

## Boosting scientific literacy

Give your students the kick-start they need to dive deep into scientific language

### HERE'S A CLEAR CONNECTION

Between science skills and maths ability, but science success also depends on literacy skills. Scientific literacy is understanding science concepts and being able to apply them in reading, writing, speaking and listening. Developing science literacy is important for success in the subject, but also in life. It involves combining science-specific language with basic literacy skills.

Here are some tried-and-tested ways to encourage and enhance science-focused talk, discussion and debating skills in your classroom.

#### 1. Use a visual stimulus

Present students with an interesting picture and ask them what they see. They can do this in pairs, small groups or individually. In science we want students to be good at observation, to be able to describe what they see in detail. We can guide students through careful questioning to focus with greater discrimination.

This type of activity provides students with a fun way to describe what they see. From descriptions, students might then be able to make inferences, such as when and where a photo was taken, as well as other background details.

You can then remove the photo and ask groups of students to recall what they saw. They often do quite well when working together. Over time these types of activity help to develop students' retrieval capacity and reinforce the importance and reasons for working collaboratively.

#### 2. Encourage healthy debate

Students often find the difference between describing and explaining a real challenge. Use images that might be familiar, but presented in an unfamiliar way to get them to use

their imaginations, be creative and think critically.

Invite students to describe what they're looking at, individually or in pairs. Then ask students if they can explain their thinking? It takes some imagination and creative thought to identify unusual images and this is a great way to encourage descriptive dialogue and discussion skills.

Scientists don't accept an answer unless it has a convincing explanation. So your students need to explain and apply evidence here. What evidence are they using to identify the object? This process can help develop students' debating skills because they need to support and defend their ideas with evidence. You can use this type of activity as a whole-school competition, where students are invited to identify, with explanations, what the image is.

#### 3. Get students investigating

Meteorite impact is a popular investigation where students must research the correlation between the height you drop an object (a marble, a small rock fragment, etc) from and the size of the crater it makes. This models the way craters are formed by meteorite impacts.

Before you get students to do this activity, show them a picture of the moon's surface to help them understand the difference between description and explanation. This task further develops their ability to describe something in detail with an explanation. Ask them to describe what they see, explaining the detail and background information.

Often students are quick to recognise that it's a photo of the moon with craters. However, to develop their observational skills and how they describe what they see, prompt questions can be helpful. For example, what colours do they see? Can students describe the crater shapes? What can they say about the crater sizes? And are the craters distributed equally across the moon's surface?

You can then ask students to explain their observations. Why are the craters circular? Why are they different sizes? Often, students will provide an explanation using ideas such as meteorites being different sizes, masses or travelling at different velocities.

To develop students understanding further ask them to focus on a section of the moon's surface. Can they describe the relationship between crater sizes (smaller ones are always on top of larger ones)? Can they then explain why (the larger craters, if formed by bigger impactors, would have more mass, and would be preferentially attracted towards the moon. There are many other possible explanations.

We need to use engaging activities to develop science literacy. The activities presented here focus on observation, description and explanation, to develop a foundation for confident argumentation and scientific literacy. ■

Andy Markwick

