



student experiment equipment summary

A student experiment module (SEM) usually consists of a number of boxes. The table below indicates which boxes and accessories are required for each module.

MODULES

Student experiment boxes (SEB)

		Mechanics 1	Mechanics 2	Thermodynamics	Electricity 1	Electricity 2	Electromagnetism supplement	Electronics supplement	Electronics complete	Optics 1	Optics 2	Optics 3	Chemistry	Electrochemistry	Distillation
Support and assembly material	P9900-4A	●	●	●	-	-	-	-	-	-	-	-	-	-	-
Mechanics 1	P9900-4B	●	-	-	-	-	-	-	-	-	-	-	-	-	-
Mechanics 2	P9900-4J	-	●	-	-	-	-	-	-	-	-	-	-	-	-
Thermodynamics	P9900-4C	-	-	●	-	-	-	-	-	-	-	-	-	-	-
Electricity 1	P9900-4D	-	-	-	●	●	●	●	-	-	-	-	-	-	-
Electricity 2 (magnetism, electromagnetism, electrostatics)	P9900-4E	-	-	-	-	●	-	●	-	-	-	-	-	-	-
Electromagnetism supplement	P9900-4T	-	-	-	-	-	●	-	-	-	-	-	-	-	-
Electronics supplement	P9900-4F	-	-	-	-	-	-	●	-	-	-	-	-	-	-
Electronics complete (electronics without electricity)	P9900-4M	-	-	-	-	-	-	-	●	-	-	-	-	-	-
Optics 1 with 20-W halogen lamp	P9900-4L	-	-	-	-	-	-	-	-	●	●	●	-	-	-
or Optics 1 with 18-W tubular lamp	P9900-4G	-	-	-	-	-	-	-	-	●	-	-	-	-	-
Optics 2	P9900-4H	-	-	-	-	-	-	-	-	-	●	-	-	-	-
Optics 3 (same as Optics 2, but including wave optics)	P9900-4K	-	-	-	-	-	-	-	-	-	-	●	-	-	-
Chemistry - support stand	C9900-4A	-	-	-	-	-	-	-	-	-	-	-	●	●	●
Chemistry - glass	C9900-4B	-	-	-	-	-	-	-	-	-	-	-	●	-	-
Chemistry - electrochemistry	C9900-4E	-	-	-	-	-	-	-	-	-	-	-	-	●	-
Chemistry - distillation	C9900-4C	-	-	-	-	-	-	-	-	-	-	-	-	-	●

Manuals

		Mechanics 1	Mechanics 2	Thermodynamics	Electricity 1	Electricity 2	Electromagnetism supplement	Electronics supplement	Electronics complete	Optics 1	Optics 2	Optics 3	Chemistry	Electrochemistry	Distillation
Mechanics 1	P9160-4B (Booklet)	●	-	-	-	-	-	-	-	-	-	-	-	-	-
Mechanics 2	P9160-5B (Booklet)	-	●	-	-	-	-	-	-	-	-	-	-	-	-
Thermodynamics	P9160-4C (Booklet)	-	-	●	-	-	-	-	-	-	-	-	-	-	-
Electricity	P9160-4D+4E+5E (Booklet)	-	-	-	●	●	●	-	-	-	-	-	-	-	-
Electronics	P9160-4F (Booklet)	-	-	-	-	-	-	●	●	-	-	-	-	-	-
Optics	P9160-5G+6G (Booklet)	-	-	-	-	-	-	-	-	●	●	●	-	-	-
Chemistry	C9160-4A (Booklet)	-	-	-	-	-	-	-	-	-	-	-	●	●	●

Recommended accessories

		Mechanics 1	Mechanics 2	Thermodynamics	Electricity 1	Electricity 2	Electromagnetism supplement	Electronics supplement	Electronics complete	Optics 1	Optics 2	Optics 3	Chemistry	Electrochemistry	Distillation
Burner for students	P2110-ff	-	-	●	-	-	-	-	-	-	-	-	●	●	●
Power supply with digital display	P3130-3D	-	●	●	●	●	●	●	●	●	●	-	-	●	-
Measuring instrument analogue (2 pcs.)	P3210-1C	-	-	●	●	●	●	●	●	-	-	-	-	●	-
Signal generator for students	P3120-3F	-	●	-	-	●	-	●	●	-	-	-	-	-	-
Connecting leads, set of 6	P3310-1S	-	●	●	-	-	-	-	-	●	●	●	-	-	-

student manuals



Experiment manuals are available as booklets or on CD-ROMs (Adobe Acrobat® format);
CD-ROM student experiments P9160-1C

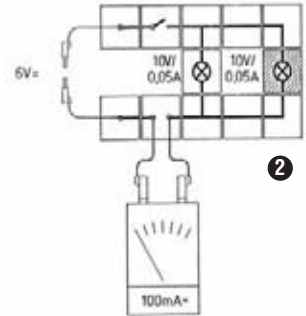


NTL's experiment manuals are prepared with special consideration to the educational needs of students when doing experiments. This makes doing experiments even more fun.

1 E 2.9 PARALLEL CONNECTION OF INCANDESCENT LAMPS

Material:

- 1 Circuit board
- 1 Set of PIB-leads
- 1 PIB-switch ON/OFF
- 2 PIB-lamp holders E 10
- 2 Incandescent lamps E 10, 10 V/0,05 A
- 1 Measuring device
- 4 Connecting leads
- Electrical power supply



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Parallel connections cause a branching of the electrical current. The characteristics of two incandescent lamps connected parallel are to be examined.

Wiring: Arrangement of the wiring according to the illustration. The PIB-lamp holder marked by hatching is not yet inserted. The ammeter with the measuring range of 100 mA is used. 6 volts DC is applied.

1. Experiment: The switch is closed and the intensity of the lamp is to be noted. Furthermore the current intensity indicated by the ammeter is registered. The switch is opened and the PIB-lamp holder marked by hatching is inserted together with the second lamp. After closing the switch it can be seen that the two lamps burn as intensely as the single lamp used before. The amount of the current intensity is double what it was before.

What happens if one lamp is removed from its holder?

Conclusion: The current intensity is doubled when two incandescent lamps are used in parallel connection. If one lamp is removed, the second lamp keeps glowing.

Note: The incandescent lamps and the electrical appliances of a house are connected parallel. The current intensity increases when several electrical appliances are switched on. The fuse serves as a protection form overloading.

- 1 Experiment description, number
- 2 Illustration(s) of the experiment
- 3 List of apparatus, additional aids and accessories
- 4 Issues
- 5 Preparation and assembly
- 6 How to perform the experiment
- 7 Observations and equations



storage



C7850-1B Container, 400x120x95 mm, blue
C7850-1A Container, 400x240x95 mm, blue
C7850-1C Container, 600x120x95 mm, blue
C7859-1A Separating wall, 240x95 mm, transparent
C7859-1B Separating wall, 120x95 mm, transparent
C7858-1A Labels for container, 70x30 mm, set
C7850-1T Container, tablet for 28 PIBs, blue



NTL Storage in Blocks

Similar equipment is stored in one drawer, and each group of students receives only the equipment required for doing the particular experiment.

- Each group of students receives only the equipment required for the experiment.
- Easier to check for loss or damage when gathering in the equipment once again.
- Equipment used in more than one chapter needs to be purchased only once, resulting in lower costs.
- Optimal use of storage space (in a cabinet).
- Drawers may also be fitted with dividers, resulting in even better use of drawer space.
- We can provide you with (self-adhesive) labels, including symbols, article numbers and descriptions, for the drawers.
- Entire collection of equipment is easier to keep track of.

NTL Storage in Sets

All of the equipment required for an entire topic is stored in one box, and each group of students receives a complete equipment set for doing experiments.

- Each of the groups in one class may perform different experiments or a different number of experiments.
- Little time required for handing out apparatus.
- Boxes are made of very strong polypropylene (3 or 4 mm thick).
- Box inserts are made of plastic and do not become brittle in time.
- The insert is formed to hold the apparatus, making it easy to spot missing pieces.
- Plans for replacing equipment aid in putting it away after experiments and in obtaining replacements for missing or defective pieces.



P7790-1A Storage wagon for small NTL boxes

For portable storage of up to 20 small storage boxes (P7806-1A).
Outer dimensions of a small box: approx. 35 x 27 x 8 cm
Dimensions: (approx.) W=43 cm, D=59 cm, H=102 cm
Weight: approx. 25 kg



P7790-1B Storage wagon for large NTL boxes

For portable storage of up to 20 large storage boxes (P7806-1B).
Outer dimensions of a large box: approx. 55 x 35 x 11 cm
Dimensions: (approx.) W=64 cm, D=77 cm, H=160 cm
Weight: approx. 45 kg

