Heating and Cooling of Earth's Surfaces

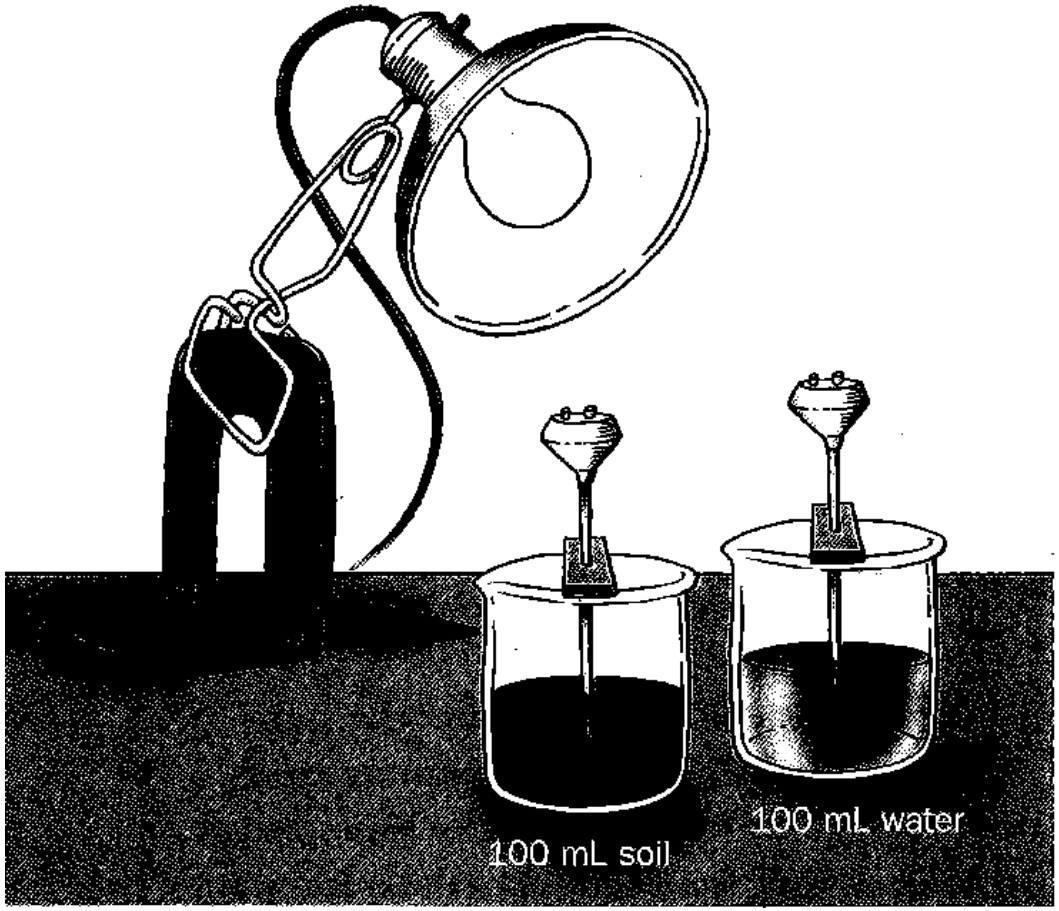
Soil and Water Investigation

Do soil and water heat and cool differently?

Materials

- Clamp lamp with stand
- 2 thermometers
- 2 strips of cardboard
- 2 glass beakers
- Soil
- Water
- Timer
- Safety Googles
- Tape measurer

Setup!



What we change:

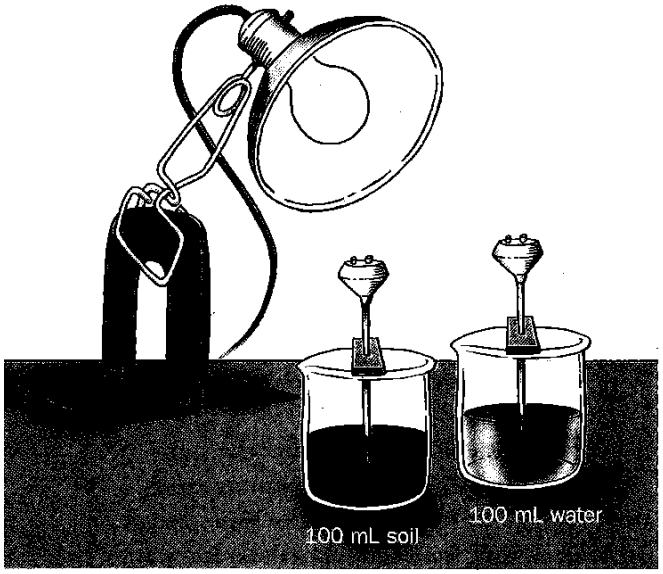
- Light on to heat then light off to cool

What we measure:

- Changing temperature of soil and water

Things we keep the same

- Distance from light – 30cm
- 125 mL of soil and water
- Heating (light on 10 min), cooling (light off 10 min)
- Depth of thermometer
- Starting temps of soil and water are the same



Procedure

Things we keep the same

Distance from light – 30cm

125 mL of soil and water

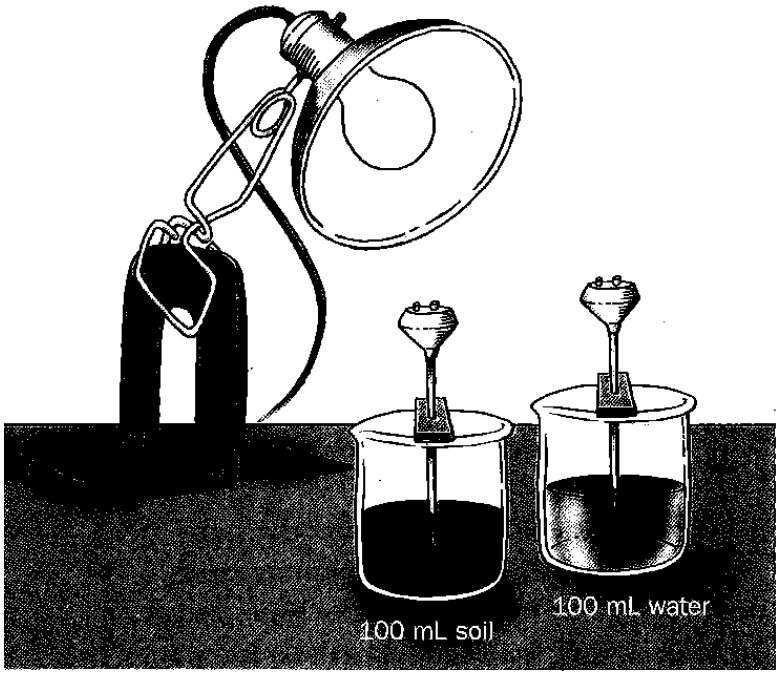
Heating (light on 10 min), cooling (light off 10 min)

Depth of thermometer

Starting temps of soil and water are the same

1. Set up and STOP, check with Mrs. Ryan
2. Record your starting temps in Celsius for soil and water
3. Turn on your light and timer at same time!
4. Record heating temps each minute for 10 minutes.
5. At 10 minutes, turn light off and KEEP TIMER GOING to 20 minutes!
6. Record cooling temps each minute for 10 minutes
7. At 20 minutes, record last temperature. Discard soil and water.

Record Starting Temperatures



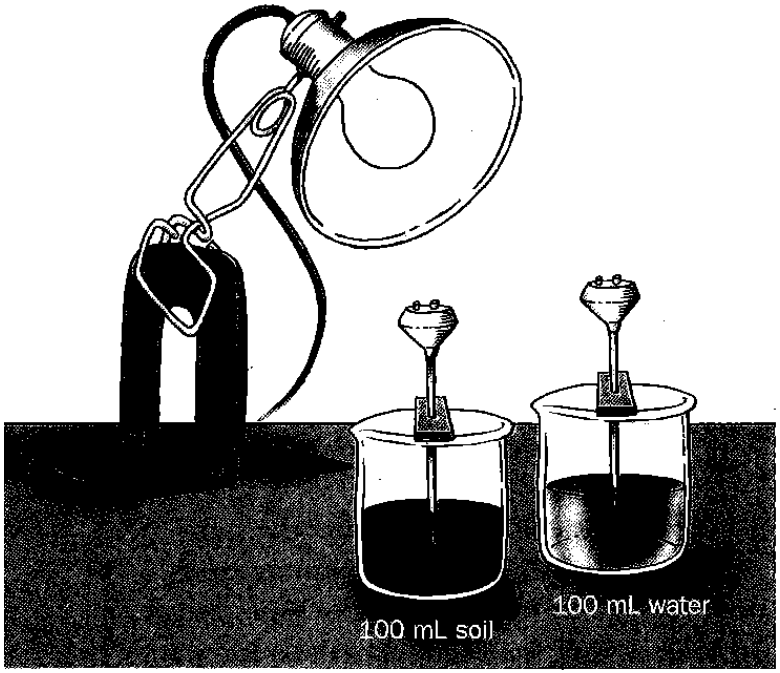
0 minutes

- Soil temp: 22.0
- Water temp: 22.0

Turn light on and start timer!

Continue Recording Temperatures

- Heating!

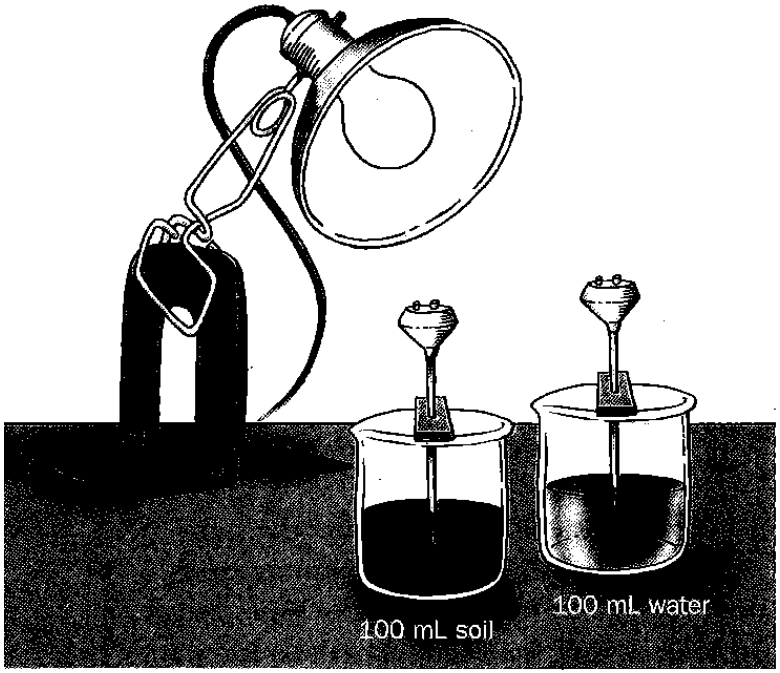


1 minute

- Soil temp: 24.0
- Water temp: 22.4

Continue Recording Temperatures

- Heating!

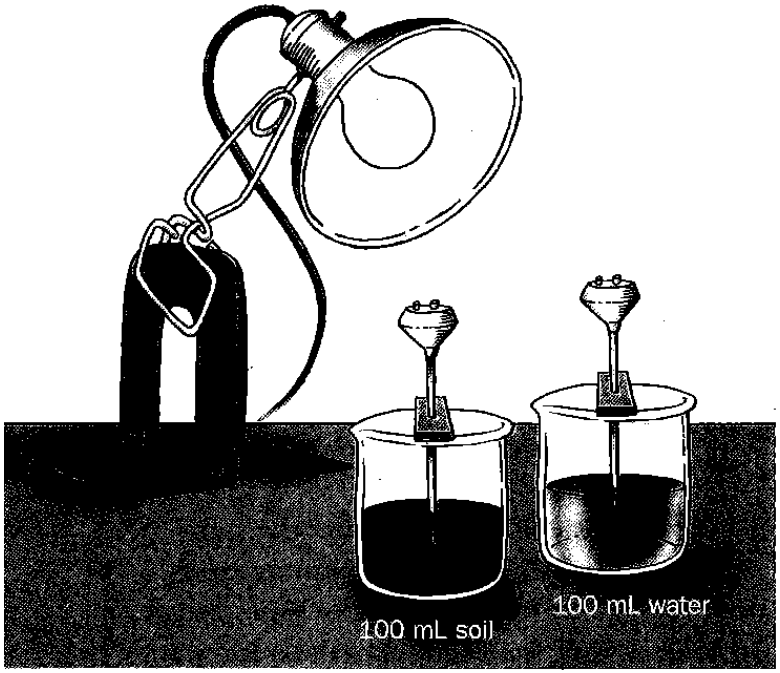


2 minutes

- Soil temp: 25.0
- Water temp: 22.6

Continue Recording Temperatures

- Heating!

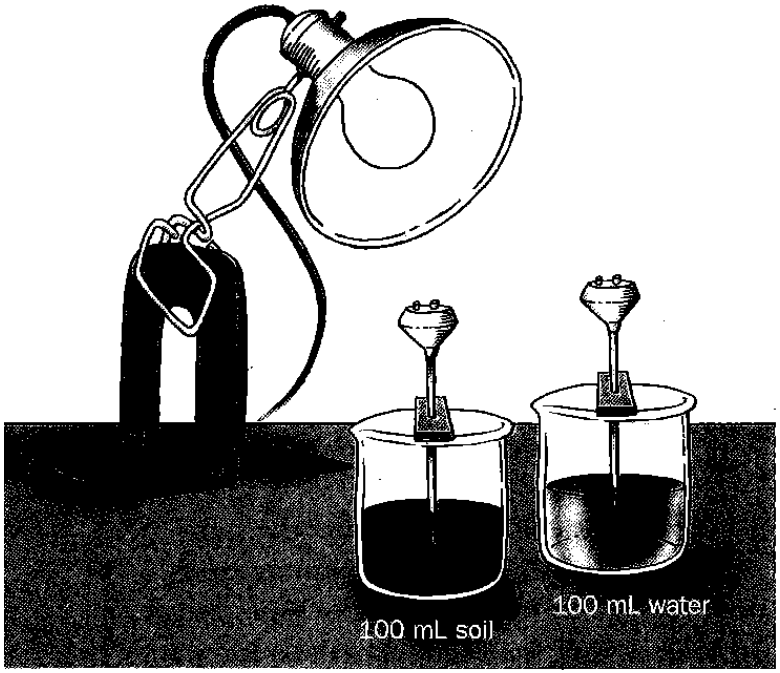


3 minutes

- Soil temp: 25.7
- Water temp: 22.7

Continue Recording Temperatures

- Heating!

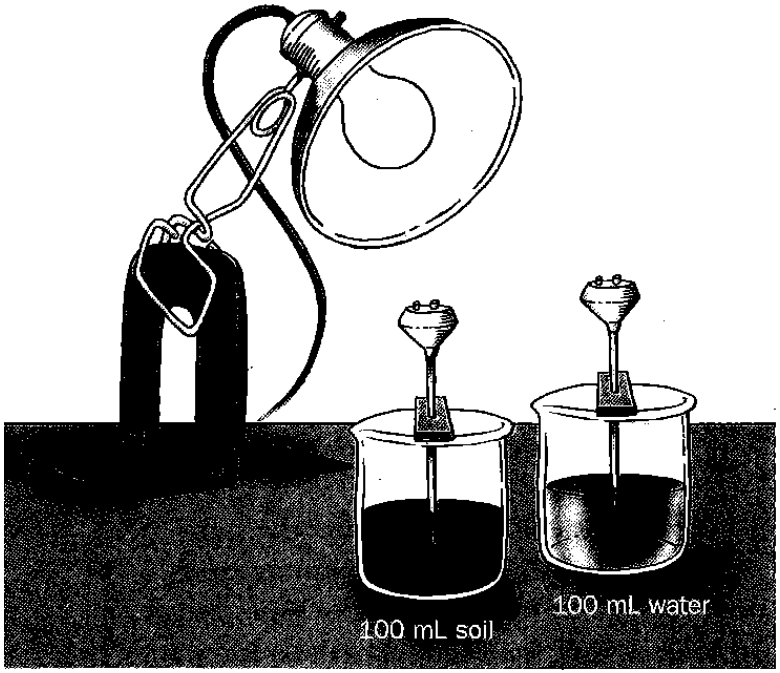


4 minutes

- Soil temp: 26.2
- Water temp: 22.9

Continue Recording Temperatures

- Heating!

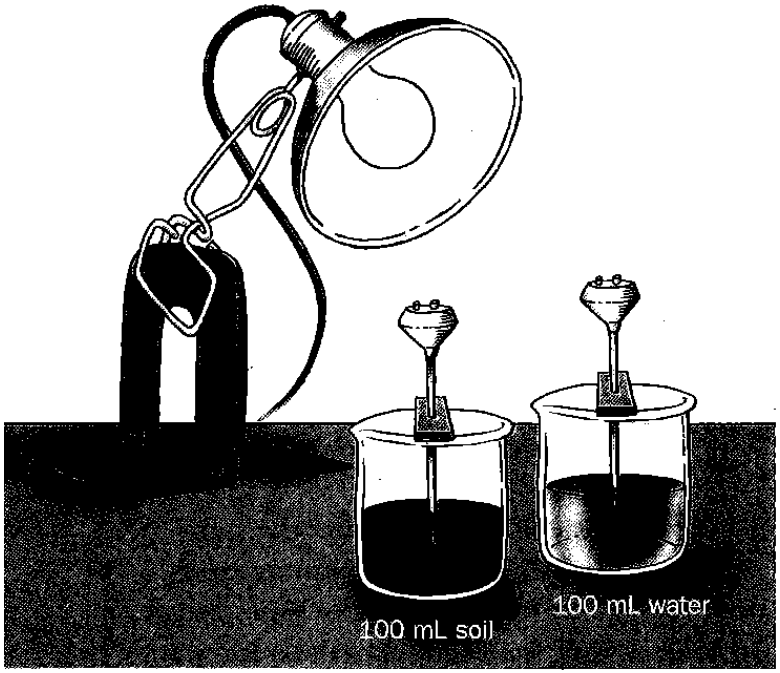


5 minutes

- Soil temp: 26.5
- Water temp: 23.0

Continue Recording Temperatures

- Heating!

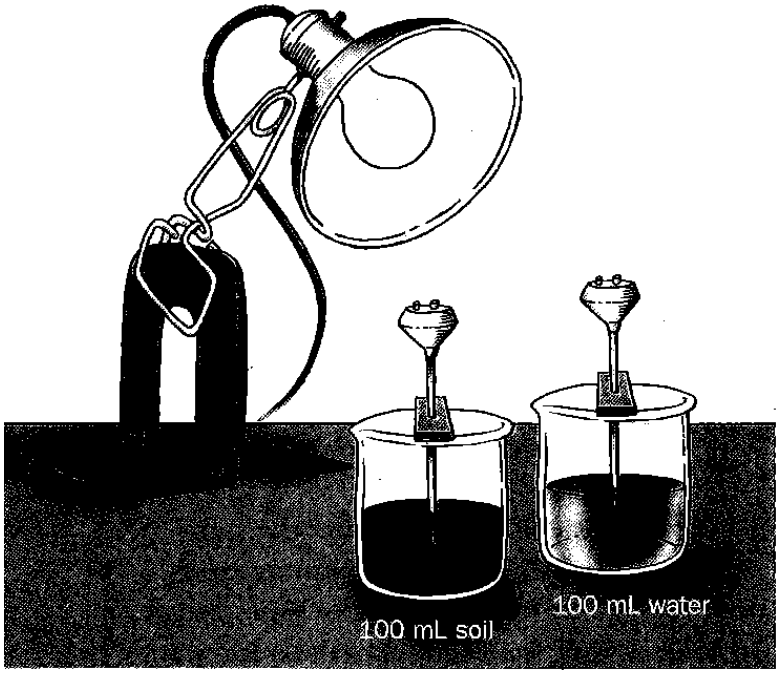


6 minutes

- Soil temp: 26.9
- Water temp: 23.1

Continue Recording Temperatures

- Heating!

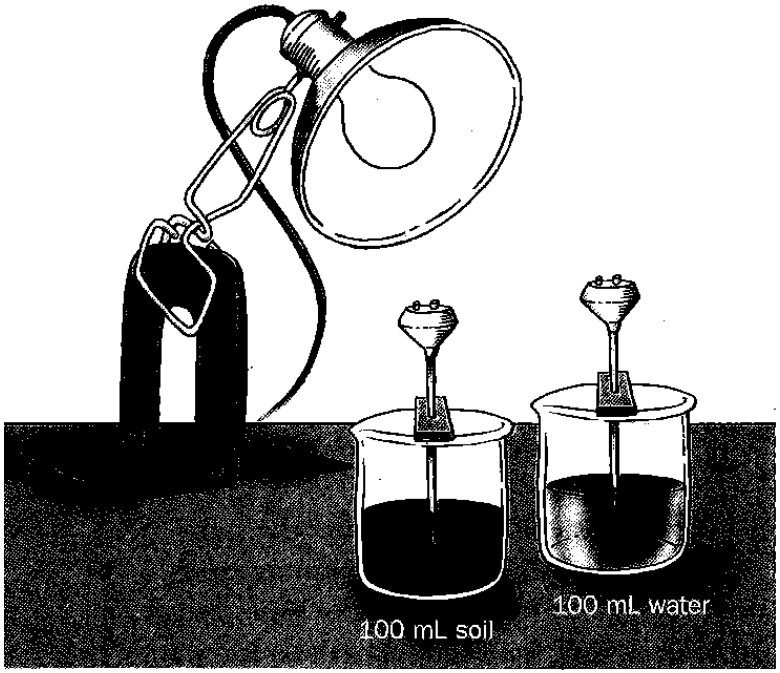


7 minutes

- Soil temp: 27.2
- Water temp: 23.3

Continue Recording Temperatures

- Heating!

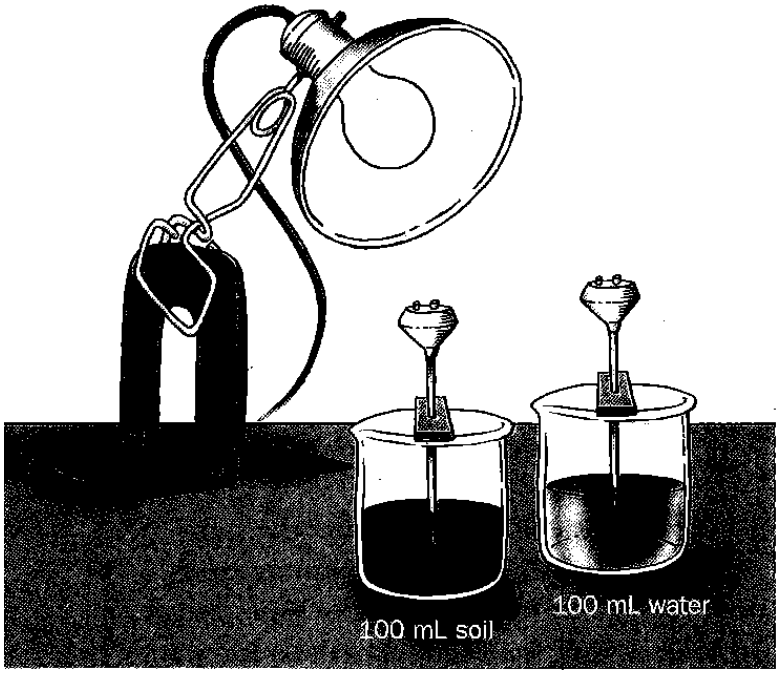


8 minutes

- Soil temp: 27.4
- Water temp: 23.4

Continue Recording Temperatures

- Heating!

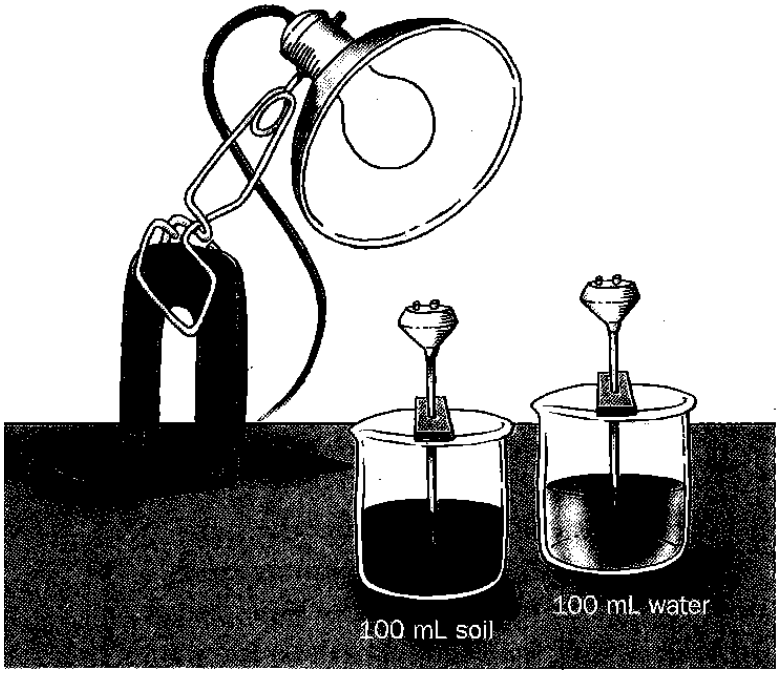


9 minutes

- Soil temp: 27.8
- Water temp: 23.6

Shut off Light!
Continue Recording Temperatures

- Cooling

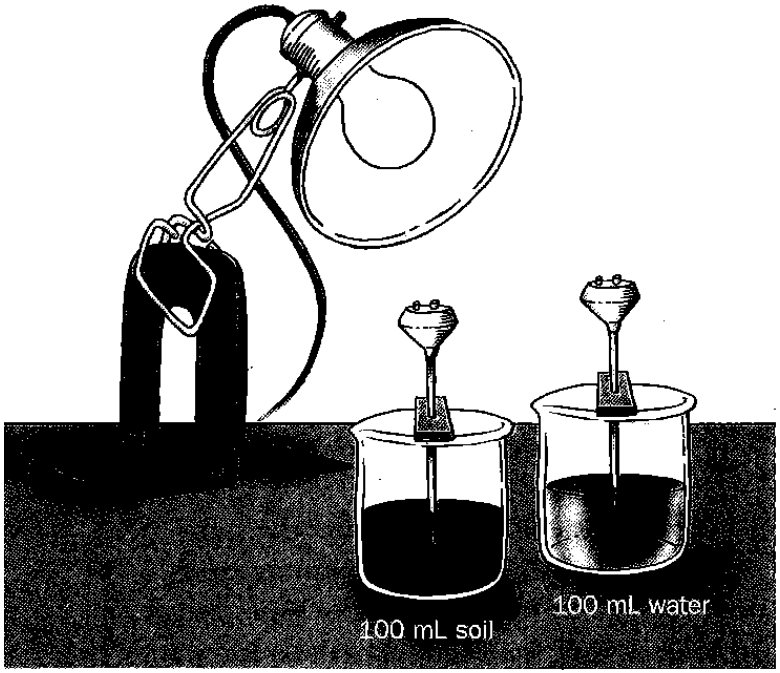


10 minutes

- Soil temp: 27.9
- Water temp: 23.7

Continue Recording Temperatures

- Cooling!

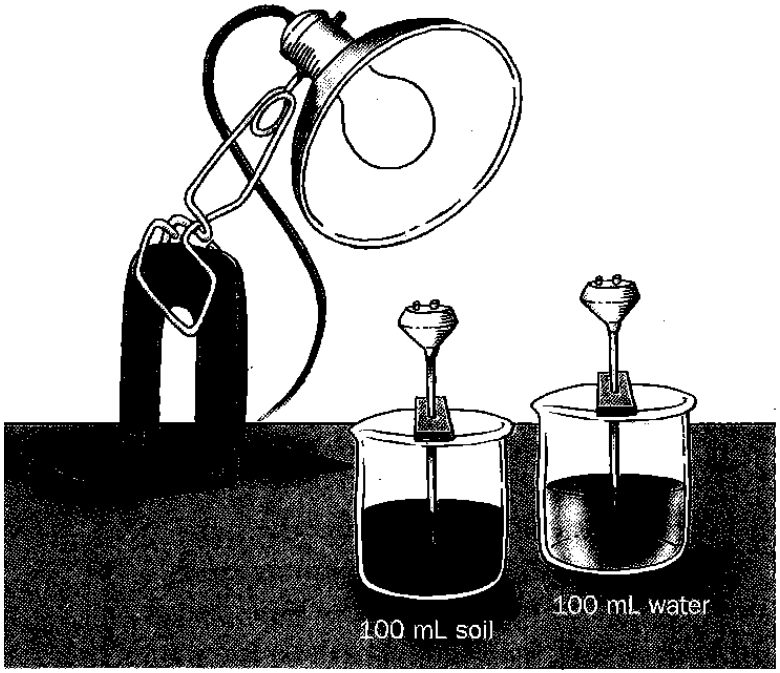


11 minutes

- Soil temp: 27.2
- Water temp: 23.7

Continue Recording Temperatures

- Cooling!

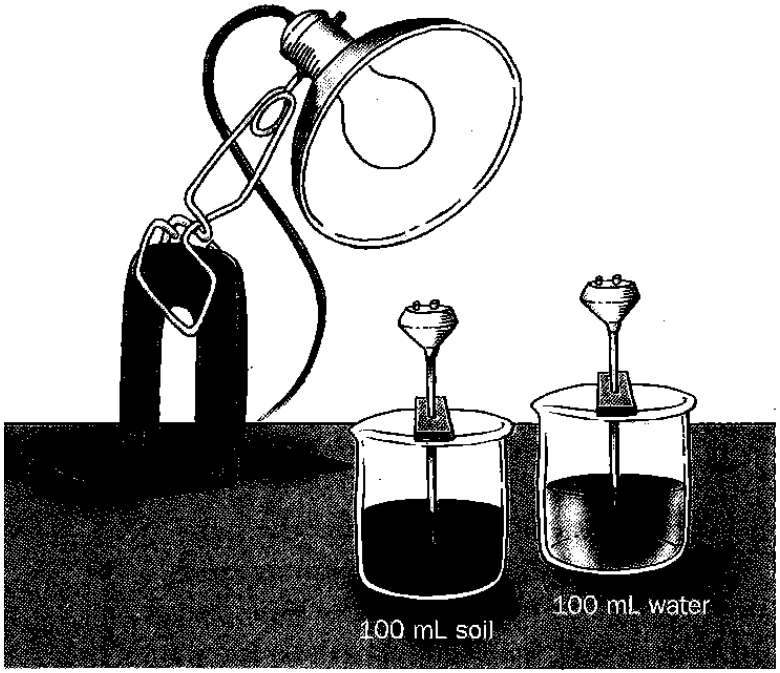


12 minutes

- Soil temp: 26.7
- Water temp: 23.7

Continue Recording Temperatures

- Cooling!

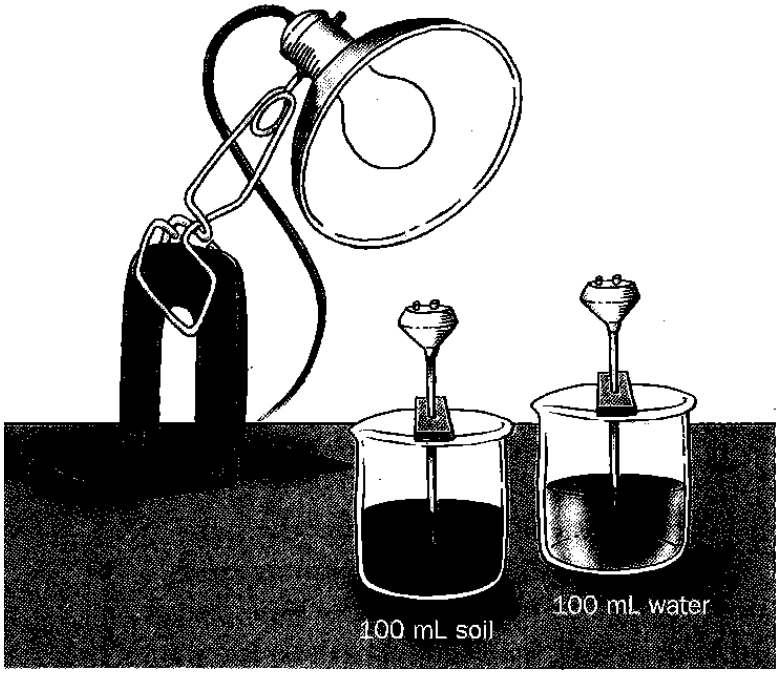


13 minutes

- Soil temp: 26.3
- Water temp: 23.7

Continue Recording Temperatures

- Cooling!

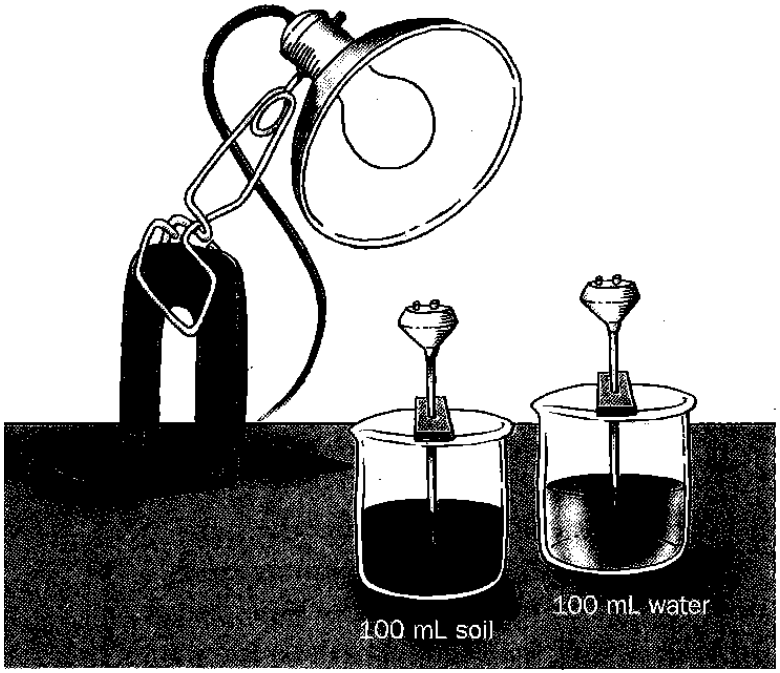


14 minutes

- Soil temp: 26.1
- Water temp: 23.7

Continue Recording Temperatures

- Cooling!

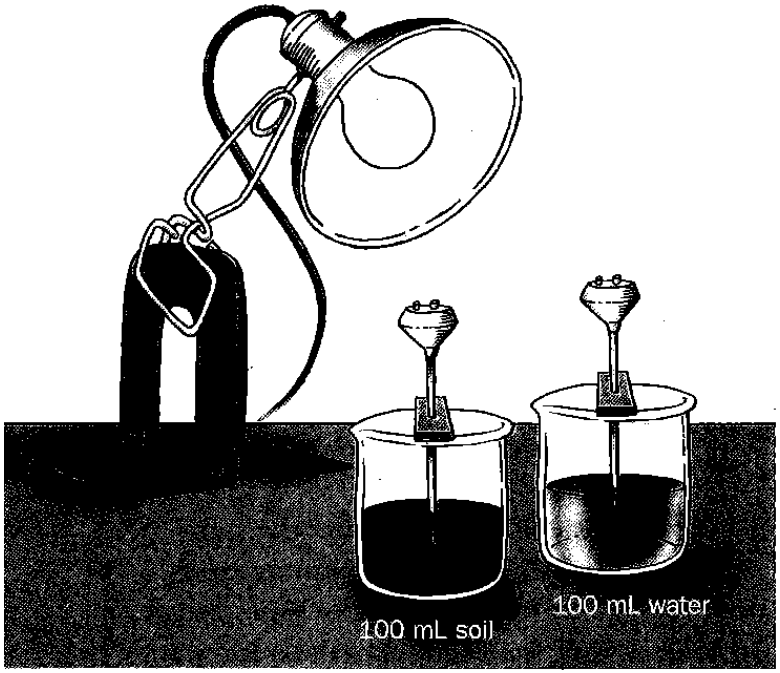


15 minutes

- Soil temp: 25.7
- Water temp: 23.6

Continue Recording Temperatures

- Cooling!

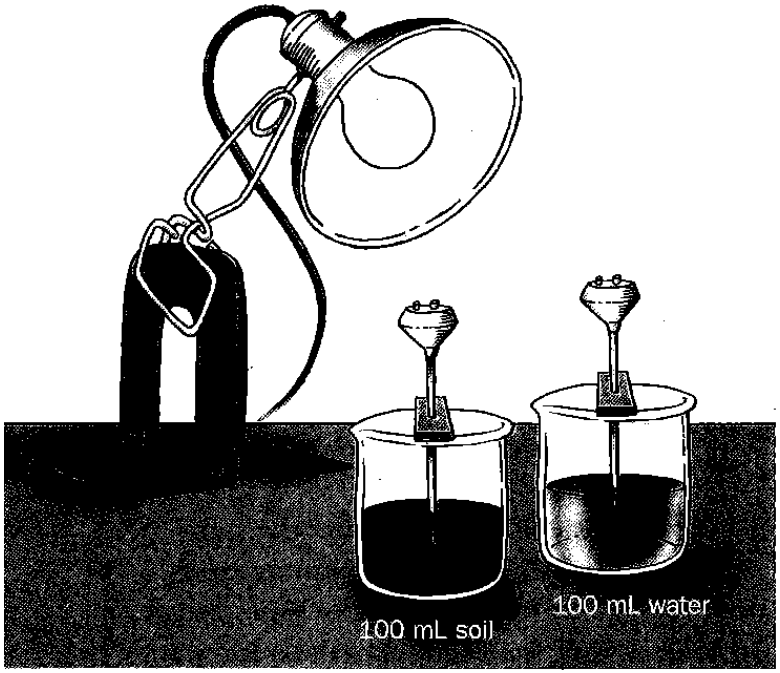


16 minutes

- Soil temp: 25.4
- Water temp: 23.6

Continue Recording Temperatures

- Cooling!

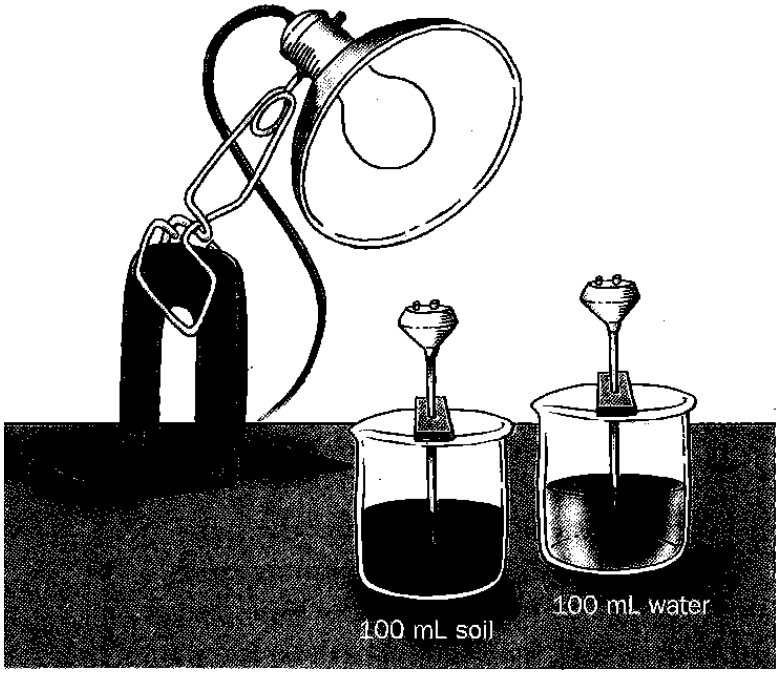


17 minutes

- Soil temp: 25.4
- Water temp: 23.6

Continue Recording Temperatures

- Cooling!

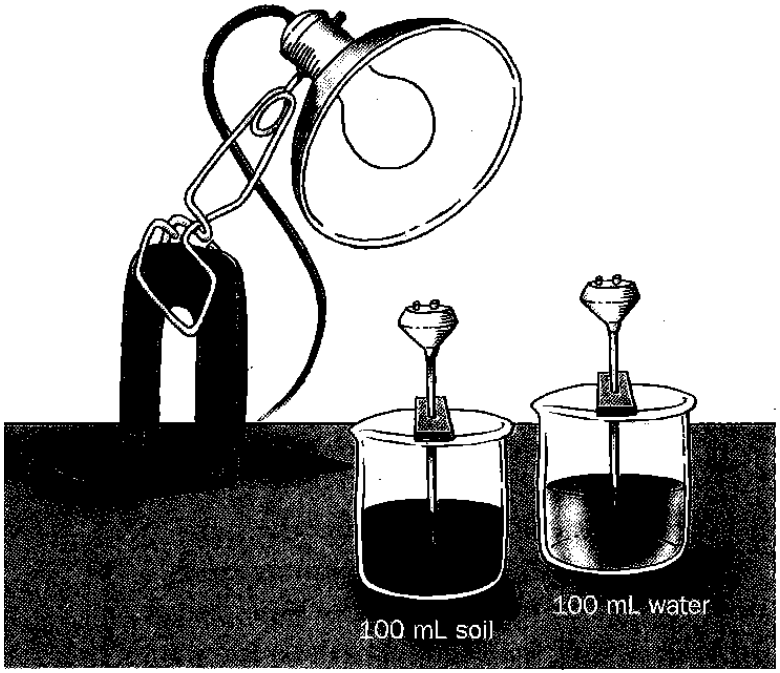


18 minutes

- Soil temp: 25.3
- Water temp: 23.5

Continue Recording Temperatures

- Cooling!

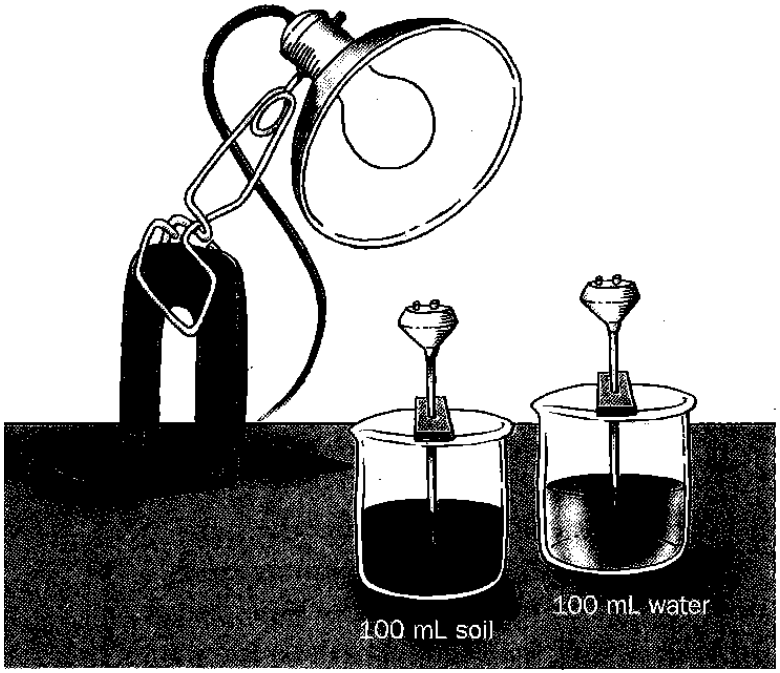


19 minutes

- Soil temp: 25.3
- Water temp: 23.5

Continue Recording Temperatures

- Cooling!



20 minutes

- Soil temp: 25.2
- Water temp: 23.5