# TAP 110- 3: Researching superconductivity

## Student instructions

You are to use books, articles or websites to research superconductivity. At the end of this you should summarise your findings on a single sheet of A4 that must be handed to your teacher by …… (some time in advance of the feedback session). This will be checked, photocopied and distributed to the class. In the lesson you will be asked to talk us through your findings (be prepared to speak for up to 5 minutes - by all means prepare some PowerPoint slides to illustrate your points). Your research should focus on (one of the questions below):

- ✓ How did Kammerlingh Onnes discover superconductivity?
- ✓ How can the low temperatures for superconductivity be reached?
- ✓ What are typical transition temperatures for metals and high temperature superconductors? Include a table and explain why high temperature superconductors are exciting.
- ✓ Why are superconductors used in strong magnets? (Find at least two examples and explain how superconductivity is maintained).
- ✓ Superconductors can be used to store energy. How?
- ✓ How would room temperature superconductors change the world?
- ✓ How are superconducting materials used in electronics and what advantages do they have over conventional conductors?

## Useful websites:

Kammerlingh Onnes: http://nobelprize.org/physics/laureates/1913/onnes-bio.html

Superconductivity:

http://superconductors.org/

http://hyperphysics.phy-astr.gsu.edu/hbase/solids/scond.html

Superconducting magnets:
http://www.google.co.uk/search?hl=en&q=superconducting+magnets&btnG=Search&meta=

http://en.wikipedia.org/wiki/Superconducting_magnet

High temperature superconductors:

http://cnls.lanl.gov/Highlights/1997-06/html/node4.html

http://www.eapen.com/jacob/superconductors/chapter5.html

Make your own! http://www.webcom.com/cfsc/scpart1.html

Applications: http://www.physnet.uni-hamburg.de/home/vms/reimer/htc/pt4.html

Energy storage: http://www.doc.ic.ac.uk/~mpj01/ise2grp/energystorage_report/node8.html