




### Components

	NAME	DESCRIPTION	AUDIENCE
	<i>Exploring conductivity</i> teachers guide	The guide describes alternative activities for investigating the conductivity of some common materials.	teachers
	<i>Exploring conductivity</i> worksheet	Students use this worksheet to interpret results from Experiment 8 (Ores and oil – bonds and batteries) in the STAWA manual, <i>Exploring Chemistry Stage 2</i> .	students
	<i>Investigating conductivity</i> procedure sheet	Students plan an experiment to measure the conductivity of given substances.	teachers

### Purpose

To investigate physical properties of different substances, interpret the data (and given information) to classify the substances into groups, and generate new ideas about properties and related structures of substances.

### Outcomes

Students will be able to:

- use practical laboratory skills;
- plan, conduct and evaluate an investigation; and
- process and interpret data.

### Activity summary

ACTIVITY	POSSIBLE STRATEGY
Complete only the practical instructions from Experiment 8 (Ores and oils – bonds and batteries), replacing the section <i>Processing of results and questions</i> with the worksheet <i>Exploring conductivity</i> .	small groups
Alternatively, design and perform an open investigation into conductivity using procedure sheet <i>Investigating conductivity</i> .	individual or small groups

### Technical requirements

The teachers guide, worksheet and procedure sheet require Adobe Reader (version 5 or later), which is a free download from [www.adobe.com](http://www.adobe.com). The worksheet and procedure sheet are also provided in Microsoft Word format.

### Teacher notes

This **Explore** activity provides students with activities to help them use prior knowledge to investigate possibilities and raise questions. Two alternate activities are presented.

- The first is a guided experiment using the instructions in Experiment 8, *Exploring Chemistry, Stage 2*<sup>(1)</sup>. Because this is to be used as an **Explore** activity prior to the students being formally taught about types of bonding, questions following Experiment 8 in the manual, are replaced with a worksheet which includes information on melting

points of the substances. The worksheet also includes additional substances to be demonstrated (solid NaOH, AgNO<sub>3</sub>, candle wax, sulfur and naphthalene). The worksheet is designed to guide interpretation of results.

- As an alternative to this experiment, students may conduct an open investigation into the electrical conductivity of substances. The procedure sheet sets the task and lists equipment and chemicals provided. The chemicals used include: ionic compounds, covalent molecular compounds, metals, and covalent network substances. Students are given safety notes. It is important that they do not attempt to melt the substances. Information on the melting points and conductivity of molten substances is provided separately, but students could also be required to research this information. The teacher may choose to demonstrate the conductivity of some molten substances, as in the guided experiment.

## Associated SPICE resources

*Structure and bonding 2: exploring conductivity* may be used in conjunction with related SPICE resources to address the broader topic of structure and bonding.

DESCRIPTION	LEARNING PURPOSE
<i>Structure and bonding</i> This learning pathway shows how a number of SPICE resources can be combined to teach the topic of structure and bonding.	
<i>Structure and bonding 1: Molecular structures</i> A short video introduces the concept of structure and bonding by looking at how silica capsules may be used in drug delivery.	Engage
<i>Structure and bonding 2: Exploring conductivity</i> Students perform experiments to examine the conductivity of various materials, and sort them into groups.	Explore
<i>Structure and bonding 3: Chemical bonds</i> Students learn about types of bonding by working through a learning object and worksheet.	Explain
<i>Structure and bonding 4: Molecules by design</i> Students learn about different applications of bonding through a series of fact sheets on current research at The University of Western Australia.	Elaborate

## Reference

- 1) Clarke J. (Ed.) (2008). *Exploring chemistry. Stage 2*. Osborne Park, WA: Science Teachers Association of Western Australia.

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