P6 (benches in gray)

1. Malus' Law.
Rotating Polaroid.
Lux meter.
Rotating potentiometer & voltage meter.

OPTICS

2. Spool.
Rotating discs or varying thickness and radii..
Light gate + light & dark disc.

ROTATIONAL MECHANICS

3. Ball drop.
Ultrasonic position sensor.
Flaccid and firm basket balls.
Pressure pad measuring force vs time.

MECHANICS

11. Video motion capture
Video motion using a camera, with scene calibrated via a metre ruler. Use Quicktime + Excel or MATLAB to analyse throwing balls., dropping hats etc.

MECHANICS

12. Spectrogram
Record sounds via mic & DI box and use MATLAB to generate the spectrogram. Bells/drums/tunig forks/instruments/whoppie cushion....

WAVES

MECHANICS

13. Air rocket
Water rocket rig, sans water!
Pressure and force meter.

RADIOACTIVITY

10. GM tube
Radioactive activity vs time.
Use as part of Protactinium half life experiment.

THERMAL

9. Cooling curves
Record temperature vs time simultaneously for three metal blocks

WAVES

8. Diffraction grating
Rotate laser incident on grating. Record light intensity vs angle using lux meter & potentiometer.

THERMAL

4. Boyle's law
Pressure sensor and syringe.
Compression of syringe controlled by a vice, movement recorded via a potentiometer.

WAVES

5. LCR resonance
Inductor, Capacitor, Resistor circuit. (Series yields resonance, parallel configuration yields a knotch filter). Picoscope. MATLAB processing

MAGNETISM

6. Magnetic field
Neodynium magnet rotated, connected to a potentiometer.
Magnetic field sensor.

ELECTRICITY

7. I,V Green Boards
Voltage vs Current curves for bulb, resistor, diode etc in potential divider circuit

ELECTRICITY

14. Capacitor charge & discharge (P5 front bench)
Classic analogue experiment, but use MATLAB for timing when voltage passes set values on meter.