

## INTRODUCTION

Debates in the classroom are teaching tools that increase critical thinking skills and simulate an important practice done by real scientists. Before a debate, students conduct research, communicate with peers, and form opinions. During a debate, students consider multiple points of view and make new judgments based on the arguments presented. After a debate, students will have learned important lessons about communication, scientific argument, compromise, empathy, and decision making.

Debates actively engage students in the learning process. These activities extend learning by allowing students to identify problems, conduct background research, challenge misconceptions, and practice communication skills. Presenting an idea and supporting it with logical reasoning are important not only in science careers but in many other career fields as well.



### *Connect to Unit Content*

Classroom debates can help students learn science more effectively by analyzing and discussing unit content in the context of real-world scenarios.

Debates can be used before, during, or after completion of a Science A–Z unit. Prior to unit study, debates can be used to introduce a topic, stimulate thinking, activate prior knowledge, and identify student misconceptions. During unit study, debates present material in a dynamic way that directly involves students. After unit study, debates are useful for reviewing unit content, for extending and solidifying knowledge, and for individual or group assessment.

### *About the Resource*

Science A–Z debates present fictional scenarios related to unit topics. Students are encouraged to weigh the pros and cons of a proposed solution and then defend a position through interactive debate.

- Each debate begins by stating a **Purpose** to frame the debate.
- To activate prior knowledge and boost understanding, **Background** information is provided.

- The **Situation** introduces the debate by describing an age-appropriate scenario related to unit content.
- The **Proposal** identifies a proposed course of action, which frames the debate.
- Page 2 provides **blank position cards**, upon which students can invent characters and explain why they do or do not agree with the Proposal.
- Page 3 consists of **completed position cards** with fictional characters and their pro or con positions.

## BEFORE THE DEBATE

### *Prior Knowledge and Research*

Preview the debate by asking students to carefully read the Purpose, Background, and Situation. Invite students to share their prior knowledge on the subject of the debate. Students may also need to conduct additional research on the topic by visiting the library or using the Internet. Be sure to check students' sources—especially those from the Internet—to ensure that they are high-quality, reputable sites.

Hold a class discussion to stimulate thinking and to access prior knowledge. Encourage students to start considering whether they will argue for the pro or con side, or assign students to a side.

### *Grouping*

Decide how students will be grouped during the debate. Various debate styles can be used, depending on age and ability.

- A student from each side can be selected to participate in a formal one-on-one debate in front of the class.
- Small groups of students from each side can hold discussion-style debates.
- An informal debate can involve the entire class at once.
- The whole class can debate with the teacher.

### *Formal vs. Informal Debate*

Formal debates require establishing rules such as the length of time allowed for each presenter, rules of etiquette, and rebuttal. Informal debates can be much less rigorous and are more likely to simulate the everyday debate practices of real scientists.

## DURING THE DEBATE



### *Using Blank Pro/Con Cards*

As a class or in small groups, brainstorm all of the stakeholders who would be affected by the Proposal. Chart these ideas on the board or have students record them in a journal. Using this information, ask students to invent a fictional character and complete at least one clipped-out pro or con card. Students should identify the character and what is important to him or her. They should also include at least three well-thought-out arguments that support the character's position.

Alternatively, assign students to either the pro or con side and have them complete an appropriate position card. By creating their own cards, students will practice creative and analytic skills by extracting different perspectives from the situation.

Student-made cards can then be used during the debate. Students can use their own position cards or trade with other students so that they are challenged to argue a new position.

### *Using Completed Pro/Con Cards*



For students at lower grade levels or for those needing additional support, use the completed pro/con cards. Have students read each position card and become familiar with the reasons for each fictional character's position. Have each student or small group choose a pro or con card, or assign students to a position. Then conduct the debate. Blank and completed cards can be used during the same debate to increase the number of characters and positions.

## AFTER THE DEBATE


Establish an end point for the debate. Debates can end after a given amount of time or can continue until all students have had a chance to present their position.

Decide whether a final decision about the proposal will be made, and if so, how. Students can vote on a winning side, or the teacher might choose a winning side on the basis of the quality of arguments presented. Alternatively, the class may come up with a new proposal that satisfies all parties. This can be an excellent opportunity to teach compromise and problem solving.

**NOTE:** In some cases, a debate may actually have a scientifically accepted correct answer rather than varying opinions. If students have concluded otherwise, discuss with them the factually correct side of the proposal. (For example, fire is, in fact, nonliving, and a platypus truly is a mammal.)

Recap the debate by asking students what they learned and whether their initial position was influenced by arguments they heard during the debate. Also discuss the debate process and ways to improve it for next time.

**EXTENSIONS AND VARIATIONS**

- *Variation*: Challenge students to argue from both the pro and con perspectives during the same debate.
- *Variation*: Use a ball (or other object) to identify the speaker during the debate. The student holding the ball presents his or her position and then passes the ball to the next student. Only the student holding the ball is allowed to speak.
- *Variation*: Perform a four-corners debate. Students stand in a corner of the classroom that represents one of four positions: strongly agree, agree, disagree, or strongly disagree. Call on students from each corner to present a position. As arguments are being made, students may change their position and move to another corner of the room. The four-corners strategy offers a dynamic and visual form of debate.
- *Writing*: Using the debate template, encourage students to write their own debate proposal on a topic that is interesting and important to them. Provide copies of the blank pro/con cards.
- *Writing*: Have students create a Venn diagram with statements supporting a proposal on one side, statements opposing the proposal on the other side, and ideas that could support both sides in the middle.
-  *Arts/Technology*: Allow students to create props, scenery, and costumes to enhance the debate. They might role-play the fictional characters, taking on the persona of a particular character and acting out his or her position. Provide students with fabric, cardboard, paints, and other art supplies. Use a digital camera to record the event, and then replay it for the class to allow students to assess their performance.
- *Home Connection*: Have students find articles in newspapers, in magazines, or online that are examples of how debate has been used to resolve problems in real life. Examples include political debates, environmental debates, debates over what kind of food to serve in school cafeterias, and debates over proposed new laws. Ask students to bring in their examples to share with the class.