SCIENCE
YEAR 3-4
Cycle B – Unit 11

Plants

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KEY VOCABULARY

stem
leaves
stalk
roots
warmth
nutrients
water
sunlight
table
bar chart
axis
tally
scale
units

Developing thinking
(Plan-Develop-Reflect integrated into activities)

RANGE

Interdependence of organisms

4. through fieldwork study the plants and animals found in two contrasting local environments
6. the environmental factors that affect what grows and lives in the environment, e.g. sunlight, water availability, temperature.

LNF – Main Numeracy Strands covered*

Strand:
Developing numerical reasoning
Elements:
Identify process and connections
Represent and communicate
Review

Strand:
Using data skills
Elements:
Collect and record data
Present and analyse data
Interpret results

**Refer to LNF numeracy framework for details of specific skills within each element.*

LNF – Literacy (writing) opportunities

Element: Organising information and ideas
Writing accurately

Writing to inform, instruct and find out

Developing ICT

School to identify and provide opportunities for developing this skill within the scope of the unit.

Curriculum Cymreig

School to identify and provide opportunities for developing this skill within the scope of the unit.

Personal and social education

School to identify and provide opportunities for developing this skill within the scope of the unit.

Science – Medium Term Planning (half termly)

Year Group	3/4	Term	Cycle B – Unit 11	Unit Title	*Plants*

Range: ***Interdependence of organisms***
4. through fieldwork study the plants and animals found in two contrasting local environments
6. the environmental factors that affect what grows and lives in the environment, e.g. sunlight, water availability, temperature.

Cross Curricular Links:

Skills (Principal skills in bold italics)	**Suggested activities**	**Resources and web links**	**Assessment Opportunities**
COMMUNICATE ***Communicate clearly by speech and writing*** **PLAN** Identify gaps in prior knowledge. Plan the process/method to be used.	**1. Big Question: What do you know about plants?** **Introduce the skill – Communicate using speech and writing** Review children's knowledge of plants as living things by asking them questions eg • What plants can you see from the window? • Are they all living? • How do you know? • How do we help plants to grow well? • Why do we need plants to grow well? **Practise the skill – Communicate using speech and writing** • Record pupils' ideas using appropriate strategy. Consider a class question booklet, question wall and/or large true-false statement board where pupils' opinions can be recorded anonymously.	http://resources.hwb.wales.gov.uk/VTC/2009-10/science/cripsat/e13-plants-animals/index.html http://www.echalk.co.uk/ True-false statements to sort	Use preferred diagnostic strategy/tool ***Can pupils use everyday ideas to explain/predict? (Level 3)***
PLAN Make predictions using scientific ideas and vocabulary **DEVELOP** ***Make careful observations and careful measurements*** **REFLECT** Decide whether the approach/method was successful	**2. Big Question: When is a plant not a plant?** **Introduce the skill – Make careful observations. Animals and Plants: NGfL KS2 activities** Use interactive activities to generate discussion and debate about what constitutes 'plant' • Do all plants have leaves? • Do all plants have flowers? Seeds? • Can we eat all plants? • Do all plants have roots and stems? **Practise the skill – Make careful observations** • Challenge pupils to predict the form of both common and more uncommon plants via drawings or speech. Reveal photos and discuss pupils' ideas. • Examine the plants, measure and record fine detail. Tabulate findings. • Sort plants according to observable features. Use a Venn and/or Carroll diagram in order to sort using different criteria. **To write to inform and explain** **Text type: notes/diagrams**	http://resources.hwb.wales.gov.uk/VTC/2009-10/science/cripsat/e13-plants-animals/index.html http://www.echalk.co.uk/ http://www.arkive.org/	***Can pupils follow a simple series of instructions to gather findings and measure using simple equipment? (Level 3)*** ***Can pupils make qualitative observations and use standard equipment to measure? (Level 4)***

PLAN ***Plan the process/method to be used.*** ***Use simple equipment.*** **DEVELOP** Make careful observations and accurate measurements. Identify, describe and begin to explain patterns and relationships. **REFLECT** Suggest how the method could be improved.	**3. Big Question: How important is light for plants?** **Introduce the skill – Plan the approach method to be used** Show pupils an area of covered grass or show them a plant that has been in the dark - ask them to describe and explain what has happened. Encourage children to speculate and ask questions: • What will happen if we uncover the grass? • Would it be the same for other plants? • Would the plant die if we leave it in the dark for a long time? **Practise the skill – Plan the approach method to be used** • Introduce the idea of a plant as an organism in which different parts *eg leaf, stem and root* all need to work properly if the plant is to grow well. • Present children with similar plants of the same species *eg geranium* and ask them to suggest how these could be used to find out whether plants need light to grow well. • Pupils list key variables that affect growth. Model a whole-class planning template focused on investigating light. • Discuss with children what they are going to measure and observe *eg height from soil level to the tip of the shoot, colour and number of leaves.* • Over a period of several weeks, help each child to make and record careful measurements of the height of the plants. Display measurements on a prepared bar chart in class or on the interactive whiteboard. **To write to inform** **Text type: science write-up/report**	http://www.arkive.org/ http://resources.hwb.wales.gov.uk/VTC/2008-09/science/cripsat/healthy_lifestyles/eng/index.html Interactive planning templates Plant pots Soil Measuring cylinders Tape measures Plants	Can pupils plan the method with some support? (Level 3) ***Can pupils plan with some independence? (Level 3)*** ***Can pupils use simple equipment? (Level 3)*** Can pupils make decisions by weighing up evidence? (Level 3)

PLAN Make predictions using prior knowledge and understanding **DEVELOP** ***Use apparatus and equipment safely*** Make comparisons and identify trends **REFLECT** Describing whether the method was successful	**4. Question: How do we know plants need water to grow?** **Introduce the skill – Select equipment and techniques** • Show children a complete head of celery and ask them to look closely at the stem of the plant. Cut a stem across and observe the cut end. Put the celery stems upright in a shallow container of water coloured with red ink or food colouring. • Ask children to make drawings or take digital microscope photos to show what they observe and to explain on their drawing what they think has happened. **Practise the skill – Select equipment and techniques** • Use interactive planning templates to model whole-class plan. • Remind children that plants need water and ask them whether they think the more water they have the better they will grow. Show children a planted seedling eg bean and ask how they could use this and similar seedlings to investigate the question. Help children to decide what evidence to collect eg give four seedlings no water, 5cm^3 water, 20cm^3 water or 50cm^3 water each day or every two days • Discuss what to measure, eg the distance from the soil to the top leaf, and help children select suitable apparatus to measure volume of water and height of the bean plant. • Set up investigation and plan for pupils to record progress at regular intervals.	Interactive planning templates Plant pots Soil Measuring cylinders Tape measures Plants	Can pupils plan with some independence? (Level 3) ***Can pupils follow a simple series of instructions to gather findings and measure using simple equipment? (Level 3)*** ***Can pupils make qualitative observations and use standard equipment to measure? (Level 4)***
PLAN ***Make predictions using prior knowledge and understanding*** ***Identify success criteria*** **DEVELOP** Use apparatus and equipment safely **REFLECT**	**5. Big Question: Can it be too cold for seeds to germinate?** **Introduce the skill – Make predictions and plan the method** • Review question about seed germination and temperature. What do pupils think? Take a class vote. **Practise the skill – Make predictions and plan the method** • Help pupils create a testable question and plan in groups. • How will pupils set up the test? One tray in the fridge, one in the warm classroom. What about keeping control variables fair, i.e. a light needed in the fridge otherwise the test is unfair. • Assign roles and responsibilities in groups, e.g. measuring manager etc. • Pupils choose simple equipment and set up test. **To write to inform** **Text type: science write-up/report**	http://www.arkive.org/ http://www.bbc.co.uk/learningzone/clips/ Interactive planning templates Plant pots Soil Measuring cylinders Tape measures Plants	***Can pupils use everyday ideas to explain/predict? (Level 3)*** ***Can pupils agree on simple success criteria? (level 3)***
PLAN Make predictions using prior knowledge and understanding **DEVELOP** ***Make comparisons and identify trends*** Form considered opinions **REFLECT** ***Describing whether the method was successful***	**6. Big Question: What do our findings tell us?** Review the progress of the previous 3 investigations – what do the findings begin to tell pupils about the effect light and water have on plant growth? Discuss. **Introduce the skill – Make comparisons and identify trends in data** • Gather findings and tabulate. Help pupils describe any patterns or trends that are evident. Use interactive planning templates to assist. • Model examples of conclusions from the science guidance. **Practise the skill – Make comparisons and identify trends in data** • Challenge pupils to create simple statements that best describe their findings. • Ask groups to swap table of data/graphs and assess other groups' statements. Ask pupils to reflect on their investigations. What made their work 'scientific'? Can pupils list some simple features that make up a successful investigation? **To write to inform** **Text type: science write-up/report**	Interactive planning templates	***Can pupils identify simple patterns and trends? (Level 3)*** ***Can pupils suggest how the method could be improved? (Level 3)***

PLAN The observations that need to be made **DEVELOP** ***Make careful observations*** ***Make comparisons and identify trends*** **REFLECT** Describe how they have learned and identify the ways that worked the best.	**7. Big Question: Can you spot any number patterns in plants?** Introduce the KS2 NGfL Fibonacci activity (with teacher notes to assist if required). Preferably, gather samples of plants with differing numbers of petals for comparison. **Introduce the skill – Make comparisons and identify trends in data** • Introduce task and challenge pupils to sort and classify the pictures of plants according to the number of petals. • What do pupils notice? • Are there any immediate patterns? **Introduce the skill – Make comparisons and identify trends in data** • Tabulate findings from above. • Help pupils identify the most commonly observed numbers of petals – these form the Fibonacci sequence: 1, 1, 2, 3, 5, 8, 13, 21 etc. • Consider asking pupils to communicate their findings using a science postcard to a friend and/or produce a 'caring for your houseplant' leaflet for the local garden centre. **To write to inform and explain** **Text type: postcard/leaflet**	http://resources.hwb.wales.gov.uk/VTC/2008-09/science/fibonacci/index.html Variety of websites and books etc	***Can pupils identify simple patterns and trends? (Level 3)*** ***Can pupils organise their findings and display them in a given format? (Level 3)***
COMMUNICATE ***Communicate using speech writing and drawings.*** **REFLECT** Describe how they have learned and identify the ways that worked the best.	**8. Big Question: Can you spot any number patterns in plants? …Cont.** **Introduce the skill – Communicate using speech, writing and drawings** • Using the NGfL Fibonacci activity, consider creating some Fibonacci-inspired artwork, including snail or nautiloid shell spirals. • Demonstrate how the Fibonacci sequence builds up into a spiral. **Introduce the skill – Communicate using speech, writing and drawings** • Challenge pupils to create a spiral using squared paper. • Create a class Fibonacci wall display, linking maths, science and art. **To write to inform and explain** **Text type: postcard/leaflet**	http://resources.hwb.wales.gov.uk/VTC/2008-09/science/fibonacci/index.html	***Can pupils organise their findings and display them in a given format? (Level 3)***

REFLECT ***Describe how they have learned, and identify the ways that worked the best.*** Link the learning to similar situations, within and outside school.	Revisit initial diagnostic assessment. Can pupils demonstrate understanding at end of topic and discuss new skills learned and/or practised?	Use preferred AfL strategy	***Can pupils say what worked and didn't work? (Level 3)*** ***Can pupils say how they could improve their method(s)? (Level 4)***
Evaluation			