Science
Age 11-13

How hot is it here?

- Temperature
- Climate change

Previous learning required

- Experience of taking a reading with a thermometer.

Learning outcomes

- To measure surface and air temperatures in the school grounds.
- To accurately record and present data findings in a table.
- To explore why different surfaces and locations display different temperatures on the same day and link these findings with how to keep cool in the school grounds.

Equipment

- Infrared digital thermometers
- 1 m long stick with a standard thermometer attached
- Recording sheets and pencils
- Map of the school grounds
- Camera or iPad to take photos
- Compass (optional)

Activity

1. Working in small groups, ask pupils to identify areas in the school grounds with different weather conditions, e.g. full sun, shade, breezy, sheltered, etc.
2. Instruct pupils to identify the different surfaces in each area (both man-made and natural, flat and at an angle) and record the following data on the recording sheet and grounds map:
    - Location
    - Time and date
    - Surface type and material
    - Colour and finish (e.g. shiny or matte)
    - Weather conditions (e.g. full sun, shade, breezy, sheltered, etc.)
    - Surface angle (e.g. flat or at an angle) and whether the angle is pointing towards the sun
3. Ask the pupils to predict the temperature of each surface and give their reasoning.
4. Pupils should then use the digital thermometer to measure the temperature of the surface, and the thermometer on a stick to measure the air temperature 1 m from the surface, recording the results in a table (see example on next page).

Check for understanding

1. What are the reasons for the differences in recorded temperature?
    - Some materials absorb heat from the sun more than others. This is due to **thermal mass**.
    - Black surfaces absorb the most heat. If a material is dense, it has the ability to absorb, store, and release heat energy. It has a **high thermal mass**.
    - Materials with a high thermal mass stay cool in the shade, but stay hot in the sun.
2. Thinking about how we could adapt the school grounds to reduce the impacts of climate change, when might it be useful to use a material with a high thermal mass? What actions could we take to mitigate the impact of increased temperatures in the school grounds?
3. Use a compass to record the direction a surface is facing. Does this influence its temperature? Why? How might this affect the location and type of adaptations we can make to the school grounds?

Learning through Landscapes

If you would like to develop your outdoor learning knowledge and skills, take a look at our range of training courses: **ltl.org.uk/outdoor-learning-training**

Location in grounds	Time and date	Surface type	Colour and finish	Weather conditions	Surface angle	Surface temperature	Air temperature

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