step Set-Up

The heat transfer kit includes contents for eight student stations.

- 32 insulated cups (8 each labeled A, B, C, D) and 32 cup liners
- 1 cup for cooling thermometers
- 16 foam lids
- 8 Aluminum bars for the experiments
 - 1 extra aluminum bar to be used before experiments
- 16 digital thermometers
- One hot water pot
- A portable mouse
- A memory stick containing all files listed above
- A notebook with all documents listed above

The following steps should be completed before class:

1. Determine how you will group your class to form up to eight experiment stations.
2. Open the Kit box and remove the hot water pot and storage boxes.
3. Remove the contents of all three boxes.
4. Fill one of the plastic storage boxes with cold or tap water to $\frac{1}{2}$ full. This will be used to cool the metal bars between experiment 1 and 2. Fill the Styrofoam cup labeled “Use to cool thermometers” with cold water.
5. Fill the pot with water, but do **NOT** heat it yet. Use it to fill the cups with cold water. **Cups labeled B should only have about 1 inch of water.** Cups C and D can be filled $\frac{3}{4}$ full.
6. Fill up hot water pot and turn on to heat the water for cups labeled A. Take one of the thermometers and measure the temperature of the water. You will only need to heat it to $\sim 60^{\circ}\text{C}$.
7. Assemble Experiment 1 apparatus for each of the eight student stations.
 - a. Place metal bar ends into two foam lids
 - b. Place a thermometer into each foam lid
 - c. Place bar/thermometer/lids into a cup “A” and cup “B”

The following steps are completed immediately before Experiment 1:

1. Stop video at the appropriate place.
2. Fill eight cups marked “A” to $\frac{3}{4}$ full of hot water.
3. Place assembled apparatus into the two cups labeled A and B making sure the metal bar is inside each cup and the foam tops are secure. The thermometers should be turned on and set to Celsius.
4. Take one apparatus to each student station.

5. Resume play of Heat Transfer, Basics video.
6. Remove apparatus from each student station when directed by the video.
7. Remove ALL thermometers and place in cup for cooling thermometers.
8. Remove all metal bars and place in storage box of water to cool.

To prepare for Experiment 2:

1. Stop video at the appropriate place.
2. Assemble Experiment 2 apparatus for each of the eight student stations.
 - a. Place metal bar ends into two foam lids
 - b. Place a thermometer into each foam lid
 - c. Place bar/thermometer/lids into a cup "C" and cup "D"

NOTE: Cup C and D will both have cold water for Experiment 2
3. Take one apparatus to each student station and turn on thermometers (Celsius)
4. Resume play of Heat Transfer, Basics video.
5. Remove apparatus from each student station when directed by the video.

To pack the kit to return to CERT:

1. Pour water out of all cups and water pot.
2. Allow all items to dry before packing them. (overnight drying on table)
3. Place all items back in appropriate storage boxes. (lids have content descriptions).
4. Place hot water pot into large box first. (handle towards the center)
5. Place three boxes into large box with the green lid.
6. C and D cups (with their liners) should be in the plastic bag.

Contact CERT for pickup of the Kit.

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