

## Level 0-2:

**Goal:** Students will become aware of what makes an argument more convincing (making your reasoning clear to your reader) and will practice doing this in their own writing.

**Teaching Strategy:** Use the Reasoning Tool to first make students aware of how important it is to write complete, reasoned arguments; next, have students practice doing this in their own writing

**Works Best With:** Individuals, with some whole class and paired discussion supporting the learning

### Details:

#### Preparation:

- Prepare to project or otherwise show the important documents for this lesson. In order to draw attention to the importance of including reasoning in arguments it is worthwhile to work through the first part of this lesson with the whole class. This introductory section of the lesson will help to ensure that all students are starting their work with the same (or similar) understandings of the importance of reasoning. To do this section of the lesson well, it is important that you project various documents, described below, for the class.
- Prepare copies of the **Reasoning Tool with Microbiome Argument** and the **Human Microbiome article** for all students.

#### Teaching:

1. Review basic concepts with students regarding the important components of an argument. Use the **Argument Representation** as needed, by projecting it for the class in order to reinforce the components of an argument.
2. Explain that reasoning is often left out when people make arguments. Say, *Many people, adults and young people alike, often forget to explain their reasoning or why and how they believe the evidence supports the claim. When you do not explain your reasoning, your argument is weak and not very clear or convincing. When you are trying to convince others and make the strongest argument you can, it is very important to include reasoning.*
3. Project **Blank Reasoning Tool**. Explain that this is the tool they will use to help make sure they are explaining their reasoning. Say, *This chart will help you to think carefully about how the information you want to explain is connected in a logical, clear and convincing way.*
4. Project **Simple Argument** image. Say, *many people make simple arguments like this every day. This isn't a very convincing argument, and it isn't a scientific*

- argument. What is it missing?* Ask students to share a few ideas about why it isn't convincing and what would make it more so (evidence, for instance).
5. Project the **Simple Argument with Evidence** image. Read over the information on this slide. Discuss how this is a more convincing argument; however it does not include some very important pieces.
  6. Ask students, *'Why is vitamin C good for you? Why is fiber good for you? It is true that vegetables include Vitamin C and fiber, but this argument does not explain why these are important; they don't explain how this evidence supports the claim. This is why it is not a convincing argument. However, many people stop here and just say this much. In this class, I am going to expect you to do more. In order to make this convincing, you will need to explain how or why this evidence is important. When we explain why evidence is important, we are including our reasoning. Even though this reasoning might feel obvious to us, it's important to make it clear for our readers. This is where explaining your reasoning and the Reasoning Tool come in.'*
  7. Project the **Reasoning Tool with Vegetable Argument, One** image. Go over the example presented in the image. Explain that this tool will help students to 'unpack' the ideas they want to present in their arguments. It will offer a helpful reminder of the importance to connecting students' evidence to their claim, and of fully explaining their thinking – two important components of reasoning.
  8. Project the **Reasoning Tool with Vegetable Argument, Two** image. Read over each row. Discuss how this example now provides a much richer, more complete and more convincing argument, after the middle column, 'Why this evidence matters...' has been completed for each piece of evidence.
  9. Project the **Reasoning Tool with the Microbiome argument**. Tell students that they will read about something called the Human Microbiome today. This is a partially completed Reasoning Tool with evidence from the Microbiome article. Their job will be to add to the middle column, 'Why this evidence matters...' by reading the article.
  10. Project the Human Microbiome article. Tell students that they will read this article in order to complete the **Reasoning Tool with the Microbiome argument**.
  11. Briefly introduce the concept of a Human Microbiome. Tell students that the human body, as with all organisms, carries trillions of microscopic organisms all over it. This article will explain more about this tiny ecosystem.
  12. Have students read. As they read, circulate and remind them to complete the middle column. As needed, direct students to the places in the article where they can find the information they need to complete the assignment.
  13. Discuss findings. After students have completed their Reasoning Tool charts, ask students to share.
  14. Turn the Reasoning Tool assignment into a written argument. Explain that this tool now carries all the information needed in order to complete a clear, convincing argument. Project a completed student example and model how you might turn each line of this tool into a written argument.

#### Resources:

- **Argument Representation**

- **Reasoning Powerpoint**
  - **Blank Reasoning Tool image**
  - **Simple Argument image**
  - **Simple Argument with Evidence image**
  - **Reasoning Tool with Vegetable Argument, One image**
  - **Reasoning Tool with Vegetable Argument, Two**
- **Reasoning Tool with Microbiome Argument**
- **Microbiome Article**

**Why This Matters:**

Advancing a claim and supporting it with evidence are the first steps to create an effective argument. However, without solid scientific reasoning, an argument lacks the link that connects the claim to the evidence. Reasoning in a scientific argument is often where students' showcase their scientific content knowledge and theoretical understanding of concepts. Through coaching students to make this knowledge clear and transparent, we help them to become more effective communicators and scientists.