Engage Teacher Conference

Top tips for getting published in ASE's SSR journal

Develop your skills and learn how to write to be published in the Association for Science Education's SSR (School Science Review) journal.

Helen Harden
Commissioning Editor, Association for Science Education
Fiona Williams
Content Editor, Association for Science Education

Engage Teacher Conference

Engage

Welcome, please be aware:

- Talks are recorded
- There will be time for questions at the end
- You can send messages in the chat or raise your hand.

Top tips for getting published in ASE's SSR journal

Helen Harden
Commissioning Editor
Fiona Williams
Content Editor

ASSOCIATION FOR SCIENCE EDUCATION

Overview of the session

- Introduction to SSR and ASE
- Tip 1- understanding the journal
- Tip 2 - understanding the process
- Tip 3 - submitting an article idea
- Tip 4 - writing your article
- Tip 5 - your audience
- Tip 6 – peer review
- Next steps

ASSOCIATION FOR SCIENCE EDUCATION

New career opportunities

Online resources, podcasts and webinars

Subject-specific CPD – discounts on events

Member-only resources

ASSOCIATION FOR SCIENCE EDUCATION

Member benefits

Pathway to professional registration

Primary Science or SSR journal included

Follow us on social media

Regular news and events

High-level networking and mutual support

Becoming a member

£45 per year ASE Membership
£25 per year ASE Technician Membership
FREE ASE Student Membership

www.ase.org.uk/ase-membership

Tip 1

Understand the readership, reach and remit of SSR.

Readership and reach

- science teachers
- science technicians
- teacher developers (initial teacher education and CPD providers)
- science education researchers
- science education consultants and others working in science education
- UK and international

Image by OpenClipart-Vectors from Pixabay

ASSOCIATION FOR SCIENCE EDUCATION

Remit

Does publish

- science education
- 11-19 science education (schools, further education, 6th form colleges)
- real-life science with links to classroom practice/curriculum
- science, biology, chemistry, physics, interdisciplinary topics, sub-specialisms...
- UK and international education systems

Does not publish

- general education
- 5-11 education (primary school), 18+ education (university degree)
- popular science with no classroom/curriculum links
- computer science, maths, geography, engineering…
- unevidenced opinion

ASSOCIATION FOR SCIENCE EDUCATION

Tip 2

Understand the process stages- what, when and why?

ASSOCIATION FOR SCIENCE EDUCATION

1 Think of an idea

(Something relevant to *SSR* readers)

Complete the Article Ideas Form

YOU

COMMISSIONING EDITOR

2 Discuss with editor

Discuss with *SSR* commissioning editor to agree most suitable article type for idea

3 Write the article

Use the commissioning editor's guidance alongside the *SSR* Submission Guidelines

YOU

4 Submit the article

Submit article (and images) via the online form Submit an article for *SSR*

ASSOCIATION FOR SCIENCE EDUCATION

5 Article peer review

Two of our reviewers make comments on your anonymised article to ensure suitability and readability for the journal

CONTENT EDITOR

6 Receive feedback

SSR content editor returns article with feedback points from reviewers

7 Make changes

Using the feedback provided, make the necessary changes to your article

YOU

8 Article accepted

Changes are checked by the *SSR* content editor and the article is accepted for publication

ASSOCIATION FOR SCIENCE EDUCATION

Copyediting

SSR copyediting team make the writing fit SSR house style

9

SSR COPYEDITORS

SSR TYPESETTER

10

Typesetting

SSR typesetter makes the article look like an SSR article

Proof

A proof is shared with you for your comments. Read through and flag any errors or things that don't appear correctly

11

YOU

12

Publication

The issue of the journal is published with your article!

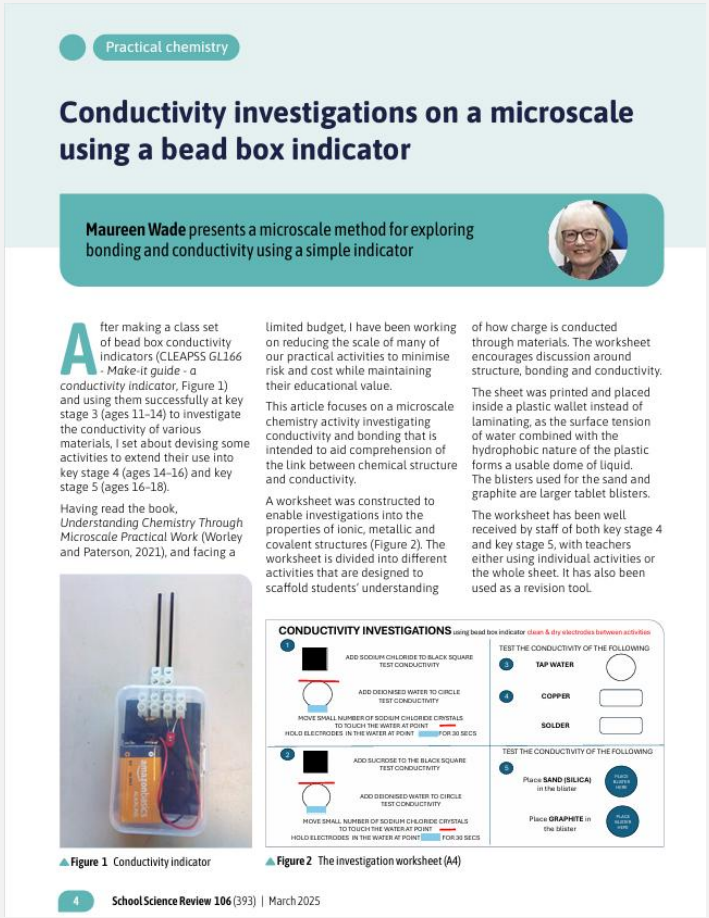
ASSOCIATION FOR SCIENCE EDUCATION

Tip 3

Be brave and submit an article idea.

ASSOCIATION FOR SCIENCE EDUCATION

Practical ideas



Practical chemistry

Conductivity investigations on a microscale using a bead box indicator

Maureen Wade presents a microscale method for exploring bonding and conductivity using a simple indicator

After making a class set of bead box conductivity indicators (CLEAPSS *GL166 - Make-it guide - a conductivity indicator*, Figure 1) and using them successfully at key stage 3 (ages 11–14) to investigate the conductivity of various materials, I set about devising some activities to extend their use into key stage 4 (ages 14–16) and key stage 5 (ages 16–18).

Having read the book, *Understanding Chemistry Through Microscale Practical Work* (Worley and Paterson, 2021), and facing a limited budget, I have been working on reducing the scale of many of our practical activities to minimise risk and cost while maintaining their educational value.

This article focuses on a microscale chemistry activity investigating conductivity and bonding that is intended to aid comprehension of the link between chemical structure and conductivity.

A worksheet was constructed to enable investigations into the properties of ionic, metallic and covalent structures (Figure 2). The worksheet is divided into different activities that are designed to scaffold students' understanding of how charge is conducted through materials. The worksheet encourages discussion around structure, bonding and conductivity.

The sheet was printed and placed inside a plastic wallet instead of laminating, as the surface tension of water combined with the hydrophobic nature of the plastic forms a usable dome of liquid. The blisters used for the sand and graphite are larger tablet blisters.

The worksheet has been well received by staff of both key stage 4 and key stage 5, with teachers either using individual activities or the whole sheet. It has also been used as a revision tool.

Figure 1 Conductivity indicator

Figure 2 The investigation worksheet (A4)

4 School Science Review 106 (393) | March 2025

[Conductivity investigations on a microscale using a bead box indicator | www.ase.org.uk]

- an alternative method to improve experimental results
- an alternative method to make running the practical in class easier
- a novel new practical
- a microscale approach
- an existing practical that is less well know that has been introduced for a specific reason

ASSOCIATION FOR SCIENCE EDUCATION

“Spotlight on Teaching”

Spotlight on teaching

Using probing questions to support the teaching and learning of moles

Amiera Davies describes how using probing questions can promote deeper thinking and improve students' understanding

The issue

Ask any chemistry teacher to name the most challenging topic for their key stage 4 classes and I'd wager the response would be 'moles'. This is reflected in the plethora of resources available to support teachers (see *Useful links*).

In my first year of teaching moles, I used shared resources. When using them, it was difficult to model my train of thought and calculations. The lessons did contain lots of tasks and activities and students were working independently but there was a sea of confusion and little opportunity for class discussion. In my second year, I modelled the calculations using the visualiser, incorporating mini whiteboards (MWBs) and cold calling. As a class we had practised the individual steps involved to solve a problem, and the students were now engaged in independent practice, successfully completing each step, when I was asked the following question:

Do we use the coefficients [from the balanced symbol equation] to calculate molar mass?

This showed me that students did not have a deeper understanding of moles. Having recently attended training on probing questions, I investigated whether this strategy could help. Probing questions are open-ended and promote deep thinking because students need to do more than recall: they need to explain and elaborate, often using prior knowledge (Sahin and Kulm, 2008). They can be used to diagnose the issue by facilitating class discussion, providing a tool to determine what students are thinking (Pimentel and McNeill, 2013).

Box 1 Probing question steps

- Students were supplied with a moles question that had been answered incorrectly.
- Students then worked in pairs to find the mistakes.
- I circulated, listening to student conversations.
- Students then completed the question themselves, independently.
- This was followed with a think-write-pair-share task to compare their answers.
- Students then completed a fresh moles problem on mini whiteboards.
- This solution was then discussed in a think-write-pair-share.
- Students shared their work as part of class discussion.

Context

This study was completed at an inner London 11–18 academy. The school currently has 1305 students and we follow OCR Gateway GCSE Chemistry. Teachers engage in regular evidence-based professional development throughout the year, both school wide and intradepartmental. We have a longer school day (08.30–16.30), and students have regular weekly homework from every subject. The class that is the focus of this study was year 10 (ages 14–15) set 1 of 9.

Approach

Probing questions were used to facilitate class discussion and to direct the students and teacher to understand misconceptions when teaching moles. Box 1 lists the steps involved.

During my circulating, it was clear that most students identified one mistake but only around half identified the second, which was connected to the stoichiometry of the chemical equation. Box 2 gives an extract of the class discussion that was recorded during the lesson. Use of MWBs is important because it reduces the stakes. Think-write-pair-share activities allow students to become comfortable with making mistakes and to practise correcting each other's work, openly and respectfully. Box 3 shows examples of probing questions.

To assess progress, a simple moles calculation exit slip (Figure 1) was used at the end of the lesson; this was repeated two weeks later to assess retention.

Moles exit sheet

$C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

1 What is the definition of molar mass?
2 What is the purpose of the coefficients in the above chemical equation?
3 Why do we need them?
4 What mass of oxygen is required to react with 132 g of propane?
5 What mass of CO_2 is produced?

Figure 1 Example exit slip for $C_3H_8 + 5O_2 \rightarrow 3CO_2 + 4H_2O$

Box 2 Transcript of class discussion

Teacher: *Why do we balance a chemical equation?*

Student: *So we can have the same number of elements on the left as we do on the right.*

[pause left for students to hear and process, hands slowly begin to raise]

So we have the same number of atoms?

[more time passes]

... types of atoms.

We now had the correct terminology and key words. Students were then given a task to balance a chemical equation, which was completed with a high success rate.

Teacher: *Why don't we use the coefficient to calculate the molar mass of a compound?*

[pause]

Teacher: *What is molar mass?*

Student: *The coefficient changes the way the element is made up, so ... by adding it, it doesn't really ... it doesn't really make sense of what it's supposed to be... $2H_2O$ is different from just H_2O.*

[pause]

Teacher: *What's the difference between H_2O and $2H_2O$?*

Student 2: *There's twice as many moles.*

Teacher: *Yes, the difference is in the quantity of the molecule you have, not the type of molecule; a mole is a measure of the quantity. What is the molar mass?*

Student 3: *Is it the protons and neutrons?*

Teacher: *No, don't go sub-level.*

Teacher (to the class): *What is the molar mass?*

Student 3: *Um, the mass of a compound, um, when, um, it's only one mole.*

Teacher: *Yes, it is the mass of one mole of a compound.*

Teacher: *So, why don't we use the coefficient when calculating molar mass?*

[more hands go up]

Student: *It's not the same as one mole; if we use the coefficient, it's not the same as one mole.*

Box 3 Example probing questions

How did you get that/it?
What is another example of ...?
How do you know?
Why do you agree with ...?
Why?'

Findings

Using probing questions forced students to think and explain what molar mass was, what the coefficients in a balanced equation were used for and, therefore, why coefficients from a balanced symbol equation are not used to calculate molar mass. At the end of the approach, all students had completed the moles exit slip correctly. Two weeks later, a different moles question in the same format was completed, with only five students making a mistake in the calculation. Originally, 16 students presented the coefficient misconception. This shows that misconceptions may have been reduced using this strategy.

Reflections and next steps

This is a small case study that only reports my findings from a high-attaining group of students (set 1). Since this study, I have been trialling this approach with lower-attaining students. This case study has helped me to reflect on how I have developed my use of resources and plan my questioning.

Probing questions are different from higher-order questions because they are instructional rather than involving analysis or application (Sahin and Kulm, 2008). Sahin and Kulm found that teachers recognised the importance of probing questions, although few purposefully incorporated them into lessons. I thought probing questions would need to be planned and so involved more preparation. It can be as simple as asking: 'Why?' Following on from this class, I have rolled out this strategy with all my year 10 classes, and as a department we are looking to redesign these lessons to purposefully create class discussion through probing questions.

Acknowledgement

With thanks to Andrew Chandler-Grevatt, Senior Lecturer at the University of Brighton, for his support as writing mentor for this article.

Useful links

RSC Education: https://edu.rsc.org/searchresults?parametrics=&qkeyword=moles

References

Pimentel, D.S. and McNeill, K.L. (2013) Conducting talk in secondary science classrooms: Investigating instructional moves and teachers' beliefs. *Science Education*, **97**(3), 367–394.

Sahin, A. and Kulm, G. (2008) Sixth grade mathematics teachers' intentions and use of probing, guiding, and factual questions. *Journal of Mathematics Teacher Education*, **11**, 221–241.

Amiera Davies is Head of Chemistry at Cranmore Independent Boys' School.
✉ amiera.davies@cranmore.org

- Evidence informed teaching approaches with professional findings and reflection (qualitative)
  - teaching tricky ideas (biology, chemistry, physics)
  - pedagogical approaches (questioning, use of diagrams, oracy…)
  - implementing a school-wide approach in a science classroom context

[Using probing questions to support the teaching and learning of moles (Davies) | www.ase.org.uk]

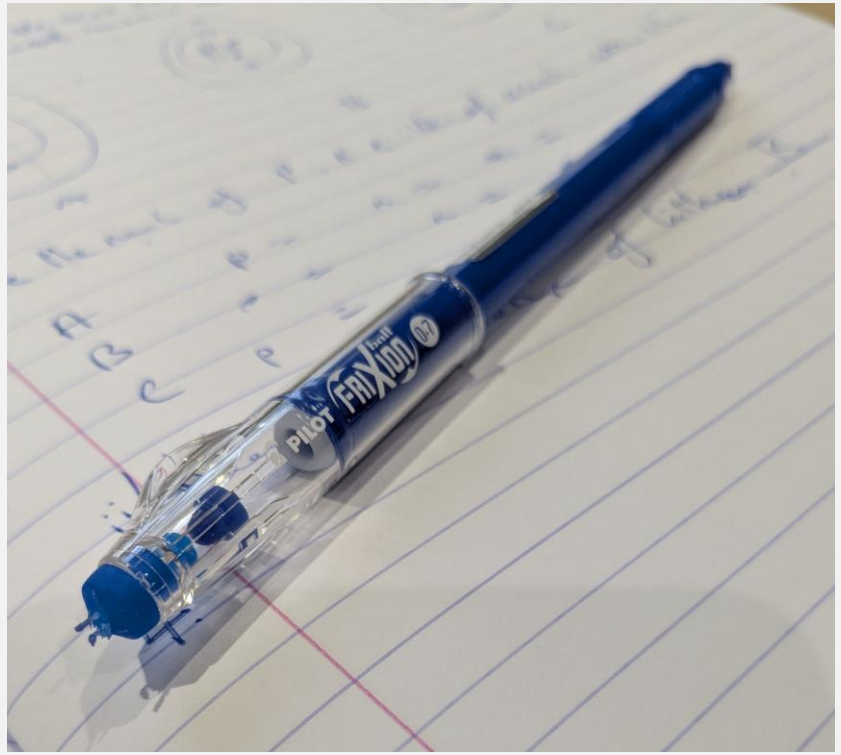
ASSOCIATION FOR SCIENCE EDUCATION

Tip 4

Use sections to structure your writing.

ASSOCIATION FOR SCIENCE EDUCATION

Getting started



- Do not aim for writing perfection in your first draft
- Get your ideas down and then refine language later
- Consider the best medium for the ideas stage (it could be pen and paper!)
- Remember that you can look at example articles to help with style

Structure

Introductory text	Maximum 15 words Format: [Author(s) names] shares/discusses/describes/other verb …
Introduction	Something to draw the reader in and introduce the topic of the article. It sometimes helps to write this last.
Main narrative	Please use subheadings to divide up the text and provide visual guidance to the reader. Writing should be formal but concise and accessible in style. Articles should be clear to read to all working in science education in the UK and internationally. If referring to qualifications or curriculum stages, please add the age range in brackets to support readers from other countries. The SSR design facilitates the use of boxes for standalone text. Please specify in your article manuscript.
Conclusion	A paragraph to wrap up the article and to precede the references. The subheading does not have to be conclusion.
Acknowledgements	For a person, please use the format: 'I/We would like to thank [name], [role] at [institution] for…' For an organisation, please use the format: 'I/We would like to thank [organisation], for…'
Useful links	List any open access resources mentioned in the article. Alternatively, the subheading may be 'Further information', which allows the listing of links to additional information.
References	The number and type of references should be appropriate to the type of article. See "article types and expectations" table below. References should be presented as Harvard but our copyediting team can format references if you are not familiar with this referencing system.

General structure – from https://www.ase.org.uk/SSR-submission-guidelines

- Using sections can help ensure you include key requirements
- Sub-headings help the reader to navigate your article
- Consider writing your introduction ("hook") last

ASSOCIATION FOR SCIENCE EDUCATION

Tip 5

Think about your audience when you write.

ASSOCIATION FOR SCIENCE EDUCATION

Reader expertise and experience

The reader experience should be a top priority.

- SSR readers have a wide range of subject expertise and professional experience
- The more readable and accessible your article, the greater the range of readers it will attract
- 11 to16 articles - assume reader is a non-specialist
- 16 to18 articles - assume subject specialist

ASSOCIATION FOR SCIENCE EDUCATION

Audience - international readership

SSR has an international readership

- Do not assume familiarity with UK curricula or qualifications
- Always give an age group
- Keep language clear and clarify any highly technical terms
- Write acronyms in full on first use
- Avoid metaphors

ASSOCIATION FOR SCIENCE EDUCATION

Tip 6

Approach peer review feedback as a developmental opportunity.

ASSOCIATION FOR SCIENCE EDUCATION

Peer review - process

Process

- anonymised script
- two anonymous reviewers
- feedback returned
- re-work as outlined by SSR content editor

Approach

- supportive
- improving

ASSOCIATION FOR SCIENCE EDUCATION

Summary

ASSOCIATION FOR SCIENCE EDUCATION

Top tips

1. Understand the readership, reach and remit
2. Understand the process stages
3. Be brave and submit an article idea
4. Use sections to structure your writing
5. Think about your audience when you write
6. Approach peer review as a developmental opportunity

ASSOCIATION FOR SCIENCE EDUCATION

Next steps

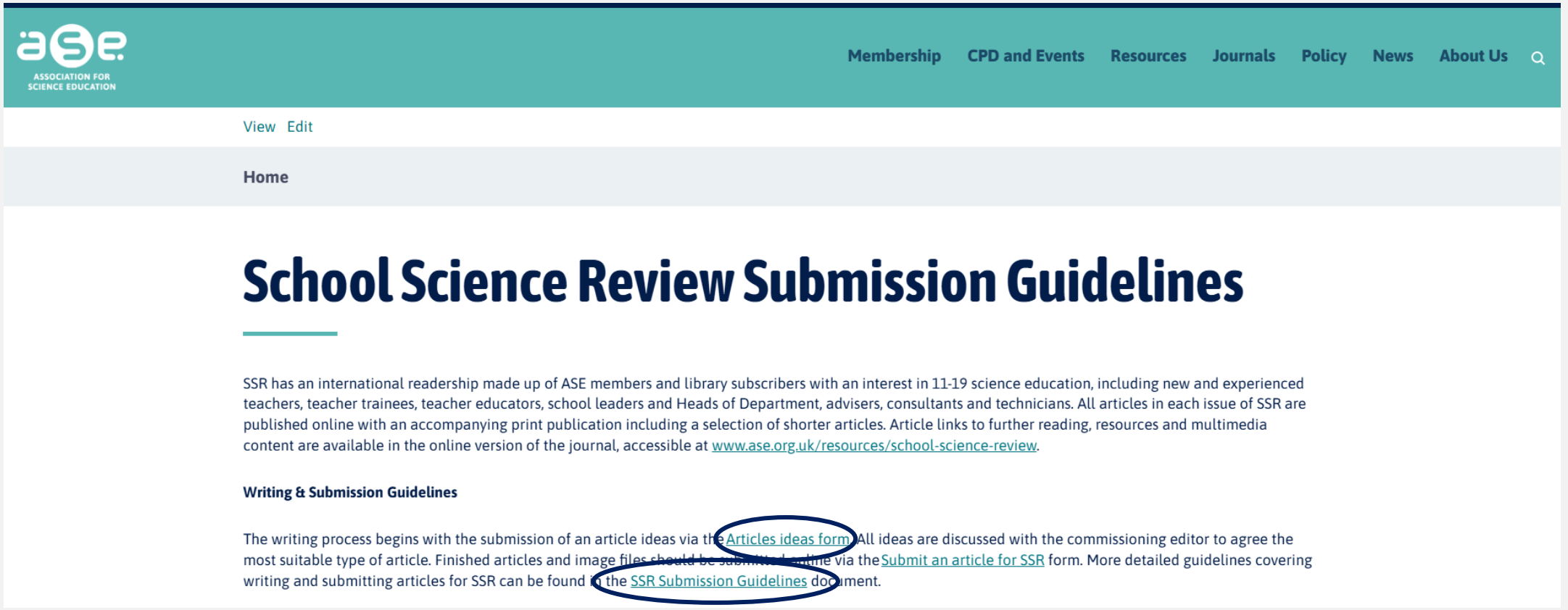
Links to supporting information

Individual reflection

ASSOCIATION FOR SCIENCE EDUCATION

Useful links

www.ase.org.uk>Journals>Write for ASE> SSR



ASSOCIATION FOR SCIENCE EDUCATION

Individual reflection

Please do submit an article idea (or two)…and let us support you on your SSR journey.

Has your confidence in getting published in SSR increased?

Are you feeling inspired?

Do you have further questions?

Q&A

helenhardenASE@gmail.com

ASSOCIATION FOR SCIENCE EDUCATION

Engage Teacher Conference

Thank you

Complete the **5-minute feedback form** for the chance to win one of ten **£10 Amazon vouchers**!
https://www.tfaforms.com/5181926

Run by

Managed by

crestawards.org/engage
crest@britishscienceassociation.org