

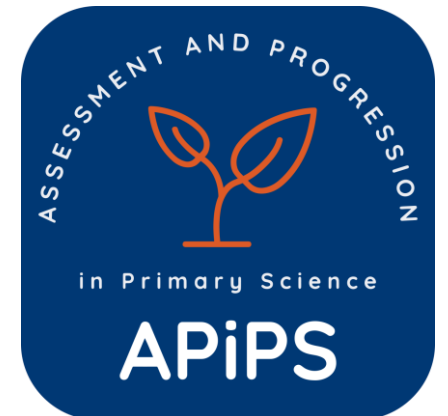
APiPS collection of Second Level science enquiry examples

This Assessment and Progression in Primary Science (APiPS) collection includes examples for each stage of the enquiry cycle, matched to [Education Scotland's Benchmarks](#). We recommend that only **one part of each enquiry** is selected as the focus for any pupil recording, with the other parts being more discussion-based. This focus makes it easier to formatively assess children's learning, as recommended by the Teacher Assessment in Primary Science ([TAPS](#)) project. Different parts of the enquiry cycle can be the focus for different lessons, enabling coverage across the year.

This Second Level (Primary 5-7, age 8-12) collection can be used to support teacher professional learning. It can be used in conjunction with the Early and First Level examples to help build a shared understanding of progression in enquiry and investigative skills. Hyperlinks are included where activities align with TAPS lesson plans. New activities and examples will continue to be added to the SSERC website as they are co-created with teachers from across Scotland.



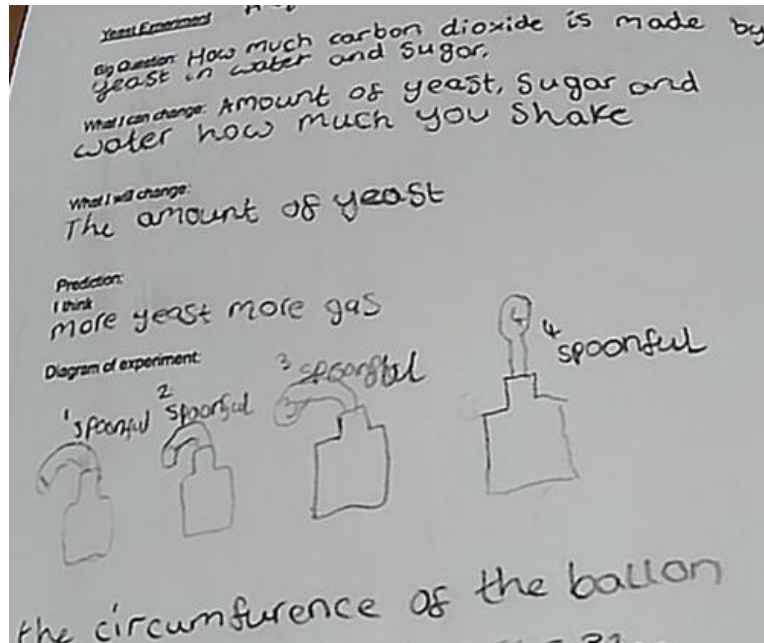
APiPS 2024 collection compiled with thanks to all schools involved.
For queries or to share further examples, please email
primary.science@bathspa.ac.uk



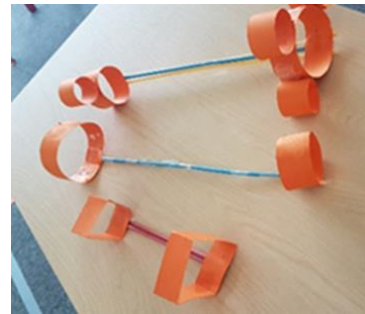
Second Level: Plan and design



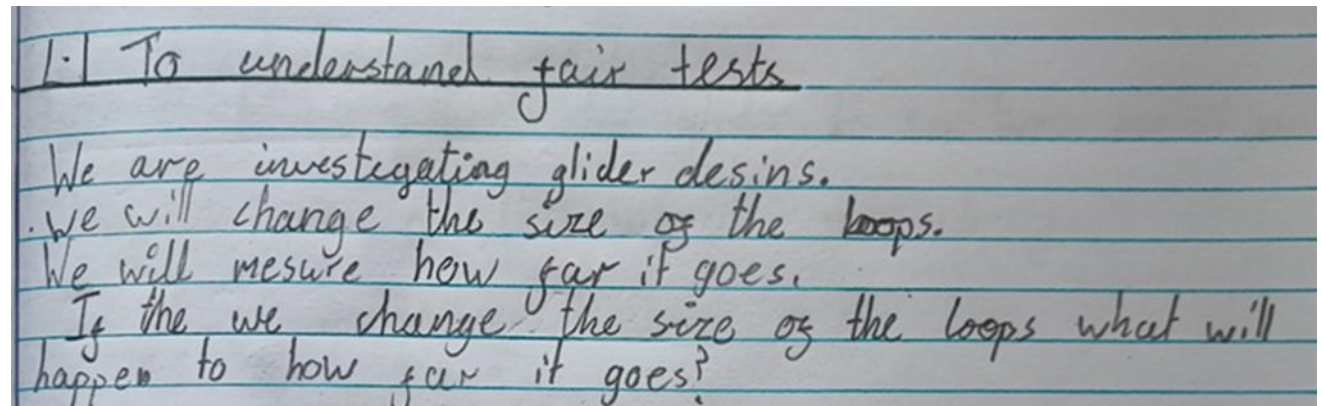
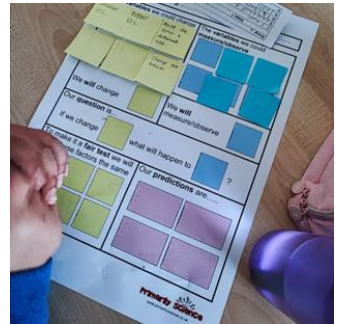
Second level benchmarks: Formulates questions & predictions (hypotheses), with assistance, based on observations & information. Identifies the independent, dependent & controlled variables, with assistance. Anticipates some risks.



P5-7 children planned an investigation into yeast growth. They predicted what would happen to the balloon in words and diagrams.



P6/7 children used post-it planners in groups to help them to identify what variables might affect the flight of an o-wing glider.

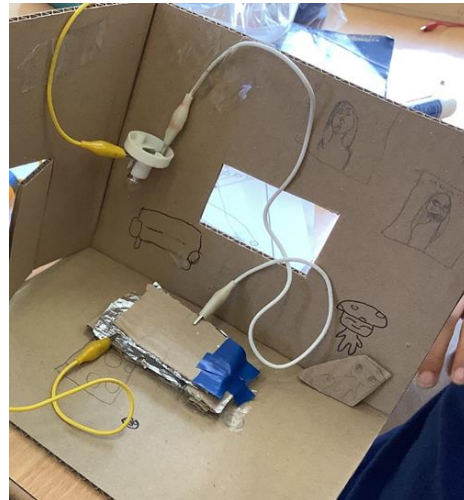
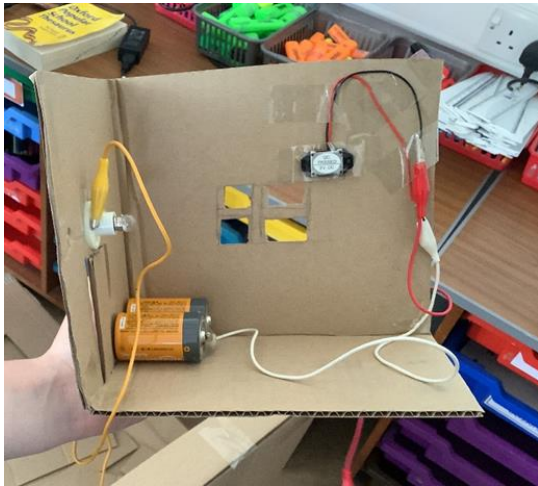


Second Level: Carry out



Second level benchmarks: Applies appropriate safety measures. Contributes to carrying out all the procedures. Makes observations, collects info & measurements using approp devices & units. Manages identified controlled variables to ensure validity of results.

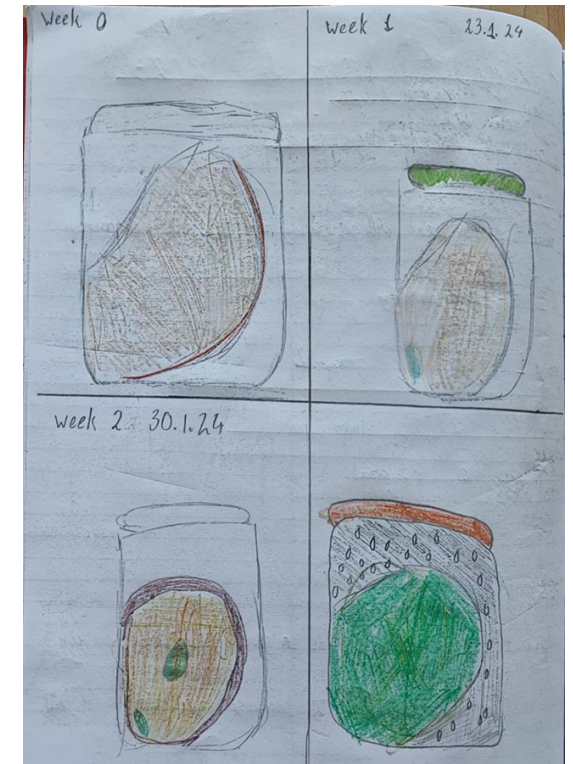
P4/5 children made 'burglar alarm' circuit including a bulb or a buzzer as the alarm. Some made their own pressure switch with foil, ensuring that they did not create a short circuit.



Type of Biscuit	We predict it will take x number of dunks before it falls in the water	Actual number of Dunks
Rich tea	5	35
chc chip cookie	30	30
chocolate Digestive	45	46
custard cream	37	32

P4/5 children collected results from their dunking biscuits investigation in a table.

P6/7 children discussed what might happen to bread if left for a few weeks. They placed a slice in a sealed jar (for safety) and observed closely each week to find out.



Second Level: Analyse, interpret and evaluate



Second level benchmarks: Draws basic conclusions consistent with findings. Recognises anomalous results & suggests possible sources of error. Evaluates the investigation & suggests one way of improving it if it was to be repeated.

P5-6 children investigated string telephones. They identified patterns such as the thinner string appeared louder and the type of cup made a difference.

“The telephone works best with string not wool and the bigger the cup the louder the sound is.”

“Even when you attach a third telephone it still works as the vibrations can travel along both pieces of string.”

“The sound doesn’t travel as well when you touch the string, as it stops the vibrations.”



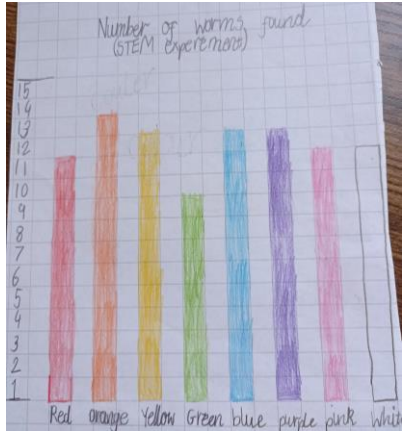
“We discovered that the temperature of the pot on its own went down much quicker than the box with lots in. I think this happened because all the heat coming from the other pot made it stay warmer than the one on its own.”

P7 children considered how quickly the body might cool in a crowded or empty lifeboat. They measured changes over time in the temperature of ‘people pots’ in a ‘lifeboat container’ in a tray of iced water, using the class results to draw their own conclusions.

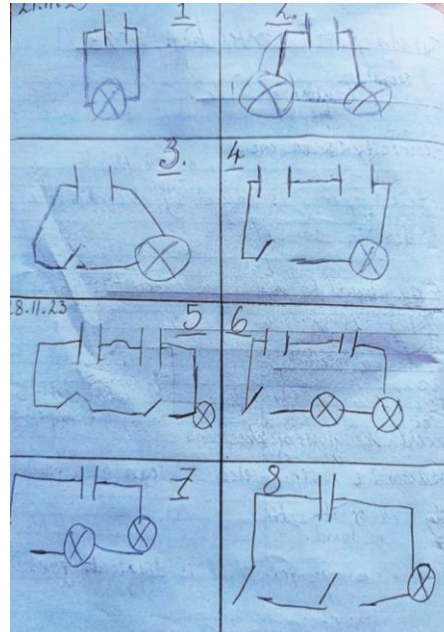
Second Level: Present findings



Second level benchmarks: Presents data/information choosing tables, charts, diagrams, bar/line graphs. Reports collaboratively & individually. Collates, organises & summarises findings, with assist, using structural headings/questions. Uses science vocabulary & acknowledges sources.



P4/5 children recorded the number of woolen 'caterpillars' found on the hedge.



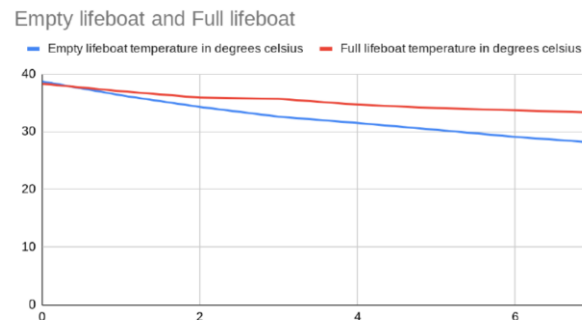
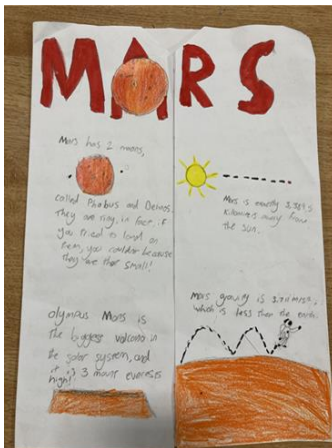
P6-7 children drew diagrams to record their circuits.

P6-7 children measure how far a ball rebounds (as a test of bounciness) and focus on recording their results in a table clearly.

to investigate the distance balls travel off the wall

	1 Attempt (cm)	2 Attempt (cm)	3 Attempt (cm)	Average (cm)
Bouncy Ball	140 cm	143 cm	115 cm	132.6 cm
Tennis balls	82 cm	58 cm	73 cm	71 cm
Wiffle ball (Big)	45 cm	19.4 cm	28 cm	30.8 cm
wiffle ball (small)	58.5 cm	31 cm	56.7 cm	51.4 cm
Playdoh	31 cm	17 cm	27.5 cm	25.1 cm
Marble	4 cm	4.5 cm	5 cm	4.5 cm
Hockey ball	5 cm	4 cm	1 cm	3.3 cm

P7 children chose to present planets research in a variety of ways: fact file, powerpoint or scaled models.



P7 children used Excel to draw a graph of their temperature measurements