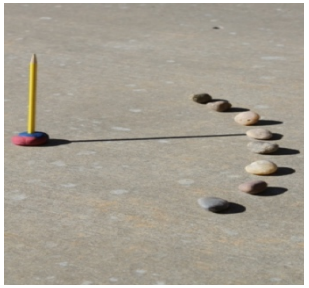
MATHS learning springboards

Shadows

Plot the shadows cast by trees or large shrubs

Aim: Pupils understand the effect of the sun's position on the length of a shadow and the impact on microclimate.



Research how sundials are made, then measure and record the length of the shadow of a plant or a tree as it changes during the day. Record the angle of the shadow at regular intervals. Use the information and research to create a sundial using the tree (or a stick, as shown) as the 'gnomon'.
Extend the activity to think about microclimate in the grounds and the impact of trees and shrubs. Where could more trees and shrubs be planted to provide more shade outdoors?

Check out the Science Learning Springboard: Heat islands.

Strategy games

Use horse chestnut conkers or acorns as game pieces

Aim: Make your own strategy games, such as "4 in a row":

- Design and chalk a game board onto the playground. Paint the conkers or acorns with acrylic paint in two different colours.
- Game suggestions: Connect 4; tic tac toe; dice and grid squares; Nim or 'two stones', a Chinese game played with just two conkers.

Weights + measures scavenger hunt

Estimating

Aim: To be able to use non-standard units of measure

- Make collections of ten of natural items found in the grounds – e.g. conkers, acorns, sycamore leaves. Find the mean weight or length of one of the items, then use it as a non-standard measure to estimate weights and distances.
- Measure the length of a bamboo stick, and examine it closely, lying horizontally on the ground and leaning upright against a wall. Now estimate distances or heights in 'bamboo sticks'. How accurate are pupils' guesses?
- Use standard measuring equipment to accurately record the heights / weights / distances.
- Record both sets of data on an appropriate chart or table.

Why were standardised measurement units introduced?

3D shape and nets

Construct 3D shapes with sticks

Aim: Pupils explore and describe nets and 3D shapes.

After an introduction to nets, pupils create their own nets and form the 3D shapes using long sticks. Fix corners using string, bungees or tape. Long robust sticks are best with drilled holes in the ends. Small twigs can be used with tape.

- Collect a range of straight twigs/sticks. If they are 1+m long then the resulting structures can be used as mini dens.
- Start with a pyramid (a very stable structure), then try to make a cube or cuboid.
- Discuss the inherent instability of various nets and cuboids.
- Discuss what can be added to make it stronger (for example, the magic triangle).

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