MATHS learning springboards

Pappus

Data handling

Human scatter graph and bar graph

Aim: Enjoy a movement based way to test knowledge of coordinates and graphs.

These activities can be used for age 11+ with appropriate adjustments to learning outcomes, and for a number of hypotheses using bivariate data.

Resources: Leaves, chalk, ropes, pebbles, 30cm rulers.

Activity 1: Use leaves to generate data for and create a scattergraph
Begin with the hypothesis: leaves grow wider as they grow longer. This will use two variables: length of leaf and width of leaf.

- On the playground, use a rope to construct the graph's axes, label and number them using chalk - or use a 100 square if you have one on the playground.
- Each child collects one leaf from the same tree and measures its width and length – write down or memorise the dimensions.
- Each child then walks along the horizontal x axis until they reach the number indicating the length of their leaf, and then turns up the y axis until they reach the number indicating their leaf's width.
- Place each leaf onto the playground and weight it down with a small pebble to prevent it blowing away.
- What do pupils notice as the scattergraph is built up? Are there any anomalies?

Activity 2:
- Use a chalked grid or a 100 square to make a bar chart: label the x axis (for leaf length) from 0 to 20cm and number the y axis (for leaf width) from 1 to 10cm.
- Gather a range of leaves; measure their length and width, rounding up to the nearest centimetre, and place them within the corresponding squares on the grid.
- The result is a bar chart from which pupils can also establish the mean, median and mode leaf length.

Key vocabulary: axes, anomaly, mean, median, mode.

Success criteria:
- ✓ I understand the structure of a coordinates grid.
- ✓ I can talk and write about how to plot points on a coordinates grid using mathematical language.

Measure and data handling

Broad bean growth data collection

Aim: Pupils grow beans and document findings to collect and analyse 'real' data.

- Place a bean between the side of a glass and a wad of damp kitchen paper.
- Grow each seed in different conditions – for example from no or low light to bright light; no water through to drenched; indoors and outdoors.
- What helps the plant to grow and what happens to plants that are deprived of water and light?
- Record what happens over time with measurements, diagrams and an explanation.
- Which plants grow fastest?
- Which plants are strong and green? Which are weak and yellowish?
- When the plants have a few true leaves, plant them into soil or compost and continue to monitor their growth over the next few months.
- When the broad beans have been harvested (May / June) pull up all of the plants and use them to make a 'real life' bar graph on the playground. Identify the mean, median and mode length of plant.

Life At the Zoo broad bean

More springboards:
- Science Learning Springboard: dissection and exploded diagrams
- PSHE Learning Springboard: cycle of life
- Literacy: connect the project to the Jack and the Beanstalk story; use it to explore writing instructional texts and seed packets.

Success criteria:
- ✓ I can explain how conducted my broad bean experiment
- ✓ I understand and can explain how to conduct a fair test
- ✓ I can explain how I collected, recorded and interpreted my data set.

Resources:
Broad bean seeds, kitchen paper, glass jars, rulers.