

Finding survivors



Apparatus

- An infra red sensor with range set to object temperature range.
- A storage box filled with shredded paper or packing chips.
- 2 or 3 small plastic bottles with caps capable of holding hot water (80+ C°).
- Some marker flags.

Data recording setup.

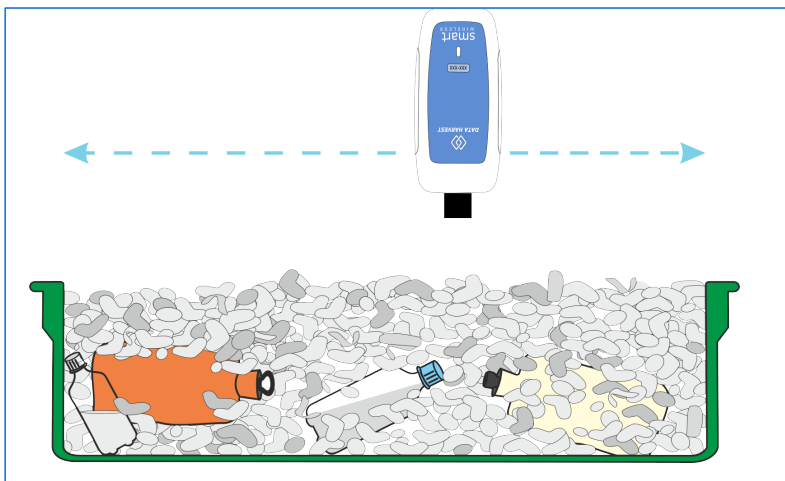
Set the display to show numeric

You may have seen pictures of natural disasters such as earthquakes. In the early stages of a disaster there is a lot of effort placed into finding survivors who may have been buried in the rubble of collapsed buildings.

You may also have seen scenes of rescuers using heat detecting equipment to find the location of a survivor. In this experiment you will simulate the “burying” of a survivor and then get someone else to use the Infrared sensor to find the ‘person’ in the rubble.

The investigation will:

- Demonstrate how radiant energy can pass through objects.
- Demonstrate how the body detection devices used in disaster relief work function.



Method.

1. Collect or prepare your “disaster zone” (a lab tray filled with shredded paper or packing chips) into which (unseen by the recovery team) 1 or more heat sources have been placed unseen by the “discovery team”
2. Open the software and connect the infra red sensor to it. Select object temperature as the only range.
3. Change the software display to a numeric display.

4. Select Start to show numbers in the display.
5. Move the sensor over to the “disaster area” and position the tip of the sensor about 3cm above the rubble (high enough to move across the rubble field and not have to lift or change position to avoid lumps). Try to keep the movement of the sensor slow to catch the hot spots.
6. When you find a hot spot, move the sensor around the area to make sure it is not a false alarm and a genuine heat mark. When you are happy it is a true heat mark place the flag so the discovery team can find the same spot.
7. Once the rubble field has been fully surveyed pass it across to the recovery team who will extract the survivors.

Questions

1. How well did the heat from the survivors show through the layer of ‘debris’?
2. How did the depth of debris affect the ability of the sensor to find the survivor?
3. If there was dead person in the debris would you see them with this sensor? Explain your answer.
4. Why would an Infrared sensor detect a body that someone had buried to hide a murder?
5. What other things apart from survivors could be shown up by the sensor?
6. How could a fireman locate a person in smoke filled room with a sensor like this?